User Guide

AWS CodeBuild



API Version 2016-10-06

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AWS CodeBuild: User Guide

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What is AWS CodeBuild?

AWS CodeBuild is a fully managed build service in the cloud. CodeBuild compiles your source code, runs unit tests, and produces artifacts that are ready to deploy. CodeBuild eliminates the need to provision, manage, and scale your own build servers. It provides prepackaged build environments for popular programming languages and build tools such as Apache Maven, Gradle, and more. You can also customize build environments in CodeBuild to use your own build tools. CodeBuild scales automatically to meet peak build requests.

CodeBuild provides these benefits:

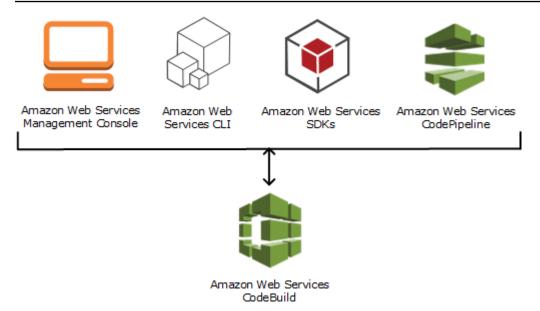
- **Fully managed** CodeBuild eliminates the need to set up, patch, update, and manage your own build servers.
- On demand CodeBuild scales on demand to meet your build needs. You pay only for the number of build minutes you consume.
- Out of the box CodeBuild provides preconfigured build environments for the most popular programming languages. All you need to do is point to your build script to start your first build.

For more information, see AWS CodeBuild.

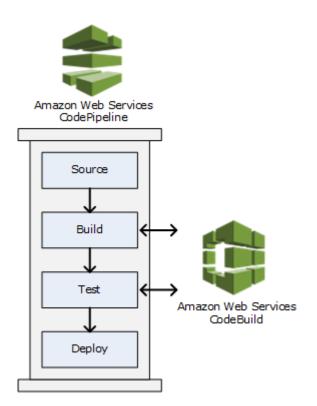
How to run CodeBuild

You can use the AWS CodeBuild or AWS CodePipeline console to run CodeBuild. You can also automate the running of CodeBuild by using the AWS Command Line Interface (AWS CLI) or the AWS SDKs.

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As the following diagram shows, you can add CodeBuild as a build or test action to the build or test stage of a pipeline in AWS CodePipeline. AWS CodePipeline is a continuous delivery service that you can use to model, visualize, and automate the steps required to release your code. This includes building your code. A *pipeline* is a workflow construct that describes how code changes go through a release process.



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To use CodePipeline to create a pipeline and then add a CodeBuild build or test action, see <u>Use</u> <u>CodeBuild with CodePipeline</u>. For more information about CodePipeline, see the <u>AWS CodePipeline</u> User Guide.

The CodeBuild console also provides a way to quickly search for your resources, such as repositories, build projects, deployment applications, and pipelines. Choose **Go to resource** or press the / key, and then enter the name of the resource. Any matches appear in the list. Searches are case insensitive. You only see resources that you have permissions to view. For more information, see Viewing resources in the console.

Pricing for CodeBuild

For information, see CodeBuild pricing.

How do I get started with CodeBuild?

We recommend that you complete the following steps:

- 1. **Learn** more about CodeBuild by reading the information in Concepts.
- 2. **Experiment** with CodeBuild in an example scenario by following the instructions in <u>Getting</u> started using the console.
- 3. Use CodeBuild in your own scenarios by following the instructions in Plan a build.

AWS CodeBuild concepts

The following concepts are important for understanding how CodeBuild works.

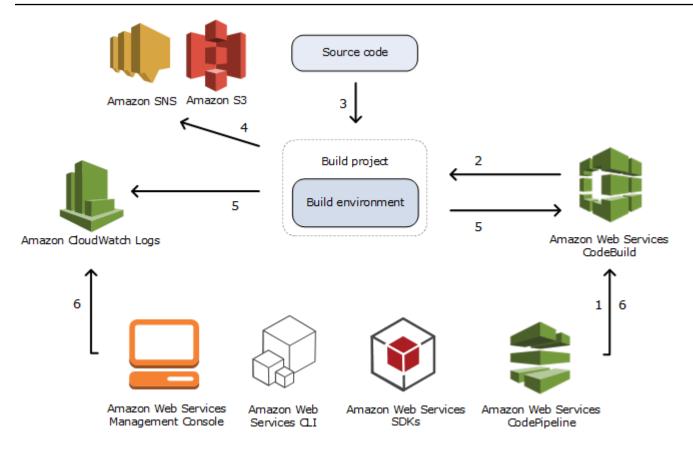
Topics

- How CodeBuild works
- Next steps

How CodeBuild works

The following diagram shows what happens when you run a build with CodeBuild:

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- 1. As input, you must provide CodeBuild with a build project. A *build project* includes information about how to run a build, including where to get the source code, which build environment to use, which build commands to run, and where to store the build output. A *build environment* represents a combination of operating system, programming language runtime, and tools that CodeBuild uses to run a build. For more information, see:
 - Create a build project
 - Build environment reference
- 2. CodeBuild uses the build project to create the build environment.
- 3. CodeBuild downloads the source code into the build environment and then uses the build specification (buildspec), as defined in the build project or included directly in the source code. A *buildspec* is a collection of build commands and related settings, in YAML format, that CodeBuild uses to run a build. For more information, see the Buildspec reference.
- 4. If there is any build output, the build environment uploads its output to an S3 bucket. The build environment can also perform tasks that you specify in the buildspec (for example, sending build notifications to an Amazon SNS topic). For an example, see Build notifications sample.

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5. While the build is running, the build environment sends information to CodeBuild and Amazon CloudWatch Logs.

6. While the build is running, you can use the AWS CodeBuild console, AWS CLI, or AWS SDKs to get summarized build information from CodeBuild and detailed build information from Amazon CloudWatch Logs. If you use AWS CodePipeline to run builds, you can get limited build information from CodePipeline.

Next steps

Now that you know more about AWS CodeBuild, we recommend these next steps:

- Experiment with CodeBuild in an example scenario by following the instructions in <u>Getting</u> started using the console.
- 2. **Use** CodeBuild in your own scenarios by following the instructions in Plan a build.

Next steps API Version 2016-10-06 5

Getting started with CodeBuild

In the following tutorials, you use AWS CodeBuild to build a collection of sample source code input files into a deployable version of the source code.

Both tutorials have the same input and results, but one uses the AWS CodeBuild console and the other uses the AWS CLI.



Important

We do not recommend that you use your AWS root account to complete this tutorial.

Topics

- Getting started with AWS CodeBuild using the console
- Getting started with AWS CodeBuild using the AWS CLI

Getting started with AWS CodeBuild using the console

In this tutorial, you use AWS CodeBuild to build a collection of sample source code input files (build input artifacts or build input) into a deployable version of the source code (build output artifact or build output). Specifically, you instruct CodeBuild to use Apache Maven, a common build tool, to build a set of Java class files into a Java Archive (JAR) file. You do not need to be familiar with Apache Maven or Java to complete this tutorial.

You can work with CodeBuild through the CodeBuild console, AWS CodePipeline, the AWS CLI, or the AWS SDKs. This tutorial demonstrates how to use the CodeBuild console. For information about using CodePipeline, see Use CodeBuild with CodePipeline.



Important

The steps in this tutorial require you to create resources (for example, an S3 bucket) that might result in charges to your AWS account. These include possible charges for CodeBuild and for AWS resources and actions related to Amazon S3, AWS KMS, and CloudWatch Logs. For more information, see AWS CodeBuild pricing, Amazon S3 pricing, AWS Key Management Service pricing, and Amazon CloudWatch pricing.

Topics

- Step 1: Create the source code
- Step 2: Create the buildspec file
- Step 3: Create two S3 buckets
- Step 4: Upload the source code and the buildspec file
- Step 5: Create the build project
- Step 6: Run the build
- Step 7: View summarized build information
- Step 8: View detailed build information
- Step 9: Get the build output artifact
- Step 10: Delete the S3 buckets
- Wrapping up

Step 1: Create the source code

(Part of: Getting started with AWS CodeBuild using the console)

In this step, you create the source code that you want CodeBuild to build to the output bucket. This source code consists of two Java class files and an Apache Maven Project Object Model (POM) file.

1. In an empty directory on your local computer or instance, create this directory structure.

2. Using a text editor of your choice, create this file, name it MessageUtil.java, and then save it in the src/main/java directory.

```
public class MessageUtil {
  private String message;

public MessageUtil(String message) {
   this.message = message;
}
```

```
public String printMessage() {
    System.out.println(message);
    return message;
}

public String salutationMessage() {
    message = "Hi!" + message;
    System.out.println(message);
    return message;
}
```

This class file creates as output the string of characters passed into it. The MessageUtil constructor sets the string of characters. The printMessage method creates the output. The salutationMessage method outputs Hi! followed by the string of characters.

3. Create this file, name it TestMessageUtil.java, and then save it in the /src/test/java directory.

```
import org.junit.Test;
import org.junit.Ignore;
import static org.junit.Assert.assertEquals;
public class TestMessageUtil {
 String message = "Robert";
 MessageUtil messageUtil = new MessageUtil(message);
 @Test
  public void testPrintMessage() {
    System.out.println("Inside testPrintMessage()");
   assertEquals(message,messageUtil.printMessage());
 }
 @Test
  public void testSalutationMessage() {
    System.out.println("Inside testSalutationMessage()");
   message = "Hi!" + "Robert";
    assertEquals(message, messageUtil.salutationMessage());
```

}

This class file sets the message variable in the MessageUtil class to Robert. It then tests to see if the message variable was successfully set by checking whether the strings Robert and Hi!Robert appear in the output.

4. Create this file, name it pom. xml, and then save it in the root (top level) directory.

```
project xmlns="http://maven.apache.org/POM/4.0.0"
    xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
    xsi:schemaLocation="http://maven.apache.org/POM/4.0.0 http://maven.apache.org/
maven-v4_0_0.xsd">
  <modelVersion>4.0.0</modelVersion>
  <groupId>org.example
  <artifactId>messageUtil</artifactId>
  <version>1.0</version>
  <packaging>jar</packaging>
  <name>Message Utility Java Sample App</name>
  <dependencies>
    <dependency>
      <groupId>junit
      <artifactId>junit</artifactId>
      <version>4.11</version>
      <scope>test</scope>
    </dependency>
  </dependencies>
  <build>
    <plugins>
      <plugin>
        <groupId>org.apache.maven.plugins
        <artifactId>maven-compiler-plugin</artifactId>
        <version>3.8.0</version>
      </plugin>
    </plugins>
  </build>
</project>
```

Apache Maven uses the instructions in this file to convert the MessageUtil.java and TestMessageUtil.java files into a file named messageUtil-1.0.jar and then run the specified tests.

At this point, your directory structure should look like this.

Step 2: Create the buildspec file

(Previous step: Step 1: Create the source code)

In this step, you create a build specification (build spec) file. A *buildspec* is a collection of build commands and related settings, in YAML format, that CodeBuild uses to run a build. Without a build spec, CodeBuild cannot successfully convert your build input into build output or locate the build output artifact in the build environment to upload to your output bucket.

Create this file, name it buildspec.yml, and then save it in the root (top level) directory.

```
version: 0.2
phases:
  install:
    runtime-versions:
      java: corretto11
  pre_build:
    commands:
      - echo Nothing to do in the pre_build phase...
  build:
    commands:
      - echo Build started on `date`
      - mvn install
  post_build:
    commands:
      - echo Build completed on `date`
artifacts:
  files:
    - target/messageUtil-1.0.jar
```

Important

Because a build spec declaration must be valid YAML, the spacing in a build spec declaration is important. If the number of spaces in your build spec declaration does not match this one, the build might fail immediately. You can use a YAML validator to test whether your build spec declaration is valid YAML.

Note

Instead of including a build spec file in your source code, you can declare build commands separately when you create a build project. This is helpful if you want to build your source code with different build commands without updating your source code's repository each time. For more information, see Buildspec syntax.

In this build spec declaration:

- version represents the version of the build spec standard being used. This build spec declaration uses the latest version, 0.2.
- phases represents the build phases during which you can instruct CodeBuild to run commands. These build phases are listed here as install, pre_build, build, and post_build. You cannot change the spelling of these build phase names, and you cannot create more build phase names.

In this example, during the build phase, CodeBuild runs the mvn install command. This command instructs Apache Maven to compile, test, and package the compiled Java class files into a build output artifact. For completeness, a few echo commands are placed in each build phase in this example. When you view detailed build information later in this tutorial, the output of these echo commands can help you better understand how CodeBuild runs commands and in which order. (Although all build phases are included in this example, you are not required to include a build phase if you do not plan to run any commands during that phase.) For each build phase, CodeBuild runs each specified command, one at a time, in the order listed, from beginning to end.

• artifacts represents the set of build output artifacts that CodeBuild uploads to the output bucket. files represents the files to include in the build output. CodeBuild uploads the single messageUtil-1.0. jar file found in the target relative directory in the build environment.

The file name messageUtil-1.0.jar and the directory name target are based on the way Apache Maven creates and stores build output artifacts for this example only. In your own builds, these file names and directories are different.

For more information, see the Buildspec reference.

At this point, your directory structure should look like this.

Step 3: Create two S3 buckets

(Previous step: Step 2: Create the buildspec file)

Although you can use a single bucket for this tutorial, two buckets makes it easier to see where the build input is coming from and where the build output is going.

- One of these buckets (the *input bucket*) stores the build input. In this tutorial, the name of this input bucket is codebuild-region-ID-account-ID-input-bucket, where region-ID is the AWS Region of the bucket and account-ID is your AWS account ID.
- The other bucket (the *output bucket*) stores the build output. In this tutorial, the name of this output bucket is codebuild-*region-ID*-account-ID-output-bucket.

If you chose different names for these buckets, be sure to use them throughout this tutorial.

These two buckets must be in the same AWS Region as your builds. For example, if you instruct CodeBuild to run a build in the US East (Ohio) Region, these buckets must also be in the US East (Ohio) Region.

For more information, see Creating a Bucket in the Amazon Simple Storage Service User Guide.



Note

Although CodeBuild also supports build input stored in CodeCommit, GitHub, and Bitbucket repositories, this tutorial does not show you how to use them. For more information, see Plan a build.

Step 4: Upload the source code and the buildspec file

(Previous step: Step 3: Create two S3 buckets)

In this step, you add the source code and build spec file to the input bucket.

Using your operating system's zip utility, create a file named MessageUtil.zip that includes MessageUtil.java, TestMessageUtil.java, pom.xml, and buildspec.yml.

The MessageUtil.zip file's directory structure must look like this.

```
MessageUtil.zip
    |-- pom.xml
    |-- buildspec.yml
    `-- src
         |-- main
               `-- java
                      `-- MessageUtil.java
         `-- test
                `-- java
                      `-- TestMessageUtil.java
```

Important

Do not include the (root directory name) directory, only the directories and files in the (root directory name) directory.

Upload the MessageUtil.zip file to the input bucket named codebuild-region-ID-account-ID-input-bucket.

Important

For CodeCommit, GitHub, and Bitbucket repositories, by convention, you must store a build spec file named buildspec.yml in the root (top level) of each repository or include the build spec declaration as part of the build project definition. Do not create a ZIP file that contains the repository's source code and build spec file.

For build input stored in S3 buckets only, you must create a ZIP file that contains the source code and, by convention, a build spec file named buildspec.yml at the root (top level) or include the build spec declaration as part of the build project definition.

If you want to use a different name for your build spec file, or you want to reference a build spec in a location other than the root, you can specify a build spec override as part of the build project definition. For more information, see Buildspec file name and storage location.

Step 5: Create the build project

(Previous step: Step 4: Upload the source code and the buildspec file)

In this step, you create a build project that AWS CodeBuild uses to run the build. A build project includes information about how to run a build, including where to get the source code, which build environment to use, which build commands to run, and where to store the build output. A build environment represents a combination of operating system, programming language runtime, and tools that CodeBuild uses to run a build. The build environment is expressed as a Docker image. For more information, see Docker overview on the Docker Docs website.

For this build environment, you instruct CodeBuild to use a Docker image that contains a version of the Java Development Kit (JDK) and Apache Maven.

To create the build project

- Sign in to the AWS Management Console and open the AWS CodeBuild console at https:// console.aws.amazon.com/codesuite/codebuild/home.
- Use the AWS region selector to choose an AWS Region where CodeBuild is supported. For more information, see AWS CodeBuild endpoints and quotas in the Amazon Web Services General Reference.
- If a CodeBuild information page is displayed, choose **Create build project**. Otherwise, on the navigation pane, expand **Build**, choose **Build projects**, and then choose **Create build project**.

4. On the **Create build project** page, in **Project configuration**, for **Project name**, enter a name for this build project (in this example, codebuild-demo-project). Build project names must be unique across each AWS account. If you use a different name, be sure to use it throughout this tutorial.

Note

On the **Create build project** page, you might see an error message similar to the following: **You are not authorized to perform this operation.** This is most likely because you signed in to the AWS Management Console as an user who does not have permissions to create a build project.. To fix this, sign out of the AWS Management Console, and then sign back in with credentials belonging to one of the following IAM entities:

- An administrator user in your AWS account. For more information, see <u>Creating your</u> first AWS account root user and group in the *user Guide*.
- An user in your AWS account with the AWSCodeBuildAdminAccess,
 AmazonS3ReadOnlyAccess, and IAMFullAccess managed policies attached to
 that user or to an IAM group that the user belongs to. If you do not have an user
 or group in your AWS account with these permissions, and you cannot add these
 permissions to your user or group, contact your AWS account administrator for
 assistance. For more information, see <u>AWS managed</u> (predefined) policies for AWS
 CodeBuild.

Both options include administrator permissions that allow you to create a build project so you can complete this tutorial. We recommend that you always use the minimum permissions required to accomplish your task. For more information, see AWS CodeBuild permissions reference.

- 5. In **Source**, for **Source provider**, choose **Amazon S3**.
- 6. For Bucket, choose codebuild-region-ID-account-ID-input-bucket.
- 7. For **S3 object key**, enter **MessageUtil.zip**.
- 8. In **Environment**, for **Environment image**, leave **Managed image** selected.
- 9. For **Operating system**, choose **Amazon Linux**.
- 10. For Runtime(s), choose Standard.

- 11. For Image, choose aws/codebuild/amazonlinux-x86_64-standard:corretto11.
- 12. In Service role, leave New service role selected, and leave Role name unchanged.
- 13. For **Buildspec**, leave **Use a buildspec file** selected.
- 14. In **Artifacts**, for **Type**, choose **Amazon S3**.
- 15. For Bucket name, choose codebuild-region-ID-account-ID-output-bucket.
- 16. Leave Name and Path blank.
- 17. Choose Create build project.

Step 6: Run the build

(Previous step: Step 5: Create the build project)

In this step, you instruct AWS CodeBuild to run the build with the settings in the build project.

To run the build

- Open the AWS CodeBuild console at https://console.aws.amazon.com/codesuite/codebuild/ home.
- 2. In the navigation pane, choose **Build projects**.
- 3. In the list of build projects, choose **codebuild-demo-project**, and then choose **Start build**. The build starts immediately.

Step 7: View summarized build information

(Previous step: Step 6: Run the build)

In this step, you view summarized information about the status of your build.

To view summarized build information

- If the codebuild-demo-project: <build-ID> page is not displayed, in the navigation bar, choose Build history. Next, in the list of build projects, for Project, choose the Build run link for codebuild-demo-project. There should be only one matching link. (If you have completed this tutorial before, choose the link with the most recent value in the Completed column.)
- 2. On the **Build status** page, in **Phase details**, the following build phases should be displayed, with **Succeeded** in the **Status** column:

Step 6: Run the build API Version 2016-10-06 16

- SUBMITTED
- QUEUED
- PROVISIONING
- DOWNLOAD_SOURCE
- INSTALL
- PRE_BUILD
- BUILD
- POST_BUILD
- UPLOAD_ARTIFACTS
- FINALIZING
- COMPLETED

In **Build Status**, **Succeeded** should be displayed.

If you see **In Progress** instead, choose the refresh button.

Next to each build phase, the **Duration** value indicates how long the build phase lasted. The
 End time value indicates when that build phase ended.

Step 8: View detailed build information

(Previous step: Step 7: View summarized build information)

In this step, you view detailed information about your build in CloudWatch Logs.

Note

To protect sensitive information, the following are hidden in CodeBuild logs:

- AWS access key IDs. For more information, see <u>Managing Access Keys for IAM Users</u> in the AWS Identity and Access Management User Guide.
- Strings specified using the Parameter Store. For more information, see <u>Systems Manager Parameter Store</u> and <u>Systems Manager Parameter Store Console Walkthrough</u> in the *Amazon EC2 Systems Manager User Guide*.

 Strings specified using AWS Secrets Manager. For more information, see Key management.

To view detailed build information

- With the build details page still displayed from the previous step, the last 10,000 lines of the build log are displayed in **Build logs**. To see the entire build log in CloudWatch Logs, choose the **View entire log** link.
- In the CloudWatch Logs log stream, you can browse the log events. By default, only the last set of log events is displayed. To see earlier log events, scroll to the beginning of the list.
- In this tutorial, most of the log events contain verbose information about CodeBuild downloading and installing build dependency files into its build environment, which you probably don't care about. You can use the **Filter events** box to reduce the information displayed. For example, if you enter "[INF0]" in Filter events, only those events that contain [INFO] are displayed. For more information, see Filter and pattern syntax in the Amazon CloudWatch User Guide.

Step 9: Get the build output artifact

(Previous step: Step 8: View detailed build information)

In this step, you get the messageUtil-1.0. jar file that CodeBuild built and uploaded to the output bucket.

You can use the CodeBuild console or the Amazon S3 console to complete this step.

To get the build output artifact (AWS CodeBuild console)

With the CodeBuild console still open and the build details page still displayed from the previous step, choose the **Build details** tab and scroll down to the **Artifacts** section.



Note

If the build details page is not displayed, in the navigation bar, choose **Build history**, and then choose the Build run link.

2. The link to the Amazon S3 folder is under the **Artifacts upload location**. This link opens the folder in Amazon S3 where you find the messageUtil-1.0.jar build output artifact file.

To get the build output artifact (Amazon S3 console)

- 1. Open the Amazon S3 console at https://console.aws.amazon.com/s3/.
- 2. Open codebuild-region-ID-account-ID-output-bucket.
- 3. Open the codebuild-demo-project folder.
- 4. Open the target folder, where you find the messageUtil-1.0.jar build output artifact file.

Step 10: Delete the S3 buckets

(Previous step: Step 9: Get the build output artifact)

To prevent ongoing charges to your AWS account, you can delete the input and output buckets used in this tutorial. For instructions, see <u>Deleting or Emptying a Bucket</u> in the *Amazon Simple Storage Service User Guide*.

If you are using the IAM user or an administrator IAM user to delete these buckets, the user must have more access permissions. Add the following statement between the markers (### BEGIN ADDING STATEMENT HERE ### and ### END ADDING STATEMENTS HERE ###) to an existing access policy for the user.

The ellipses (...) in this statement are used for brevity. Do not remove any statements in the existing access policy. Do not enter these ellipses into the policy.

```
{
   "Version": "2012-10-17",
   "Id": "...",
   "Statement": [
        ### BEGIN ADDING STATEMENT HERE ###
   {
        "Effect": "Allow",
        "Action": [
            "s3:DeleteBucket",
            "s3:DeleteObject"
        ],
        "Resource": "*"
```

```
}
    ### END ADDING STATEMENT HERE ###
  ٦
}
```

Wrapping up

In this tutorial, you used AWS CodeBuild to build a set of Java class files into a JAR file. You then viewed the build's results.

You can now try using CodeBuild in your own scenarios. Follow the instructions in Plan a build. If you don't feel ready yet, you might want to try building some of the samples. For more information, see Use case-based samples for CodeBuild.

Getting started with AWS CodeBuild using the AWS CLI

In this tutorial, you use AWS CodeBuild to build a collection of sample source code input files (called build input artifacts or build input) into a deployable version of the source code (called build output artifact or build output). Specifically, you instruct CodeBuild to use Apache Maven, a common build tool, to build a set of Java class files into a Java Archive (JAR) file. You do not need to be familiar with Apache Maven or Java to complete this tutorial.

You can work with CodeBuild through the CodeBuild console, AWS CodePipeline, the AWS CLI, or the AWS SDKs. This tutorial demonstrates how to use CodeBuild with the AWS CLI. For information about using CodePipeline, see Use CodeBuild with CodePipeline.

The steps in this tutorial require you to create resources (for example, an S3 bucket) that might result in charges to your AWS account. These include possible charges for CodeBuild and for AWS resources and actions related to Amazon S3, AWS KMS, and CloudWatch Logs. For more information, see CodeBuild pricing, Amazon S3 pricing, AWS Key Management Service pricing, and Amazon CloudWatch pricing.

Topics

- Step 1: Create the source code
- Step 2: Create the buildspec file

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- Step 3: Create two S3 buckets
- Step 4: Upload the source code and the buildspec file
- Step 5: Create the build project
- Step 6: Run the build
- Step 7: View summarized build information
- Step 8: View detailed build information
- Step 9: Get the build output artifact
- Step 10: Delete the S3 buckets
- Wrapping up

Step 1: Create the source code

(Part of: Getting started with AWS CodeBuild using the AWS CLI)

In this step, you create the source code that you want CodeBuild to build to the output bucket. This source code consists of two Java class files and an Apache Maven Project Object Model (POM) file.

1. In an empty directory on your local computer or instance, create this directory structure.

2. Using a text editor of your choice, create this file, name it MessageUtil.java, and then save it in the src/main/java directory.

```
public class MessageUtil {
  private String message;

public MessageUtil(String message) {
    this.message = message;
  }

public String printMessage() {
    System.out.println(message);
}
```

```
return message;
}

public String salutationMessage() {
  message = "Hi!" + message;
  System.out.println(message);
  return message;
}
```

This class file creates as output the string of characters passed into it. The MessageUtil constructor sets the string of characters. The printMessage method creates the output. The salutationMessage method outputs Hi! followed by the string of characters.

3. Create this file, name it TestMessageUtil.java, and then save it in the /src/test/java directory.

```
import org.junit.Test;
import org.junit.Ignore;
import static org.junit.Assert.assertEquals;
public class TestMessageUtil {
 String message = "Robert";
 MessageUtil messageUtil = new MessageUtil(message);
 @Test
 public void testPrintMessage() {
   System.out.println("Inside testPrintMessage()");
    assertEquals(message, messageUtil.printMessage());
 }
 @Test
 public void testSalutationMessage() {
    System.out.println("Inside testSalutationMessage()");
   message = "Hi!" + "Robert";
   assertEquals(message,messageUtil.salutationMessage());
 }
}
```

This class file sets the message variable in the MessageUtil class to Robert. It then tests to see if the message variable was successfully set by checking whether the strings Robert and Hi!Robert appear in the output.

4. Create this file, name it pom.xml, and then save it in the root (top level) directory.

```
project xmlns="http://maven.apache.org/POM/4.0.0"
    xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
    xsi:schemaLocation="http://maven.apache.org/POM/4.0.0 http://maven.apache.org/
maven-v4_0_0.xsd">
  <modelVersion>4.0.0</modelVersion>
  <groupId>org.example
  <artifactId>messageUtil</artifactId>
  <version>1.0</version>
  <packaging>jar</packaging>
  <name>Message Utility Java Sample App</name>
  <dependencies>
    <dependency>
      <groupId>junit
     <artifactId>junit</artifactId>
     <version>4.11</version>
     <scope>test</scope>
    </dependency>
  </dependencies>
  <build>
    <plugins>
     <plugin>
       <groupId>org.apache.maven.plugins
       <artifactId>maven-compiler-plugin</artifactId>
       <version>3.8.0
     </plugin>
    </plugins>
  </build>
</project>
```

Apache Maven uses the instructions in this file to convert the MessageUtil.java and TestMessageUtil.java files into a file named messageUtil-1.0.jar and then run the specified tests.

At this point, your directory structure should look like this.

Step 2: Create the buildspec file

(Previous step: Step 1: Create the source code)

In this step, you create a build specification (build spec) file. A *buildspec* is a collection of build commands and related settings, in YAML format, that CodeBuild uses to run a build. Without a build spec, CodeBuild cannot successfully convert your build input into build output or locate the build output artifact in the build environment to upload to your output bucket.

Create this file, name it buildspec.yml, and then save it in the root (top level) directory.

```
version: 0.2
phases:
  install:
    runtime-versions:
      java: corretto11
  pre_build:
    commands:
      - echo Nothing to do in the pre_build phase...
  build:
    commands:
      - echo Build started on `date`
      - mvn install
  post_build:
    commands:
      - echo Build completed on `date`
artifacts:
  files:
    - target/messageUtil-1.0.jar
```

Important

Because a build spec declaration must be valid YAML, the spacing in a build spec declaration is important. If the number of spaces in your build spec declaration does not match this one, the build might fail immediately. You can use a YAML validator to test whether your build spec declaration is valid YAML.

Note

Instead of including a build spec file in your source code, you can declare build commands separately when you create a build project. This is helpful if you want to build your source code with different build commands without updating your source code's repository each time. For more information, see Buildspec syntax.

In this build spec declaration:

- version represents the version of the build spec standard being used. This build spec declaration uses the latest version, 0.2.
- phases represents the build phases during which you can instruct CodeBuild to run commands. These build phases are listed here as install, pre_build, build, and post_build. You cannot change the spelling of these build phase names, and you cannot create more build phase names.

In this example, during the build phase, CodeBuild runs the mvn install command. This command instructs Apache Maven to compile, test, and package the compiled Java class files into a build output artifact. For completeness, a few echo commands are placed in each build phase in this example. When you view detailed build information later in this tutorial, the output of these echo commands can help you better understand how CodeBuild runs commands and in which order. (Although all build phases are included in this example, you are not required to include a build phase if you do not plan to run any commands during that phase.) For each build phase, CodeBuild runs each specified command, one at a time, in the order listed, from beginning to end.

• artifacts represents the set of build output artifacts that CodeBuild uploads to the output bucket. files represents the files to include in the build output. CodeBuild uploads the single messageUtil-1.0. jar file found in the target relative directory in the build environment.

The file name messageUtil-1.0.jar and the directory name target are based on the way Apache Maven creates and stores build output artifacts for this example only. In your own builds, these file names and directories are different.

For more information, see the Buildspec reference.

At this point, your directory structure should look like this.

Step 3: Create two S3 buckets

(Previous step: Step 2: Create the buildspec file)

Although you can use a single bucket for this tutorial, two buckets makes it easier to see where the build input is coming from and where the build output is going.

- One of these buckets (the *input bucket*) stores the build input. In this tutorial, the name of this input bucket is codebuild-region-ID-account-ID-input-bucket, where region-ID is the AWS Region of the bucket and account-ID is your AWS account ID.
- The other bucket (the *output bucket*) stores the build output. In this tutorial, the name of this output bucket is codebuild-*region-ID*-account-ID-output-bucket.

If you chose different names for these buckets, be sure to use them throughout this tutorial.

These two buckets must be in the same AWS Region as your builds. For example, if you instruct CodeBuild to run a build in the US East (Ohio) Region, these buckets must also be in the US East (Ohio) Region.

For more information, see Creating a Bucket in the Amazon Simple Storage Service User Guide.



Note

Although CodeBuild also supports build input stored in CodeCommit, GitHub, and Bitbucket repositories, this tutorial does not show you how to use them. For more information, see Plan a build.

Step 4: Upload the source code and the buildspec file

(Previous step: Step 3: Create two S3 buckets)

In this step, you add the source code and build spec file to the input bucket.

Using your operating system's zip utility, create a file named MessageUtil.zip that includes MessageUtil.java, TestMessageUtil.java, pom.xml, and buildspec.yml.

The MessageUtil.zip file's directory structure must look like this.

```
MessageUtil.zip
    |-- pom.xml
    |-- buildspec.yml
    `-- src
         |-- main
               `-- java
                      `-- MessageUtil.java
         `-- test
                `-- java
                      `-- TestMessageUtil.java
```

Important

Do not include the (root directory name) directory, only the directories and files in the (root directory name) directory.

Upload the MessageUtil.zip file to the input bucket named codebuild-region-ID-account-ID-input-bucket.

Important

For CodeCommit, GitHub, and Bitbucket repositories, by convention, you must store a build spec file named buildspec.yml in the root (top level) of each repository or include the build spec declaration as part of the build project definition. Do not create a ZIP file that contains the repository's source code and build spec file.

For build input stored in S3 buckets only, you must create a ZIP file that contains the source code and, by convention, a build spec file named buildspec.yml at the root (top level) or include the build spec declaration as part of the build project definition.

If you want to use a different name for your build spec file, or you want to reference a build spec in a location other than the root, you can specify a build spec override as part of the build project definition. For more information, see Buildspec file name and storage location.

Step 5: Create the build project

(Previous step: Step 4: Upload the source code and the buildspec file)

In this step, you create a build project that AWS CodeBuild uses to run the build. A build project includes information about how to run a build, including where to get the source code, which build environment to use, which build commands to run, and where to store the build output. A build environment represents a combination of operating system, programming language runtime, and tools that CodeBuild uses to run a build. The build environment is expressed as a Docker image. For more information, see Docker overview on the Docker Docs website.

For this build environment, you instruct CodeBuild to use a Docker image that contains a version of the Java Development Kit (JDK) and Apache Maven.

To create the build project

Use the AWS CLI to run the **create-project** command:

```
aws codebuild create-project --generate-cli-skeleton
```

JSON-formatted data appears in the output. Copy the data to a file named createproject. json in a location on the local computer or instance where the AWS CLI is installed. If you choose to use a different file name, be sure to use it throughout this tutorial.

Modify the copied data to follow this format, and then save your results:

```
{
  "name": "codebuild-demo-project",
  "source": {
    "type": "S3",
    "location": "codebuild-region-ID-account-ID-input-bucket/MessageUtil.zip"
  },
  "artifacts": {
    "type": "S3",
    "location": "codebuild-region-ID-account-ID-output-bucket"
  },
  "environment": {
    "type": "LINUX_CONTAINER",
    "image": "aws/codebuild/standard:5.0",
    "computeType": "BUILD GENERAL1 SMALL"
 },
  "serviceRole": "serviceIAMRole"
}
```

Replace *serviceIAMRole* with the Amazon Resource Name (ARN) of a CodeBuild service role (for example, arn: aws:iam::account-ID:role/role-name). To create one, see <u>Allow</u> CodeBuild to interact with other AWS services.

In this data:

- name represents a required identifier for this build project (in this example, codebuild-demo-project). Build project names must be unique across all build projects in your account.
- For source, type is a required value that represents the source code's repository type (in this example, S3 for an Amazon S3 bucket).
- For source, location represents the path to the source code (in this example, the input bucket name followed by the ZIP file name).
- For artifacts, type is a required value that represents the build output artifact's repository type (in this example, S3 for an Amazon S3 bucket).
- For artifacts, location represents the name of the output bucket you created or identified earlier (in this example, codebuild-*region-ID-account-ID*-output-bucket).

• For environment, type is a required value that represents the type of build environment (in this example, LINUX_CONTAINER).

• For environment, image is a required value that represents the Docker image name and tag combination this build project uses, as specified by the Docker image repository type (in this example, aws/codebuild/standard:5.0 for a Docker image in the CodeBuild Docker images repository). aws/codebuild/standard is the name of the Docker image. 5.0 is the tag of the Docker image.

To find more Docker images you can use in your scenarios, see the <u>Build environment</u> reference.

• For environment, computeType is a required value that represents the computing resources CodeBuild uses (in this example, BUILD_GENERAL1_SMALL).

Note

Other available values in the original JSON-formatted data, such as description, buildspec, auth (including type and resource), path, namespaceType, name (for artifacts), packaging, environmentVariables (including name and value), timeoutInMinutes, encryptionKey, and tags (including key and value) are optional. They are not used in this tutorial, so they are not shown here. For more information, see Create a build project (AWS CLI).

2. Switch to the directory that contains the file you just saved, and then run the **create-project** command again.

```
aws codebuild create-project --cli-input-json file://create-project.json
```

If successful, data similar to this appears in the output.

```
{
  "project": {
    "name": "codebuild-demo-project",
    "serviceRole": "serviceIAMRole",
    "tags": [],
    "artifacts": {
        "packaging": "NONE",
        "type": "S3",
```

```
"location": "codebuild-region-ID-account-ID-output-bucket",
      "name": "message-util.zip"
    },
    "lastModified": 1472661575.244,
    "timeoutInMinutes": 60,
    "created": 1472661575.244,
    "environment": {
      "computeType": "BUILD_GENERAL1_SMALL",
      "image": "aws/codebuild/standard:5.0",
      "type": "LINUX_CONTAINER",
      "environmentVariables": []
    },
    "source": {
      "type": "S3",
      "location": "codebuild-region-ID-account-ID-input-bucket/MessageUtil.zip"
    },
    "encryptionKey": "arn:aws:kms:region-ID:account-ID:alias/aws/s3",
    "arn": "arn:aws:codebuild:region-ID:account-ID:project/codebuild-demo-project"
 }
}
```

- project represents information about this build project.
 - tags represents any tags that were declared.
 - packaging represents how the build output artifact is stored in the output bucket. NONE
 means that a folder is created in the output bucket. The build output artifact is stored in
 that folder.
 - lastModified represents the time, in Unix time format, when information about the build project was last changed.
 - timeoutInMinutes represents the number of minutes after which CodeBuild stops the build if the build has not been completed. (The default is 60 minutes.)
 - created represents the time, in Unix time format, when the build project was created.
 - environmentVariables represents any environment variables that were declared and are available for CodeBuild to use during the build.
 - encryptionKey represents the ARN of the customer managed key that CodeBuild used to encrypt the build output artifact.
 - arn represents the ARN of the build project.



Note

After you run the **create-project** command, an error message similar to the following might be output: User: user-ARN is not authorized to perform: codebuild:CreateProject. This is most likely because you configured the AWS CLI with the credentials of an user who does not have sufficient permissions to use CodeBuild to create build projects. To fix this, configure the AWS CLI with credentials belonging to one of the following IAM entities:

- An administrator user in your AWS account. For more information, see Creating your first AWS account root user and group in the user Guide.
- An user in your AWS account with the AWSCodeBuildAdminAccess, AmazonS3ReadOnlyAccess, and IAMFullAccess managed policies attached to that user or to an IAM group that the user belongs to. If you do not have an user or group in your AWS account with these permissions, and you cannot add these permissions to your user or group, contact your AWS account administrator for assistance. For more information, see AWS managed (predefined) policies for AWS CodeBuild.

Step 6: Run the build

(Previous step: Step 5: Create the build project)

In this step, you instruct AWS CodeBuild to run the build with the settings in the build project.

To run the build

Use the AWS CLI to run the **start-build** command:

```
aws codebuild start-build --project-name project-name
```

Replace project-name with your build project name from the previous step (for example, codebuild-demo-project).

If successful, data similar to the following appears in the output:

```
{
  "build": {
    "buildComplete": false,
    "initiator": "user-name",
    "artifacts": {
```

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```
"location": "arn:aws:s3:::codebuild-region-ID-account-ID-output-bucket/
message-util.zip"
    },
    "projectName": "codebuild-demo-project",
    "timeoutInMinutes": 60,
    "buildStatus": "IN_PROGRESS",
    "environment": {
      "computeType": "BUILD_GENERAL1_SMALL",
      "image": "aws/codebuild/standard:5.0",
      "type": "LINUX_CONTAINER",
      "environmentVariables": []
    },
    "source": {
      "type": "S3",
      "location": "codebuild-region-ID-account-ID-input-bucket/MessageUtil.zip"
    },
    "currentPhase": "SUBMITTED",
    "startTime": 1472848787.882,
    "id": "codebuild-demo-project:0cfbb6ec-3db9-4e8c-992b-1ab28EXAMPLE",
    "arn": "arn:aws:codebuild:region-ID:account-ID:build/codebuild-demo-
project:0cfbb6ec-3db9-4e8c-992b-1ab28EXAMPLE"
  }
}
```

- build represents information about this build.
 - buildComplete represents whether the build was completed (true). Otherwise, false.
 - initiator represents the entity that started the build.
 - artifacts represents information about the build output, including its location.
 - projectName represents the name of the build project.
 - buildStatus represents the current build status when the start-build command was run.
 - currentPhase represents the current build phase when the **start-build** command was
 - startTime represents the time, in Unix time format, when the build process started.
 - id represents the ID of the build.
 - arn represents the ARN of the build.

Make a note of the id value. You need it in the next step.

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Step 7: View summarized build information

(Previous step: Step 6: Run the build)

In this step, you view summarized information about the status of your build.

To view summarized build information

• Use the AWS CLI to run the **batch-get-builds** command.

```
aws codebuild batch-get-builds --ids id
```

Replace *id* with the id value that appeared in the output of the previous step.

If successful, data similar to this appears in the output.

```
{
  "buildsNotFound": [],
  "builds": [
      "buildComplete": true,
      "phases": [
        {
          "phaseStatus": "SUCCEEDED",
          "endTime": 1472848788.525,
          "phaseType": "SUBMITTED",
          "durationInSeconds": 0,
          "startTime": 1472848787.882
        },
        ... The full list of build phases has been omitted for brevity ...
          "phaseType": "COMPLETED",
          "startTime": 1472848878.079
        }
      ],
      "logs": {
        "groupName": "/aws/codebuild/codebuild-demo-project",
        "deepLink": "https://console.aws.amazon.com/cloudwatch/home?region=region-
ID#logEvent:group=/aws/codebuild/codebuild-demo-project;stream=38ca1c4a-e9ca-4dbc-
bef1-d52bfEXAMPLE",
        "streamName": "38ca1c4a-e9ca-4dbc-bef1-d52bfEXAMPLE"
      "artifacts": {
```

```
"md5sum": "MD5-hash",
        "location": "arn:aws:s3:::codebuild-region-ID-account-ID-output-bucket/
message-util.zip",
        "sha256sum": "SHA-256-hash"
      },
      "projectName": "codebuild-demo-project",
      "timeoutInMinutes": 60,
      "initiator": "user-name",
      "buildStatus": "SUCCEEDED",
      "environment": {
        "computeType": "BUILD_GENERAL1_SMALL",
        "image": "aws/codebuild/standard:5.0",
        "type": "LINUX_CONTAINER",
        "environmentVariables": []
      },
      "source": {
        "type": "S3",
        "location": "codebuild-region-ID-account-ID-input-bucket/MessageUtil.zip"
      },
      "currentPhase": "COMPLETED",
      "startTime": 1472848787.882,
      "endTime": 1472848878.079,
      "id": "codebuild-demo-project:38ca1c4a-e9ca-4dbc-bef1-d52bfEXAMPLE",
      "arn": "arn:aws:codebuild:region-ID:account-ID:build/codebuild-demo-
project:38ca1c4a-e9ca-4dbc-bef1-d52bfEXAMPLE"
    }
  ]
}
```

- buildsNotFound represents the build IDs for any builds where information is not available. In this example, it should be empty.
- builds represents information about each build where information is available. In this example, information about only one build appears in the output.
 - phases represents the set of build phases CodeBuild runs during the build process.
 Information about each build phase is listed separately as startTime, endTime, and durationInSeconds (when the build phase started and ended, expressed in Unix time format, and how long it lasted, in seconds), and phaseType such as (SUBMITTED, PROVISIONING, DOWNLOAD_SOURCE, INSTALL, PRE_BUILD, BUILD, POST_BUILD, UPLOAD_ARTIFACTS, FINALIZING, or COMPLETED) and phaseStatus (such as SUCCEEDED, FAILED, FAULT, TIMED_OUT, IN_PROGRESS, or STOPPED). The first time you run the batch-get-builds command, there might not be many (or any) phases. After

subsequent runs of the **batch-get-builds** command with the same build ID, more build phases should appear in the output.

- logs represents information in Amazon CloudWatch Logs about the build's logs.
- md5sum and sha256sum represent MD5 and SHA-256 hashes of the build's output artifact. These appear in the output only if the build project's packaging value is set to ZIP. (You did not set this value in this tutorial.) You can use these hashes along with a checksum tool to confirm file integrity and authenticity.

Note

You can also use the Amazon S3 console to view these hashes. Select the box next to the build output artifact, choose **Actions**, and then choose **Properties**. In the **Properties** pane, expand **Metadata**, and view the values for **x-amz-meta-codebuild-content-md5** and **x-amz-meta-codebuild-content-sha256**. (In the Amazon S3 console, the build output artifact's **ETag** value should not be interpreted to be either the MD5 or SHA-256 hash.)

If you use the AWS SDKs to get these hashes, the values are named codebuild-content-md5 and codebuild-content-sha256.

• endTime represents the time, in Unix time format, when the build process ended.

Note

Amazon S3 metadata has a CodeBuild header named x-amz-meta-codebuild-buildarn which contains the buildArn of the CodeBuild build that publishes artifacts to Amazon S3. The buildArn is added to allow source tracking for notifications and to reference which build the artifact is generated from.

Step 8: View detailed build information

(Previous step: Step 7: View summarized build information)

In this step, you view detailed information about your build in CloudWatch Logs.



Note

To protect sensitive information, the following are hidden in CodeBuild logs:

 AWS access key IDs. For more information, see Managing Access Keys for IAM Users in the AWS Identity and Access Management User Guide.

- Strings specified using the Parameter Store. For more information, see Systems Manager Parameter Store and Systems Manager Parameter Store Console Walkthrough in the Amazon EC2 Systems Manager User Guide.
- Strings specified using AWS Secrets Manager. For more information, see Key management.

To view detailed build information

- Use your web browser to go to the deepLink location that appeared in the output in the previous step (for example, https://console.aws.amazon.com/cloudwatch/ home?region=region-ID#logEvent:group=/aws/codebuild/codebuild-demoproject; stream=38ca1c4a-e9ca-4dbc-bef1-d52bfEXAMPLE).
- 2. In the CloudWatch Logs log stream, you can browse the log events. By default, only the last set of log events is displayed. To see earlier log events, scroll to the beginning of the list.
- In this tutorial, most of the log events contain verbose information about CodeBuild downloading and installing build dependency files into its build environment, which you probably don't care about. You can use the Filter events box to reduce the information displayed. For example, if you enter "[INF0]" in Filter events, only those events that contain [INFO] are displayed. For more information, see Filter and pattern syntax in the Amazon CloudWatch User Guide.

These portions of a CloudWatch Logs log stream pertain to this tutorial.

```
[Container] 2016/04/15 17:49:42 Entering phase PRE_BUILD
[Container] 2016/04/15 17:49:42 Running command echo Entering pre_build phase...
[Container] 2016/04/15 17:49:42 Entering pre_build phase...
[Container] 2016/04/15 17:49:42 Phase complete: PRE_BUILD Success: true
[Container] 2016/04/15 17:49:42 Entering phase BUILD
[Container] 2016/04/15 17:49:42 Running command echo Entering build phase...
```

```
[Container] 2016/04/15 17:49:42 Entering build phase...
[Container] 2016/04/15 17:49:42 Running command mvn install
[Container] 2016/04/15 17:49:44 [INFO] Scanning for projects...
[Container] 2016/04/15 17:49:44 [INFO]
[Container] 2016/04/15 17:49:44 [INFO]
______
[Container] 2016/04/15 17:49:44 [INFO] Building Message Utility Java Sample App 1.0
[Container] 2016/04/15 17:49:44 [INFO]
[Container] 2016/04/15 17:49:55
   -----
[Container] 2016/04/15 17:49:55 T E S T S
[Container] 2016/04/15 17:49:55
[Container] 2016/04/15 17:49:55 Running TestMessageUtil
[Container] 2016/04/15 17:49:55 Inside testSalutationMessage()
[Container] 2016/04/15 17:49:55 Hi!Robert
[Container] 2016/04/15 17:49:55 Inside testPrintMessage()
[Container] 2016/04/15 17:49:55 Robert
[Container] 2016/04/15 17:49:55 Tests run: 2, Failures: 0, Errors: 0, Skipped: 0, Time
elapsed: 0.018 sec
[Container] 2016/04/15 17:49:55
[Container] 2016/04/15 17:49:55 Results :
[Container] 2016/04/15 17:49:55
[Container] 2016/04/15 17:49:55 Tests run: 2, Failures: 0, Errors: 0, Skipped: 0
[Container] 2016/04/15 17:49:56 [INFO]
______
[Container] 2016/04/15 17:49:56 [INFO] BUILD SUCCESS
[Container] 2016/04/15 17:49:56 [INFO]
[Container] 2016/04/15 17:49:56 [INFO] Total time: 11.845 s
[Container] 2016/04/15 17:49:56 [INFO] Finished at: 2016-04-15T17:49:56+00:00
[Container] 2016/04/15 17:49:56 [INFO] Final Memory: 18M/216M
[Container] 2016/04/15 17:49:56 [INFO]
[Container] 2016/04/15 17:49:56 Phase complete: BUILD Success: true
[Container] 2016/04/15 17:49:56 Entering phase POST_BUILD
[Container] 2016/04/15 17:49:56 Running command echo Entering post_build phase...
[Container] 2016/04/15 17:49:56 Entering post_build phase...
[Container] 2016/04/15 17:49:56 Phase complete: POST_BUILD Success: true
[Container] 2016/04/15 17:49:57 Preparing to copy artifacts
[Container] 2016/04/15 17:49:57 Assembling file list
```

```
[Container] 2016/04/15 17:49:57 Expanding target/messageUtil-1.0.jar
[Container] 2016/04/15 17:49:57 Found target/messageUtil-1.0.jar
[Container] 2016/04/15 17:49:57 Creating zip artifact
```

In this example, CodeBuild successfully completed the pre-build, build, and post-build build phases. It ran the unit tests and successfully built the messageUtil-1.0. jar file.

Step 9: Get the build output artifact

(Previous step: Step 8: View detailed build information)

In this step, you get the messageUtil-1.0. jar file that CodeBuild built and uploaded to the output bucket.

You can use the CodeBuild console or the Amazon S3 console to complete this step.

To get the build output artifact (AWS CodeBuild console)

With the CodeBuild console still open and the build details page still displayed from the previous step, choose the **Build details** tab and scroll down to the **Artifacts** section.



Note

If the build details page is not displayed, in the navigation bar, choose **Build history**, and then choose the Build run link.

The link to the Amazon S3 folder is under the **Artifacts upload location**. This link opens the folder in Amazon S3 where you find the messageUtil-1.0. jar build output artifact file.

To get the build output artifact (Amazon S3 console)

- Open the Amazon S3 console at https://console.aws.amazon.com/s3/. 1.
- 2. Open codebuild-region-ID-account-ID-output-bucket.
- Open the codebuild-demo-project folder. 3.
- 4. Open the target folder, where you find the messageUtil-1.0. jar build output artifact file.

Step 10: Delete the S3 buckets

(Previous step: Step 9: Get the build output artifact)

To prevent ongoing charges to your AWS account, you can delete the input and output buckets used in this tutorial. For instructions, see <u>Deleting or Emptying a Bucket</u> in the *Amazon Simple Storage Service User Guide*.

If you are using the IAM user or an administrator IAM user to delete these buckets, the user must have more access permissions. Add the following statement between the markers (### BEGIN ADDING STATEMENT HERE ### and ### END ADDING STATEMENTS HERE ###) to an existing access policy for the user.

The ellipses (...) in this statement are used for brevity. Do not remove any statements in the existing access policy. Do not enter these ellipses into the policy.

```
{
  "Version": "2012-10-17",
  "Id": "...",
  "Statement": [
    ### BEGIN ADDING STATEMENT HERE ###
  {
      "Effect": "Allow",
      "Action": [
            "s3:DeleteBucket",
            "s3:DeleteObject"
      ],
      "Resource": "*"
    }
  ### END ADDING STATEMENT HERE ###
]
}
```

Wrapping up

In this tutorial, you used AWS CodeBuild to build a set of Java class files into a JAR file. You then viewed the build's results.

You can now try using CodeBuild in your own scenarios. Follow the instructions in <u>Plan a build</u>. If you don't feel ready yet, you might want to try building some of the samples. For more information, see Use case-based samples for CodeBuild.

Use case-based samples for CodeBuild

You can use these use case-based samples to experiment with AWS CodeBuild:

Cross-service samples

A list of cross-service samples to experiment with AWS CodeBuild.

Build badges sample

Shows how to set up CodeBuild with build badges.

Test report sample

Uses the AWS CLI to create, run, and view the results of a test report.

Docker samples for CodeBuild

Shows how to use custom Docker images, publish Docker images to a repository in Amazon ECR, and use Docker images in a private registry.

Host build output in an S3 bucket

Shows how to create a static website in an S3 bucket using unencrypted build artifacts.

Multiple inputs and outputs sample

Shows how to use multiple input sources and multiple output artifacts in a build project.

Parallel test execution samples

Shows how to use the codebuild-tests-run CLI command to split and run tests across parallel execution environments.

Runtime versions in buildspec file sample

Shows how to specify runtimes and their versions in the buildspec file.

Source version sample

Shows how to use a specific version of your source in a CodeBuild build project.

Third-party source repository samples for CodeBuild

Shows how to create BitBucket, GitHub Enterprise Server, and GitHub pull requests with webhooks using CodeBuild.

Set artifact names at build time using semantic versioning

Shows how to use semantic versioning to create an artifact name at build time.

Cross-service samples for CodeBuild

You can use these cross-service samples to experiment with AWS CodeBuild:

Amazon ECR sample

Uses a Docker image in an Amazon ECR repository to use Apache Maven to produce a single JAR file. The sample instructions will show you how to create and push a Docker image to Amazon ECR, create a Go project, build the project, run the project, and set up permissions to allow CodeBuild to connect to Amazon ECR.

Amazon EFS sample

Shows how to configure a buildspec file so that a CodeBuild project mounts and builds on an Amazon EFS file system. The sample instructions will show you how to create a Amazon VPC, create file system in the Amazon VPC, create and build a project that uses the Amazon VPC, and then review the generated project file and variables.

AWS CodePipeline samples

Shows how to use AWS CodePipeline to create a build with batch builds as well as multiple input sources and multiple output artifacts. Included in this section are example JSON files that show pipeline structures that create batch builds with separate artifacts, and combined artifacts. An additional JSON sample is provided that show the pipeline structure with multiple input sources and multiple output artifacts.

AWS Config sample

Shows how to set up AWS Config. Lists which CodeBuild resources are tracked and describes how to look up CodeBuild projects in AWS Config. The sample instructions will show you the prerequisites for integrating with AWS Config, the steps to set up AWS Config, and the steps to look up CodeBuild projects and data in AWS Config.

Build notifications sample

Uses Apache Maven to produce a single JAR file. Sends a build notification to subscribers of an Amazon SNS topic. The sample instructions show you how to set up permissions so that

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CodeBuild can communicate with Amazon SNS and CloudWatch, how to create and identify CodeBuild topics in Amazon SNS, how to subscribe recipients to the topic, and how to set up rules in CloudWatch.

Amazon ECR sample for CodeBuild

This sample uses a Docker image in an Amazon Elastic Container Registry (Amazon ECR) image repository to build a sample Go project.

Important

Running this sample might result in charges to your AWS account. These include possible charges for AWS CodeBuild and for AWS resources and actions related to Amazon S3, AWS KMS, CloudWatch Logs, and Amazon ECR. For more information, see CodeBuild pricing, Amazon S3 pricing, AWS Key Management Service pricing, Amazon CloudWatch pricing, and Amazon Elastic Container Registry pricing.

Topics

Run the Amazon ECR sample

Run the Amazon ECR sample

Use the following instructions to run the Amazon ECR sample for CodeBuild.

To run this sample

- To create and push the Docker image to your image repository in Amazon ECR, complete the steps in the Run the 'Publish Docker image to Amazon ECR' sample section of the 'Publish Docker image to Amazon ECR' sample.
- 2. Create a Go project:
 - Create the files as described in the Go project structure and Go project files sections of this topic, and then upload them to an S3 input bucket or an AWS CodeCommit, GitHub, or Bitbucket repository.

Important

Do not upload (root directory name), just the files inside of (root directory name).

If you are using an S3 input bucket, be sure to create a ZIP file that contains the files, and then upload it to the input bucket. Do not add (root directory name) to the ZIP file, just the files inside of (root directory name).

b. Create a build project, run the build, and view related build information.

If you use the AWS CLI to create the build project, the JSON-formatted input to the create-project command might look similar to this. (Replace the placeholders with your own values.)

```
"name": "sample-go-project",
  "source": {
    "type": "S3",
    "location": "codebuild-region-ID-account-ID-input-bucket/GoSample.zip"
 },
  "artifacts": {
   "type": "S3",
    "location": "codebuild-region-ID-account-ID-output-bucket",
    "packaging": "ZIP",
    "name": "GoOutputArtifact.zip"
 },
  "environment": {
    "type": "LINUX_CONTAINER",
    "image": "aws/codebuild/standard:5.0",
    "computeType": "BUILD_GENERAL1_SMALL"
 },
  "serviceRole": "arn:aws:iam::account-ID:role/role-name",
  "encryptionKey": "arn:aws:kms:region-ID:account-ID:key/key-ID"
}
```

- To get the build output artifact, open your S3 output bucket.
- Download the GoOutputArtifact. zip file to your local computer or instance, and then extract the contents of the file. In the extracted contents, get the hello file.

3. If one of the following is true, you must add permissions to your image repository in Amazon ECR so that AWS CodeBuild can pull its Docker image into the build environment.

- Your project uses CodeBuild credentials to pull Amazon ECR images. This is denoted by a value of CODEBUILD in the imagePullCredentialsType attribute of your ProjectEnvironment.
- Your project uses a cross-account Amazon ECR image. In this case, your project
 must use its service role to pull Amazon ECR images. To enable this behavior, set
 the imagePullCredentialsType attribute of your ProjectEnvironment to
 SERVICE_ROLE.
- 1. Open the Amazon ECR console at https://console.aws.amazon.com/ecr/.
- 2. In the list of repository names, choose the name of the repository you created or selected.
- 3. From the navigation pane, choose **Permissions**, choose **Edit**, and then choose **Add statement**.
- 4. For **Statement name**, enter an identifier (for example, **CodeBuildAccess**).
- 5. For **Effect**, leave **Allow** selected. This indicates that you want to allow access to another AWS account.
- 6. For **Principal**, do one of the following:
 - If your project uses CodeBuild credentials to pull an Amazon ECR image, in **Service principal**, enter **codebuild.amazonaws.com**.
 - If your project uses a cross-account Amazon ECR image, for **AWS account IDs**, enter IDs of the AWS accounts that you want to give access.
- 7. Skip the **All IAM entities** list.
- 8. For **Action**, select the pull-only actions: **ecr:GetDownloadUrlForLayer**, **ecr:BatchGetImage**, and **ecr:BatchCheckLayerAvailability**.
- 9. For **Conditions**, add the following:

```
{
    "StringEquals":{
        "aws:SourceAccount":"<AWS-account-ID>",
        "aws:SourceArn":"arn:aws:codebuild:<region>:<AWS-account-ID>:project/
ID>:project/
    }
}
```

10Choose Save.

This policy is displayed in **Permissions**. The principal is what you entered for **Principal** in step 3 of this procedure:

- If your project uses CodeBuild credentials to pull an Amazon ECR image, "codebuild.amazonaws.com" appears under Service principals.
- If your project uses a cross-account Amazon ECR image, the ID of the AWS account that you want to give access appears under **AWS Account IDs**.

The following sample policy uses both CodeBuild credentials and a cross-account Amazon ECR image.

```
{
   "Version": "2012-10-17",
   "Statement":[
      {
         "Sid": "CodeBuildAccessPrincipal",
         "Effect": "Allow",
         "Principal":{
            "Service": "codebuild.amazonaws.com"
         },
         "Action":[
            "ecr:GetDownloadUrlForLayer",
            "ecr:BatchGetImage",
            "ecr:BatchCheckLayerAvailability"
         ],
         "Condition":{
            "StringEquals":{
                "aws:SourceArn":"arn:aws:codebuild:<region>:<aws-account-
id>:project/ct-name>",
               "aws:SourceAccount":"<aws-account-id>"
         }
      },
         "Sid": "CodeBuildAccessCrossAccount",
         "Effect": "Allow",
         "Principal":{
            "AWS": "arn:aws:iam:: < AWS-account-ID>:root"
         },
         "Action":[
            "ecr:GetDownloadUrlForLayer",
```

• If your projects use CodeBuild credentials and you would like your CodeBuild projects to have open access to the Amazon ECR repository, you can omit the Condition keys and add the following sample policy.

```
{
  "Version": "2012-10-17",
  "Statement":[
    {
      "Sid": "CodeBuildAccessPrincipal",
      "Effect": "Allow",
      "Principal":{
        "Service": "codebuild.amazonaws.com"
      },
      "Action":[
        "ecr:GetDownloadUrlForLayer",
        "ecr:BatchGetImage",
        "ecr:BatchCheckLayerAvailability"
      ]
    },
      "Sid": "CodeBuildAccessCrossAccount",
      "Effect": "Allow",
      "Principal":{
        "AWS": "arn:aws:iam:: < AWS-account-ID>:root"
      },
      "Action":[
        "ecr:GetDownloadUrlForLayer",
        "ecr:BatchGetImage",
        "ecr:BatchCheckLayerAvailability"
      ]
    }
  ]
}
```

4. Create a build project, run the build, and view build information.

If you use the AWS CLI to create the build project, the JSON-formatted input to the create-project command might look similar to this. (Replace the placeholders with your own values.)

```
{
  "name": "amazon-ecr-sample-project",
  "source": {
    "type": "S3",
    "location": "codebuild-region-ID-account-ID-input-bucket/GoSample.zip"
  "artifacts": {
    "type": "S3",
    "location": "codebuild-region-ID-account-ID-output-bucket",
    "packaging": "ZIP",
    "name": "GoOutputArtifact.zip"
  },
  "environment": {
    "type": "LINUX_CONTAINER",
    "image": "account-ID.dkr.ecr.region-ID.amazonaws.com/your-Amazon-ECR-repo-
name:tag",
    "computeType": "BUILD_GENERAL1_SMALL"
  },
  "serviceRole": "arn:aws:iam::account-ID:role/role-name",
  "encryptionKey": "arn:aws:kms:region-ID:account-ID:key/key-ID"
}
```

- 5. To get the build output artifact, open your S3 output bucket.
- 6. Download the *GoOutputArtifact*. zip file to your local computer or instance, and then extract the contents of the *GoOutputArtifact*. zip file. In the extracted contents, get the hello file.

Go project structure

This sample assumes this directory structure.

```
(root directory name)
### buildspec.yml
### hello.go
```

Go project files

This sample uses these files.

buildspec.yml (in (root directory name))

```
version: 0.2
phases:
  install:
   runtime-versions:
     golang: 1.13
  build:
    commands:
      - echo Build started on `date`
      - echo Compiling the Go code
      - go build hello.go
  post_build:
    commands:
      - echo Build completed on `date`
artifacts:
  files:
    - hello
```

hello.go(in (root directory name))

```
package main
import "fmt"

func main() {
  fmt.Println("hello world")
  fmt.Println("1+1 =", 1+1)
  fmt.Println("7.0/3.0 =", 7.0/3.0)
  fmt.Println(true && false)
  fmt.Println(true || false)
  fmt.Println(!true)
}
```

Amazon Elastic File System sample for AWS CodeBuild

You might want to create your AWS CodeBuild builds on Amazon Elastic File System, a scalable, shared file service for Amazon EC2 instances. The storage capacity with Amazon EFS is elastic, so

it grows or shrinks as files are added and removed. It has a simple web services interface that you can use to create and configure file systems. It also manages all of the file storage infrastructure for you, so you do not need to worry about deploying, patching, or maintaining file system configurations. For more information, see What is Amazon Elastic File System? in the Amazon Elastic File System User Guide.

This sample shows you how to configure a CodeBuild project so that it mounts and then builds a Java application to an Amazon EFS file system. Before you begin, you must have a Java application ready to build that is uploaded to an S3 input bucket or an AWS CodeCommit, GitHub, GitHub Enterprise Server, or Bitbucket repository.

Data in transit for your file system is encrypted. To encrypt data in transit using a different image, see Encrypting data in transit.

Topics

- Use AWS CodeBuild with Amazon Elastic File System
- Troubleshoot the Amazon EFS integration

Use AWS CodeBuild with Amazon Elastic File System

The sample covers the four high-level steps required to use Amazon EFS with AWS CodeBuild. They are:

- 1. Create a virtual private cloud (VPC) in your AWS account.
- 2. Create a file system that uses this VPC.
- 3. Create and build a CodeBuild project that uses the VPC. The CodeBuild project uses the following to identify the file system:
 - A unique file system identifier. You choose the identifier when you specify the file system in your build project.
 - The file system ID. The ID is displayed when you view your file system in the Amazon EFS console.
 - A mount point. This is a directory in your Docker container that mounts the file system.
 - Mount options. These include details about how to mount the file system.
- 4. Review the build project to ensure that the correct project files and variables were generated.



Note

A file system created in Amazon EFS is supported on Linux platforms only.

Topics

- Step 1: Create a VPC using AWS CloudFormation
- Step 2: Create an Amazon Elastic File System file system with your VPC
- Step 3: Create a CodeBuild project to use with Amazon EFS
- Step 4: Review the build project

Step 1: Create a VPC using AWS CloudFormation

Create your VPC with an AWS CloudFormation template.

1. Follow the instructions in AWS CloudFormation VPC template to use AWS CloudFormation to create a VPC.



Note

The VPC created by this AWS CloudFormation template has two private subnets and two public subnets. You must only use private subnets when you use AWS CodeBuild to mount the file system you created in Amazon EFS. If you use one of the public subnets, the build fails.

- 2. Sign in to the AWS Management Console and open the Amazon VPC console at https:// console.aws.amazon.com/vpc/.
- Choose the VPC you created with AWS CloudFormation. 3.
- On the **Description** tab, make a note of the name of your VPC and its ID. Both are required 4. when you create your AWS CodeBuild project later in this sample.

Step 2: Create an Amazon Elastic File System file system with your VPC

Create a simple Amazon EFS file system for this sample using the VPC you created earlier.

1. Sign in to the AWS Management Console and open the Amazon EFS console at https://console.aws.amazon.com/efs/.

- 2. Choose Create file system.
- 3. From **VPC**, choose the VPC name you noted earlier in this sample.
- 4. Leave the Availability Zones associated with your subnets selected.
- 5. Choose **Next Step**.
- In Add tags, for the default Name key, in Value, enter the name of your Amazon EFS file system.
- 7. Keep **Bursting** and **General Purpose** selected as your default performance and throughput modes, and then choose **Next Step**.
- 8. For **Configure client access**, choose **Next Step**.
- 9. Choose Create File System.
- 10. (Optional) We recommend adding a policy to your Amazon EFS file system that enforces encryption of data in transit. In the Amazon EFS console, choose File system policy, choose Edit, select the box labeled Enforce in-transit encryption for all clients, and then choose Save.

Step 3: Create a CodeBuild project to use with Amazon EFS

Create a AWS CodeBuild project that uses the VPC you created earlier in this sample. When the build is run, it mounts the Amazon EFS file system created earlier. Next, it stores the .jar file created by your Java application in your file system's mount point directory.

- 1. Open the AWS CodeBuild console at https://console.aws.amazon.com/codesuite/codebuild/ home.
- 2. From the navigation pane, choose **Build projects**, and then choose **Create build project**.
- 3. In **Project name**, enter a name for your project.
- 4. From **Source provider**, choose the repository that contains the Java application you want to build.
- 5. Enter information, such as a repository URL, that CodeBuild uses to locate your application. The options are different for each source provider. For more information, see Choose source provider.

From Environment image, choose Managed image.

- From Operating system, choose Amazon Linux 2. 7.
- From Runtime(s), choose Standard. 8.
- From Image, choose aws/codebuild/amazonlinux-x86_64-standard:4.0.
- 10. From **Environment type**, choose **Linux**.
- 11. Under Service role, choose New service role. In Role name, enter a name for the role CodeBuild creates for you.
- Expand Additional configuration.
- 13. Select Enable this flag if you want to build Docker images or want your builds to get elevated privileges.



Note

By default, Docker daemon is enabled for non-VPC builds. If you would like to use Docker containers for VPC builds, see Runtime Privilege and Linux Capabilities on the Docker Docs website and enable privileged mode. Also, Windows does not support privileged mode.

- 14. From **VPC**, choose the VPC ID.
- 15. From **Subnets**, choose one or more of the private subnets associated with your VPC. You must use private subnets in a build that mounts an Amazon EFS file system. If you use a public subnet, the build fails.
- 16. From **Security Groups**, choose the default security group.
- 17. In **File systems**, enter the following information:
 - For Identifier, enter a unique file system identifier. It must be fewer than 129 characters and contain only alphanumeric characters and underscores. CodeBuild uses this identifier to create an environment variable that identifies the elastic file system. The environment variable format is CODEBUILD_<file_system_identifier> in capital letters. For example, if you enter my_efs, the environment variable is CODEBUILD_MY_EFS.
 - For ID, choose the file system ID.
 - (Optional) Enter a directory in the file system. CodeBuild mounts this directory. If you leave **Directory path** blank, CodeBuild mounts the entire file system. The path is relative to the root of the file system.
 - For **Mount point**, enter the absolute path of the directory in your build container where the file system is mounted. If this directory does not exist, CodeBuild creates it during the build.

• (Optional) Enter mount options. If you leave **Mount options** blank, CodeBuild uses its default mount options:

```
nfsvers=4.1
rsize=1048576
wsize=1048576
hard
timeo=600
retrans=2
```

For more information, see <u>Recommended NFS Mount Options</u> in the *Amazon Elastic File System User Guide*.

- 18. For **Build specification**, choose **Insert build commands**, and then choose **Switch to editor**.
- 19. Enter the following build spec commands into the editor. Replace <file_system_identifier> with the identifier you entered in step 17. Use capital letters (for example, CODEBUILD_MY_EFS).

- 20. Use the default values for all other settings, and then choose **Create build project**. When your build is complete, the console page for your project is displayed.
- 21. Choose Start build.

Step 4: Review the build project

After your AWS CodeBuild project is built:

• You have a .jar file created by your Java application that is built to your Amazon EFS file system under your mount point directory.

• An environment variable that identifies your file system is created using the file system identifier you entered when you created the project.

For more information, see Mounting file systems in the Amazon Elastic File System User Guide.

Troubleshoot the Amazon EFS integration

The following are errors you might encounter when setting up Amazon EFS with CodeBuild.

Topics

- CLIENT_ERROR: mounting '127.0.0.1:/' failed. permission denied
- CLIENT_ERROR: mounting '127.0.0.1:/' failed. connection reset by peer
- VPC_CLIENT_ERROR: Unexpected EC2 error: UnauthorizedOperation

CLIENT_ERROR: mounting '127.0.0.1:/' failed. permission denied

IAM authorization is not supported for mounting Amazon EFS with CodeBuild. If you are using a custom Amazon EFS file system policy, you will need to grant read and write access to all IAM principals. For example:

```
"Principal": {
    "AWS": "*"
}
```

CLIENT_ERROR: mounting '127.0.0.1:/' failed. connection reset by peer

There are two possible causes for this error:

- The CodeBuild VPC subnet is in a different availability zone than the Amazon EFS mount target.
 You can resolve this by adding a VPC subnet in the same availability zone as the Amazon EFS mount target.
- The security group does not have permissions to communicate with Amazon EFS. You can resolve this by adding an inbound rule to allow all traffic from either the VPC (add the primary CIDR block for your VPC), or the security group itself.

VPC_CLIENT_ERROR: Unexpected EC2 error: UnauthorizedOperation

This error occurs when all of the subnets in your VPC configuration for the CodeBuild project are public subnets. You must have at least one private subnet in the VPC to ensure network connectivity.

AWS CodePipeline samples for CodeBuild

This section describes sample integrations between CodePipeline and CodeBuild.

Sample	Description
Samples of CodePipeline/CodeBuild integrations and batch builds	These samples demonstrate how to use AWS CodePipeline to create a build project that uses batch builds.
Sample of a CodePipeline/CodeBuild integration with multiple input sources and output artifacts	This sample demonstrates how to use AWS CodePipeline to create a build project that uses multiple input sources to create multiple output artifacts.

Samples of CodePipeline/CodeBuild integrations and batch builds

AWS CodeBuild supports batch builds. The following samples demonstrate how to use AWS CodePipeline to create a build project that uses batch builds.

Batch build with individual artifacts

Use the following JSON file as an example of a pipeline structure that creates a batch build with separate artifacts. To enable batch builds in CodePipeline, set the BatchEnabled parameter of the configuration object to true.

```
{
  "pipeline": {
    "roleArn": "arn:aws:iam::account-id:role/my-AWS-CodePipeline-service-role-name",
    "stages": [
```

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```
{
  "name": "Source",
  "actions": [
    {
      "inputArtifacts": [],
      "name": "Source1",
      "actionTypeId": {
        "category": "Source",
        "owner": "AWS",
        "version": "1",
        "provider": "S3"
      },
      "outputArtifacts": [
          "name": "source1"
        }
      ],
      "configuration": {
        "S3Bucket": "<my-input-bucket-name>",
        "S30bjectKey": "my-source-code-file-name.zip"
      },
      "runOrder": 1
    },
      "inputArtifacts": [],
      "name": "Source2",
      "actionTypeId": {
        "category": "Source",
        "owner": "AWS",
        "version": "1",
        "provider": "S3"
      },
      "outputArtifacts": [
          "name": "source2"
        }
     ],
      "configuration": {
        "S3Bucket": "<my-other-input-bucket-name>",
        "S30bjectKey": "my-other-source-code-file-name.zip"
      },
      "runOrder": 1
  ]
```

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```
},
{
  "name": "Build",
  "actions": [
    {
      "inputArtifacts": [
          "name": "source1"
        },
          "name": "source2"
      ],
      "name": "Build",
      "actionTypeId": {
        "category": "Build",
        "owner": "AWS",
        "version": "1",
        "provider": "CodeBuild"
      },
      "outputArtifacts": [
          "name": "build1"
        },
          "name": "build1_artifact1"
        },
          "name": "build1_artifact2"
        },
          "name": "build2_artifact1"
        },
          "name": "build2_artifact2"
        }
      ],
      "configuration": {
        "ProjectName": "my-build-project-name",
        "PrimarySource": "source1",
        "BatchEnabled": "true"
      },
      "runOrder": 1
```

```
}

I,

"artifactStore": {
    "type": "S3",
    "location": "<AWS-CodePipeline-internal-bucket-name>"
},
    "name": "my-pipeline-name",
    "version": 1
}
```

The following is an example of a CodeBuild buildspec file that will work with this pipeline configuration.

```
version: 0.2
batch:
  build-list:
    - identifier: build1
      env:
        compute-type: BUILD_GENERAL1_SMALL
    - identifier: build2
      env:
        compute-type: BUILD_GENERAL1_MEDIUM
phases:
  build:
    commands:
      - echo 'file' > output_file
artifacts:
  files:
    - output_file
  secondary-artifacts:
    artifact1:
      files:
        - output_file
    artifact2:
      files:
        - output_file
```

The names of the output artifacts specified in the pipeline's JSON file must match the identifier of the builds and artifacts defined in your buildspec file. The syntax is buildIdentifier for the primary artifacts, and buildIdentifier_artifactIdentifier for the secondary artifacts.

For example, for output artifact name build1, CodeBuild will upload the primary artifact of build1 to the location of build1. For output name build1_artifact1, CodeBuild will upload the secondary artifact artifact1 of build1 to the location of build1_artifact1, and so on. If only one output location is specified, the name should be buildIdentifier only.

After you create the JSON file, you can create your pipeline. Use the AWS CLI to run the **create-pipeline** command and pass the file to the --cli-input-json parameter. For more information, see Create a pipeline (CLI) in the AWS CodePipeline User Guide.

Batch build with combined artifacts

Use the following JSON file as an example of a pipeline structure that creates a batch build with combined artifacts. To enable batch builds in CodePipeline, set the BatchEnabled parameter of the configuration object to true. To combine the build artifacts into the same location, set the CombineArtifacts parameter of the configuration object to true.

```
{
 "pipeline": {
  "roleArn": "arn:aws:iam::account-id:role/my-AWS-CodePipeline-service-role-name",
  "stages": [
    {
      "name": "Source",
      "actions": [
        {
          "inputArtifacts": [],
          "name": "Source1",
          "actionTypeId": {
            "category": "Source",
            "owner": "AWS",
            "version": "1",
            "provider": "S3"
          },
          "outputArtifacts": [
            {
              "name": "source1"
            }
          "configuration": {
```

```
"S3Bucket": "<my-input-bucket-name>",
        "S30bjectKey": "my-source-code-file-name.zip"
      },
      "runOrder": 1
    },
      "inputArtifacts": [],
      "name": "Source2",
      "actionTypeId": {
        "category": "Source",
        "owner": "AWS",
        "version": "1",
        "provider": "S3"
      },
      "outputArtifacts": [
          "name": "source2"
        }
      ],
      "configuration": {
        "S3Bucket": "<my-other-input-bucket-name>",
        "S30bjectKey": "my-other-source-code-file-name.zip"
      },
      "runOrder": 1
    }
  ]
},
  "name": "Build",
  "actions": [
    {
      "inputArtifacts": [
        {
          "name": "source1"
        },
          "name": "source2"
        }
      ],
      "name": "Build",
      "actionTypeId": {
        "category": "Build",
        "owner": "AWS",
        "version": "1",
```

```
"provider": "CodeBuild"
          },
          "outputArtifacts": [
              "name": "output1 "
            }
          ],
          "configuration": {
            "ProjectName": "my-build-project-name",
            "PrimarySource": "source1",
             "BatchEnabled": "true",
             "CombineArtifacts": "true"
          },
          "runOrder": 1
    }
  ],
  "artifactStore": {
    "type": "S3",
    "location": "<AWS-CodePipeline-internal-bucket-name>"
  },
  "name": "my-pipeline-name",
  "version": 1
 }
}
```

The following is an example of a CodeBuild buildspec file that will work with this pipeline configuration.

```
version: 0.2
batch:
  build-list:
    - identifier: build1
      env:
          compute-type: BUILD_GENERAL1_SMALL
    - identifier: build2
      env:
          compute-type: BUILD_GENERAL1_MEDIUM

phases:
  build:
    commands:
```

```
- echo 'file' > output_file
artifacts:
  files:
    - output_file
```

If combined artifacts is enabled for the batch build, there is only one output allowed. CodeBuild will combine the primary artifacts of all the builds into one single ZIP file.

After you create the JSON file, you can create your pipeline. Use the AWS CLI to run the **create-pipeline** command and pass the file to the --cli-input-json parameter. For more information, see Create a pipeline (CLI) in the AWS CodePipeline User Guide.

Sample of a CodePipeline/CodeBuild integration with multiple input sources and output artifacts

An AWS CodeBuild project can take more than one input source. It can also create more than one output artifact. This sample demonstrates how to use AWS CodePipeline to create a build project that uses multiple input sources to create multiple output artifacts. For more information, see Multiple input sources and output artifacts sample.

You can use a JSON-formatted file that defines the structure of your pipeline, and then use it with the AWS CLI to create the pipeline. Use the following JSON file as an example of a pipeline structure that creates a build with more than one input source and more than one output artifact. Later in this sample you see how this file specifies the multiple inputs and outputs. For more information, see CodePipeline pipeline structure reference in the AWS CodePipeline User Guide.

```
"provider": "S3"
      },
      "outputArtifacts": [
          "name": "source1"
        }
      ],
      "configuration": {
        "S3Bucket": "my-input-bucket-name",
        "S30bjectKey": "my-source-code-file-name.zip"
      },
      "runOrder": 1
    },
      "inputArtifacts": [],
      "name": "Source2",
      "actionTypeId": {
        "category": "Source",
        "owner": "AWS",
        "version": "1",
        "provider": "S3"
      },
      "outputArtifacts": [
        {
          "name": "source2"
        }
      ],
      "configuration": {
        "S3Bucket": "my-other-input-bucket-name",
        "S30bjectKey": "my-other-source-code-file-name.zip"
      },
      "runOrder": 1
  ]
},
  "name": "Build",
  "actions": [
    {
      "inputArtifacts": [
        {
          "name": "source1"
        },
```

```
"name": "source2"
            }
          ],
          "name": "Build",
          "actionTypeId": {
            "category": "Build",
            "owner": "AWS",
            "version": "1",
            "provider": "AWS CodeBuild"
          },
          "outputArtifacts": [
            {
              "name": "artifact1"
            },
              "name": "artifact2"
            }
          ],
          "configuration": {
            "ProjectName": "my-build-project-name",
            "PrimarySource": "source1"
          },
          "runOrder": 1
        }
      ]
    }
  ],
  "artifactStore": {
    "type": "S3",
    "location": "AWS-CodePipeline-internal-bucket-name"
  },
  "name": "my-pipeline-name",
  "version": 1
 }
}
```

In this JSON file:

One of your input sources must be designated the PrimarySource. This source is the directory
where CodeBuild looks for and runs your buildspec file. The keyword PrimarySource is used to
specify the primary source in the configuration section of the CodeBuild stage in the JSON
file.

Each input source is installed in its own directory. This directory is stored in the
built-in environment variable \$CODEBUILD_SRC_DIR for the primary source and
\$CODEBUILD_SRC_DIR_yourInputArtifactName for all other sources. For the
pipeline in this sample, the two input source directories are \$CODEBUILD_SRC_DIR and
\$CODEBUILD_SRC_DIR_source2. For more information, see Environment variables in build
environments.

• The names of the output artifacts specified in the pipeline's JSON file must match the names of the secondary artifacts defined in your buildspec file. This pipeline uses the following buildspec file. For more information, see Buildspec syntax.

```
version: 0.2
phases:
  build:
    commands:
      touch source1_file
      - cd $CODEBUILD_SRC_DIR_source2
      - touch source2_file
artifacts:
  files:
    - '**/*'
  secondary-artifacts:
    artifact1:
      base-directory: $CODEBUILD_SRC_DIR
      files:
        - source1_file
    artifact2:
      base-directory: $CODEBUILD_SRC_DIR_source2
      files:
        - source2_file
```

After you create the JSON file, you can create your pipeline. Use the AWS CLI to run the **create-pipeline** command and pass the file to the --cli-input-json parameter. For more information, see Create a pipeline (CLI) in the AWS CodePipeline User Guide.

AWS Config sample with CodeBuild

AWS Config provides an inventory of your AWS resources and a history of configuration changes to these resources. AWS Config now supports AWS CodeBuild as an AWS resource, which means

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the service can track your CodeBuild projects. For more information about AWS Config, see <u>What is</u> AWS Config? in the AWS Config Developer Guide.

You can see the following information about CodeBuild resources on the **Resource Inventory** page in the AWS Config console:

- A timeline of your CodeBuild configuration changes.
- Configuration details for each CodeBuild project.
- Relationships with other AWS resources.
- A list of changes to your CodeBuild projects.

Topics

- Use CodeBuild with AWS Config
- Step 3: View AWS CodeBuild data in the AWS Config console

Use CodeBuild with AWS Config

The procedures in this topic show you how to set up AWS Config and look up CodeBuild projects.

Topics

- Prerequisites
- Step 1: Set up AWS Config
- Step 2: Look up AWS CodeBuild projects

Prerequisites

Create your AWS CodeBuild project. For instructions, see Create a build project.

Step 1: Set up AWS Config

- Setting up AWS Config (console)
- Setting up AWS Config (AWS CLI)

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Note

After you complete setup, it might take up to 10 minutes before you can see AWS CodeBuild projects in the AWS Config console.

Step 2: Look up AWS CodeBuild projects

- Sign in to the AWS Management Console and open the AWS Config console at https:// console.aws.amazon.com/config.
- On the Resource inventory page, select AWS CodeBuild Project under Resource type. Scroll down and select the **CodeBuild project** check box.
- 3. Choose **Look up**.
- After the list of CodeBuild projects is added, choose the CodeBuild project name link in the **Config timeline** column.

Step 3: View AWS CodeBuild data in the AWS Config console

When you look up resources on the **Resource inventory** page, you can choose the AWS Config timeline to view details about your CodeBuild project. The details page for a resource provides information about the configuration, relationships, and number of changes made to that resource.

The blocks at the top of the page are collectively called the timeline. The timeline shows the date and time that the recording was made.

For more information, see Viewing configuration details in the AWS Config console in the AWS Config Developer Guide.

Build notifications sample for CodeBuild

Amazon CloudWatch Events has built-in support for AWS CodeBuild. CloudWatch Events is a stream of system events describing changes in your AWS resources. With CloudWatch Events, you write declarative rules to associate events of interest with automated actions to be taken. This sample uses Amazon CloudWatch Events and Amazon Simple Notification Service (Amazon SNS) to send build notifications to subscribers whenever builds succeed, fail, go from one build phase to another, or any combination of these events.

Important

Running this sample might result in charges to your AWS account. These include possible charges for CodeBuild and for AWS resources and actions related to Amazon CloudWatch and Amazon SNS. For more information, see CodeBuild pricing, Amazon CloudWatch pricing, and Amazon SNS pricing.

Topics

- Run the build notifications sample
- Build notifications input format reference

Run the build notifications sample

Use the following procedure to run the build notifications sample.

To run this sample

If you already have a topic set up and subscribed to in Amazon SNS that you want to use for this sample, skip ahead to step 4. Otherwise, if you are using an IAM user instead of an AWS root account or an administrator user to work with Amazon SNS, add the following statement (between ### BEGIN ADDING STATEMENT HERE ### and ### END ADDING STATEMENT HERE ###) to the user (or IAM group the user is associated with). Using an AWS root account is not recommended. This statement enables viewing, creating, subscribing, and testing the sending of notifications to topics in Amazon SNS. Ellipses (...) are used for brevity and to help you locate where to add the statement. Do not remove any statements, and do not type these ellipses into the existing policy.

```
{
  "Statement": [
    ### BEGIN ADDING STATEMENT HERE ###
    {
      "Action": [
        "sns:CreateTopic",
        "sns:GetTopicAttributes",
        "sns:List*",
        "sns:Publish",
        "sns:SetTopicAttributes",
        "sns:Subscribe"
```

```
],
    "Resource": "*",
    "Effect": "Allow"
},
    ### END ADDING STATEMENT HERE ###
    ...
],
    "Version": "2012-10-17"
}
```

Note

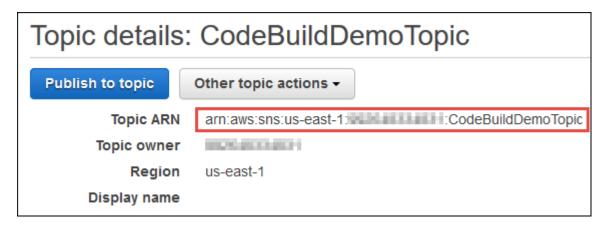
The IAM entity that modifies this policy must have permission in IAM to modify policies.

For more information, see <u>Editing customer managed policies</u> or the "To edit or delete an inline policy for a group, user, or role" section in <u>Working with inline policies</u> (console) in the *IAM User Guide*.

2. Create or identify a topic in Amazon SNS. AWS CodeBuild uses CloudWatch Events to send build notifications to this topic through Amazon SNS.

To create a topic:

- 1. Open the Amazon SNS console at https://console.aws.amazon.com/sns.
- 2. Choose Create topic.
- In Create new topic, for Topic name, enter a name for the topic (for example,
 CodeBuildDemoTopic). (If you choose a different name, substitute it throughout this sample.)
- 4. Choose Create topic.
- 5. On the **Topic details: CodeBuildDemoTopic** page, copy the **Topic ARN** value. You need this value for the next step.



For more information, see <u>Create a topic</u> in the *Amazon SNS Developer Guide*.

3. Subscribe one or more recipients to the topic to receive email notifications.

To subscribe a recipient to a topic:

- 1. With the Amazon SNS console open from the previous step, in the navigation pane, choose **Subscriptions**, and then choose **Create subscription**.
- 2. In **Create subscription**, for **Topic ARN**, paste the topic ARN you copied from the previous step.
- 3. For **Protocol**, choose **Email**.
- 4. For **Endpoint**, enter the recipient's full email address.



5. Choose Create Subscription.

6. Amazon SNS sends a subscription confirmation email to the recipient. To begin receiving email notifications, the recipient must choose the **Confirm subscription** link in the subscription confirmation email. After the recipient clicks the link, if successfully subscribed, Amazon SNS displays a confirmation message in the recipient's web browser.

For more information, see Subscribe to a topic in the Amazon SNS Developer Guide.

4. If you are using an user instead of an AWS root account or an administrator user to work with CloudWatch Events, add the following statement (between ### BEGIN ADDING STATEMENT HERE ### and ### END ADDING STATEMENT HERE ###) to the user (or IAM group the user is associated with). Using an AWS root account is not recommended. This statement is used to allow the user to work with CloudWatch Events. Ellipses (...) are used for brevity and to help you locate where to add the statement. Do not remove any statements, and do not type these ellipses into the existing policy.

Note

The IAM entity that modifies this policy must have permission in IAM to modify policies.

For more information, see <u>Editing customer managed policies</u> or the "To edit or delete an inline policy for a group, user, or role" section in <u>Working with inline policies</u> (<u>console</u>) in the *IAM User Guide*.

5. Create a rule in CloudWatch Events. To do this, open the CloudWatch console, at https://console.aws.amazon.com/cloudwatch.

- 6. In the navigation pane, under **Events**, choose **Rules**, and then choose **Create rule**.
- 7. On the Step 1: Create rule page, Event Pattern and Build event pattern to match events by service should already be selected.
- 8. For Service Name, choose CodeBuild. For Event Type, All Events should already be selected.
- 9. The following code should be displayed in **Event Pattern Preview**:

```
{
   "source": [
    "aws.codebuild"
  ]
}
```

10. Choose **Edit** and replace the code in **Event Pattern Preview** with one of the following two rule patterns.

This first rule pattern triggers an event when a build starts or completes for the specified build projects in AWS CodeBuild.

```
{
  "source": [
    "aws.codebuild"
  ],
  "detail-type": [
    "CodeBuild Build State Change"
  ],
  "detail": {
    "build-status": [
      "IN_PROGRESS",
      "SUCCEEDED",
      "FAILED",
      "STOPPED"
    ],
    "project-name": [
      "my-demo-project-1",
      "my-demo-project-2"
    ]
  }
}
```

In the preceding rule, make the following code changes as needed.

• To trigger an event when a build starts or completes, either leave all of the values as shown in the build-status array, or remove the build-status array altogether.

- To trigger an event only when a build completes, remove IN_PROGRESS from the buildstatus array.
- To trigger an event only when a build starts, remove all of the values except IN_PROGRESS from the build-status array.
- To trigger events for all build projects, remove the project-name array altogether.
- To trigger events only for individual build projects, specify the name of each build project in the project-name array.

This second rule pattern triggers an event whenever a build moves from one build phase to another for the specified build projects in AWS CodeBuild.

```
{
  "source": [
    "aws.codebuild"
  ],
  "detail-type": [
    "CodeBuild Build Phase Change"
  ],
  "detail": {
    "completed-phase": [
      "SUBMITTED",
      "PROVISIONING",
      "DOWNLOAD_SOURCE",
      "INSTALL",
      "PRE_BUILD",
      "BUILD",
      "POST_BUILD",
      "UPLOAD_ARTIFACTS",
      "FINALIZING"
    ],
    "completed-phase-status": [
      "TIMED_OUT",
      "STOPPED",
      "FAILED",
      "SUCCEEDED",
```

```
"FAULT",
      "CLIENT_ERROR"
    ],
    "project-name": [
      "my-demo-project-1",
      "my-demo-project-2"
    ]
  }
}
```

In the preceding rule, make the following code changes as needed.

- To trigger an event for every build phase change (which might send up to nine notifications for each build), either leave all of the values as shown in the completed-phase array, or remove the completed-phase array altogether.
- To trigger events only for individual build phase changes, remove the name of each build phase in the completed-phase array that you do not want to trigger an event for.
- To trigger an event for every build phase status change, either leave all of the values as shown in the completed-phase-status array, or remove the completed-phasestatus array altogether.
- To trigger events only for individual build phase status changes, remove the name of each build phase status in the completed-phase-status array that you do not want to trigger an event for.
- To trigger events for all build projects, remove the project-name array.
- To trigger events for individual build projects, specify the name of each build project in the project-name array.

For more information about event patterns, see Event Patterns in the Amazon EventBridge User Guide.

For more information about filtering with event patterns, see Content-based Filtering with Event Patterns in the Amazon EventBridge User Guide.



Note

If you want to trigger events for both build state changes and build phase changes, you must create two separate rules: one for build state changes and another for build

phase changes. If you try to combine both rules into a single rule, the combined rule might produce unexpected results or stop working altogether.

When you have finished replacing the code, choose **Save**.

- 11. For Targets, choose Add target.
- 12. In the list of targets, choose **SNS topic**.
- 13. For **Topic**, choose the topic you identified or created earlier.
- 14. Expand Configure input, and then choose Input Transformer.
- 15. In the **Input Path** box, enter one of the following input paths.

For a rule with a detail-type value of CodeBuild Build State Change, enter the following.

```
{"build-id":"$.detail.build-id","project-name":"$.detail.project-name","build-
status":"$.detail.build-status"}
```

For a rule with a detail-type value of CodeBuild Build Phase Change, enter the following.

```
{"build-id":"$.detail.build-id", "project-name":"$.detail.project-name", "completed-phase":"$.detail.completed-phase-status":"$.detail.completed-phase-status"}
```

To get other types of information, see the <u>Build notifications input format reference</u>.

16. In the **Input Template** box, enter one of the following input templates.

For a rule with a detail-type value of CodeBuild Build State Change, enter the following.

```
"Build '<build-id>' for build project '<project-name>' has reached the build status of '<build-status>'."
```

For a rule with a detail-type value of CodeBuild Build Phase Change, enter the following.

```
"Build '<build-id>' for build project '<project-name>' has completed the build phase of '<completed-phase>' with a status of '<completed-phase-status>'."
```

- 17. Choose **Configure details**.
- 18. On the **Step 2: Configure rule details** page, enter a name and an optional description. For **State**, leave **Enabled** selected.
- 19. Choose Create rule.
- 20. Create build projects, run the builds, and view build information.
- 21. Confirm that CodeBuild is now successfully sending build notifications. For example, check to see if the build notification emails are now in your inbox.

To change a rule's behavior, in the CloudWatch console, choose the rule you want to change, choose **Actions**, and then choose **Edit**. Make changes to the rule, choose **Configure details**, and then choose **Update rule**.

To stop using a rule to send build notifications, in the CloudWatch console, choose the rule you want to stop using, choose **Actions**, and then choose **Disable**.

To delete a rule altogether, in the CloudWatch console, choose the rule you want to delete, choose **Actions**, and then choose **Delete**.

Build notifications input format reference

CloudWatch delivers notifications in JSON format.

Build state change notifications use the following format:

```
{
   "version": "0",
   "id": "c030038d-8c4d-6141-9545-00ff7b7153EX",
   "detail-type": "CodeBuild Build State Change",
   "source": "aws.codebuild",
   "account": "123456789012",
   "time": "2017-09-01T16:14:28Z",
   "region": "us-west-2",
   "resources":[
        "arn:aws:codebuild:us-west-2:123456789012:build/my-sample-project:8745a7a9-c340-456a-9166-edf953571bEX"
   ],
```

```
"detail":{
    "build-status": "SUCCEEDED",
    "project-name": "my-sample-project",
    "build-id": "arn:aws:codebuild:us-west-2:123456789012:build/my-sample-
project:8745a7a9-c340-456a-9166-edf953571bEX",
    "additional-information": {
      "artifact": {
        "md5sum": "da9c44c8a9a3cd4b443126e823168fEX",
        "sha256sum":
 "6ccc2ae1df9d155ba83c597051611c42d60e09c6329dcb14a312cecc0a8e39EX",
        "location": "arn:aws:s3:::codebuild-123456789012-output-bucket/my-output-
artifact.zip"
      },
      "environment": {
        "image": "aws/codebuild/standard:5.0",
        "privileged-mode": false,
        "compute-type": "BUILD_GENERAL1_SMALL",
        "type": "LINUX_CONTAINER",
        "environment-variables": []
      },
      "timeout-in-minutes": 60,
      "build-complete": true,
      "initiator": "MyCodeBuildDemoUser",
      "build-start-time": "Sep 1, 2017 4:12:29 PM",
      "source": {
        "location": "codebuild-123456789012-input-bucket/my-input-artifact.zip",
        "type": "S3"
      },
      "logs": {
        "group-name": "/aws/codebuild/my-sample-project",
        "stream-name": "8745a7a9-c340-456a-9166-edf953571bEX",
        "deep-link": "https://console.aws.amazon.com/cloudwatch/home?region=us-
west-2#logEvent:group=/aws/codebuild/my-sample-project;stream=8745a7a9-c340-456a-9166-
edf953571bEX"
      },
      "phases": [
        {
          "phase-context": [],
          "start-time": "Sep 1, 2017 4:12:29 PM",
          "end-time": "Sep 1, 2017 4:12:29 PM",
          "duration-in-seconds": 0,
          "phase-type": "SUBMITTED",
          "phase-status": "SUCCEEDED"
        },
```

```
{
  "phase-context": [],
  "start-time": "Sep 1, 2017 4:12:29 PM",
  "end-time": "Sep 1, 2017 4:13:05 PM",
  "duration-in-seconds": 36,
  "phase-type": "PROVISIONING",
  "phase-status": "SUCCEEDED"
},
{
  "phase-context": [],
  "start-time": "Sep 1, 2017 4:13:05 PM",
  "end-time": "Sep 1, 2017 4:13:10 PM",
  "duration-in-seconds": 4,
  "phase-type": "DOWNLOAD_SOURCE",
  "phase-status": "SUCCEEDED"
},
  "phase-context": [],
  "start-time": "Sep 1, 2017 4:13:10 PM",
  "end-time": "Sep 1, 2017 4:13:10 PM",
  "duration-in-seconds": 0,
  "phase-type": "INSTALL",
  "phase-status": "SUCCEEDED"
},
  "phase-context": [],
  "start-time": "Sep 1, 2017 4:13:10 PM",
  "end-time": "Sep 1, 2017 4:13:10 PM",
  "duration-in-seconds": 0,
  "phase-type": "PRE_BUILD",
  "phase-status": "SUCCEEDED"
},
{
  "phase-context": [],
  "start-time": "Sep 1, 2017 4:13:10 PM",
  "end-time": "Sep 1, 2017 4:14:21 PM",
  "duration-in-seconds": 70,
  "phase-type": "BUILD",
  "phase-status": "SUCCEEDED"
},
  "phase-context": [],
  "start-time": "Sep 1, 2017 4:14:21 PM",
  "end-time": "Sep 1, 2017 4:14:21 PM",
```

```
"duration-in-seconds": 0,
          "phase-type": "POST_BUILD",
          "phase-status": "SUCCEEDED"
        },
          "phase-context": [],
          "start-time": "Sep 1, 2017 4:14:21 PM",
          "end-time": "Sep 1, 2017 4:14:21 PM",
          "duration-in-seconds": 0,
          "phase-type": "UPLOAD_ARTIFACTS",
          "phase-status": "SUCCEEDED"
        },
          "phase-context": [],
          "start-time": "Sep 1, 2017 4:14:21 PM",
          "end-time": "Sep 1, 2017 4:14:26 PM",
          "duration-in-seconds": 4,
          "phase-type": "FINALIZING",
          "phase-status": "SUCCEEDED"
        },
          "start-time": "Sep 1, 2017 4:14:26 PM",
          "phase-type": "COMPLETED"
        }
      1
    },
    "current-phase": "COMPLETED",
    "current-phase-context": "[]",
    "version": "1"
  }
}
```

Build phase change notifications use the following format:

```
"version": "0",
"id": "43ddc2bd-af76-9ca5-2dc7-b695e15adeEX",
"detail-type": "CodeBuild Build Phase Change",
"source": "aws.codebuild",
"account": "123456789012",
"time": "2017-09-01T16:14:21Z",
"region": "us-west-2",
"resources":[
```

```
"arn:aws:codebuild:us-west-2:123456789012:build/my-sample-project:8745a7a9-
c340-456a-9166-edf953571bEX"
  ],
  "detail":{
    "completed-phase": "COMPLETED",
    "project-name": "my-sample-project",
    "build-id": "arn:aws:codebuild:us-west-2:123456789012:build/my-sample-
project:8745a7a9-c340-456a-9166-edf953571bEX",
    "completed-phase-context": "[]",
    "additional-information": {
      "artifact": {
        "md5sum": "da9c44c8a9a3cd4b443126e823168fEX",
        "sha256sum":
 "6ccc2ae1df9d155ba83c597051611c42d60e09c6329dcb14a312cecc0a8e39EX",
        "location": "arn:aws:s3:::codebuild-123456789012-output-bucket/my-output-
artifact.zip"
      },
      "environment": {
        "image": "aws/codebuild/standard:5.0",
        "privileged-mode": false,
        "compute-type": "BUILD_GENERAL1_SMALL",
        "type": "LINUX_CONTAINER",
        "environment-variables": []
      },
      "timeout-in-minutes": 60,
      "build-complete": true,
      "initiator": "MyCodeBuildDemoUser",
      "build-start-time": "Sep 1, 2017 4:12:29 PM",
      "source": {
        "location": "codebuild-123456789012-input-bucket/my-input-artifact.zip",
        "type": "S3"
      },
      "logs": {
        "group-name": "/aws/codebuild/my-sample-project",
        "stream-name": "8745a7a9-c340-456a-9166-edf953571bEX",
        "deep-link": "https://console.aws.amazon.com/cloudwatch/home?region=us-
west-2#logEvent:group=/aws/codebuild/my-sample-project;stream=8745a7a9-c340-456a-9166-
edf953571bEX"
      },
      "phases": [
          "phase-context": [],
          "start-time": "Sep 1, 2017 4:12:29 PM",
          "end-time": "Sep 1, 2017 4:12:29 PM",
```

```
"duration-in-seconds": 0,
  "phase-type": "SUBMITTED",
  "phase-status": "SUCCEEDED"
},
{
  "phase-context": [],
  "start-time": "Sep 1, 2017 4:12:29 PM",
  "end-time": "Sep 1, 2017 4:13:05 PM",
  "duration-in-seconds": 36,
  "phase-type": "PROVISIONING",
  "phase-status": "SUCCEEDED"
},
{
  "phase-context": [],
  "start-time": "Sep 1, 2017 4:13:05 PM",
  "end-time": "Sep 1, 2017 4:13:10 PM",
  "duration-in-seconds": 4,
  "phase-type": "DOWNLOAD_SOURCE",
  "phase-status": "SUCCEEDED"
},
{
  "phase-context": [],
  "start-time": "Sep 1, 2017 4:13:10 PM",
  "end-time": "Sep 1, 2017 4:13:10 PM",
  "duration-in-seconds": 0,
  "phase-type": "INSTALL",
  "phase-status": "SUCCEEDED"
},
  "phase-context": [],
  "start-time": "Sep 1, 2017 4:13:10 PM",
  "end-time": "Sep 1, 2017 4:13:10 PM",
  "duration-in-seconds": 0,
  "phase-type": "PRE_BUILD",
  "phase-status": "SUCCEEDED"
},
{
  "phase-context": [],
  "start-time": "Sep 1, 2017 4:13:10 PM",
  "end-time": "Sep 1, 2017 4:14:21 PM",
  "duration-in-seconds": 70,
  "phase-type": "BUILD",
  "phase-status": "SUCCEEDED"
},
```

```
{
          "phase-context": [],
          "start-time": "Sep 1, 2017 4:14:21 PM",
          "end-time": "Sep 1, 2017 4:14:21 PM",
          "duration-in-seconds": 0,
          "phase-type": "POST_BUILD",
          "phase-status": "SUCCEEDED"
        },
          "phase-context": [],
          "start-time": "Sep 1, 2017 4:14:21 PM",
          "end-time": "Sep 1, 2017 4:14:21 PM",
          "duration-in-seconds": 0,
          "phase-type": "UPLOAD_ARTIFACTS",
          "phase-status": "SUCCEEDED"
        },
          "phase-context": [],
          "start-time": "Sep 1, 2017 4:14:21 PM",
          "end-time": "Sep 1, 2017 4:14:26 PM",
          "duration-in-seconds": 4,
          "phase-type": "FINALIZING",
          "phase-status": "SUCCEEDED"
        },
          "start-time": "Sep 1, 2017 4:14:26 PM",
          "phase-type": "COMPLETED"
        }
      ]
    },
    "completed-phase-status": "SUCCEEDED",
    "completed-phase-duration-seconds": 4,
    "version": "1",
    "completed-phase-start": "Sep 1, 2017 4:14:21 PM",
    "completed-phase-end": "Sep 1, 2017 4:14:26 PM"
  }
}
```

Build badges sample with CodeBuild

AWS CodeBuild now supports the use of build badges, which provide an embeddable, dynamically generated image (*badge*) that displays the status of the latest build for a project. This image is

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accessible through a publicly available URL generated for your CodeBuild project. This allows anyone to view the status of a CodeBuild project. Build badges do not contain any security information, so they do not require authentication.

Topics

- Create a build project with build badges
- Access AWS CodeBuild build badges
- Publish CodeBuild build badges
- CodeBuild badge statuses

Create a build project with build badges

Use the following one of the following procedures to create a build project with build badges enabled. You can use AWS CLI or the AWS Management Console.

To create a build project with build badges enabled (AWS CLI)

 For information about creating a build project, see <u>Create a build project (AWS CLI)</u>. To include build badges with your AWS CodeBuild project, you must specify <u>badgeEnabled</u> with a value of true.

To create a build project with build badges enabled (console)

- 1. Open the AWS CodeBuild console at https://console.aws.amazon.com/codesuite/codebuild/ home.
- 2. If a CodeBuild information page is displayed, choose **Create build project**. Otherwise, on the navigation pane, expand **Build**, choose **Build projects**, and then choose **Create build project**.
- 3. In **Project name**, enter a name for this build project. Build project names must be unique across each AWS account. You can also include an optional description of the build project to help other users understand what this project is used for.
- 4. In **Source**, for **Source provider**, choose the source code provider type, and then do one of the following:



Note

CodeBuild does not support build badges with the Amazon S3 source provider. Because AWS CodePipeline uses Amazon S3 for artifact transfers, build badges are not supported for build projects that are part of a pipeline created in CodePipeline.

- If you chose CodeCommit, then for Repository, choose the name of the repository. Select **Enable build badge** to make your project's build status visible and embeddable.
- If you chose **GitHub**, follow the instructions to connect (or reconnect) with GitHub. On the GitHub Authorize application page, for Organization access, choose Request access next to each repository you want AWS CodeBuild to be able to access. After you choose Authorize **application**, back in the AWS CodeBuild console, for **Repository**, choose the name of the repository that contains the source code. Select **Enable build badge** to make your project's build status visible and embeddable.
- If you chose **Bitbucket**, follow the instructions to connect (or reconnect) with Bitbucket. On the Bitbucket Confirm access to your account page, for Organization access, choose Grant access. After you choose Grant access, back in the AWS CodeBuild console, for Repository, choose the name of the repository that contains the source code. Select **Enable build badge** to make your project's build status visible and embeddable.



Important

Updating your project source might affect the accuracy of the project's build badges.

In Environment: 5.

For **Environment image**, do one of the following:

- To use a Docker image managed by AWS CodeBuild, choose Managed image, and then make selections from Operating system, Runtime(s), Image, and Image version. Make a selection from **Environment type** if it is available.
- To use another Docker image, choose **Custom image**. For **Environment type**, choose **ARM**, Linux, Linux GPU, or Windows. If you choose Other registry, for External registry URL, enter the name and tag of the Docker image in Docker Hub, using the format docker

repository/docker image name. If you choose Amazon ECR, use Amazon ECR repository and Amazon ECR image to choose the Docker image in your AWS account.

 To use a private Docker image, choose Custom image. For Environment type, choose ARM, Linux, Linux GPU, or Windows. For Image registry, choose Other registry, and then enter the ARN of the credentials for your private Docker image. The credentials must be created by Secrets Manager. For more information, see What Is AWS Secrets Manager? in the AWS Secrets Manager User Guide.

6. In **Service role**, do one of the following:

- If you do not have a CodeBuild service role, choose **New service role**. In **Role name**, enter a name for the new role.
- If you have a CodeBuild service role, choose **Existing service role**. In **Role ARN**, choose the service role.

Note

When you use the console to create or update a build project, you can create a CodeBuild service role at the same time. By default, the role works with that build project only. If you use the console to associate this service role with another build project, the role is updated to work with the other build project. A service role can work with up to 10 build projects.

7. In **Buildspec**, do one of the following:

- Choose **Use a buildspec file** to use the buildspec.yml file in the source code root directory.
- Choose Insert build commands to use the console to insert build commands.

For more information, see the Buildspec reference.

- 8. In **Artifacts**, for **Type**, do one of the following:
 - If you do not want to create build output artifacts, choose No artifacts.
 - To store the build output in an S3 bucket, choose **Amazon S3**, and then do the following:
 - If you want to use your project name for the build output ZIP file or folder, leave **Name** blank. Otherwise, enter the name. By default, the artifact name is the project name. If you want to use a different name, enter it in the artifacts name box. If you want to output a ZIP file, include the zip extension.

- For **Bucket name**, choose the name of the output bucket.
- If you chose **Insert build commands** earlier in this procedure, for **Output files**, enter the locations of the files from the build that you want to put into the build output ZIP file or folder. For multiple locations, separate each location with a comma (for example, appspec.yml, target/my-app.jar). For more information, see the description of files in Buildspec syntax.
- 9. Expand **Additional configuration** and choose options as appropriate.
- 10. Choose Create build project. On the Review page, choose Start build to run the build.

Access AWS CodeBuild build badges

You can use AWS CodeBuild console or the AWS CLI to access build badges.

- In the CodeBuild console, in the list of build projects, in the Name column, choose the link that
 corresponds to the build project. On the Build project: project-name page, in Configuration,
 choose Copy badge URL. For more information, see View a build project's details (console).
- In the AWS CLI, run the batch-get-projects command. The build badge URL is included in the project environment details section of the output. For more information, see <u>View a build project's details (AWS CLI)</u>.

The build badge request URL is generated with a common default branch, but you can specify any branch in your source repository that you have used to run a build. For example:

```
https://codebuild.us-east-1.amazon.com/badges?uuid=...&branch=<branch>
```

You can also specify a tag from your source repository by substituting the branch parameter with the tag parameter in the badge URL. For example:

```
https://codebuild.us-east-1.amazon.com/badges?uuid=...&tag=<tag>
```

Publish CodeBuild build badges

You can display the status of the latest build in a markdown file using your build badge URL in a markdown image. This is useful to display the status of the most recent build in the readme.md file in your source repository (for example, GitHub or CodeCommit). For example:

![](<build badge URL>)

CodeBuild badge statuses

The CodeBuild build badge can have one of the following statuses.

- **PASSING** The most recent build on the given branch passed.
- **FAILING** The most recent build on the given branch timed out, failed, faulted, or was stopped.
- IN_PROGRESS The most recent build on the given branch is in progress.
- **UNKNOWN** The project has not yet run a build for the given branch or at all. Also, the build badges feature might have been disabled.

'Test report using the AWS CLI' sample

Tests that you specify in your buildspec file are run during your build. This sample shows you how to use the AWS CLI to incorporate tests into builds in CodeBuild. You can use JUnit to create unit tests, or you can use another tool to create configuration tests. You can then evaluate the test results to fix issues or optimize your application.

You can use the CodeBuild API or the AWS CodeBuild console to access the test results. This sample shows you how to configure your report so its test results are exported to an S3 bucket.

Topics

Run the test report sample

Run the test report sample

Use the following steps to run the trest report sample.

Topics

- Prerequisites
- Step 1: Create a report group
- Step 2: Configure a project with a report group
- Step 3: Run and view results of a report

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Prerequisites

• Create your test cases. This sample is written with the assumption that you have test cases to include in your sample test report. You specify the location of your test files in the buildspec file.

The following test report file formats are supported:

- Cucumber JSON (.json)
- JUnit XML (.xml)
- NUnit XML (.xml)
- NUnit3 XML (.xml)
- TestNG XML (.xml)
- Visual Studio TRX (.trx)
- Visual Studio TRX XML (.xml)

Create your test cases with any test framework that can create report files in one of these formats (for example, Surefire JUnit plugin, TestNG, or Cucumber).

- Create an S3 bucket and make a note of its name. For more information, see <u>How do I create an</u>
 S3 bucket? in the *Amazon S3 User Guide*.
- Create an IAM role and make a note of its ARN. You need the ARN when you create your build project.
- If your role does not have the following permissions, add them.

For more information, see Permissions for test reporting operations.

Step 1: Create a report group

- 1. Create a file named CreateReportGroupInput.json.
- 2. Create a folder in your S3 bucket where your test results are exported.
- 3. Copy the following into CreateReportGroupInput.json. For <<u>bucket-name</u>>, use the name of the S3 bucket. For <<u>path-to-folder</u>>, enter the path to the folder in your S3 bucket.

```
{
  "name": "<report-name>",
  "type": "TEST",
  "exportConfig": {
    "exportConfigType": "S3",
    "s3Destination": {
        "bucket": "<bucket-name>",
        "path": "<path-to-folder>",
        "packaging": "NONE"
    }
}
```

4. Run the following command in the directory that contains CreateReportGroupInput.json.

```
aws codebuild create-report-group --cli-input-json file://
CreateReportGroupInput.json
```

The output looks like the following. Make a note of the ARN for the reportGroup. You use it when you create a project that uses this report group.

```
{
  "reportGroup": {
    "arn": "arn:aws:codebuild:us-west-2:123456789012:report-group/<report-name>",
    "name": "<report-name>",
    "type": "TEST",
    "exportConfig": {
        "exportConfigType": "S3",
        "s3Destination": {
            "bucket": "<s3-bucket-name>",
            "path": "<folder-path>",
            "packaging": "NONE",
            "encryptionKey": "arn:aws:kms:us-west-2:123456789012:alias/aws/s3"
```

```
}
},
"created": 1570837165.885,
"lastModified": 1570837165.885
}
}
```

Step 2: Configure a project with a report group

To run a report, you first create a CodeBuild build project that is configured with your report group. Test cases specified for your report group are run when you run a build.

- 1. Create a buildspec file named buildspec.yml.
- 2. Use the following YAML as a template for your buildspec.yml file. Be sure to include the commands that run your tests. In the reports section, specify the files that contain the results of your test cases. These files store the test results you can access with CodeBuild. They expire 30 days after they are created. These files are different from the raw test case result files you export to an S3 bucket.

```
version: 0.2
  phases:
  install:
    runtime-versions:
        java: openjdk8
build:
    commands:
        - echo Running tests
        - <enter commands to run your tests>

reports:
    <report-name-or-arn>: #test file information
    files:
        - '<test-result-files>'
    base-directory: '<optional-base-directory>'
    discard-paths: false #do not remove file paths from test result files
```

Note

Instead of the ARN of an existing report group, you can also specify a name for a report group that has not been created. If you specify a name instead of an ARN,

CodeBuild creates a report group when it runs a build. Its name contains your project name and the name you specify in the buildspec file, in this format: project-name-report-group-name. For more information, see Create test reports and Report group naming.

- 3. Create a file named project. json. This file contains input for the create-project command.
- 4. Copy the following JSON into project.json. For source, enter the type and location of the repository that contains your source files. For serviceRole, specify the ARN of the role you are using.

```
{
  "name": "test-report-project",
  "description": "sample-test-report-project",
  "source": {
    "type": "CODECOMMIT|CODEPIPELINE|GITHUB|S3|BITBUCKET|GITHUB_ENTERPRISE|
NO_SOURCE",
    "location": "<your-source-url>"
  },
  "artifacts": {
    "type": "NO_ARTIFACTS"
  "cache": {
    "type": "NO_CACHE"
  },
  "environment": {
    "type": "LINUX_CONTAINER",
    "image": "aws/codebuild/standard:5.0",
    "computeType": "small"
  },
  "serviceRole": "arn:aws:iam::<your-aws-account-id>:role/service-role/<your-role-
name>"
}
```

5. Run the following command in the directory that contains project.json. This creates a project named test-project.

```
aws codebuild create-project --cli-input-json file://project.json
```

Step 3: Run and view results of a report

In this section, you run a build of the project you created earlier. During the build process, CodeBuild creates a report with the results of the test cases. The report is contained in the report group you specified.

1. To start a build, run the following command. test-report-project is the name of the build project created above. Make a note of the build ID that appears in the output.

```
aws codebuild start-build --project-name test-report-project
```

2. Run the following command to get information about your build, including the ARN of your report. For

build-id>, specify your build ID. Make a note of the report ARN in the reportArns property of the output.

```
aws codebuild batch-get-builds --ids <build-id>
```

Run the following command to get details about your report. For <report-arn>, specify your report ARN.

```
aws codebuild batch-get-reports --report-arns <report-arn>
```

The output looks like the following. This sample output shows how many of the tests were successful, failed, skipped, resulted in an error, or return an unknown status.

```
{
  "reports": [
    {
      "status": "FAILED",
      "reportGroupArn": "<report-group-arn>",
      "name": "<report-group-name>",
      "created": 1573324770.154,
      "exportConfig": {
        "exportConfigType": "S3",
        "s3Destination": {
          "bucket": "<amzn-s3-demo-bucket>",
          "path": "<path-to-your-report-results>",
          "packaging": "NONE",
          "encryptionKey": "<encryption-key>"
        }
      },
```

```
"expired": 1575916770.0,
      "truncated": false,
      "executionId": "arn:aws:codebuild:us-west-2:123456789012:build/<name-of-
build-project>:2c254862-ddf6-4831-a53f-6839a73829c1",
      "type": "TEST",
      "arn": "<report-arn>",
      "testSummary": {
        "durationInNanoSeconds": 6657770,
        "total": 11,
        "statusCounts": {
          "FAILED": 3,
          "SKIPPED": 7,
          "ERROR": 0,
          "SUCCEEDED": 1,
          "UNKNOWN": 0
      }
    }
  ],
  "reportsNotFound": []
}
```

4. Run the following command to list information about test cases for your report. For <report-arn>, specify the ARN of your report. For the optional --filter parameter, you can specify one status result (SUCCEEDED, FAILED, SKIPPED, ERROR, or UNKNOWN).

```
aws codebuild describe-test-cases \
    --report-arn < report-arn> \
    --filter status=SUCCEEDED|FAILED|SKIPPED|ERROR|UNKNOWN
```

The output looks like the following.

```
{
  "testCases": [
    {
        "status": "FAILED",
        "name": "Test case 1",
        "expired": 1575916770.0,
        "reportArn": "<report-arn>",
        "prefix": "Cucumber tests for agent",
        "message": "A test message",
        "durationInNanoSeconds": 1540540,
```

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```
"testRawDataPath": "<path-to-output-report-files>"
},
{
    "status": "SUCCEEDED",
    "name": "Test case 2",
    "expired": 1575916770.0,
    "reportArn": "<report-arn>",
    "prefix": "Cucumber tests for agent",
    "message": "A test message",
    "durationInNanoSeconds": 1540540,
    "testRawDataPath": "<path-to-output-report-files>"
}
]
```

Docker samples for CodeBuild

This section describes sample integrations between Docker and AWS CodeBuild.

Sample	Description
Docker in custom image sample for CodeBuild	This sample builds and runs a Docker image by using CodeBuild and a custom Docker build image (docker:dind in Docker Hub).
Docker image build server sample for CodeBuild	This sample offloads your Docker builds to a managed image build server.
Windows Docker builds sample for CodeBuild	This sample builds and runs a Windows Docker image by using CodeBuild.
'Publish Docker image to an Amazon ECR image repository' sample for CodeBuild	This sample produces as build output a Docker image and then pushes the Docker image to an Amazon Elastic Container Registry (Amazon ECR) image repository.
Private registry with AWS Secrets Manager sample for CodeBuild	This sample shows you how to use a Docker image that is stored in a private registry as your CodeBuild runtime environment.

Docker in custom image sample for CodeBuild

The following sample builds and runs a Docker image by using AWS CodeBuild and a custom Docker build image (docker: dind in Docker Hub).

To learn how to build a Docker image by using a build image provided by CodeBuild with Docker support instead, see our 'Publish Docker image to Amazon ECR' sample.

Important

Running this sample might result in charges to your AWS account. These include possible charges for CodeBuild and for AWS resources and actions related to Amazon S3, AWS KMS, and CloudWatch Logs. For more information, see CodeBuild pricing, Amazon S3 pricing, AWS Key Management Service pricing, and Amazon CloudWatch pricing.

Topics

• Run the Docker in custom image sample

Run the Docker in custom image sample

Use the following procedure to run the Docker in custom image sample. For more information about this sample, see Docker in custom image sample for CodeBuild.

To run the Docker in custom image sample

Create the files as described in the Directory structure and Files sections of this topic, and then upload them to an S3 input bucket or an AWS CodeCommit, GitHub, or Bitbucket repository.

Important

Do not upload (root directory name), just the files inside of (root directory name).

If you are using an S3 input bucket, be sure to create a ZIP file that contains the files, and then upload it to the input bucket. Do not add (root directory name) to the ZIP file, just the files inside of (root directory name).

Create a build project, run the build, and view related build information. 2.

If you use the AWS CLI to create the build project, the JSON-formatted input to the create-project command might look similar to this. (Replace the placeholders with your own values.)

```
{
  "name": "sample-docker-custom-image-project",
  "source": {
    "type": "S3",
    "location": "codebuild-region-ID-account-ID-input-
bucket/DockerCustomImageSample.zip"
  },
  "artifacts": {
    "type": "NO_ARTIFACTS"
 },
  "environment": {
    "type": "LINUX_CONTAINER",
    "image": "docker:dind",
    "computeType": "BUILD_GENERAL1_SMALL",
    "privilegedMode": false
  "serviceRole": "arn:aws:iam::account-ID:role/role-name",
  "encryptionKey": "arn:aws:kms:region-ID:account-ID:key/key-ID"
}
```

Note

By default, Docker daemon is enabled for non-VPC builds. If you would like to use Docker containers for VPC builds, see <u>Runtime Privilege and Linux Capabilities</u> on the Docker Docs website and enable privileged mode. Also, Windows does not support privileged mode.

3. To see the build results, look in the build's log for the string Hello, World!. For more information, see View build details.

Directory structure

This sample assumes this directory structure.

```
(root directory name)
```

```
### buildspec.yml
### Dockerfile
```

Files

The base image of the operating system used in this sample is Ubuntu. The sample uses these files.

buildspec.yml (in (root directory name))

```
version: 0.2

phases:
    pre_build:
        commands:
        - docker build -t helloworld .

build:
        commands:
        - docker images
        - docker run helloworld echo "Hello, World!"
```

Dockerfile (in (root directory name))

```
FROM maven:3.3.9-jdk-8

RUN echo "Hello World"
```

Docker image build server sample for CodeBuild

The following sample offloads your Docker builds to a managed image build server. You can adapt this sample to provision a dedicated and managed Docker image build server in your CodeBuild project configuration. Note that the provisioned instance is active while builds are actively run for the project, and the instance is stopped when builds are not running. The provisioned instance is stored for up to a month before it is recycled. For more information, see CodeBuild Docker Server Capability.

Important

Running this sample might result in charges to your AWS account. These include possible charges for CodeBuild and for AWS resources and actions related to Amazon S3, AWS KMS,

and CloudWatch Logs. For more information, see <u>CodeBuild pricing</u>, <u>Amazon S3 pricing</u>, AWS Key Management Service pricing, and Amazon CloudWatch pricing.

Topics

Configure a Docker server

Configure a Docker server

Use the following procedure to provision a dedicated compute environment for a CodeBuild project that manages Docker workloads and stores Docker image layers.

To configure a Docker server

1. Create the files as described in the <u>Directory structure</u> and <u>Files</u> sections of this topic, and then upload them to an S3 input bucket or an AWS CodeCommit, GitHub, or Bitbucket repository.

Important

Do not upload (root directory name), just the files inside of (root directory name).

If you are using an S3 input bucket, be sure to create a ZIP file that contains the files, and then upload it to the input bucket. Do not add (root directory name) to the ZIP file, just the files inside of (root directory name).

- 2. Create a build project, run the build, and view related build information:
 - a. In the Environment section of the console, choose Additional configuration, navigate to Docker server configuration, and then select Enable docker server for this project. You can then choose the Docker server compute type and supply a Registry credential.
 - b. If you use the AWS CLI to create the build project, the JSON-formatted input to the create-project command might look similar to this. (Replace the placeholders with your own values.)

```
{
   "name": "sample-docker-custom-image-project",
   "source": {
     "type": "S3",
```

```
"location": "codebuild-region-ID-account-ID-input-
bucket/DockerServerSample.zip"
  },
  "artifacts": {
    "type": "NO_ARTIFACTS"
  },
  "environment": {
    "type": "LINUX_CONTAINER",
    "image": "aws/codebuild/amazonlinux-x86_64-standard:5.0",
    "computeType": "BUILD_GENERAL1_LARGE",
    "dockerServer": [
         {
            "computeType": "BUILD_GENERAL1_LARGE",
            "securityGroupIds": [ "security-groups-ID" ]
      ]
 },
  "serviceRole": "arn:aws:iam::account-ID:role/role-name"
}
```

Note

Security groups configured for Docker servers should allow ingress network traffic from the VPC configured in the project. They should allow ingress on port 9876.

3. To see the build results, look in the build's log for the string Hello, World!. For more information, see View build details.

Directory structure

This sample assumes this directory structure.

```
(root directory name)
### buildspec.yml
### Dockerfile
```

Files

The base image of the operating system used in this sample is Ubuntu. The sample uses these files.

```
buildspec.yml (in (root directory name))
```

```
version: 0.2
phases:
  build:
    commands:
      - docker buildx build .
      - docker run helloworld echo "Hello, World!"
```

Dockerfile (in (root directory name))

```
FROM public.ecr.aws/amazonlinux/amazonlinux:latest
RUN echo "Hello World"
```

Windows Docker builds sample for CodeBuild

The following sample builds and runs a Windows Docker image by using CodeBuild.

Topics

Run Windows Docker builds sample

Run Windows Docker builds sample

Use the following procedure to run the Windows Docker builds.

To run Windows Docker builds sample

Create the files as described in the Directory structure and Files sections of this topic, and then upload them to an S3 input bucket or an AWS CodeCommit, GitHub, or Bitbucket repository.

Important

Do not upload (root directory name), just the files inside of (root directory name).

If you are using an S3 input bucket, be sure to create a ZIP file that contains the files, and then upload it to the input bucket. Do not add (root directory name) to the ZIP file, just the files inside of (root directory name).

2. Create a WINDOWS_EC2 fleet.

If you use the AWS CLI to create the fleet, the JSON-formatted input to the create-fleet command might look similar to this. (Replace the placeholders with your own values.)

```
{
  "name": "fleet-name",
  "baseCapacity": 1,
  "environmentType": "WINDOWS_EC2",
  "computeType": "BUILD_GENERAL1_MEDIUM"
}
```

3. Create a build project, run the build, and view related build information.

If you use the AWS CLI to create the build project, the JSON-formatted input to the create-project command might look similar to this. (Replace the placeholders with your own values.)

```
"name": "project-name",
  "source": {
    "type": "S3",
    "location": "bucket-name/DockerImageSample.zip"
 },
  "artifacts": {
    "type": "NO_ARTIFACTS"
 },
  "environment": {
    "type": "WINDOWS_EC2",
    "image": "Windows",
    "computeType": "BUILD_GENERAL1_MEDIUM",
    "fleet": {
       "fleetArn": "fleet-arn"
    }
 },
  "serviceRole": "arn:aws:iam::account-ID:role/role-name"
}
```

4. To see the build results, look in the build's log for the string Hello, World!. For more information, see View build details.

Directory structure

This sample assumes this directory structure.

```
(root directory name)
### buildspec.yml
### Dockerfile
```

Files

The base image of the operating system used in this sample is mcr.microsoft.com/windows/servercore:ltsc2022. The sample uses these files.

buildspec.yml(in (root directory name))

```
version: 0.2

phases:
    pre_build:
    commands:
        - docker build -t helloworld .
    build:
    commands:
        - docker images
        - docker run helloworld powershell -Command "Write-Host 'Hello World!'"
```

Dockerfile (in (root directory name))

```
FROM mcr.microsoft.com/windows/servercore:ltsc2022

RUN powershell -Command "Write-Host 'Hello World'"
```

'Publish Docker image to an Amazon ECR image repository' sample for CodeBuild

This sample produces as build output a Docker image and then pushes the Docker image to an Amazon Elastic Container Registry (Amazon ECR) image repository. You can adapt this sample to push the Docker image to Docker Hub. For more information, see Adapt the 'Publish Docker image to Amazon ECR' sample to push to Docker Hub.

To learn how to build a Docker image by using a custom Docker build image (docker:dind in Docker Hub), see our Docker in custom image sample.

This sample was tested referencing golang: 1.12.

This sample uses the new multi-stage Docker builds feature, which produces a Docker image as build output. It then pushes the Docker image to an Amazon ECR image repository. Multi-stage Docker image builds help to reduce the size of the final Docker image. For more information, see Use multi-stage builds with Docker.

Important

Running this sample might result in charges to your AWS account. These include possible charges for AWS CodeBuild and for AWS resources and actions related to Amazon S3, AWS KMS, CloudWatch Logs, and Amazon ECR. For more information, see CodeBuild pricing, Amazon S3 pricing, AWS Key Management Service pricing, Amazon CloudWatch pricing, and Amazon Elastic Container Registry pricing.

Topics

- Run the 'Publish Docker image to Amazon ECR' sample
- Adapt the 'Publish Docker image to Amazon ECR' sample to push to Docker Hub

Run the 'Publish Docker image to Amazon ECR' sample

Use the following procedure to run the sample that publishes a Docker image to Amazon ECR. For more infomration about this sample, see 'Publish Docker image to an Amazon ECR image repository' sample for CodeBuild.

To run this sample

If you already have an image repository in Amazon ECR you want to use, skip to step 3. Otherwise, if you are using an user instead of an AWS root account or an administrator user to work with Amazon ECR, add this statement (between ### BEGIN ADDING STATEMENT HERE ### and ### END ADDING STATEMENT HERE ###) to the user (or IAM group the user is associated with). Using an AWS root account is not recommended. This statement allows the creation of Amazon ECR repositories for storing Docker images. Ellipses (...) are used for brevity and to help you locate where to add the statement. Do not remove any statements,

and do not type these ellipses into the policy. For more information, see <u>Working with inline</u> policies using the AWS Management Console in the *user Guide*.

```
{
  "Statement": [
    ### BEGIN ADDING STATEMENT HERE ###
  {
        "Action": [
            "ecr:CreateRepository"
        ],
        "Resource": "*",
        "Effect": "Allow"
        },
        ### END ADDING STATEMENT HERE ###
        ...
    ],
    "Version": "2012-10-17"
}
```

Note

The IAM entity that modifies this policy must have permission in IAM to modify policies.

- 2. Create an image repository in Amazon ECR. Be sure to create the repository in the same AWS Region where you create your build environment and run your build. For more information, see Creating a repository in the Amazon ECR User Guide. This repository's name must match the repository name you specify later in this procedure, represented by the IMAGE_REPO_NAME environment variable. Ensure that the Amazon ECR repository policy grants image push access for your CodeBuild service IAM role.
- 3. Add this statement (between ### BEGIN ADDING STATEMENT HERE ### and ### END ADDING STATEMENT HERE ###) to the policy you attached to your AWS CodeBuild service role. This statement allows CodeBuild to upload Docker images to Amazon ECR repositories. Ellipses (...) are used for brevity and to help you locate where to add the statement. Do not remove any statements, and do not type these ellipses into the policy.

```
{
    "Statement": [
    ### BEGIN ADDING STATEMENT HERE ###
```

```
{
      "Action": [
        "ecr:BatchCheckLayerAvailability",
        "ecr:CompleteLayerUpload",
        "ecr:GetAuthorizationToken",
        "ecr:InitiateLayerUpload",
        "ecr:PutImage",
        "ecr:UploadLayerPart"
      ],
      "Resource": "*",
      "Effect": "Allow"
    },
    ### END ADDING STATEMENT HERE ###
 ],
  "Version": "2012-10-17"
}
```

Note

The IAM entity that modifies this policy must have permission in IAM to modify policies.

4. Create the files as described in the <u>Directory structure</u> and <u>Files</u> sections of this topic, and then upload them to an S3 input bucket or an AWS CodeCommit, GitHub, or Bitbucket repository. For more information, see <u>Image definitions file reference</u> in the *AWS CodePipeline User Guide*.

Important

Do not upload (root directory name), just the files inside of (root directory name).

If you are using an S3 input bucket, be sure to create a ZIP file that contains the files, and then upload it to the input bucket. Do not add (root directory name) to the ZIP file, just the files inside of (root directory name).

5. Create a build project, run the build, and view build information.

If you use the console to create your project:

a. For Operating system, choose Ubuntu.

- b. For **Runtime**, choose **Standard**.
- c. For Image, choose aws/codebuild/standard:5.0.
- d. Add the following environment variables:
 - AWS_DEFAULT_REGION with a value of region-ID
 - AWS_ACCOUNT_ID with a value of account-ID
 - IMAGE_TAG with a value of Latest
 - IMAGE_REPO_NAME with a value of Amazon-ECR-repo-name

If you use the AWS CLI to create the build project, the JSON-formatted input to the create-project command might look similar to this. (Replace the placeholders with your own values.)

```
"name": "sample-docker-project",
"source": {
  "type": "S3",
  "location": "codebuild-region-ID-account-ID-input-bucket/DockerSample.zip"
},
"artifacts": {
  "type": "NO_ARTIFACTS"
},
"environment": {
  "type": "LINUX_CONTAINER",
  "image": "aws/codebuild/standard:5.0",
  "computeType": "BUILD_GENERAL1_SMALL",
  "environmentVariables": [
    {
      "name": "AWS_DEFAULT_REGION",
      "value": "region-ID"
    },
      "name": "AWS_ACCOUNT_ID",
      "value": "account-ID"
    },
      "name": "IMAGE_REPO_NAME",
      "value": "Amazon-ECR-repo-name"
    },
```

- 6. Confirm that CodeBuild successfully pushed the Docker image to the repository:
 - 1. Open the Amazon ECR console at https://console.aws.amazon.com/ecr/.
 - 2. Choose the repository name. The image should be listed in the **Image tag** column.

Directory structure

This sample assumes this directory structure.

```
(root directory name)
### buildspec.yml
### Dockerfile
```

Files

This sample uses these files.

buildspec.yml (in (root directory name))

```
post_build:
    commands:
      - echo Build completed on `date`
      - echo Pushing the Docker image...
      - docker push $AWS_ACCOUNT_ID.dkr.ecr.$AWS_DEFAULT_REGION.amazonaws.com/
$IMAGE REPO NAME: $IMAGE TAG
```

Dockerfile (in (root directory name))

```
FROM golang:1.12-alpine AS build
#Install git
RUN apk add --no-cache git
#Get the hello world package from a GitHub repository
RUN go get github.com/golang/example/hello
WORKDIR /go/src/github.com/golang/example/hello
# Build the project and send the output to /bin/HelloWorld
RUN go build -o /bin/HelloWorld
FROM golang:1.12-alpine
#Copy the build's output binary from the previous build container
COPY --from=build /bin/HelloWorld /bin/HelloWorld
ENTRYPOINT ["/bin/HelloWorld"]
```

Note

CodeBuild overrides the ENTRYPOINT for custom Docker images.

Adapt the 'Publish Docker image to Amazon ECR' sample to push to Docker Hub

To adapt the 'Publish Docker image to Amazon ECR' sample so that the Docker image is pushed to Docker Hub instead of Amazon ECR, edit the sample's code. For more information about the sample, see 'Publish Docker image to an Amazon ECR image repository' sample for CodeBuild and Run the 'Publish Docker image to Amazon ECR' sample.



Note

If you are using a version of Docker earlier than 17.06, remove the --no-include-email option.

1. Replace these Amazon ECR-specific lines of code in the buildspec.yml file:

```
pre_build:
    commands:
      - echo Logging in to Amazon ECR...
      - aws ecr get-login-password --region $AWS_DEFAULT_REGION |
docker login --username AWS --password-stdin $AWS_ACCOUNT_ID.dkr.ecr.
$AWS_DEFAULT_REGION.amazonaws.com
 build:
    commands:
      - echo Build started on `date`
      - echo Building the Docker image...
      - docker build -t $IMAGE_REPO_NAME:$IMAGE_TAG .
      docker tag $IMAGE_REPO_NAME:$IMAGE_TAG $AWS_ACCOUNT_ID.dkr.ecr.
$AWS_DEFAULT_REGION.amazonaws.com/$IMAGE_REPO_NAME:$IMAGE_TAG
  post_build:
   commands:
      echo Build completed on `date`
      - echo Pushing the Docker image...
      docker push $AWS_ACCOUNT_ID.dkr.ecr.$AWS_DEFAULT_REGION.amazonaws.com/
$IMAGE_REPO_NAME:$IMAGE_TAG
```

With these Docker Hub-specific lines of code:

```
pre_build:
    commands:
        - echo Logging in to Docker Hub...
    # Type the command to log in to your Docker Hub account here.
build:
    commands:
        - echo Build started on `date`
        - echo Building the Docker image...
        - docker build -t $IMAGE_REPO_NAME:$IMAGE_TAG .
        - docker tag $IMAGE_REPO_NAME:$IMAGE_TAG $IMAGE_REPO_NAME:$IMAGE_TAG
post_build:
    commands:
        - echo Build completed on `date`
        - echo Pushing the Docker image...
        - docker push $IMAGE_REPO_NAME:$IMAGE_TAG
```

Upload the edited code to an S3 input bucket or an AWS CodeCommit, GitHub, or Bitbucket 2. repository.

Important

Do not upload (root directory name), just the files inside of (root directory name).

If you are using an S3 input bucket, be sure to create a ZIP file that contains the files, and then upload it to the input bucket. Do not add (root directory name) to the ZIP file, just the files inside of (root directory name).

Replace these lines of code from the JSON-formatted input to the create-project command:

```
"environmentVariables": [
 {
    "name": "AWS_DEFAULT_REGION",
    "value": "region-ID"
 },
  {
    "name": "AWS_ACCOUNT_ID",
    "value": "account-ID"
 },
    "name": "IMAGE_REPO_NAME",
    "value": "Amazon-ECR-repo-name"
 },
    "name": "IMAGE_TAG",
    "value": "latest"
 }
]
```

With these lines of code:

```
"environmentVariables": [
```

```
{
    "name": "IMAGE_REPO_NAME",
    "value": "your-Docker-Hub-repo-name"
  },
    "name": "IMAGE_TAG",
    "value": "latest"
  }
]
```

- 4. Create a build environment, run the build, and view related build information.
- 5. Confirm that AWS CodeBuild successfully pushed the Docker image to the repository. Sign in to Docker Hub, go to the repository, and choose the Tags tab. The latest tag should contain a very recent Last Updated value.

Private registry with AWS Secrets Manager sample for CodeBuild

This sample shows you how to use a Docker image that is stored in a private registry as your AWS CodeBuild runtime environment. The credentials for the private registry are stored in AWS Secrets Manager. Any private registry works with CodeBuild. This sample uses Docker Hub.



Note

Secrets are visible to actions and are not masked when written to a file.

Topics

- Private registry sample requirements
- Create a CodeBuild project with a private registry
- Configure a private registry credential for self-hosted runners

Private registry sample requirements

To use a private registry with AWS CodeBuild, you must have the following:

 A Secrets Manager secret that stores your Docker Hub credentials. The credentials are used to access your private repository.



Note

You will be charged for secrets that you create.

- A private repository or account.
- A CodeBuild service role IAM policy that grants access to your Secrets Manager secret.

Follow these steps to create these resources and then create a CodeBuild build project using the Docker images stored in your private registry.

Create a CodeBuild project with a private registry

For information about how to create a free private repository, see Repositories on Docker Hub. You can also run the following commands in a terminal to pull an image, get its ID, and push it to a new repository.

```
docker pull amazonlinux
docker images amazonlinux --format {{.ID}}
docker tag image-id your-username/repository-name:tag
docker login
docker push your-username/repository-name
```

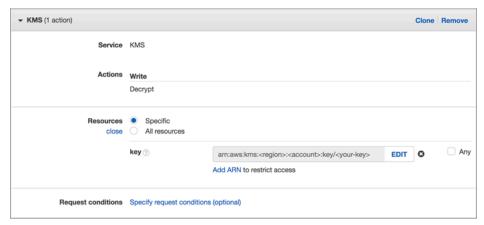
- Follow the steps in Create an AWS Secrets Manager secret in the AWS Secrets Manager User Guide.
 - In step 3, in **Choose secret type**, choose **Other type of secret**.
 - In **Key/value pairs**, create one key-value pair for your Docker Hub user name and one keyb. value pair for your Docker Hub password.
 - c. Continue following the steps in Create an AWS Secrets Manager secret.
 - In step 5, on the **Configure automatic rotation** page, turn it off because the keys correspond to your Docker Hub credentials.
 - Finish following the steps in Create an AWS Secrets Manager secret.

For more information, see What is AWS Secrets Manager?

When you create an AWS CodeBuild project in the console, CodeBuild attaches the required permission for you. If you use an AWS KMS key other than DefaultEncryptionKey, you

must add it to the service role. For more information, see Modifying a role (console) in the IAM User Guide.

For your service role to work with Secrets Manager, it must have, at a minimum, the secretsmanager:GetSecretValue permission.



To use the console to create a project with an environment stored in a private registry, do the following while you create a project. For information, see Create a build project (console).



Note

If your private registry is in your VPC, it must have public internet access. CodeBuild cannot pull an image from a private IP address in a VPC.

- In **Environment image**, choose **Custom image**. a.
- b. For **Environment type**, choose **Linux** or **Windows**.
- For **Image registry**, choose **Other registry**. c.
- In External registry URL, enter the image location and in Registry credential optional d. enter the ARN or name of your Secrets Manager credentials.



Note

If your credentials do not exist in your current Region, then you must use the ARN. You cannot use the credential name if the credentials exist in a different Region.

Configure a private registry credential for self-hosted runners

Use the following instructions to configure a registry credential for a self-hosted runner.



Note

Note that these credentials will only be used if the images are overridden with those from private registries.

AWS Management Console

- Open the AWS CodeBuild console at https://console.aws.amazon.com/codesuite/ codebuild/home.
- 2. Create a build project or select an existing project. For information, see Create a build project (console) and Change a build project's settings (console).
- In **Environment**, choose **Additional configuration**. 3.
- In **Additional configuration**, enter the name or ARN of the secret from AWS Secrets Manager for Registry credential - optional.

```
Registry credential - optional
```

AWS CLI

If you'd like to create a new project, run the **create-project** command.

```
aws codebuild create-project \
    --name project-name \
    --source type=source-type,location=source-location \
    --environment "type=environment-type,image=image,computeType=compute-
type, registryCredential={credentialProvider=SECRETS_MANAGER, credential=secret-
name-or-arn},imagePullCredentialsType=CODEBUILD|SERVICE_ROLE" \
    --artifacts type=artifacts-type \
    --service-role arn:aws:iam::account-ID:role/service-role/service-role-name
```

If you'd like to update an existing project, run the **update-project** command. 2.

```
aws codebuild update-project \
```

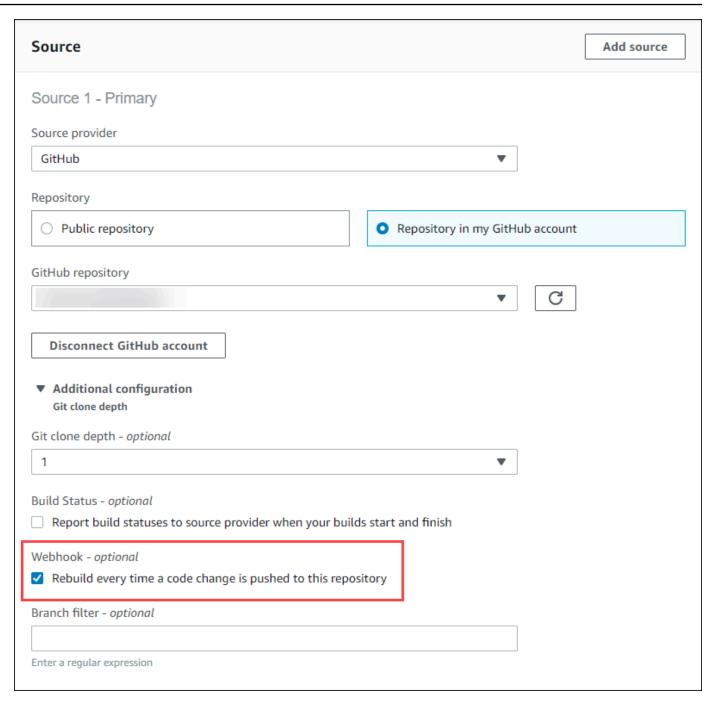
```
--name project-name \
    --environment "type=environment-type,image=image,computeType=compute-
type,registryCredential={credentialProvider=SECRETS_MANAGER,credential=secret-
name-or-arn}"
```

Create a static website with build output hosted in an S3 bucket

You can disable the encryption of artifacts in a build. You might want to do this so that you can publish artifacts to a location that is configured to host a website. (You cannot publish encrypted artifacts.) This sample shows how you can use webhooks to trigger a build and publish its artifacts to an S3 bucket that is configured to be a website.

- 1. Follow the instructions in <u>Setting up a static website</u> to configure an S3 bucket to function like a website.
- 2. Open the AWS CodeBuild console at https://console.aws.amazon.com/codesuite/codebuild/ home.
- 3. If a CodeBuild information page is displayed, choose **Create build project**. Otherwise, on the navigation pane, expand **Build**, choose **Build projects**, and then choose **Create build project**.
- 4. In **Project name**, enter a name for this build project. Build project names must be unique across each AWS account. You can also include an optional description of the build project to help other users understand what this project is used for.
- In Source, for Source provider, choose GitHub. Follow the instructions to connect (or reconnect) with GitHub, and then choose Authorize.

For **Webhook**, select **Rebuild every time a code change is pushed to this repository**. You can select this check box only if you chose **Use a repository in my account**.



6. In **Environment**:

For **Environment image**, do one of the following:

• To use a Docker image managed by AWS CodeBuild, choose **Managed image**, and then make selections from **Operating system**, **Runtime(s)**, **Image**, and **Image version**. Make a selection from **Environment type** if it is available.

To use another Docker image, choose Custom image. For Environment type, choose ARM, Linux, Linux GPU, or Windows. If you choose Other registry, for External registry URL, enter the name and tag of the Docker image in Docker Hub, using the format docker repository/docker image name. If you choose Amazon ECR, use Amazon ECR repository and Amazon ECR image to choose the Docker image in your AWS account.

- To use a private Docker image, choose Custom image. For Environment type, choose ARM, Linux, Linux GPU, or Windows. For Image registry, choose Other registry, and then enter the ARN of the credentials for your private Docker image. The credentials must be created by Secrets Manager. For more information, see What Is AWS Secrets Manager? in the AWS Secrets Manager User Guide.
- 7. In **Service role**, do one of the following:
 - If you do not have a CodeBuild service role, choose **New service role**. In **Role name**, enter a name for the new role.
 - If you have a CodeBuild service role, choose **Existing service role**. In **Role ARN**, choose the service role.

Note

When you use the console to create or update a build project, you can create a CodeBuild service role at the same time. By default, the role works with that build project only. If you use the console to associate this service role with another build project, the role is updated to work with the other build project. A service role can work with up to 10 build projects.

- 8. In **Buildspec**, do one of the following:
 - Choose **Use a buildspec file** to use the buildspec.yml file in the source code root directory.
 - Choose Insert build commands to use the console to insert build commands.

For more information, see the Buildspec reference.

- 9. In Artifacts, for Type, choose Amazon S3 to store the build output in an S3 bucket.
- 10. For **Bucket name**, choose the name of the S3 bucket you configured to function as a website in step 1.

11. If you chose Insert build commands in Environment, then for Output files, enter the locations of the files from the build that you want to put into the output bucket. If you have more than one location, use a comma to separate each location (for example, appspec.yml, target/my-app.jar). For more information, see Artifacts reference-key in the buildspec file.

- 12. Select **Disable artifacts encryption**.
- 13. Expand Additional configuration and choose options as appropriate.
- 14. Choose **Create build project**. On the build project page, in **Build history**, choose **Start build** to run the build.
- 15. (Optional) Follow the instructions in <u>Example: Speed up your website with Amazon CloudFront</u> in the *Amazon S3 Developer Guide*.

Multiple input sources and output artifacts sample

You can create an AWS CodeBuild build project with more than one input source and more than one set of output artifacts. This sample shows you how to set up a build project that:

- Uses multiple sources and repositories of varying types.
- Publishes build artifacts to multiple S3 buckets in a single build.

In the following sample, you create a build project and use it to run a build. The sample uses the build project's buildspec file to show you how to incorporate more than one source and create more than one set of artifacts.

To learn how to to create a pipeline that uses multiple source inputs to CodeBuild to create multiple output artifacts, see <u>Sample of a CodePipeline/CodeBuild integration with multiple input sources and output artifacts</u>.

Topics

- Create a build project with multiple inputs and outputs
- Create a build project without a source

Create a build project with multiple inputs and outputs

Use the following procedure to create a build project with multiple inputs and outputs.

To create a build project with multiple inputs and outputs

1. Upload your sources to one or more S3 buckets, CodeCommit, GitHub, GitHub Enterprise Server, or Bitbucket repositories.

- 2. Choose which source is the primary source. This is the source in which CodeBuild looks for and runs your buildspec file.
- 3. Create a build project. For more information, see Create a build project in AWS CodeBuild.
- 4. Create your build project, run the build, and get information about the build.
- 5. If you use the AWS CLI to create the build project, the JSON-formatted input to the create-project command might look similar to the following:

```
{
  "name": "sample-project",
  "source": {
    "type": "S3",
    "location": "<bucket/sample.zip>"
 },
  "secondarySources": [
   {
      "type": "CODECOMMIT",
      "location": "https://git-codecommit.us-west-2.amazonaws.com/v1/repos/repo",
      "sourceIdentifier": "source1"
    },
      "type": "GITHUB",
      "location": "https://github.com/awslabs/aws-codebuild-jenkins-plugin",
      "sourceIdentifier": "source2"
    }
 ],
  "secondaryArtifacts": [ss
    {
      "type": "S3",
      "location": "<output-bucket>",
      "artifactIdentifier": "artifact1"
    },
      "type": "S3",
      "location": "<other-output-bucket>",
      "artifactIdentifier": "artifact2"
    }
  ],
```

```
"environment": {
    "type": "LINUX_CONTAINER",
    "image": "aws/codebuild/standard:5.0",
    "computeType": "BUILD_GENERAL1_SMALL"
},
    "serviceRole": "arn:aws:iam::account-ID:role/role-name",
    "encryptionKey": "arn:aws:kms:region-ID:account-ID:key/key-ID"
}
```

Your primary source is defined under the source attribute. All other sources are called secondary sources and appear under secondary Sources. All secondary sources are installed in their own directory. This directory is stored in the built-in environment variable CODEBUILD_SRC_DIR_sourceIdentifer. For more information, see Environment variables in build environments.

The secondaryArtifacts attribute contains a list of artifact definitions. These artifacts use the secondary-artifacts block of the buildspec file that is nested inside the artifacts block.

Secondary artifacts in the buildspec file have the same structure as artifacts and are separated by their artifact identifier.

Note

In the <u>CodeBuild API</u>, the artifactIdentifier on a secondary artifact is a required attribute in CreateProject and UpdateProject. It must be used to reference a secondary artifact.

Using the preceding JSON-formatted input, the buildspec file for the project might look like:

```
version: 0.2

phases:
    install:
    runtime-versions:
        java: openjdk11
    build:
    commands:
        - cd $CODEBUILD_SRC_DIR_source1
        - touch file1
```

```
- cd $CODEBUILD_SRC_DIR_source2
- touch file2

artifacts:
files:
- '**.*'
secondary-artifacts:
artifact1:
base-directory: $CODEBUILD_SRC_DIR_source1
files:
- file1
artifact2:
base-directory: $CODEBUILD_SRC_DIR_source2
files:
- file2
```

You can override the version of the primary source using the API with the sourceVersion attribute in StartBuild. To override one or more secondary source versions, use the secondarySourceVersionOverride attribute.

The JSON-formatted input to the the start-build command in the AWS CLI might look like:

Create a build project without a source

You can configure a CodeBuild project by choosing the **NO_SOURCE** source type when you configure your source. When your source type is **NO_SOURCE**, you cannot specify a buildspec file because your project does not have a source. Instead, you must specify a YAML-formatted buildspec string in

the buildspec attribute of the JSON-formatted input to the create-project CLI command. It might look like this:

```
{
  "name": "project-name",
  "source": {
    "type": "NO_SOURCE",
    "buildspec": "version: 0.2\n\nphases:\n build:\n
                                                          commands:\n
                                                                            - command"
   },
  "environment": {
    "type": "LINUX_CONTAINER",
    "image": "aws/codebuild/standard:5.0",
    "computeType": "BUILD_GENERAL1_SMALL",
  },
  "serviceRole": "arn:aws:iam::account-ID:role/role-name",
  "encryptionKey": "arn:aws:kms:region-ID:account-ID:key/key-ID"
}
```

For more information, see Create a build project (AWS CLI).

Runtime versions in buildspec file sample for CodeBuild

If you use the Amazon Linux 2 (AL2) standard image version 1.0 or later, or the Ubuntu standard image version 2.0 or later, you can specify one or more runtimes in the runtime-versions section of your buildspec file. The following samples show how you can change your project runtime, specify more than one runtime, and specify a runtime that is dependent on another runtime. For information about supported runtimes, see Docker images provided by CodeBuild.



If you use Docker in your build container, your build must run in privileged mode. For more information, see Run AWS CodeBuild builds manually and Create a build project in AWS CodeBuild.

Topics

- Update the runtime version in the buildspec file
- Specify two runtimes

Update the runtime version in the buildspec file

You can modify the runtime used by your project to a new version by updating the runtime-versions section of your buildspec file. The following examples show how to specify java versions 8 and 11.

• A runtime-versions section that specifies version 8 of Java:

```
phases:
  install:
    runtime-versions:
       java: corretto8
```

• A runtime-versions section that specifies version 11 of Java:

```
phases:
  install:
    runtime-versions:
       java: corretto11
```

The following examples show how to specify different versions of Python using the Ubuntu standard image 5.0 or the Amazon Linux 2 standard image 3.0:

A runtime-versions section that specifies Python version 3.7:

```
phases:
  install:
    runtime-versions:
    python: 3.7
```

A runtime-versions section that specifies Python version 3.8:

```
phases:
  install:
    runtime-versions:
    python: 3.8
```

This sample demonstrates a project that starts with the Java version 8 runtime, and then is updated to the Java version 10 runtime.

1. Download and install Maven. For information, see <u>Downloading Apache Maven</u> and <u>Installing</u> Apache Maven on the Apache Maven website.

2. Switch to an empty directory on your local computer or instance, and then run this Maven command.

```
mvn archetype:generate "-DgroupId=com.mycompany.app" "-DartifactId=R00T" "-
DarchetypeArtifactId=maven-archetype-webapp" "-DinteractiveMode=false"
```

If successful, this directory structure and files are created.

```
.
### ROOT

### pom.xml

### src

### resources

### webapp

### WEB-INF

# ### web.xml

### index.jsp
```

Create a file named buildspec.yml with the following contents. Store the file in the (root directory name)/my-web-app directory.

In the buildspec file:

• The runtime-versions section specifies that the project uses version 8 of the Java runtime.

• The - java -version command displays the version of Java used by your project when it builds.

Your file structure should now look like this.

```
(root directory name)
### my-web-app
### src
# ### main
# ### resources
# ### webapp
# ### WEB-INF
# ### web.xml
# ### index.jsp
### buildspec.yml
### pom.xml
```

4. Upload the contents of the my-web-app directory to an S3 input bucket or a CodeCommit, GitHub, or Bitbucket repository.

Important

Do not upload (root directory name) or (root directory name)/my-web-app, just the directories and files in (root directory name)/my-web-app. If you are using an S3 input bucket, be sure to create a ZIP file that contains the directory structure and files, and then upload it to the input bucket. Do not add (root directory name) or (root directory name)/my-web-app to the ZIP file, just the directories and files in (root directory name)/my-web-app.

- 5. Open the AWS CodeBuild console at https://console.aws.amazon.com/codesuite/codebuild/ home.
- 6. Create a build project. For more information, see <u>Create a build project (console)</u> and <u>Run a build (console)</u>. Leave all settings at their default values, except for these settings.
 - For Environment:
 - For **Environment image**, choose **Managed image**.

- For Operating system, choose Amazon Linux 2.
- For Runtime(s), choose Standard.
- For Image, choose aws/codebuild/amazonlinux-x86_64-standard:4.0.
- 7. Choose **Start build**.
- 8. On **Build configuration**, accept the defaults, and then choose **Start build**.
- 9. After the build is complete, view the build output on the **Build logs** tab. You should see output similar to the following:

```
[Container] Date Time Phase is DOWNLOAD_SOURCE
[Container] Date Time CODEBUILD_SRC_DIR=/codebuild/output/src460614277/src
[Container] Date Time YAML location is /codebuild/output/src460614277/src/
buildspec.yml
[Container] Date Time Processing environment variables
[Container] Date Time Selecting 'java' runtime version 'corretto8' based on manual selections...
[Container] Date Time Running command echo "Installing Java version 8 ..."
Installing Java version 8 ...
[Container] Date Time Running command export JAVA_HOME="$JAVA_8_HOME"

[Container] Date Time Running command export JRE_HOME="$JRE_8_HOME"

[Container] Date Time Running command export JDK_HOME="$JDK_8_HOME"

[Container] Date Time Running command for tool_path in "$JAVA_8_HOME"/bin/*

"$JRE_8_HOME"/bin/*;
```

10. Update the runtime-versions section with Java version 11:

```
install:
    runtime-versions:
        java: corretto11
```

11. After you save the change, run your build again and view the build output. You should see that the installed version of Java is 11. You should see output similar to the following:

```
[Container] Date Time Phase is DOWNLOAD_SOURCE
[Container] Date Time CODEBUILD_SRC_DIR=/codebuild/output/src460614277/src
[Container] Date Time YAML location is /codebuild/output/src460614277/src/buildspec.yml
```

```
[Container] Date Time Processing environment variables
[Container] Date Time Selecting 'java' runtime version 'corretto11' based on manual
selections...
Installing Java version 11 ...

[Container] Date Time Running command export JAVA_HOME="$JAVA_11_HOME"

[Container] Date Time Running command export JRE_HOME="$JRE_11_HOME"

[Container] Date Time Running command export JDK_HOME="$JDK_11_HOME"

[Container] Date Time Running command for tool_path in "$JAVA_11_HOME"/bin/*
   "$JRE_11_HOME"/bin/*;
```

Specify two runtimes

You can specify more than one runtime in the same CodeBuild build project. This sample project uses two source files: one that uses the Go runtime and one that uses the Node.js runtime.

- 1. Create a directory named my-source.
- 2. Inside the my-source directory, create a directory named golang-app.
- Create a file named hello.go with the following contents. Store the file in the golang-app directory.

```
package main
import "fmt"

func main() {
   fmt.Println("hello world from golang")
   fmt.Println("1+1 =", 1+1)
   fmt.Println("7.0/3.0 =", 7.0/3.0)
   fmt.Println(true && false)
   fmt.Println(true || false)
   fmt.Println(!true)
   fmt.Println(!true)
   fmt.Println("good bye from golang")
}
```

4. Inside the my-source directory, create a directory named nodejs-app. It should be at the same level as the golang-app directory.

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5. Create a file named index.js with the following contents. Store the file in the nodejs-app directory.

```
console.log("hello world from nodejs");
console.log("1+1 =" + (1+1));
console.log("7.0/3.0 =" + 7.0/3.0);
console.log(true && false);
console.log(true || false);
console.log(!true);
console.log("good bye from nodejs");
```

6. Create a file named package.json with the following contents. Store the file in the nodejsapp directory.

```
{
   "name": "mycompany-app",
   "version": "1.0.0",
   "description": "",
   "main": "index.js",
   "scripts": {
      "test": "echo \"run some tests here\""
   },
   "author": "",
   "license": "ISC"
}
```

7. Create a file named buildspec.yml with the following contents. Store the file in the my-source directory, at the same level as the nodejs-app and golang-app directories. The runtime-versions section specifies the Node.js version 12 and Go version 1.13 runtimes.

```
version: 0.2

phases:
    install:
    runtime-versions:
        golang: 1.13
        nodejs: 12

build:
    commands:
        - echo Building the Go code...
        - cd $CODEBUILD_SRC_DIR/golang-app
        - go build hello.go
```

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```
- echo Building the Node code...
    - cd $CODEBUILD_SRC_DIR/nodejs-app
    - npm run test
artifacts:
    secondary-artifacts:
    golang_artifacts:
    base-directory: golang-app
    files:
        - hello
    nodejs_artifacts:
    base-directory: nodejs-app
    files:
        - index.js
        - package.json
```

8. Your file structure should now look like this.

```
my-source
### golang-app
# ### hello.go
### nodejs.app
# ### index.js
# ### package.json
### buildspec.yml
```

Upload the contents of the my-source directory to an S3 input bucket or a CodeCommit, GitHub, or Bitbucket repository.

Important

If you are using an S3 input bucket, be sure to create a ZIP file that contains the directory structure and files, and then upload it to the input bucket. Do not add my-source to the ZIP file, just the directories and files in my-source.

- 10. Open the AWS CodeBuild console at https://console.aws.amazon.com/codesuite/codebuild/ home.
- 11. Create a build project. For more information, see <u>Create a build project (console)</u> and <u>Run a build (console)</u>. Leave all settings at their default values, except for these settings.
 - For Environment:
 - For Environment image, choose Managed image.

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- For Operating system, choose Amazon Linux 2.
- For Runtime(s), choose Standard.
- For Image, choose aws/codebuild/amazonlinux-x86_64-standard:4.0.
- 12. Choose **Create build project**.
- 13. Choose Start build.
- 14. On **Build configuration**, accept the defaults, and then choose **Start build**.
- 15. After the build is complete, view the build output on the **Build logs** tab. You should see output similar to the following. It shows output from the Go and Node.js runtimes. It also shows output from the Go and Node.js applications.

```
[Container] Date Time Processing environment variables
[Container] Date Time Selecting 'golang' runtime version '1.13' based on manual
selections...
[Container] Date Time Selecting 'nodejs' runtime version '12' based on manual
[Container] Date Time Running command echo "Installing Go version 1.13 ..."
Installing Go version 1.13 ...
[Container] Date Time Running command echo "Installing Node.js version 12 ..."
Installing Node.js version 12 ...
[Container] Date Time Running command n $NODE_12_VERSION
   installed : v12.20.1 (with npm 6.14.10)
[Container] Date Time Moving to directory /codebuild/output/src819694850/src
[Container] Date Time Registering with agent
[Container] Date Time Phases found in YAML: 2
[Container] Date Time INSTALL: 0 commands
[Container] Date Time BUILD: 1 commands
[Container] Date Time Phase complete: DOWNLOAD_SOURCE State: SUCCEEDED
[Container] Date Time Phase context status code: Message:
[Container] Date Time Entering phase INSTALL
[Container] Date Time Phase complete: INSTALL State: SUCCEEDED
[Container] Date Time Phase context status code: Message:
[Container] Date Time Entering phase PRE_BUILD
[Container] Date Time Phase complete: PRE_BUILD State: SUCCEEDED
[Container] Date Time Phase context status code: Message:
[Container] Date Time Entering phase BUILD
[Container] Date Time Running command echo Building the Go code...
Building the Go code...
```

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```
[Container] Date Time Running command cd $CODEBUILD_SRC_DIR/golang-app
[Container] Date Time Running command go build hello.go
[Container] Date Time Running command echo Building the Node code...
Building the Node code...
[Container] Date Time Running command cd $CODEBUILD_SRC_DIR/nodejs-app
[Container] Date Time Running command npm run test
> mycompany-app@1.0.0 test /codebuild/output/src924084119/src/nodejs-app
> echo "run some tests here"
run some tests here
```

Source version sample with AWS CodeBuild

This sample demonstrates how to specify a version of your source using a format other than a commit ID (also known as a commit SHA). You can specify the version of your source in the following ways:

- For an Amazon S3 source provider, use the version ID of the object that represents the build input ZIP file.
- For CodeCommit, Bitbucket, GitHub, and GitHub Enterprise Server, use one of the following:
 - Pull request as a pull request reference (for example, refs/pull/1/head).
 - Branch as a branch name.
 - Commit ID.
 - Tag.
 - Reference and a commit ID. The reference can be one of the following:
 - A tag (for example, refs/tags/mytagv1.0^{full-commit-SHA}).
 - A branch (for example, refs/heads/mydevbranch^{full-commit-SHA}).
 - A pull request (for example, refs/pull/1/head^{full-commit-SHA}).
- For GitLab and GitLab Self Managed, use one of the following:
 - Branch as a branch name.

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- Commit ID.
- Tag.



Note

You can specify the version of a pull request source only if your repository is GitHub or GitHub Enterprise Server.

If you use a reference and a commit ID to specify a version, the DOWNLOAD_SOURCE phase of your build is faster than if you provide the version only. This is because when you add a reference, CodeBuild does not need to download the entire repository to find the commit.

- You can specify a source version with only a commit ID, such as 12345678901234567890123467890123456789. If you do this, CodeBuild must download the entire repository to find the version.
- You can specify a source version with a reference and a commit ID in this format: refs/heads/branchname^{full-commit-SHA} (for example, refs/heads/ main^{12345678901234567890123467890123456789}). If you do this, CodeBuild downloads only the specified branch to find the version. .



Note

To speed up the DOWNLOAD_SOURCE phase of your build, you can also to set Git clone depth to a low number. CodeBuild downloads fewer versions of your repository.

Topics

- Specify a GitHub repository version with a commit ID
- Specify a GitHub repository version with a reference and commit ID

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Specify a GitHub repository version with a commit ID

You can specify a source version with only a commit ID, such as 12345678901234567890123467890123456789. If you do this, CodeBuild must download the entire repository to find the version.

To specify a GitHub repository version with a commit ID

- Open the AWS CodeBuild console at https://console.aws.amazon.com/codesuite/codebuild/ home.
- 2. Create a build project. For information, see <u>Create a build project (console)</u> and <u>Run a build</u> (console). Leave all settings at their default values, except for these settings:
 - In Source:
 - For Source provider, choose GitHub. If you are not connected to GitHub, follow the instructions to connect.
 - For Repository, choose Public repository.
 - For Repository URL, enter https://github.com/aws/aws-sdk-ruby.git.
 - In Environment:
 - For **Environment image**, choose **Managed image**.
 - For Operating system, choose Amazon Linux 2.
 - For **Runtime(s)**, choose **Standard**.
 - For Image, choose aws/codebuild/amazonlinux-x86_64-standard:4.0.
- 3. For **Build specifications**, choose **Insert build commands**, and then choose **Switch to editor**.
- 4. In **Build commands**, replace the placeholder text with the following:

The runtime-versions section is required when you use the Ubuntu standard image 2.0. Here, the Ruby version 2.6 runtime is specified, but you can use any runtime. The echo command displays the version of the source code stored in the CODEBUILD_RESOLVED_SOURCE_VERSION environment variable.

- 5. On **Build configuration**, accept the defaults, and then choose **Start build**.
- 6. For **Source version**, enter **046e8b67481d53bdc86c3f6affdd5d1afae6d369**. This is the SHA of a commit in the https://github.com/aws/aws-sdk-ruby.git repository.
- 7. Choose Start build.
- 8. When the build is complete, you should see the following:
 - On the **Build logs** tab, which version of the project source was used. Here is an example.

[Container] Date Time Running command echo \$CODEBUILD_RESOLVED_SOURCE_VERSION 046e8b67481d53bdc86c3f6affdd5d1afae6d369

[Container] Date Time Phase complete: BUILD State: SUCCEEDED

- On the **Environment variables** tab, the **Resolved source version** matches the commit ID used to create the build.
- On the **Phase details** tab, the duration of the DOWNLOAD_SOURCE phase.

Specify a GitHub repository version with a reference and commit ID

You can specify a source version with a reference and a commit ID in this format: $refs/heads/branchname^{full-commit-SHA}$ (for example, refs/heads/main^{12345678901234567890123467890123456789}). If you do this, CodeBuild downloads only the specified branch to find the version.

To specify a GitHub repository version with a reference and commit ID.

- 1. Complete the steps in Specify a GitHub repository version with a commit ID.
- From the left navigation pane, choose Build projects, and then choose the project you created earlier.
- Choose Start build.

4. In **Source version**, enter **refs/heads/ main^{046e8b67481d53bdc86c3f6affdd5d1afae6d369}**. This is the same commit ID and a reference to a branch in the format **refs/heads/branchname**^{full-commit-SHA}.

- 5. Choose **Start build**.
- 6. When the build is complete, you should see the following:
 - On the **Build logs** tab, which version of the project source was used. Here is an example.

[Container] Date Time Running command echo \$CODEBUILD_RESOLVED_SOURCE_VERSION 046e8b67481d53bdc86c3f6affdd5d1afae6d369

[Container] Date Time Phase complete: BUILD State: SUCCEEDED

- On the Environment variables tab, the Resolved source version matches the commit ID
 used to create the build.
- On the **Phase details** tab, the duration of the DOWNLOAD_SOURCE phase should be shorter than the duration when you used only the commit ID to specify the version of your source.

Third-party source repository samples for CodeBuild

This section describes sample integrations between third-party source repositories and CodeBuild.

Sample	Description
BitBucket pull request and webhook filter sample – see Run the 'Bitbucket pull request and webhook filter' sample for CodeBuild	This sample shows you how to create a pull request using a Bitbucket repository. It also shows you how to use a Bitbucket webhook to trigger CodeBuild to create a build of a project.
GitHub Enterprise Server sample – see Run the GitHub Enterprise Server sample for CodeBuild	This sample shows you how to set up your CodeBuild projects when your GitHub Enterprise Server repository has a certifica te installed. It also shows how to enable webhooks so that CodeBuild rebuilds the source code every time a code change is

Sample	Description
	pushed to your GitHub Enterprise Server repository.
GitHub pull request and webhook filter sample – see Run the GitHub pull request and webhook filter sample for CodeBuild	This sample shows you how to create a pull request using a GitHub Enterprise Server repository. It also shows how to enable webhooks so that CodeBuild rebuilds the source code every time a code change is pushed to your GitHub Enterprise Server repository.

Run the 'Bitbucket pull request and webhook filter' sample for CodeBuild

AWS CodeBuild supports webhooks when the source repository is Bitbucket. This means that for a CodeBuild build project that has its source code stored in a Bitbucket repository, webhooks can be used to rebuild the source code every time a code change is pushed to the repository. For more information, see Bitbucket webhook events.

This sample shows you how to create a pull request using a Bitbucket repository. It also shows you how to use a Bitbucket webhook to trigger CodeBuild to create a build of a project.



Note

When using webhooks, it is possible for a user to trigger an unexpected build. To mitigate this risk, see Best practices for using webhooks.

Topics

- Prerequisites
- Step 1: Create a build project with Bitbucket and enable webhooks
- Step 2: Trigger a build with a Bitbucket webhook

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Prerequisites

To run this sample you must connect your AWS CodeBuild project with your Bitbucket account.



Note

CodeBuild has updated its permissions with Bitbucket. If you previously connected your project to Bitbucket and now receive a Bitbucket connection error, you must reconnect to grant CodeBuild permission to manage your webhooks.

Step 1: Create a build project with Bitbucket and enable webhooks

The following steps describe how to create an AWS CodeBuild project with Bitbucket as a source repository and enable webhooks.

- Open the AWS CodeBuild console at https://console.aws.amazon.com/codesuite/codebuild/ home.
- If a CodeBuild information page is displayed, choose **Create build project**. Otherwise, on the navigation pane, expand Build, choose Build projects, and then choose Create build project.
- Choose Create build project. 3.
- In **Project configuration**:

Project name

Enter a name for this build project. Build project names must be unique across each AWS account. You can also include an optional description of the build project to help other users understand what this project is used for.

In Source:

Source provider

Choose Bitbucket. Follow the instructions to connect (or reconnect) with Bitbucket and then choose Authorize.

Repository

Choose **Repository in my Bitbucket account**.

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If you have not previously connected to your Bitbucket account, enter your Bitbucket username and app password, and select Save Bitbucket credentials.

Bitbucket repository

Enter the URL for your Bitbucket repository.

In **Primary source webhook events**, select the following.



Note

The **Primary source webhook events** section is only visible if you chose **Repository in** my Bitbucket account in the previous step.

- 1. Select **Rebuild every time a code change is pushed to this repository** when you create your project.
- 2. From **Event type**, choose one or more events.
- 3. To filter when an event triggers a build, under **Start a build under these conditions**, add one or more optional filters.
- 4. To filter when an event is not triggered, under **Don't start a build under these conditions**, add one or more optional filters.
- 5. Choose **Add filter group** to add another filter group, if needed.

For more information about Bitbucket webhook event types and filters, see Bitbucket webhook events.

In Environment: 7.

Environment image

Choose one of the following:

To use a Docker image managed by AWS CodeBuild:

Choose Managed image, and then make selections from Operating system, Runtime(s), Image, and Image version. Make a selection from Environment type if it is available.

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To use another Docker image:

Choose **Custom image**. For **Environment type**, choose **ARM**, **Linux**, **Linux GPU**, or **Windows**. If you choose **Other registry**, for **External registry URL**, enter the name and tag of the Docker image in Docker Hub, using the format *docker repository/docker image name*. If you choose **Amazon ECR**, use **Amazon ECR repository** and **Amazon ECR image** to choose the Docker image in your AWS account.

To use a private Docker image:

Choose **Custom image**. For **Environment type**, choose **ARM**, **Linux**, **Linux GPU**, or **Windows**. For **Image registry**, choose **Other registry**, and then enter the ARN of the credentials for your private Docker image. The credentials must be created by Secrets Manager. For more information, see <u>What Is AWS Secrets Manager?</u> in the *AWS Secrets Manager User Guide*.

Service role

Choose one of the following:

- If you do not have a CodeBuild service role, choose **New service role**. In **Role name**, enter a name for the new role.
- If you have a CodeBuild service role, choose **Existing service role**. In **Role ARN**, choose the service role.

Note

When you use the console to create or update a build project, you can create a CodeBuild service role at the same time. By default, the role works with that build project only. If you use the console to associate this service role with another build project, the role is updated to work with the other build project. A service role can work with up to 10 build projects.

- 8. In **Buildspec**, do one of the following:
 - Choose **Use a buildspec file** to use the buildspec.yml file in the source code root directory.
 - Choose Insert build commands to use the console to insert build commands.

For more information, see the Buildspec reference.

9. In Artifacts:

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Type

Choose one of the following:

- If you do not want to create build output artifacts, choose No artifacts.
- To store the build output in an S3 bucket, choose **Amazon S3**, and then do the following:
 - If you want to use your project name for the build output ZIP file or folder, leave **Name** blank. Otherwise, enter the name. By default, the artifact name is the project name. If you want to use a different name, enter it in the artifacts name box. If you want to output a ZIP file, include the zip extension.
 - For **Bucket name**, choose the name of the output bucket.
 - If you chose **Insert build commands** earlier in this procedure, for **Output files**, enter the locations of the files from the build that you want to put into the build output ZIP file or folder. For multiple locations, separate each location with a comma (for example, appspec.yml, target/my-app.jar). For more information, see the description of files in <u>Buildspec syntax</u>.

Additional configuration

Expand **Additional configuration** and set options as appropriate.

10. Choose Create build project. On the Review page, choose Start build to run the build.

Step 2: Trigger a build with a Bitbucket webhook

For a project that uses Bitbucket webhooks, AWS CodeBuild creates a build when the Bitbucket repository detects a change in your source code.

- 1. Open the AWS CodeBuild console at https://console.aws.amazon.com/codesuite/codebuild/ home.
- 2. On the navigation pane, choose **Build projects**, and then choose a project associated with a Bitbucket repository with webhooks. For information about creating a Bitbucket webhook project, see the section called "Step 1: Create a build project with Bitbucket and enable webhooks".
- 3. Make some changes in the code in your project's Bitbucket repository.
- 4. Create a pull request on your Bitbucket repository. For more information, see <u>Making a pull</u> request.
- 5. On the Bitbucket webhooks page, choose **View request** to see a list of recent events.

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6. Choose **View details** to see details about the response returned by CodeBuild. It might look something like this:

```
"response":"Webhook received and build started: https://us-
east-1.console.aws.amazon.com/codebuild/home..."
"statusCode":200
```

7. Navigate to the Bitbucket pull request page to see the status of the build.

Run the GitHub Enterprise Server sample for CodeBuild

AWS CodeBuild supports GitHub Enterprise Server as a source repository. This sample shows how to set up your CodeBuild projects when your GitHub Enterprise Server repository has a certificate installed. It also shows how to enable webhooks so that CodeBuild rebuilds the source code every time a code change is pushed to your GitHub Enterprise Server repository.

Topics

- Prerequisites
- Step 1: Create a build project with GitHub Enterprise Server and enable webhooks

Prerequisites

1. Generate a personal access token for your CodeBuild project. We recommend that you create a GitHub Enterprise user and generate a personal access token for this user. Copy it to your clipboard so that it can be used when you create your CodeBuild project. For more information, see Creating a personal access token for the command line on the GitHub Help website.

When you create the personal access token, include the **repo** scope in the definition.



2. Download your certificate from GitHub Enterprise Server. CodeBuild uses the certificate to make a trusted SSL connection to the repository.

Linux/macOS clients:

From a terminal window, run the following command:

```
echo -n | openssl s_client -connect HOST:PORTNUMBER \
    | sed -ne '/-BEGIN CERTIFICATE-/,/-END CERTIFICATE-/p' > /folder/filename.pem
```

Replace the placeholders in the command with the following values:

HOST. The IP address of your GitHub Enterprise Server repository.

PORTNUMBER. The port number you are using to connect (for example, 443).

folder. The folder where you downloaded your certificate.

filename. The file name of your certificate file.



Important

Save the certificate as a .pem file.

Windows clients:

Use your browser to download your certificate from GitHub Enterprise Server. To see the site's certificate details, choose the padlock icon. For information about how to export the certificate, see your browser documentation.

Important

Save the certificate as a .pem file.

3. Upload your certificate file to an S3 bucket. For information about how to create an S3 bucket, see How do I create an S3 Bucket? For information about how to upload objects to an S3 bucket, see How do I upload files and folders to a bucket?



Note

This bucket must be in the same AWS region as your builds. For example, if you instruct CodeBuild to run a build in the US East (Ohio) Region, the bucket must be in the US East (Ohio) Region.

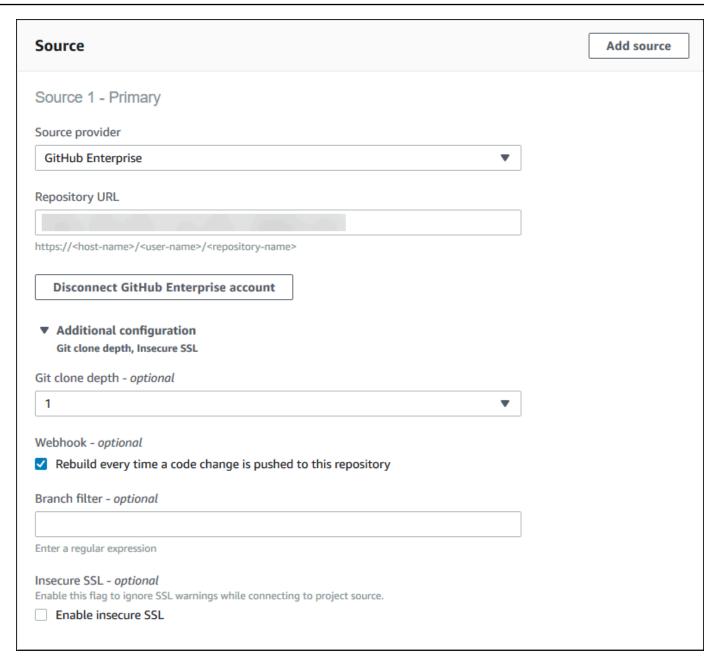
Step 1: Create a build project with GitHub Enterprise Server and enable webhooks

- Open the AWS CodeBuild console at https://console.aws.amazon.com/codesuite/codebuild/ home.
- If a CodeBuild information page is displayed, choose **Create build project**. Otherwise, on the navigation pane, expand **Build**, choose **Build projects**, and then choose **Create build project**.
- In **Project name**, enter a name for this build project. Build project names must be unique across each AWS account. You can also include an optional description of the build project to help other users understand what this project is used for.
- In **Source**, in **Source provider**, choose **GitHub Enterprise Server**.
 - Choose Manage account credentials, and then choose Personal access token. For Service, choose **Secrets Manager (recommended)**, and configure your secret. Then in **,GitHub Enterprise personal access token**, enter your personal access token and choose **Save**.
 - In **Repository URL**, enter the path to your repository, including the name of the repository.
 - Expand Additional configuration.
 - Select Rebuild every time a code change is pushed to this repository to rebuild every time a code change is pushed to this repository.
 - Select Enable insecure SSL to ignore SSL warnings while you connect to your GitHub Enterprise Server project repository.



Note

We recommend that you use **Enable insecure SSL** for testing only. It should not be used in a production environment.



5. In **Environment**:

For **Environment image**, do one of the following:

- To use a Docker image managed by AWS CodeBuild, choose **Managed image**, and then make selections from **Operating system**, **Runtime(s)**, **Image**, and **Image version**. Make a selection from **Environment type** if it is available.
- To use another Docker image, choose **Custom image**. For **Environment type**, choose **ARM**, **Linux**, **Linux GPU**, or **Windows**. If you choose **Other registry**, for **External registry URL**,

enter the name and tag of the Docker image in Docker Hub, using the format docker repository/docker image name. If you choose Amazon ECR, use Amazon ECR repository and Amazon ECR image to choose the Docker image in your AWS account.

 To use a private Docker image, choose Custom image. For Environment type, choose ARM, Linux, Linux GPU, or Windows. For Image registry, choose Other registry, and then enter the ARN of the credentials for your private Docker image. The credentials must be created by Secrets Manager. For more information, see What Is AWS Secrets Manager? in the AWS Secrets Manager User Guide.

6. In **Service role**, do one of the following:

- If you do not have a CodeBuild service role, choose New service role. In Role name, enter a
 name for the new role.
- If you have a CodeBuild service role, choose **Existing service role**. In **Role ARN**, choose the service role.

Note

When you use the console to create or update a build project, you can create a CodeBuild service role at the same time. By default, the role works with that build project only. If you use the console to associate this service role with another build project, the role is updated to work with the other build project. A service role can work with up to 10 build projects.

7. Expand **Additional configuration**.

If you want CodeBuild to work with your VPC:

- For VPC, choose the VPC ID that CodeBuild uses.
- For VPC Subnets, choose the subnets that include resources that CodeBuild uses.
- For VPC Security groups, choose the security groups that CodeBuild uses to allow access to resources in the VPCs.

For more information, see Use AWS CodeBuild with Amazon Virtual Private Cloud.

- 8. In **Buildspec**, do one of the following:
 - Choose **Use a buildspec file** to use the buildspec.yml file in the source code root directory.

Choose Insert build commands to use the console to insert build commands.

For more information, see the Buildspec reference.

- In **Artifacts**, for **Type**, do one of the following:
 - If you do not want to create build output artifacts, choose **No artifacts**.
 - To store the build output in an S3 bucket, choose **Amazon S3**, and then do the following:
 - If you want to use your project name for the build output ZIP file or folder, leave Name blank. Otherwise, enter the name. By default, the artifact name is the project name. If you want to use a different name, enter it in the artifacts name box. If you want to output a ZIP file, include the zip extension.
 - For **Bucket name**, choose the name of the output bucket.
 - If you chose **Insert build commands** earlier in this procedure, for **Output files**, enter the locations of the files from the build that you want to put into the build output ZIP file or folder. For multiple locations, separate each location with a comma (for example, appspec.yml, target/my-app.jar). For more information, see the description of files in Buildspec syntax.
- 10. For **Cache type**, choose one of the following:
 - If you do not want to use a cache, choose No cache.
 - If you want to use an Amazon S3 cache, choose **Amazon S3**, and then do the following:
 - For **Bucket**, choose the name of the S3 bucket where the cache is stored.
 - (Optional) For Cache path prefix, enter an Amazon S3 path prefix. The Cache path prefix value is similar to a directory name. It makes it possible for you to store the cache under the same directory in a bucket.



Important

Do not append a trailing slash (/) to the end of the path prefix.

• If you want to use a local cache, choose **Local**, and then choose one or more local cache modes.



Note

Docker layer cache mode is available for Linux only. If you choose it, your project must run in privileged mode.

Using a cache saves considerable build time because reusable pieces of the build environment are stored in the cache and used across builds. For information about specifying a cache in the buildspec file, see Buildspec syntax. For more information about caching, see Cache builds to improve performance.

11. Choose Create build project. On the build project page, choose Start build.

Run the GitHub pull request and webhook filter sample for CodeBuild

AWS CodeBuild supports webhooks when the source repository is GitHub. This means that for a CodeBuild build project that has its source code stored in a GitHub repository, webhooks can be used to rebuild the source code every time a code change is pushed to the repository. For CodeBuild samples, see AWS CodeBuild Samples.



(i) Note

When using webhooks, it is possible for a user to trigger an unexpected build. To mitigate this risk, see Best practices for using webhooks.

Topics

- Step 1: Create a build project with GitHub and enable webhooks
- Step 2: Verify that webhooks are enabled

Step 1: Create a build project with GitHub and enable webhooks

- Open the AWS CodeBuild console at https://console.aws.amazon.com/codesuite/codebuild/ home.
- If a CodeBuild information page is displayed, choose **Create build project**. Otherwise, on the navigation pane, expand Build, choose Build projects, and then choose Create build project.

Choose Create build project. 3.

In **Project configuration**: 4.

Project name

Enter a name for this build project. Build project names must be unique across each AWS account. You can also include an optional description of the build project to help other users understand what this project is used for.

5. In Source:

Source provider

Choose **GitHub**. Follow the instructions to connect (or reconnect) with GitHub and then choose Authorize.

Repository

Choose Repository in my GitHub account.

GitHub repository

Enter the URL for your GitHub repository.

In **Primary source webhook events**, select the following.



The **Primary source webhook events** section is only visible if you chose **Repository in** my GitHub account in the previous step.

- 1. Select **Rebuild every time a code change is pushed to this repository** when you create your project.
- 2. From **Event type**, choose one or more events.
- 3. To filter when an event triggers a build, under **Start a build under these conditions**, add one or more optional filters.
- 4. To filter when an event is not triggered, under **Don't start a build under these conditions**, add one or more optional filters.
- 5. Choose **Add filter group** to add another filter group, if needed.

For more information about GitHub webhook event types and filters, see <u>GitHub webhook</u> events.

7. In **Environment**:

Environment image

Choose one of the following:

To use a Docker image managed by AWS CodeBuild:

Choose **Managed image**, and then make selections from **Operating system**, **Runtime(s)**, **Image**, and **Image version**. Make a selection from **Environment type** if it is available.

To use another Docker image:

Choose **Custom image**. For **Environment type**, choose **ARM**, **Linux**, **Linux GPU**, or **Windows**. If you choose **Other registry**, for **External registry URL**, enter the name and tag of the Docker image in Docker Hub, using the format *docker repository/docker image name*. If you choose **Amazon ECR**, use **Amazon ECR repository** and **Amazon ECR image** to choose the Docker image in your AWS account.

To use a private Docker image:

Choose **Custom image**. For **Environment type**, choose **ARM**, **Linux**, **Linux GPU**, or **Windows**. For **Image registry**, choose **Other registry**, and then enter the ARN of the credentials for your private Docker image. The credentials must be created by Secrets Manager. For more information, see <u>What Is AWS Secrets Manager?</u> in the *AWS Secrets Manager User Guide*.

Service role

Choose one of the following:

- If you do not have a CodeBuild service role, choose **New service role**. In **Role name**, enter a name for the new role.
- If you have a CodeBuild service role, choose **Existing service role**. In **Role ARN**, choose the service role.



Note

When you use the console to create or update a build project, you can create a CodeBuild service role at the same time. By default, the role works with that build project only. If you use the console to associate this service role with another build project, the role is updated to work with the other build project. A service role can work with up to 10 build projects.

- In **Buildspec**, do one of the following: 8.
 - Choose Use a buildspec file to use the buildspec.yml file in the source code root directory.
 - Choose Insert build commands to use the console to insert build commands.

For more information, see the Buildspec reference.

9. In Artifacts:

Type

Choose one of the following:

- If you do not want to create build output artifacts, choose No artifacts.
- To store the build output in an S3 bucket, choose Amazon S3, and then do the following:
 - If you want to use your project name for the build output ZIP file or folder, leave Name blank. Otherwise, enter the name. By default, the artifact name is the project name. If you want to use a different name, enter it in the artifacts name box. If you want to output a ZIP file, include the zip extension.
 - For Bucket name, choose the name of the output bucket.
 - If you chose **Insert build commands** earlier in this procedure, for **Output files**, enter the locations of the files from the build that you want to put into the build output ZIP file or folder. For multiple locations, separate each location with a comma (for example, appspec.yml, target/my-app.jar). For more information, see the description of files in Buildspec syntax.

Additional configuration

Expand **Additional configuration** and set options as appropriate.

10. Choose Create build project. On the Review page, choose Start build to run the build.

Step 2: Verify that webhooks are enabled

1. Open the AWS CodeBuild console at https://console.aws.amazon.com/codesuite/codebuild/ home.

- 2. In the navigation pane, choose Build projects.
- 3. Do one of the following:
 - Choose the link for the build project with webhooks you want to verify, and then choose
 Build details.
 - Choose the button next to the build project with webhooks you want to verify, choose View details, and then choose the Build details tab.
- 4. In **Primary source webhook events**, choose the **Webhook** URL link.
- 5. In your GitHub repository, on the **Settings** page, under **Webhooks**, verify that **Pull Requests** and **Pushes** are selected.
- 6. In your GitHub profile settings, under **Personal settings**, **Applications**, **Authorized OAuth Apps**, you should see that your application has been authorized to access the AWS Region you selected.

Tutorial: Apple code signing with Fastlane in CodeBuild using S3 for certificate storage

<u>fastlane</u> is a popular open source automation tool to automate beta deployments and releases for your iOS and Android apps. It handles all tedious tasks, like generating screenshots, dealing with code signing, and releasing your application.

Prerequisites

To complete this tutorial, you must first have set up the following:

- An AWS account
- An Apple Developer account
- An S3 bucket for storing certificates
- fastlane installed in your project Guide to install fastlane

Step 1: Set up Fastlane Match with S3 on your local machine

<u>Fastlane Match</u> is one of the <u>Fastlane tools</u>, and it allows for seamless configuration for code signing in both your local development environment and on CodeBuild. Fastlane Match stores all of your code signing certificates and provisioning profiles in a Git repository/S3 Bucket/Google Cloud Storage, and downloads and installs the necessary certificates and profiles when required.

In this example configuration, you will set up and use an Amazon S3 bucket for storage.

1. Initialize match in your project:

```
fastlane match init
```

- 2. When prompted, choose S3 as the storage mode.
- 3. Update your `Matchfile` to use S3:

```
storage_mode("s3")
    s3_bucket("your-s3-bucket-name")
    s3_region("your-aws-region")
    type("appstore") # The default type, can be: appstore, adhoc, enterprise or development
```

Step 2: Set up your Fastfile

Create or update your `Fastfile` with the following lane.

On CodeBuild, Fastlane Match will need to be run every time you build and sign your app. The easiest way to do this is to add the match action to the lane which builds your app.

```
default_platform(:ios)

platform :ios do
  before_all do
    setup_ci
  end

desc "Build and sign the app"
  lane :build do
    match(type: "appstore", readonly: true)
```

```
gym(
    scheme: "YourScheme",
    export_method: "app-store"
    )
    end
end
```

Note

Make sure to add setup_ci to the before_all section in Fastfile for the match action to work correctly. This ensures that a temporary Fastlane keychain with the appropriate permissions is used. Without using this you may see build failures or inconsistent results.

Step 3: Run the fastlane match command to generate respective certificates and profiles

The fastlane match command for the given type (i.e., development, appstore, adhoc, enterprise) will generate the certificate and profile if not available in remote store. The certificates and profiles will be stored in S3 by fastlane.

```
bundle exec fastlane match appstore
```

The command execution will be interactive and fastlane will ask to set pass phrase for decrypting the certificates.

Step 4: Create the application file for your project

Create or add the application file as appropriate for your project.

- Create or add the <u>Gymfile</u>, <u>Appfile</u>, <u>Snapfile</u>, <u>Deliverfile</u> based on your project build requirements.
- 2. Commit the changes to your remote repository

Step 5: Create environment variables in Secrets Manager

Create two secrets for storing the fastlane session cookie and matching pass phrase. For more information about creating secrets in Secrets Manager, see Create an AWS Secrets Manager secret.

- Access your fastlane session cookie as follows.
 - Secret key FASTLANE_SESSION a.
 - Secret value session cookie generated from running the following command on your local machine.



Note

This value is available after authentication in a local file: ~/.fastlane/ spaceship/my_appleid_username/cookie.

fastlane spaceauth -u <apple account>

- Fastlane Match pass phrase To enable Fastlane Match to decrypt the certificates and profiles stored in the S3 bucket, it is necessary to add the encryption passphrase that you configured in the Match setup step to the CodeBuild project's environment variables.
 - Secret key MATCH_PASSWORD a.
 - Secret value <match passphrase to decrypt certificates>. The passphrase is set while generating the certificates in Step 3.



Note

While creating the above secrets in Secrets Manager, remember to give a secret name with the following prefix: /CodeBuild/

Step 6: Create a compute fleet

Create the compute fleet for your project.

- 1. In the console, go to CodeBuild and create a new compute fleet.
- 2. Choose "macOS" as the operating system and select an appropriate compute type and image.

Step 7: Create a project in CodeBuild

Create your project in CodeBuild.

- 1. Open the AWS CodeBuild console at https://console.aws.amazon.com/codesuite/codebuild/ home.
- 2. Create a build project. For information, see <u>Create a build project (console)</u> and <u>Run a build</u> (console).
- 3. Set up your source provider (such as GitHub, CodeCommit). This is iOS project source repository and not certificates repository.
- 4. In **Environment**:
 - Choose Reserved Capacity.
 - For Fleet, select the fleet created above.
 - Provide the name of the service role that CodeBuild will create for you.
 - Provide the below environment variables.
 - Name: MATCH_PASSWORD, Value: <secrets arn>, Type: Secrets Manager (Secrets ARN created in step 5 for MATCH_PASSWORD)
 - Name: FASTLANE_SESSION, Value: <secrets arn>, Type: Secrets Manager (Secrets ARN created in Step 5 for FASTLANE_SESSION)
- 5. In **Buildspec**, add the following:

```
version: 0.2

phases:
    install:
    commands:
        - gem install bundler
        - bundle install
    build:
        commands:
```

```
- echo "Building and signing the app..."
- bundle exec fastlane build
post_build:
    commands:
    - echo "Build completed on date"

artifacts:
    files:
    - '*/.ipa'
name: app-$(date +%Y-%m-%d)
```

Step 8: Configure IAM role

Once the project is created, ensure your CodeBuild project's service role has permissions to access the S3 bucket containing the certificates. Add the following policy to the role:

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Effect": "Allow",
             "Action": [
                 "s3:GetBucketLocation",
                 "s3:ListBucket"
            ],
            "Resource": "arn:aws:s3:::your-s3-bucket-name"
        },
            "Effect": "Allow",
            "Action": [
                 "s3:GetObject",
                 "s3:PutObject",
                 "s3:DeleteObject"
            ],
            "Resource": "arn:aws:s3:::your-s3-bucket-name/*"
        }
    ]
}
```

Step 9: Run the build

Run the build. You can review the build status and logs in CodeBuild.

Once the job is completed, you will be able to view the log of the job.

Troubleshooting

• If you encounter issues with certificate fetching, ensure your IAM permissions are set up correctly for S3 access.

- If you encounter issues with certificate decrypting, ensure you set correct passphrase in MATCH_PASSWORD environment variable.
- For code signing issues, verify that your Apple Developer account has the necessary certificates
 and profiles, and that the bundle identifier in your Xcode project matches the one in your
 provisioning profile.

Security considerations

The following are security considerations for this tutorial.

- Ensure your S3 bucket has appropriate security settings, including encryption at rest. In
 particular, make sure the bucket has no public access and restrict access to only CodeBuild and
 the system that needs to have an access.
- Consider using AWS Secrets Manager for storing sensitive information like the MATCH_PASSWORD and FASTLANE_SESSION.

This sample provides a setup for iOS code signing with Fastlane in CodeBuild using Amazon S3 for certificate storage. You may need to adjust some steps based on your specific project requirements and CodeBuild environment. This approach leverages AWS services for enhanced security and integration within the AWS ecosystem.

Tutorial: Apple code signing with Fastlane in CodeBuild using GitHub for certificate storage

<u>fastlane</u> is a popular open source automation tool to automate beta deployments and releases for your iOS and Android apps. It handles all tedious tasks, like generating screenshots, dealing with code signing, and releasing your application.

This sample demonstrates how to set up Apple code signing using Fastlane in a CodeBuild project running on Mac fleet, with GitHub as the storage for certificates and provisioning profiles.

Prerequisites

To complete this tutorial, you must first have set up the following:

- An AWS account
- An Apple Developer account
- A private GitHub repository for storing certificates
- fastlane installed in your project Guide to install fastlane

Step 1: Set up Fastlane Match with GitHub on your local machine

<u>Fastlane Match</u> is one of the <u>Fastlane tools</u>, and it allows for seamless configuration for code signing in both your local development environment and on CodeBuild. Fastlane Match stores all of your code signing certificates and provisioning profiles in a Git repository/S3 Bucket/Google Cloud Storage, and downloads and installs the necessary certificates and profiles when required.

In this example configuration, we will set up and use a Git repository for storage.

Initialize match in your project:

```
fastlane match init
```

- 2. When prompted, choose GitHub as the storage mode.
- 3. Update your `Matchfile` to use GitHub:

```
git_url("https://github.com/your-username/your-certificate-repo.git")
storage_mode("git")
type("development") # The default type, can be: appstore, adhoc, enterprise or
development
```

Note

Make sure you enter HTTPS URL for your Git repository for fastlane to successfully authenticate and clone. Otherwise, you may see an authentication error when you attempt to use match.

Step 2: Set up your Fastfile

Create or update your `Fastfile` with the following lane.

On CodeBuild, Fastlane Match will need to be run every time you build and sign your app. The easiest way to do this is to add the match action to the lane which builds your app.

```
default_platform(:ios)

platform :ios do
   before_all do
    setup_ci
   end

desc "Build and sign the app"
   lane :build do
    match(type: "appstore", readonly: true)
   gym(
    scheme: "YourScheme",
       export_method: "app-store"
   )
   end
end
```

Note

Make sure to add setup_ci to the before_all section in Fastfile for the match action to work correctly. This ensures that a temporary Fastlane keychain with the appropriate permissions is used. Without using this you may see build failures or inconsistent results.

Step 3: Run the fastlane match command to generate respective certificates and profiles

The fastlane match command for the given type (i.e. development, appstore, adhoc, enterprise) will generate the certificate and profile if not available in remote store. The certificates and profiles will be stored in GitHub by fastlane.

```
bundle exec fastlane match appstore
```

The command execution will be interactive and fastlane will ask to set pass phrase for decrypting the certificates.

Step 4: Create the application file for your project

Create or add the application file as appropriate for your project.

- 1. Create or add the <u>Gymfile</u>, <u>Appfile</u>, <u>Snapfile</u>, <u>Deliverfile</u> based on your project build requirements.
- 2. Commit the changes to your remote repository.

Step 5: Create environment variables in Secrets Manager

Create three secrets for storing the fastlane session cookie and matching pass phrase. For more information about creating secrets in Secrets Manager, see Create an AWS Secrets Manager secret.

- 1. Access your fastlane session cookie as follows.
 - a. Secret key FASTLANE_SESSION
 - b. Secret value session cookie generated from running the following command on your local machine.



This value is available after authentication in a local file: ~/.fastlane/spaceship/my_appleid_username/cookie.

fastlane spaceauth -u <Apple_account>

- Fastlane Match pass phrase To enable Fastlane Match to decrypt the certificates and
 profiles stored in the Git repository, it is necessary to add the encryption passphrase that you
 configured in the Match setup step to the CodeBuild project's environment variables.
 - a. Secret key MATCH_PASSWORD
 - b. Secret value <match passphrase to decrypt certificates>. The passphrase is set while generating the certificates in Step 3.

- 3. Fastlane MATCH_GIT_BASIC_AUTHORIZATION set a basic authorization for *match*:
 - a. Secret key:

```
MATCH_GIT_BASIC_AUTHORIZATION
```

b. Secret value - The value should be a base64 encoded string of your username and personal access token (PAT) in the format username: password. You can generate it using the following command:

```
echo -n your_github_username:your_personal_access_token | base64
```

You can generate your PAT on the GitHub console in **Your Profile > Settings > Developers Settings > Personal Access Token**. For more information, see the following guide: https://docs.github.com/en/authentication/keeping-your-account-and-data-secure/managing-your-personal-access-tokens.



While creating the above secrets in Secrets Manager, remember to give a secret name with the following prefix: /CodeBuild/

Step 6: Create a compute fleet

Create the compute fleet for your project.

- 1. In the console, go to CodeBuild and create a new compute fleet.
- 2. Choose macOS as the operating system and select an appropriate compute type and image.

Step 7: Create a project in CodeBuild

Create your project in CodeBuild.

1. Open the AWS CodeBuild console at https://console.aws.amazon.com/codesuite/codebuild/ home.

2. Create a build project. For information, see <u>Create a build project (console)</u> and <u>Run a build</u> (console).

3. Set up your source provider (such as GitHub, CodeCommit). This is iOS project source repository and not certificates repository.

4. In **Environment**:

- Choose Reserved Capacity.
- For **Fleet**, select the fleet created above.
- Provide the name of the service role that CodeBuild will create for you.
- Provide the below environment variables.
 - Name: MATCH_PASSWORD, Value: <secrets arn>, Type: Secrets Manager (Secrets ARN created in step 5 for MATCH_PASSWORD)
 - Name: FASTLANE_SESSION, Value: <secrets arn>, Type: Secrets Manager (Secrets ARN created in step 5 for FASTLANE_SESSION)
 - Name: MATCH_GIT_BASIC_AUTHORIZATION, Value: <secrets ARN>, Type: Secrets Manager Secrets ARN (created in step 5 for MATCH_GIT_BASIC_AUTHORIZATION)
- 5. In **Buildspec**, add the following:

```
version: 0.2
phases:
 install:
    commands:
      - gem install bundler
      - bundle install
  build:
    commands:
      - echo "Building and signing the app..."
      - bundle exec fastlane build
  post_build:
    commands:
      - echo "Build completed on date"
artifacts:
 files:
    - '*/.ipa'
  name: app-$(date +%Y-%m-%d)
```

Step 8: Run the build

Run the build. You can review the build status and logs in CodeBuild.

Once the job is completed, you will be able to view the log of the job.

Troubleshooting

- If you encounter issues accessing the GitHub repository, double-check your personal access token and the MATCH_GIT_BASIC_AUTHORIZATION environment variable.
- If you encounter issues with certificate decrypting, ensure you set correct passphrase in MATCH_PASSWORD environment variable.
- For code signing issues, verify that your Apple Developer account has the necessary certificates
 and profiles, and that the bundle identifier in your Xcode project matches the one in your
 provisioning profile.

Security considerations

The following are security considerations for this tutorial.

- Keep your GitHub repository for certificates private and regularly audit access.
- Consider using AWS Secrets Manager for storing sensitive information like the MATCH_PASSWORD and FASTLANE_SESSION.

This sample provides a setup for iOS code signing with Fastlane in CodeBuild using GitHub for certificate storage. You may need to adjust some steps based on your specific project requirements and CodeBuild environment. This approach leverages AWS services for enhanced security and integration within the AWS ecosystem.

Set artifact names at build time using semantic versioning

This sample contains example buildspec files that demonstrate how to specify an artifact name that is created at build time. A name specified in a buildspec file can incorporate Shell commands and environment variables to make it unique. A name you specify in a buildspec file overrides a name you enter in the console when you create your project.

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If you build multiple times, using an artifact name specified in the buildspec file can ensure your output artifact file names are unique. For example, you can use a date and timestamp that is inserted into an artifact name at build time.

If you want to override the artifact name you entered in the console with a name in the buildspec file, do the following:

- 1. Set your build project to override the artifact name with a name in the buildspec file.
 - If you use the console to create your build project, select **Enable semantic versioning**. For more information, see Create a build project (console).
 - If you use the AWS CLI, set the overrideArtifactName to true in the JSON-formatted file passed to create-project. For more information, see Create a build project (AWS CLI).
 - If you use the AWS CodeBuild API, set the overrideArtifactName flag on the ProjectArtifacts object when a project is created or updated or a build is started.
- 2. Specify a name in the buildspec file. Use the following sample buildspec files as a guide.

This Linux example shows you how to specify an artifact name that includes the date the build is created:

```
version: 0.2
phases:
  build:
    commands:
        - rspec HelloWorld_spec.rb
artifacts:
  files:
        - '**/*'
    name: myname-$(date +%Y-%m-%d)
```

This Linux example shows you how to specify an artifact name that uses a CodeBuild environment variable. For more information, see Environment variables in build environments.

```
version: 0.2
phases:
  build:
    commands:
    - rspec HelloWorld_spec.rb
artifacts:
```

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```
files:
    - '**/*'
name: myname-$AWS_REGION
```

This Windows example shows you how to specify an artifact name that includes the date and time the build is created:

```
version: 0.2
env:
  variables:
    TEST_ENV_VARIABLE: myArtifactName
phases:
  build:
    commands:
        - cd samples/helloworld
        - dotnet restore
        - dotnet run
artifacts:
  files:
        - '**/*'
  name: $Env:TEST_ENV_VARIABLE-$(Get-Date -UFormat "%Y%m%d-%H%M%S")
```

This Windows example shows you how to specify an artifact name that uses a variable declared in the buildspec file and a CodeBuild environment variable. For more information, see Environment variables in build environments.

```
version: 0.2
env:
    variables:
        TEST_ENV_VARIABLE: myArtifactName
phases:
    build:
        commands:
            - cd samples/helloworld
            - dotnet restore
            - dotnet run
artifacts:
    files:
            - '**/*'
    name: $Env:TEST_ENV_VARIABLE-$Env:AWS_REGION
```

For more information, see Build specification reference for CodeBuild.

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Run Microsoft Windows samples for CodeBuild

These samples use an AWS CodeBuild build environment running Microsoft Windows Server 2019, the .NET Framework, and the .NET Core SDK to build runtime files out of code written in F# and Visual Basic.

Important

Running these samples might result in charges to your AWS account. These include possible charges for CodeBuild and for AWS resources and actions related to Amazon S3, AWS KMS, and CloudWatch Logs. For more information, see CodeBuild pricing, Amazon S3 pricing, AWS Key Management Service pricing, and Amazon CloudWatch pricing.

Run the Windows samples

Use the following procedure to run the Windows samples.

To run the Windows samples

Create the files as described in the Directory structure and Files sections of this topic, and then upload them to an S3 input bucket or a CodeCommit or GitHub repository.

Important

Do not upload (root directory name), just the files inside of (root directory name).

If you are using an S3 input bucket, be sure to create a ZIP file that contains the files, and then upload it to the input bucket. Do not add (root directory name) to the ZIP file, just the files inside of (root directory name).

Create a build project. The build project must use the mcr.microsoft.com/dotnet/ framework/sdk: 4.8 image to build .NET Framework projects.

If you use the AWS CLI to create the build project, the JSON-formatted input to the createproject command might look similar to this. (Replace the placeholders with your own values.)

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```
"name": "sample-windows-build-project",
  "source": {
    "type": "S3",
    "location": "codebuild-region-ID-account-ID-input-bucket/windows-build-input-
artifact.zip"
  },
  "artifacts": {
    "type": "S3",
    "location": "codebuild-region-ID-account-ID-output-bucket",
    "packaging": "ZIP",
    "name": "windows-build-output-artifact.zip"
 },
  "environment": {
    "type": "WINDOWS_SERVER_2019_CONTAINER",
    "image": "mcr.microsoft.com/dotnet/framework/sdk:4.8",
    "computeType": "BUILD_GENERAL1_MEDIUM"
 },
  "serviceRole": "arn:aws:iam::account-ID:role/role-name",
  "encryptionKey": "arn:aws:kms:region-ID:account-ID:key/key-ID"
}
```

- 3. Run the build, and follow the steps in Run builds manually.
- 4. To get the build output artifact, in your S3 output bucket, download the *windows-build-output-artifact*. zip file to your local computer or instance. Extract the contents to get to the runtime and other files.
 - The runtime file for the F# sample using the .NET Framework, FSharpHelloWorld.exe, can be found in the FSharpHelloWorld\bin\Debug directory.
 - The runtime file for the Visual Basic sample using the .NET Framework, VBHelloWorld.exe, can be found in the VBHelloWorld\bin\Debug directory.

Directory structure

These samples assume the following directory structures.

F# and the .NET Framework

```
(root directory name)
```

Directory structure API Version 2016-10-06 168

```
### buildspec.yml
### FSharpHelloWorld.sln
### FSharpHelloWorld
### App.config
### AssemblyInfo.fs
### FSharpHelloWorld.fsproj
### Program.fs
```

Visual Basic and the .NET Framework

```
(root directory name)
### buildspec.yml
### VBHelloWorld.sln
### VBHelloWorld
### App.config
### HelloWorld.vb
### VBHelloWorld.vbproj
### WProject
### Application.Designer.vb
### Application.myapp
### AssemblyInfo.vb
### Resources.Designer.vb
### Resources.resx
### Settings.Designer.vb
### Settings.Designer.vb
```

Files

These samples use the following files.

F# and the .NET Framework

buildspec.yml (in (root directory name)):

```
version: 0.2
env:
  variables:
    SOLUTION: .\FSharpHelloWorld.sln
    PACKAGE_DIRECTORY: .\packages
    DOTNET_FRAMEWORK: 4.8
```

```
phases:
    build:
    commands:
        - '& nuget restore $env:SOLUTION -PackagesDirectory $env:PACKAGE_DIRECTORY'
        - '& msbuild -p:FrameworkPathOverride="C:\Program Files (x86)\Reference
Assemblies\Microsoft\Framework\.NETFramework\v$env:DOTNET_FRAMEWORK" $env:SOLUTION'
artifacts:
    files:
        - .\FSharpHelloWorld\bin\Debug\*
```

FSharpHelloWorld.sln(in(root directory name)):

```
Microsoft Visual Studio Solution File, Format Version 12.00
# Visual Studio 14
VisualStudioVersion = 14.0.25420.1
MinimumVisualStudioVersion = 10.0.40219.1
Project("{F2A71F9B-5D33-465A-A702-920D77279786}") = "FSharpHelloWorld",
 "FSharpHelloWorld\FSharpHelloWorld.fsproj", "{D60939B6-526D-43F4-9A89-577B2980DF62}"
EndProject
Global
  GlobalSection(SolutionConfigurationPlatforms) = preSolution
    Debug | Any CPU = Debug | Any CPU
    Release|Any CPU = Release|Any CPU
  EndGlobalSection
  GlobalSection(ProjectConfigurationPlatforms) = postSolution
    \{D60939B6-526D-43F4-9A89-577B2980DF62\}. Debug | Any CPU. ActiveCfg = Debug | Any CPU
    \{D60939B6-526D-43F4-9A89-577B2980DF62\}.Debug|Any CPU.Build.0 = Debug|Any CPU
    {D60939B6-526D-43F4-9A89-577B2980DF62}.Release|Any CPU.ActiveCfg = Release|Any CPU
    {D60939B6-526D-43F4-9A89-577B2980DF62}.Release|Any CPU.Build.0 = Release|Any CPU
  EndGlobalSection
  GlobalSection(SolutionProperties) = preSolution
    HideSolutionNode = FALSE
  EndGlobalSection
EndGlobal
```

App.config (in (root directory name)\FSharpHelloWorld):

```
</configuration>
```

AssemblyInfo.fs (in (root directory name)\FSharpHelloWorld):

```
namespace FSharpHelloWorld.AssemblyInfo
open System.Reflection
open System.Runtime.CompilerServices
open System.Runtime.InteropServices
// General Information about an assembly is controlled through the following
// set of attributes. Change these attribute values to modify the information
// associated with an assembly.
[<assembly: AssemblyTitle("FSharpHelloWorld")>]
[<assembly: AssemblyDescription("")>]
[<assembly: AssemblyConfiguration("")>]
[<assembly: AssemblyCompany("")>]
[<assembly: AssemblyProduct("FSharpHelloWorld")>]
[<assembly: AssemblyCopyright("Copyright @ 2017")>]
[<assembly: AssemblyTrademark("")>]
[<assembly: AssemblyCulture("")>]
// Setting ComVisible to false makes the types in this assembly not visible
// to COM components. If you need to access a type in this assembly from
// COM, set the ComVisible attribute to true on that type.
[<assembly: ComVisible(false)>]
// The following GUID is for the ID of the typelib if this project is exposed to COM
[<assembly: Guid("d60939b6-526d-43f4-9a89-577b2980df62")>]
// Version information for an assembly consists of the following four values:
//
// Major Version
// Minor Version
// Build Number
// Revision
//
// You can specify all the values or you can default the Build and Revision Numbers
// by using the '*' as shown below:
// [<assembly: AssemblyVersion("1.0.*")>]
[<assembly: AssemblyVersion("1.0.0.0")>]
[<assembly: AssemblyFileVersion("1.0.0.0")>]
```

```
do
()
```

FSharpHelloWorld.fsproj(in(*root directory name*)\FSharpHelloWorld):

```
<?xml version="1.0" encoding="utf-8"?>
<Project ToolsVersion="14.0" DefaultTargets="Build" xmlns="http://</pre>
schemas.microsoft.com/developer/msbuild/2003">
  <Import Project="$(MSBuildExtensionsPath)\</pre>
$(MSBuildToolsVersion)\Microsoft.Common.props"
 Condition="Exists('$(MSBuildExtensionsPath)\
$(MSBuildToolsVersion)\Microsoft.Common.props')" />
  <PropertyGroup>
    <Configuration Condition=" '$(Configuration)' == '' ">Debug</Configuration>
    <Platform Condition=" '$(Platform)' == '' ">AnyCPU</Platform>
    <SchemaVersion>2.0</SchemaVersion>
    <ProjectGuid>d60939b6-526d-43f4-9a89-577b2980df62</ProjectGuid>
    <OutputType>Exe
    <RootNamespace>FSharpHelloWorld/RootNamespace>
    <AssemblyName>FSharpHelloWorld</AssemblyName>
    <TargetFrameworkVersion>v4.8</TargetFrameworkVersion>
    <AutoGenerateBindingRedirects>true</AutoGenerateBindingRedirects>
    <TargetFSharpCoreVersion>4.4.0.0</TargetFSharpCoreVersion>
    <Name>FSharpHelloWorld</Name>
  </PropertyGroup>
  <PropertyGroup Condition=" '$(Configuration)|$(Platform)' == 'Debug|AnyCPU' ">
    <DebugSymbols>true</DebugSymbols>
    <DebugType>full</DebugType>
    <Optimize>false
    <Tailcalls>false</Tailcalls>
    <OutputPath>bin\Debug\</OutputPath>
    <DefineConstants>DEBUG;TRACE</DefineConstants>
    <WarningLevel>3</WarningLevel>
    <PlatformTarget>AnyCPU</PlatformTarget>
    <DocumentationFile>bin\Debug\FSharpHelloWorld.XML</DocumentationFile>
    <Prefer32Bit>true</Prefer32Bit>
  </PropertyGroup>
  <PropertyGroup Condition=" '$(Configuration)|$(Platform)' == 'Release|AnyCPU' ">
    <DebugType>pdbonly</DebugType>
    <Optimize>true</Optimize>
    <Tailcalls>true</Tailcalls>
    <OutputPath>bin\Release\</OutputPath>
    <DefineConstants>TRACE</DefineConstants>
```

```
<WarningLevel>3</WarningLevel>
    <PlatformTarget>AnyCPU</PlatformTarget>
    <DocumentationFile>bin\Release\FSharpHelloWorld.XML</DocumentationFile>
    <Prefer32Bit>true</Prefer32Bit>
  </PropertyGroup>
  <ItemGroup>
    <Reference Include="mscorlib" />
    <Reference Include="FSharp.Core, Version=$(TargetFSharpCoreVersion),</pre>
 Culture=neutral, PublicKeyToken=b03f5f7f11d50a3a">
      <Private>True</Private>
    </Reference>
    <Reference Include="System" />
    <Reference Include="System.Core" />
    <Reference Include="System.Numerics" />
  </ItemGroup>
  <ItemGroup>
    <Compile Include="AssemblyInfo.fs" />
    <Compile Include="Program.fs" />
    <None Include="App.config" />
  </ItemGroup>
  <PropertyGroup>
    <MinimumVisualStudioVersion Condition="'$(MinimumVisualStudioVersion)' == ''">11
MinimumVisualStudioVersion>
  </PropertyGroup>
  <Choose>
    <When Condition="'$(VisualStudioVersion)' == '11.0'">
      <PropertyGroup Condition="Exists('$(MSBuildExtensionsPath32)\..\Microsoft SDKs\F#</pre>
\3.0\Framework\v4.0\Microsoft.FSharp.Targets')">
        <FSharpTargetsPath>$(MSBuildExtensionsPath32)\..\Microsoft SDKs\F#
\3.0\Framework\v4.0\Microsoft.FSharp.Targets</FSharpTargetsPath>
      </PropertyGroup>
    </When>
    <Otherwise>
      <PropertyGroup Condition="Exists('$(MSBuildExtensionsPath32)\Microsoft</pre>
\VisualStudio\v$(VisualStudioVersion)\FSharp\Microsoft.FSharp.Targets')">
        <FSharpTargetsPath>$(MSBuildExtensionsPath32)\Microsoft\VisualStudio\v
$(VisualStudioVersion)\FSharp\Microsoft.FSharp.Targets</FSharpTargetsPath>
      </PropertyGroup>
    </Otherwise>
  </Choose>
  <Import Project="$(FSharpTargetsPath)" />
  <!-- To modify your build process, add your task inside one of the targets below and
 uncomment it.
       Other similar extension points exist, see Microsoft.Common.targets.
```

```
<Target Name="BeforeBuild">
  </Target>
  <Target Name="AfterBuild">
  </Target>
  -->
  </Project>
```

Program.fs (in (root directory name)\FSharpHelloWorld):

```
// Learn more about F# at http://fsharp.org
// See the 'F# Tutorial' project for more help.

[<EntryPoint>]
let main argv =
    printfn "Hello World"
    0 // return an integer exit code
```

Visual Basic and the .NET Framework

buildspec.yml (in (root directory name)):

```
version: 0.2
env:
  variables:
    SOLUTION: .\VBHelloWorld.sln
    PACKAGE_DIRECTORY: .\packages
    DOTNET_FRAMEWORK: 4.8
phases:
  build:
    commands:
      - '& "C:\ProgramData\chocolatey\bin\NuGet.exe" restore $env:SOLUTION -
PackagesDirectory $env:PACKAGE_DIRECTORY'
      - '& "C:\Program Files (x86)\MSBuild\14.0\Bin\MSBuild.exe" -
p:FrameworkPathOverride="C:\Program Files (x86)\Reference Assemblies\Microsoft
\Framework\.NETFramework\v\env:DOTNET_FRAMEWORK" \\env:SOLUTION'
artifacts:
  files:
    - .\VBHelloWorld\bin\Debug\*
```

VBHelloWorld.sln (in (root directory name)):

```
Microsoft Visual Studio Solution File, Format Version 12.00
# Visual Studio 14
VisualStudioVersion = 14.0.25420.1
MinimumVisualStudioVersion = 10.0.40219.1
Project("{F184B08F-C81C-45F6-A57F-5ABD9991F28F}") = "VBHelloWorld", "VBHelloWorld
\VBHelloWorld.vbproj", "{4DCEC446-7156-4FE6-8CCC-219E34DD409D}"
EndProject
Global
  GlobalSection(SolutionConfigurationPlatforms) = preSolution
    Debug|Any CPU = Debug|Any CPU
    Release | Any CPU = Release | Any CPU
  EndGlobalSection
  GlobalSection(ProjectConfigurationPlatforms) = postSolution
    {4DCEC446-7156-4FE6-8CCC-219E34DD409D}.Debug|Any CPU.ActiveCfg = Debug|Any CPU
    {4DCEC446-7156-4FE6-8CCC-219E34DD409D}.Debug|Any CPU.Build.0 = Debug|Any CPU
    {4DCEC446-7156-4FE6-8CCC-219E34DD409D}.Release|Any CPU.ActiveCfg = Release|Any CPU
    {4DCEC446-7156-4FE6-8CCC-219E34DD409D}.Release|Any CPU.Build.0 = Release|Any CPU
  EndGlobalSection
  GlobalSection(SolutionProperties) = preSolution
    HideSolutionNode = FALSE
  EndGlobalSection
EndGlobal
```

App.config(in(root directory name)\VBHelloWorld):

HelloWorld.vb (in (root directory name)\VBHelloWorld):

```
Module HelloWorld

Sub Main()

MsgBox("Hello World")

End Sub

End Module
```

VBHelloWorld.vbproj (in (root directory name)\VBHelloWorld):

```
<?xml version="1.0" encoding="utf-8"?>
<Project ToolsVersion="14.0" DefaultTargets="Build" xmlns="http://</pre>
schemas.microsoft.com/developer/msbuild/2003">
  <Import Project="$(MSBuildExtensionsPath)\</pre>
$(MSBuildToolsVersion)\Microsoft.Common.props"
 Condition="Exists('$(MSBuildExtensionsPath)\
$(MSBuildToolsVersion)\Microsoft.Common.props')" />
  <PropertyGroup>
    <Configuration Condition=" '$(Configuration)' == '' ">Debug</Configuration>
    <Platform Condition=" '$(Platform)' == '' ">AnyCPU</Platform>
    <ProjectGuid>{4DCEC446-7156-4FE6-8CCC-219E34DD409D}</ProjectGuid>
    <OutputType>Exe</OutputType>
    <StartupObject>VBHelloWorld.HelloWorld</StartupObject>
    <RootNamespace>VBHelloWorld/RootNamespace>
    <AssemblyName>VBHelloWorld</AssemblyName>
    <FileAlignment>512</FileAlignment>
    <MyType>Console</MyType>
    <TargetFrameworkVersion>v4.8</TargetFrameworkVersion>
    <AutoGenerateBindingRedirects>true</AutoGenerateBindingRedirects>
  </PropertyGroup>
  <PropertyGroup Condition=" '$(Configuration)|$(Platform)' == 'Debug|AnyCPU' ">
    <PlatformTarget>AnyCPU</PlatformTarget>
    <DebugSymbols>true</DebugSymbols>
    <DebugType>full</DebugType>
    <DefineDebug>true</DefineDebug>
    <DefineTrace>true</DefineTrace>
    <OutputPath>bin\Debug\</OutputPath>
    <DocumentationFile>VBHelloWorld.xml</DocumentationFile>
    <NoWarn>42016,41999,42017,42018,42019,42032,42036,42020,42021,42022</NoWarn>
  </PropertyGroup>
  <PropertyGroup Condition=" '$(Configuration)|$(Platform)' == 'Release|AnyCPU' ">
    <PlatformTarget>AnyCPU</PlatformTarget>
    <DebugType>pdbonly</DebugType>
    <DefineDebug>false</DefineDebug>
    <DefineTrace>true/DefineTrace>
    <Optimize>true
    <OutputPath>bin\Release\</OutputPath>
    <DocumentationFile>VBHelloWorld.xml</DocumentationFile>
    <NoWarn>42016,41999,42017,42018,42019,42032,42036,42020,42021,42022</NoWarn>
  </PropertyGroup>
  <PropertyGroup>
    <OptionExplicit>On</OptionExplicit>
```

```
</PropertyGroup>
<PropertyGroup>
  <OptionCompare>Binary</OptionCompare>
</PropertyGroup>
<PropertyGroup>
  <OptionStrict>Off</OptionStrict>
</PropertyGroup>
<PropertyGroup>
  <OptionInfer>On/OptionInfer>
</PropertyGroup>
<ItemGroup>
  <Reference Include="System" />
  <Reference Include="System.Data" />
  <Reference Include="System.Deployment" />
  <Reference Include="System.Xml" />
  <Reference Include="System.Core" />
  <Reference Include="System.Xml.Ling" />
  <Reference Include="System.Data.DataSetExtensions" />
  <Reference Include="System.Net.Http" />
</ItemGroup>
<ItemGroup>
  <Import Include="Microsoft.VisualBasic" />
  <Import Include="System" />
  <Import Include="System.Collections" />
  <Import Include="System.Collections.Generic" />
  <Import Include="System.Data" />
  <Import Include="System.Diagnostics" />
  <Import Include="System.Linq" />
  <Import Include="System.Xml.Ling" />
  <Import Include="System.Threading.Tasks" />
</ItemGroup>
<ItemGroup>
  <Compile Include="HelloWorld.vb" />
  <Compile Include="My Project\AssemblyInfo.vb" />
  <Compile Include="My Project\Application.Designer.vb">
    <AutoGen>True</AutoGen>
    <DependentUpon>Application.myapp/DependentUpon>
  </Compile>
  <Compile Include="My Project\Resources.Designer.vb">
    <AutoGen>True</AutoGen>
    <DesignTime>True</DesignTime>
    <DependentUpon>Resources.resx</DependentUpon>
  </Compile>
  <Compile Include="My Project\Settings.Designer.vb">
```

```
<AutoGen>True</AutoGen>
      <DependentUpon>Settings.settings/DependentUpon>
      <DesignTimeSharedInput>True</DesignTimeSharedInput>
    </Compile>
 </ItemGroup>
 <ItemGroup>
    <EmbeddedResource Include="My Project\Resources.resx">
      <Generator>VbMyResourcesResXFileCodeGenerator/Generator>
      <LastGenOutput>Resources.Designer.vb</LastGenOutput>
      <CustomToolNamespace>My.Resources</CustomToolNamespace>
      <SubType>Designer</SubType>
    </EmbeddedResource>
 </ItemGroup>
 <ItemGroup>
    <None Include="My Project\Application.myapp">
      <Generator>MyApplicationCodeGenerator</Generator>
      <LastGenOutput>Application.Designer.vb</LastGenOutput>
    </None>
    <None Include="My Project\Settings.settings">
      <Generator>SettingsSingleFileGenerator</Generator>
      <CustomToolNamespace>My</CustomToolNamespace>
      <LastGenOutput>Settings.Designer.vb</LastGenOutput>
    </None>
    <None Include="App.config" />
 </ItemGroup>
 <Import Project="$(MSBuildToolsPath)\Microsoft.VisualBasic.targets" />
 <!-- To modify your build process, add your task inside one of the targets below and
 uncomment it.
       Other similar extension points exist, see Microsoft.Common.targets.
 <Target Name="BeforeBuild">
 </Target>
 <Target Name="AfterBuild">
 </Target>
  -->
</Project>
```

Application.Designer.vb(in (root directory name)\VBHelloWorld\My Project):

```
'-----
' <auto-generated>
' This code was generated by a tool.
' Runtime Version:4.0.30319.42000
'
```

Application.myapp (in (root directory name)\VBHelloWorld\My Project):

AssemblyInfo.vb(in(root directory name)\VBHelloWorld\My Project):

```
'The following GUID is for the ID of the typelib if this project is exposed to COM <Assembly: Guid("137c362b-36ef-4c3e-84ab-f95082487a5a")>

' Version information for an assembly consists of the following four values:

' Major Version
' Minor Version
' Build Number
' Revision
'
' You can specify all the values or you can default the Build and Revision Numbers
' by using the '*' as shown below:
' <Assembly: AssemblyVersion("1.0.0.0")>

<Assembly: AssemblyVersion("1.0.0.0")>
```

Resources.Designer.vb(in(root directory name)\VBHelloWorld\My Project):

```
' <auto-generated>
   This code was generated by a tool.
   Runtime Version: 4.0.30319.42000
  Changes to this file may cause incorrect behavior and will be lost if
  the code is regenerated.
' </auto-generated>
Option Strict On
Option Explicit On
Namespace My.Resources
  'This class was auto-generated by the StronglyTypedResourceBuilder
  'class via a tool like ResGen or Visual Studio.
  'To add or remove a member, edit your .ResX file then rerun ResGen
  'with the /str option, or rebuild your VS project.
  '''<summary>
  ''' A strongly-typed resource class, for looking up localized strings, etc.
  '''</summary>
```

```
<Global.System.CodeDom.Compiler.GeneratedCodeAttribute("System.Resources.Tools.StronglyTypedRe
"4.0.0.0"), _
 Global.System.Diagnostics.DebuggerNonUserCodeAttribute(), _
 Global.System.Runtime.CompilerServices.CompilerGeneratedAttribute(), _
 Global.Microsoft.VisualBasic.HideModuleNameAttribute()> _
 Friend Module Resources
   Private resourceMan As Global.System.Resources.ResourceManager
   Private resourceCulture As Global.System.Globalization.CultureInfo
   '''<summary>
   ''' Returns the cached ResourceManager instance used by this class.
   '''</summary>
<Global.System.ComponentModel.EditorBrowsableAttribute(Global.System.ComponentModel.EditorBrow
   Friend ReadOnly Property ResourceManager() As
Global.System.Resources.ResourceManager
     Get
       If Object.ReferenceEquals(resourceMan, Nothing) Then
         Dim temp As Global.System.Resources.ResourceManager = New
Global.System.Resources.ResourceManager("VBHelloWorld.Resources",
GetType(Resources).Assembly)
         resourceMan = temp
       End If
       Return resourceMan
     End Get
   End Property
   '''<summary>
   ''' Overrides the current thread's CurrentUICulture property for all
       resource lookups using this strongly typed resource class.
   '''</summary>
<Global.System.ComponentModel.EditorBrowsableAttribute(Global.System.ComponentModel.EditorBrow
   Friend Property Culture() As Global.System.Globalization.CultureInfo
     Get
       Return resourceCulture
     End Get
     Set(ByVal value As Global.System.Globalization.CultureInfo)
       resourceCulture = value
```

```
End Set
End Property
End Module
End Namespace
```

Resources.resx(in (root directory name)\VBHelloWorld\My Project):

```
<?xml version="1.0" encoding="utf-8"?>
<root>
 <!--
   Microsoft ResX Schema
   Version 2.0
   The primary goals of this format is to allow a simple XML format
    that is mostly human readable. The generation and parsing of the
    various data types are done through the TypeConverter classes
    associated with the data types.
   Example:
    ... ado.net/XML headers & schema ...
    <resheader name="resmimetype">text/microsoft-resx</resheader>
    <resheader name="version">2.0</resheader>
    <resheader name="reader">System.Resources.ResXResourceReader,
System.Windows.Forms, ...</resheader>
    <resheader name="writer">System.Resources.ResXResourceWriter,
System.Windows.Forms, ...</resheader>
    <data name="Name1"><value>this is my long string</value><comment>this is a
comment</comment></data>
    <data name="Color1" type="System.Drawing.Color, System.Drawing">Blue</data>
    <data name="Bitmap1" mimetype="application/x-microsoft.net.object.binary.base64">
      <value>[base64 mime encoded serialized .NET Framework object]</value>
    </data>
    <data name="Icon1" type="System.Drawing.Icon, System.Drawing"</pre>
mimetype="application/x-microsoft.net.object.bytearray.base64">
      <value>[base64 mime encoded string representing a byte array form of the .NET
Framework object]</value>
      <comment>This is a comment
    </data>
    There are any number of "resheader" rows that contain simple
    name/value pairs.
```

Each data row contains a name, and value. The row also contains a type or mimetype. Type corresponds to a .NET class that support text/value conversion through the TypeConverter architecture. Classes that don't support this are serialized and stored with the mimetype set.

The mimetype is used for serialized objects, and tells the ResXResourceReader how to depersist the object. This is currently not extensible. For a given mimetype the value must be set accordingly:

Note - application/x-microsoft.net.object.binary.base64 is the format that the ResXResourceWriter will generate, however the reader can read any of the formats listed below.

read any of the formats listed below. mimetype: application/x-microsoft.net.object.binary.base64 value : The object must be serialized with : System.Serialization.Formatters.Binary.BinaryFormatter : and then encoded with base64 encoding. mimetype: application/x-microsoft.net.object.soap.base64 : The object must be serialized with : System.Runtime.Serialization.Formatters.Soap.SoapFormatter : and then encoded with base64 encoding. mimetype: application/x-microsoft.net.object.bytearray.base64 value : The object must be serialized into a byte array : using a System.ComponentModel.TypeConverter : and then encoded with base64 encoding. --> <xsd:schema id="root" xmlns="" xmlns:xsd="http://www.w3.org/2001/XMLSchema"</pre> xmlns:msdata="urn:schemas-microsoft-com:xml-msdata"> <xsd:element name="root" msdata:IsDataSet="true"> <xsd:complexType> <xsd:choice max0ccurs="unbounded"> <xsd:element name="metadata"> <xsd:complexType> <xsd:sequence> <xsd:element name="value" type="xsd:string" min0ccurs="0" /> </xsd:sequence> <xsd:attribute name="name" type="xsd:string" /> <xsd:attribute name="type" type="xsd:string" /> <xsd:attribute name="mimetype" type="xsd:string" /> </xsd:complexType>

```
</xsd:element>
         <xsd:element name="assembly">
           <xsd:complexType>
             <xsd:attribute name="alias" type="xsd:string" />
             <xsd:attribute name="name" type="xsd:string" />
           </xsd:complexType>
         </xsd:element>
         <xsd:element name="data">
           <xsd:complexType>
             <xsd:sequence>
               <xsd:element name="value" type="xsd:string" min0ccurs="0"</pre>
msdata:Ordinal="1" />
               <xsd:element name="comment" type="xsd:string" min0ccurs="0"</pre>
msdata:Ordinal="2" />
             </xsd:sequence>
             <xsd:attribute name="name" type="xsd:string" msdata:Ordinal="1" />
             <xsd:attribute name="type" type="xsd:string" msdata:Ordinal="3" />
             <xsd:attribute name="mimetype" type="xsd:string" msdata:Ordinal="4" />
           </xsd:complexType>
         </xsd:element>
         <xsd:element name="resheader">
           <xsd:complexType>
             <xsd:sequence>
               <xsd:element name="value" type="xsd:string" min0ccurs="0"</pre>
msdata:Ordinal="1" />
             </xsd:sequence>
             <xsd:attribute name="name" type="xsd:string" use="required" />
           </xsd:complexType>
         </xsd:element>
       </xsd:choice>
     </xsd:complexType>
   </xsd:element>
 </xsd:schema>
 <resheader name="resmimetype">
   <value>text/microsoft-resx</value>
 </resheader>
 <resheader name="version">
   <value>2.0</value>
 </resheader>
 <resheader name="reader">
   <value>System.Resources.ResXResourceReader, System.Windows.Forms, Version=2.0.0.0,
Culture=neutral, PublicKeyToken=b77a5c561934e089</value>
 </resheader>
 <resheader name="writer">
```

```
<value>System.Resources.ResXResourceWriter, System.Windows.Forms, Version=2.0.0.0,
Culture=neutral, PublicKeyToken=b77a5c561934e089</value>
    </resheader>
</root>
```

Settings.Designer.vb(in (root directory name)\VBHelloWorld\My Project):

```
' <auto-generated>
      This code was generated by a tool.
      Runtime Version: 4.0.30319.42000
      Changes to this file may cause incorrect behavior and will be lost if
      the code is regenerated.
' </auto-generated>
Option Strict On
Option Explicit On
Namespace My
  <Global.System.Runtime.CompilerServices.CompilerGeneratedAttribute(), _</pre>
 Global.System.CodeDom.Compiler.GeneratedCodeAttribute("Microsoft.VisualStudio.Editors.Settings
 "11.0.0.0"), _
 Global.System.ComponentModel.EditorBrowsableAttribute(Global.System.ComponentModel.EditorBrows
  Partial Friend NotInheritable Class MySettings
    Inherits Global.System.Configuration.ApplicationSettingsBase
    Private Shared defaultInstance As MySettings =
 CType(Global.System.Configuration.ApplicationSettingsBase.Synchronized(New
 MySettings), MySettings)
    #Region "My.Settings Auto-Save Functionality"
      #If _MyType = "WindowsForms" Then
        Private Shared addedHandler As Boolean
        Private Shared addedHandlerLockObject As New Object
```

```
<Global.System.Diagnostics.DebuggerNonUserCodeAttribute(),</pre>
 Global.System.ComponentModel.EditorBrowsableAttribute(Global.System.ComponentModel.EditorBrows
        Private Shared Sub AutoSaveSettings(ByVal sender As Global.System.Object, ByVal
 e As Global.System.EventArgs)
          If My.Application.SaveMySettingsOnExit Then
            My.Settings.Save()
          End If
        End Sub
      #End If
    #End Region
    Public Shared ReadOnly Property [Default]() As MySettings
      Get
        #If _MyType = "WindowsForms" Then
          If Not addedHandler Then
            SyncLock addedHandlerLockObject
              If Not addedHandler Then
                AddHandler My.Application.Shutdown, AddressOf AutoSaveSettings
                addedHandler = True
              End If
            End SyncLock
          End If
        #End If
        Return defaultInstance
      End Get
    End Property
  End Class
End Namespace
Namespace My
  <Global.Microsoft.VisualBasic.HideModuleNameAttribute(), _</pre>
  Global.System.Diagnostics.DebuggerNonUserCodeAttribute(), _
  Global.System.Runtime.CompilerServices.CompilerGeneratedAttribute()> _
  Friend Module MySettingsProperty
    <Global.System.ComponentModel.Design.HelpKeywordAttribute("My.Settings")> _
    Friend ReadOnly Property Settings() As Global.VBHelloWorld.My.MySettings
      Get
        Return Global.VBHelloWorld.My.MySettings.Default
      End Get
    End Property
```

End Module
End Namespace

Settings.settings(in (root directory name)\VBHelloWorld\My Project):

```
<?xml version='1.0' encoding='utf-8'?>
<SettingsFile xmlns="http://schemas.microsoft.com/VisualStudio/2004/01/settings"
CurrentProfile="(Default)" UseMySettingsClassName="true">
    <Profiles>
        <Profile Name="(Default)" />
        </Profiles>
        <Settings />
        <SettingsFile>
```

Plan a build in AWS CodeBuild

Before you use AWS CodeBuild, you must answer these questions:

1. Where is the source code stored? CodeBuild currently supports building from the following source code repository providers. The source code must contain a build specification (buildspec) file. A *buildspec* is a collection of build commands and related settings, in YAML format, that CodeBuild uses to run a build. You can declare a buildspec in a build project definition.

Repository provider	Required	Documentation
CodeCommit	Repository name. (Optional) Commit ID associated with the source code.	See these topics in the AWS CodeCommit User Guide: Create a CodeCommit repository Create a commit in CodeCommit
Amazon S3	Input bucket name. Object name corresponding to the build input ZIP file that contains the source code. (Optional) Version ID associated with the build input ZIP file.	See these topics in the Amazon S3 Getting Started Guide: Create a bucket Add an object to a bucket

Repository provider	Required	Documentation
GitHub	Repository name. (Optional) Commit ID associated with the source code.	See this topic on the GitHub Help website: Create a repo
Bitbucket	Repository name. (Optional) Commit ID associated with the source code.	See this topic on the Bitbucket Cloud documentation website: Create a repository

- 2. Which build commands do you need to run and in what order? By default, CodeBuild downloads the build input from the provider you specify and uploads the build output to the bucket you specify. You use the buildspec to instruct how to turn the downloaded build input into the expected build output. For more information, see the Buildspec reference.
- 3. Which runtimes and tools do you need to run the build? For example, are you building for Java, Ruby, Python, or Node.js? Does the build need Maven or Ant or a compiler for Java, Ruby, or Python? Does the build need Git, the AWS CLI, or other tools?

CodeBuild runs builds in build environments that use Docker images. These Docker images must be stored in a repository type supported by CodeBuild. These include the CodeBuild Docker image repository, Docker Hub, and Amazon Elastic Container Registry (Amazon ECR). For more information about the CodeBuild Docker image repository, see Docker images provided by CodeBuild.

- 4. Do you need AWS resources that aren't provided automatically by CodeBuild? If so, which security policies do those resources need? For example, you might need to modify the CodeBuild service role to allow CodeBuild to work with those resources.
- 5. **Do you want CodeBuild to work with your VPC?** If so, you need the VPC ID, the subnet IDs, and security group IDs for your VPC configuration. For more information, see <u>Use AWS CodeBuild</u> with Amazon Virtual Private Cloud.

After you have answered these questions, you should have the settings and resources you need to run a build successfully. To run your build, you can:

• Use the AWS CodeBuild console, AWS CLI, or AWS SDKs. For more information, see <u>Run builds</u> <u>manually</u>.

• Create or identify a pipeline in AWS CodePipeline, and then add a build or test action that instructs CodeBuild to automatically test your code, run your build, or both. For more information, see Use CodeBuild with CodePipeline.

Build specification reference for CodeBuild

This topic provides important reference information about build specification (buildspec) files. A *buildspec* is a collection of build commands and related settings, in YAML format, that CodeBuild uses to run a build. You can include a buildspec as part of the source code or you can define a buildspec when you create a build project. For information about how a build spec works, see How CodeBuild works.

Topics

- Buildspec file name and storage location
- Buildspec syntax
- Buildspec example
- Buildspec versions
- Batch build buildspec reference

Buildspec file name and storage location

If you include a buildspec as part of the source code, by default, the buildspec file must be named buildspec.yml and placed in the root of your source directory.

You can override the default buildspec file name and location. For example, you can:

- Use a different buildspec file for different builds in the same repository, such as buildspec_debug.yml and buildspec_release.yml.
- Store a buildspec file somewhere other than the root of your source directory, such as config/buildspec.yml or in an S3 bucket. The S3 bucket must be in the same AWS Region as your build project. Specify the buildspec file using its ARN (for example, arn:aws:s3:::<my-codebuild-sample2>/buildspec.yml).

You can specify only one buildspec for a build project, regardless of the buildspec file's name.

To override the default buildspec file name, location, or both, do one of the following:

• Run the AWS CLI create-project or update-project command, setting the buildspec value to the path to the alternate buildspec file relative to the value of the built-in environment variable CODEBUILD_SRC_DIR. You can also do the equivalent with the create project

operation in the AWS SDKs. For more information, see <u>Create a build project</u> or <u>Change build</u> project settings.

- Run the AWS CLI start-build command, setting the buildspecOverride value to the
 path to the alternate buildspec file relative to the value of the built-in environment variable
 CODEBUILD_SRC_DIR. You can also do the equivalent with the start build operation in the
 AWS SDKs. For more information, see Run builds manually.
- In an AWS CloudFormation template, set the BuildSpec property of Source in a resource of type AWS::CodeBuild::Project to the path to the alternate buildspec file relative to the value of the built-in environment variable CODEBUILD_SRC_DIR. For more information, see the BuildSpec property in AWS CodeBuild project source in the AWS CloudFormation User Guide.

Buildspec syntax

Buildspec files must be expressed in YAML format.

If a command contains a character, or a string of characters, that is not supported by YAML, you must enclose the command in quotation marks (""). The following command is enclosed in quotation marks because a colon (:) followed by a space is not allowed in YAML. The quotation mark in the command is escaped (\").

```
"export PACKAGE_NAME=$(cat package.json | grep name | head -1 | awk -F: '{ print $2 }'
| sed 's/[\",]//g')"
```

The buildspec has the following syntax:

```
version: 0.2

run-as: Linux-user-name

env:
    shell: shell-tag
    variables:
        key: "value"
        key: "value"
        parameter-store:
        key: "value"
        key: "value"
        key: "value"
        exported-variables:
        - variable
```

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```
- variable
  secrets-manager:
    key: secret-id:json-key:version-stage:version-id
  git-credential-helper: no | yes
proxy:
  upload-artifacts: no | yes
  logs: no | yes
batch:
 fast-fail: false | true
  # build-list:
  # build-matrix:
  # build-graph:
  # build-fanout:
phases:
  install:
    run-as: Linux-user-name
    on-failure: ABORT | CONTINUE | RETRY | RETRY-count | RETRY-regex |
 RETRY-count-regex
    runtime-versions:
      runtime: version
     runtime: version
    commands:
      - command
      - command
    finally:
      - command
      - command
  pre_build:
    run-as: Linux-user-name
    on-failure: ABORT | CONTINUE | RETRY | RETRY-count | RETRY-regex |
 RETRY-count-regex
    commands:
      - command
      - command
    finally:
      - command
      - command
  build:
    run-as: Linux-user-name
```

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```
on-failure: ABORT | CONTINUE | RETRY | RETRY-count | RETRY-regex |
 RETRY-count-regex
    commands:
      - command
      - command
    finally:
      - command
      - command
  post_build:
    run-as: Linux-user-name
    on-failure: ABORT | CONTINUE | RETRY | RETRY-count | RETRY-regex |
 RETRY-count-regex
    commands:
      - command
      - command
    finally:
      - command
      - command
reports:
  report-group-name-or-arn:
    files:
      - location
      - location
    base-directory: location
    discard-paths: no | yes
    file-format: report-format
artifacts:
  files:
    - location
    - location
  name: artifact-name
  discard-paths: no | yes
  base-directory: location
  exclude-paths: excluded paths
  enable-symlinks: no | yes
  s3-prefix: prefix
  secondary-artifacts:
    artifactIdentifier:
      files:
        - location
        - location
      name: secondary-artifact-name
```

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```
discard-paths: no | yes
      base-directory: location
    artifactIdentifier:
      files:
        - location
        - location
      discard-paths: no | yes
      base-directory: location
cache:
  key: key
  fallback-keys:
    - fallback-key
    - fallback-key
  action: restore | save
  paths:
    - path
    - path
```

The buildspec contains the following:

version

Required mapping. Represents the buildspec version. We recommend that you use 0.2.



Note

Although version 0.1 is still supported, we recommend that you use version 0.2 whenever possible. For more information, see Buildspec versions.

run-as

Optional sequence. Available to Linux users only. Specifies a Linux user that runs commands in this buildspec file. run-as grants the specified user read and run permissions. When you specify runas at the top of the buildspec file, it applies globally to all commands. If you don't want to specify a user for all buildspec file commands, you can specify one for commands in a phase by using runas in one of the phases blocks. If run-as is not specified, then all commands run as the root user.

env

Optional sequence. Represents information for one or more custom environment variables.

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Note

To protect sensitive information, the following are hidden in CodeBuild logs:

 AWS access key IDs. For more information, see Managing Access Keys for IAM Users in the AWS Identity and Access Management User Guide.

- Strings specified using the Parameter Store. For more information, see Systems Manager Parameter Store and Systems Manager Parameter Store Console Walkthrough in the Amazon EC2 Systems Manager User Guide.
- Strings specified using AWS Secrets Manager. For more information, see Key management.

env/shell

Optional sequence. Specifies the supported shell for Linux or Windows operating systems.

For Linux operating systems, supported shell tags are:

- bash
- /bin/sh

For Windows operating systems, supported shell tags are:

- powershell.exe
- cmd.exe

env/variables

Required if env is specified, and you want to define custom environment variables in plain text. Contains a mapping of key/value scalars, where each mapping represents a single custom environment variable in plain text. key is the name of the custom environment variable, and value is that variable's value.



Important

We strongly discourage the storing of sensitive values in environment variables. Environment variables can be displayed in plain text using tools such as the CodeBuild console and the AWS CLI. For sensitive values, we recommend that you use parameter-store or secrets-manager mapping instead, as described later in this section.

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Any environment variables you set replace existing environment variables. For example, if the Docker image already contains an environment variable named MY_VAR with a value of my_value, and you set an environment variable named MY_VAR with a value of other_value, then my_value is replaced by other_value. Similarly, if the Docker image already contains an environment variable named PATH with a value of /usr/ local/sbin:/usr/local/bin, and you set an environment variable named PATH with a value of \$PATH:/usr/share/ant/bin, then /usr/local/sbin:/usr/ local/bin is replaced by the literal value \$PATH:/usr/share/ant/bin. Do not set any environment variable with a name that starts with CODEBUILD_. This prefix is reserved for internal use.

If an environment variable with the same name is defined in multiple places, the value is determined as follows:

- The value in the start build operation call takes highest precedence. You can add or override environment variables when you create a build. For more information, see Run AWS CodeBuild builds manually.
- The value in the build project definition takes next precedence. You can add environment variables at the project level when you create or edit a project. For more information, see Create a build project in AWS CodeBuild and Change build project settings in AWS CodeBuild.
- The value in the buildspec declaration takes lowest precedence.

env/parameter-store

Required if env is specified, and you want to retrieve custom environment variables stored in Amazon EC2 Systems Manager Parameter Store. Contains a mapping of key/value scalars, where each mapping represents a single custom environment variable stored in Amazon EC2 Systems Manager Parameter Store. key is the name you use later in your build commands to refer to this custom environment variable, and *value* is the name of the custom environment variable stored in Amazon EC2 Systems Manager Parameter Store. To store sensitive values, see Systems Manager Parameter Store and Walkthrough: Create and test a String parameter (console) in the Amazon EC2 Systems Manager User Guide.

Important

To allow CodeBuild to retrieve custom environment variables stored in Amazon EC2 Systems Manager Parameter Store, you must add the ssm: GetParameters action to

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your CodeBuild service role. For more information, see <u>Allow CodeBuild to interact with</u> other AWS services.

Any environment variables you retrieve from Amazon EC2 Systems Manager Parameter Store replace existing environment variables. For example, if the Docker image already contains an environment variable named MY_VAR with a value of my_value, and you retrieve an environment variable named MY_VAR with a value of other_value, then my_value is replaced by other_value. Similarly, if the Docker image already contains an environment variable named PATH with a value of /usr/local/sbin:/usr/local/bin, and you retrieve an environment variable named PATH with a value of \$PATH:/usr/share/ant/bin, then /usr/local/sbin:/usr/local/bin is replaced by the literal value \$PATH:/usr/share/ant/bin.

Do not store any environment variable with a name that starts with CODEBUILD_. This prefix is reserved for internal use.

If an environment variable with the same name is defined in multiple places, the value is determined as follows:

- The value in the start build operation call takes highest precedence. You can add or override environment variables when you create a build. For more information, see Run AWS CodeBuild builds manually.
- The value in the build project definition takes next precedence. You can add environment variables at the project level when you create or edit a project. For more information, see <u>Create a build project in AWS CodeBuild</u> and <u>Change build project</u> settings in AWS CodeBuild.
- The value in the buildspec declaration takes lowest precedence.

env/secrets-manager

Required if you want to retrieve custom environment variables stored in AWS Secrets Manager. Specify a Secrets Manager reference-key using the following pattern:

```
<key>: <secret-id>:<json-key>:<version-stage>:<version-id>
<key>
```

(Required) The local environment variable name. Use this name to access the variable during the build.

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<secret-id>

(Required) The name or Amazon Resource Name (ARN) that serves as a unique identifier for the secret. To access a secret in your AWS account, simply specify the secret name. To access a secret in a different AWS account, specify the secret ARN.

<json-key>

(Optional) Specifies the key name of the Secrets Manager key-value pair whose value you want to retrieve. If you do not specify a json-key, CodeBuild retrieves the entire secret text.

<version-stage>

(Optional) Specifies the secret version that you want to retrieve by the staging label attached to the version. Staging labels are used to keep track of different versions during the rotation process. If you use version-stage, don't specify version-id. If you don't specify a version stage or version ID, the default is to retrieve the version with the version stage value of AWSCURRENT.

<version-id>

(Optional) Specifies the unique identifier of the version of the secret that you want to use. If you specify version-id, don't specify version-stage. If you don't specify a version stage or version ID, the default is to retrieve the version with the version stage value of AWSCURRENT.

In the following example, TestSecret is the name of the key-value pair stored in Secrets Manager. The key for TestSecret is MY_SECRET_VAR. You access the variable during the build using the LOCAL_SECRET_VAR name.

```
env:
    secrets-manager:
    LOCAL_SECRET_VAR: "TestSecret:MY_SECRET_VAR"
```

For more information, see <u>What is AWS Secrets Manager</u> in the *AWS Secrets Manager User Guide*.

env/exported-variables

Optional mapping. Used to list environment variables you want to export. Specify the name of each variable you want to export on a separate line under exported-variables. The

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variable you want to export must be available in your container during the build. The variable you export can be an environment variable.

Exported environment variables are used in conjunction with AWS CodePipeline to export environment variables from the current build stage to subsequent stages in the pipeline. For more information, see Working with variables in the AWS CodePipeline User Guide.

During a build, the value of a variable is available starting with the install phase. It can be updated between the start of the install phase and the end of the post build phase. After the post build phase ends, the value of exported variables cannot change.



Note

The following cannot be exported:

- Amazon EC2 Systems Manager Parameter Store secrets specified in the build project.
- Secrets Manager secrets specified in the build project
- Environment variables that start with AWS_.

env/git-credential-helper

Optional mapping. Used to indicate if CodeBuild uses its Git credential helper to provide Git credentials. yes if it is used. Otherwise, no or not specified. For more information, see gitcredentials on the Git website.



Note

git-credential-helper is not supported for builds that are triggered by a webhook for a public Git repository.

proxy

Optional sequence. Used to represent settings if you run your build in an explicit proxy server. For more information, see Run CodeBuild in an explicit proxy server.

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proxy/upload-artifacts

Optional mapping. Set to yes if you want your build in an explicit proxy server to upload artifacts. The default is no.

proxy/logs

Optional mapping. Set to yes for your build in a explicit proxy server to create CloudWatch logs. The default is no.

phases

Required sequence. Represents the commands CodeBuild runs during each phase of the build.



Note

In buildspec version 0.1, CodeBuild runs each command in a separate instance of the default shell in the build environment. This means that each command runs in isolation from all other commands. Therefore, by default, you cannot run a single command that relies on the state of any previous commands (for example, changing directories or setting environment variables). To get around this limitation, we recommend that you use version 0.2, which solves this issue. If you must use buildspec version 0.1, we recommend the approaches in Shells and commands in build environments.

phases/*/run-as

Optional sequence. Use in a build phase to specify a Linux user that runs its commands. If run-as is also specified globally for all commands at the top of the buildspec file, then the phase-level user takes precedence. For example, if globally run-as specifies User-1, and for the install phase only a run-as statement specifies User-2, then all commands in then buildspec file are run as User-1 except commands in the install phase, which are run as User-2.

phases/*/on-failure

Optional sequence. Specifies the action to take if a failure occurs during the phase. This can be one of the following values:

- ABORT Abort the build.
- CONTINUE Continue to the next phase.

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 RETRY - Retry the build up to 3 times with an error message that matches the regular expression .*.

- RETRY-count Retry the build for a specified number of times, as represented by count with an error message that matches the regular expression .*. Note that count must be between 0 and 100. For example, valid values include RETRY-4 and RETRY-8.
- RETRY-regex Retry the build up to 3 times, and use regex to include a regular expression to match a specifed error message. For example, valid values include Retry-.*Error: Unable to connect to database.* and RETRY-invalid+.
- RETRY-count-regex Retry the build for a specified number of times, as represented by count. Note that count must be between 0 and 100. You can also use regex to include a regular expression to match the error message. For example, valid values include Retry-3-.*connection timed out.* and RETRY-8-invalid+.

If this property is not specified, the failure process follows the transition phases as shown in Build phase transitions.

phases/*/finally

Optional block. Commands specified in a finally block are run after commands in the commands block. The commands in a finally block are run even if a command in the commands block fails. For example, if the commands block contains three commands and the first fails, CodeBuild skips the remaining two commands and runs any commands in the finally block. The phase is successful when all commands in the commands and the finally blocks run successfully. If any command in a phase fails, the phase fails.

The allowed build phase names are:

phases/install

Optional sequence. Represents the commands, if any, that CodeBuild runs during installation. We recommend that you use the install phase only for installing packages in the build environment. For example, you might use this phase to install a code testing framework such as Mocha or RSpec.

phases/install/runtime-versions

Optional sequence. A runtime version is supported with the Ubuntu standard image 5.0 or later and the Amazon Linux 2 standard image 4.0 or later. If specified, at least one runtime must be included in this section. Specify a runtime using a specific version, a major version

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followed by .x to specify that CodeBuild uses that major version with its latest minor version, or latest to use the most recent major and minor version (for example, ruby: 3.2, nodejs: 18.x, or java: latest). You can specify the runtime using a number or an environment variable. For example, if you use the Amazon Linux 2 standard image 4.0, then the following specifies that version 17 of Java, the latest minor version of python version 3, and a version contained in an environment variable of Ruby is installed. For more information, see Docker images provided by CodeBuild.

```
phases:
  install:
    runtime-versions:
      java: corretto8
      python: 3.x
      ruby: "$MY_RUBY_VAR"
```

You can specify one or more runtimes in the runtime-versions section of your buildspec file. If your runtime is dependent upon another runtime, you can also specify its dependent runtime in the buildspec file. If you do not specify any runtimes in the buildspec file, CodeBuild chooses the default runtimes that are available in the image you use. If you specify one or more runtimes, CodeBuild uses only those runtimes. If a dependent runtime is not specified, CodeBuild attempts to choose the dependent runtime for you.

If two specified runtimes conflict, the build fails. For example, android: 29 and java: openjdk11 conflict, so if both are specified, the build fails.

For more information about the available runtimes, see Available runtimes.



Note

If you specify a runtime-versions section and use an image other than Ubuntu Standard Image 2.0 or later, or the Amazon Linux 2 (AL2) standard image 1.0 or later, the build issues the warning, "Skipping install of runtimes. Runtime version selection is not supported by this build image."

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phases/install/commands

Optional sequence. Contains a sequence of scalars, where each scalar represents a single command that CodeBuild runs during installation. CodeBuild runs each command, one at a time, in the order listed, from beginning to end.

phases/pre_build

Optional sequence. Represents the commands, if any, that CodeBuild runs before the build. For example, you might use this phase to sign in to Amazon ECR, or you might install npm dependencies.

phases/pre_build/commands

Required sequence if pre_build is specified. Contains a sequence of scalars, where each scalar represents a single command that CodeBuild runs before the build. CodeBuild runs each command, one at a time, in the order listed, from beginning to end.

phases/build

Optional sequence. Represents the commands, if any, that CodeBuild runs during the build. For example, you might use this phase to run Mocha, RSpec, or sbt.

phases/build/commands

Required if build is specified. Contains a sequence of scalars, where each scalar represents a single command that CodeBuild runs during the build. CodeBuild runs each command, one at a time, in the order listed, from beginning to end.

phases/post_build

Optional sequence. Represents the commands, if any, that CodeBuild runs after the build. For example, you might use Maven to package the build artifacts into a JAR or WAR file, or you might push a Docker image into Amazon ECR. Then you might send a build notification through Amazon SNS.

phases/post_build/commands

Required if post_build is specified. Contains a sequence of scalars, where each scalar represents a single command that CodeBuild runs after the build. CodeBuild runs each command, one at a time, in the order listed, from beginning to end.

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reports

report-group-name-or-arn

Optional sequence. Specifies the report group that the reports are sent to. A project can have a maximum of five report groups. Specify the ARN of an existing report group, or the name of a new report group. If you specify a name, CodeBuild creates a report group using your project name and the name you specify in the format project-name>-<report-group-name>. The report group name can also be set using an environment variable in the buildspec such as \$REPORT_GROUP_NAME. For more information, see Report group naming.

reports/<report-group>/files

Required sequence. Represents the locations that contain the raw data of test results generated by the report. Contains a sequence of scalars, with each scalar representing a separate location where CodeBuild can find test files, relative to the original build location or, if set, the base-directory. Locations can include the following:

- A single file (for example, my-test-report-file.json).
- A single file in a subdirectory (for example, my-subdirectory/my-test-report-file.json or my-parent-subdirectory/my-subdirectory/my-test-report-file.json).
- '**/*' represents all files recursively.
- my-subdirectory/* represents all files in a subdirectory named my-subdirectory.
- my-subdirectory/**/* represents all files recursively starting from a subdirectory named my-subdirectory.

reports/<report-group>/file-format

Optional mapping. Represents the report file format. If not specified, JUNITXML is used. This value is not case sensitive. Possible values are:

Test reports

CUCUMBERJSON

Cucumber JSON

JUNITXML

JUnit XML

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NUNITXML

NUnit XML

NUNIT3XML

NUnit 3 XML

TESTNGXML

TestNG XML

VISUALSTUDIOTRX

Visual Studio TRX

Code coverage reports

CLOVERXML

Clover XML

COBERTURAXML

Cobertura XML

JACOCOXML

JaCoCo XML

SIMPLECOV

SimpleCov JSON



Note

CodeBuild accepts JSON code coverage reports generated by simplecov, not simplecov-json.

reports/<report-group>/base-directory

Optional mapping. Represents one or more top-level directories, relative to the original build location, that CodeBuild uses to determine where to find the raw test files.

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reports/<report-group>/discard-paths

Optional. Specifies if the report file directories are flattened in the output. If this is not specified, or contains no, report files are output with their directory structure intact. If this contains yes, all of the test files are placed in the same output directory. For example, if a path to a test result is com/myapp/mytests/TestResult.xml, specifying yes will place this file in /TestResult.xml.

artifacts

Optional sequence. Represents information about where CodeBuild can find the build output and how CodeBuild prepares it for uploading to the S3 output bucket. This sequence is not required if, for example, you are building and pushing a Docker image to Amazon ECR, or you are running unit tests on your source code, but not building it.



Note

Amazon S3 metadata has a CodeBuild header named x-amz-meta-codebuild-buildarn which contains the buildArn of the CodeBuild build that publishes artifacts to Amazon S3. The buildArn is added to allow source tracking for notifications and to reference which build the artifact is generated from.

artifacts/files

Required sequence. Represents the locations that contain the build output artifacts in the build environment. Contains a sequence of scalars, with each scalar representing a separate location where CodeBuild can find build output artifacts, relative to the original build location or, if set, the base directory. Locations can include the following:

- A single file (for example, my-file.jar).
- A single file in a subdirectory (for example, my-subdirectory/my-file.jar or my-parent-subdirectory/my-subdirectory/my-file.jar).
- '**/*' represents all files recursively.
- my-subdirectory/* represents all files in a subdirectory named my-subdirectory.
- my-subdirectory/**/* represents all files recursively starting from a subdirectory named my-subdirectory.

When you specify build output artifact locations, CodeBuild can locate the original build location in the build environment. You do not have to prepend your build artifact output locations with the path to the original build location or specify ./ or similar. If you want to know the path to this location, you can run a command such as echo \$CODEBUILD_SRC_DIR during a build. The location for each build environment might be slightly different.

artifacts/name

Optional name. Specifies a name for your build artifact. This name is used when one of the following is true.

- You use the CodeBuild API to create your builds and the overrideArtifactName flag is set on the ProjectArtifacts object when a project is updated, a project is created, or a build is started.
- You use the CodeBuild console to create your builds, a name is specified in the buildspec file, and you select **Enable semantic versioning** when you create or update a project. For more information, see Create a build project (console).

You can specify a name in the buildspec file that is calculated at build time. The name specified in a buildspec file uses the Shell command language. For example, you can append a date and time to your artifact name so that it is always unique. Unique artifact names prevent artifacts from being overwritten. For more information, see Shell command language.

• This is an example of an artifact name appended with the date the artifact is created.

```
version: 0.2
phases:
  build:
    commands:
        - rspec HelloWorld_spec.rb
artifacts:
  files:
        - '**/*'
  name: myname-$(date +%Y-%m-%d)
```

• This is an example of an artifact name that uses a CodeBuild environment variable. For more information, see Environment variables in build environments.

```
version: 0.2
phases:
  build:
    commands:
```

```
- rspec HelloWorld_spec.rb
artifacts:
   files:
        - '**/*'
name: myname-$AWS_REGION
```

• This is an example of an artifact name that uses a CodeBuild environment variable with the artifact's creation date appended to it.

```
version: 0.2
phases:
  build:
    commands:
        - rspec HelloWorld_spec.rb
artifacts:
  files:
        - '**/*'
  name: $AWS_REGION-$(date +%Y-%m-%d)
```

You can add path information to the name so that the named artifacts are placed in directories based on the path in the name. In this example, build artifacts are placed in the output under builds/<build number>/my-artifacts.

```
version: 0.2
phases:
  build:
    commands:
        - rspec HelloWorld_spec.rb
artifacts:
  files:
        - '**/*'
  name: builds/$CODEBUILD_BUILD_NUMBER/my-artifacts
```

artifacts/discard-paths

Optional. Specifies if the build artifact directories are flattened in the output. If this is not specified, or contains no, build artifacts are output with their directory structure intact. If this contains yes, all of the build artifacts are placed in the same output directory. For example, if a path to a file in the build output artifact is com/mycompany/app/HelloWorld.java, specifying yes will place this file in /HelloWorld.java.

artifacts/base-directory

Optional mapping. Represents one or more top-level directories, relative to the original build location, that CodeBuild uses to determine which files and subdirectories to include in the build output artifact. Valid values include:

- A single top-level directory (for example, my-directory).
- 'my-directory*' represents all top-level directories with names starting with my-directory.

Matching top-level directories are not included in the build output artifact, only their files and subdirectories.

You can use files and discard-paths to further restrict which files and subdirectories are included. For example, for the following directory structure:

```
.
### my-build-1
# ### my-file-1.txt
### my-build-2
### my-file-2.txt
### my-subdirectory
### my-file-3.txt
```

And for the following artifacts sequence:

```
artifacts:
    files:
        - '*/my-file-3.txt'
    base-directory: my-build-2
```

The following subdirectory and file would be included in the build output artifact:

```
.
### my-subdirectory
### my-file-3.txt
```

While for the following artifacts sequence:

```
artifacts:
```

```
files:
    - '**/*'
base-directory: 'my-build*'
discard-paths: yes
```

The following files would be included in the build output artifact:

```
### my-file-1.txt
### my-file-2.txt
### my-file-3.txt
```

artifacts/exclude-paths

Optional mapping. Represents one or more paths, relative to base-directory, that CodeBuild will exclude from the build artifacts. The asterisk (*) character matches zero or more characters of a name component without crossing folder boundaries. A double asterisk (**) matches zero or more characters of a name component across all directories.

Examples of exclude-paths include the following:

- To exclude a file from all directories: "**/file-name/**/*"
- To exclude all dot folders: "**/.*/*"
- To exclude all dot files: "**/.*"

artifacts/enable-symlinks

Optional. If the output type is ZIP, specifies if internal symbolic links are preserved in the ZIP file. If this contains yes, all internal symbolic links in the source will be preserved in the artifacts ZIP file.

artifacts/s3-prefix

Optional. Specifies a prefix used when the artifacts are output to an Amazon S3 bucket and the namespace type is BUILD_ID. When used, the output path in the bucket is <s3-prefix>/ <build-id>/<name>.zip.

artifacts/secondary-artifacts

Optional sequence. Represents one or more artifact definitions as a mapping between an artifact identifier and an artifact definition. Each artifact identifiers in this block must match

an artifact defined in the secondaryArtifacts attribute of your project. Each separate definition has the same syntax as the artifacts block above.



Note

The artifacts/files sequence is always required, even when there are only secondary artifacts defined.

For example, if your project has the following structure:

```
{
  "name": "sample-project",
  "secondaryArtifacts": [
      "type": "S3",
      "location": "<output-bucket1>",
      "artifactIdentifier": "artifact1",
      "name": "secondary-artifact-name-1"
    },
      "type": "S3",
      "location": "<output-bucket2>",
      "artifactIdentifier": "artifact2",
      "name": "secondary-artifact-name-2"
    }
  ]
}
```

Then your buildspec looks like the following:

```
version: 0.2
phases:
build:
  commands:
    - echo Building...
artifacts:
  files:
    - '**/*'
  secondary-artifacts:
    artifact1:
```

```
files:
    - directory/file1
name: secondary-artifact-name-1
artifact2:
    files:
    - directory/file2
name: secondary-artifact-name-2
```

cache

Optional sequence. Represents information about where CodeBuild can prepare the files for uploading cache to an S3 cache bucket. This sequence is not required if the cache type of the project is No Cache.

cache/key

Optional sequence. Represents the primary key used when search or restore a cache. CodeBuild does an exact match for the primary key.

Here is an example for the key:

```
key: npm-key-$(codebuild-hash-files package-lock.json) }
```

cache/fallback-keys

Optional sequence. Represents a list of fallback keys used sequentially when a cache cannot be found using the primary key. Up to five fallback keys are supported, and each is matched using a prefix search. This sequence will be ignored if **key** is not provided.

Here is an example for the fallback-keys:

```
fallback-keys:
    - npm-key-$(codebuild-hash-files package-lock.json) }
    - npm-key-
    - npm-
```

cache/action

Optional sequence. Specifies the action to perform on the cache. Valid values include:

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- restore which only restores the cache without saving updates.
- save which only saves the cache without restoring a previous version.

If no value is provided, CodeBuild defaults to performing both restore and save.

cache/paths

Required sequence. Represents the locations of the cache. Contains a sequence of scalars, with each scalar representing a separate location where CodeBuild can find build output artifacts, relative to the original build location or, if set, the base directory. Locations can include the following:

- A single file (for example, my-file.jar).
- A single file in a subdirectory (for example, my-subdirectory/my-file.jar or my-parent-subdirectory/my-subdirectory/my-file.jar).
- '**/*' represents all files recursively.
- my-subdirectory/* represents all files in a subdirectory named my-subdirectory.
- my-subdirectory/**/* represents all files recursively starting from a subdirectory named my-subdirectory.

Important

Because a buildspec declaration must be valid YAML, the spacing in a buildspec declaration is important. If the number of spaces in your buildspec declaration is invalid, builds might fail immediately. You can use a YAML validator to test whether your buildspec declarations are valid YAML.

If you use the AWS CLI, or the AWS SDKs to declare a buildspec when you create or update a build project, the buildspec must be a single string expressed in YAML format, along with required whitespace and newline escape characters. There is an example in the next section.

If you use the CodeBuild or AWS CodePipeline consoles instead of a buildspec.yml file, you can insert commands for the build phase only. Instead of using the preceding syntax, you list, in a single line, all of the commands that you want to run during the build phase. For multiple commands, separate each command by && (for example, mvn test && mvn package).

You can use the CodeBuild or CodePipeline consoles instead of a buildspec.yml file to specify the locations of the build output artifacts in the build environment. Instead of using the preceding syntax, you list, in a single line, all of the locations. For multiple locations,

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separate each location with a comma (for example, buildspec.yml, target/my-app.jar).

Buildspec example

Here is an example of a buildspec.yml file.

```
version: 0.2
env:
  variables:
    JAVA_HOME: "/usr/lib/jvm/java-8-openjdk-amd64"
  parameter-store:
    LOGIN_PASSWORD: /CodeBuild/dockerLoginPassword
phases:
  install:
    commands:
      - echo Entered the install phase...
      apt-get update -y
      - apt-get install -y maven
   finally:
      - echo This always runs even if the update or install command fails
  pre_build:
    commands:
      - echo Entered the pre_build phase...
      - docker login -u User -p $LOGIN_PASSWORD
    finally:
      - echo This always runs even if the login command fails
  build:
    commands:
      - echo Entered the build phase...
      - echo Build started on `date`
      - mvn install
   finally:
      - echo This always runs even if the install command fails
  post_build:
    commands:
      - echo Entered the post_build phase...
      - echo Build completed on `date`
```

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```
reports:
  arn:aws:codebuild:your-region:your-aws-account-id:report-group/report-group-name-1:
    files:
      - "**/*"
    base-directory: 'target/tests/reports'
    discard-paths: no
  reportGroupCucumberJson:
    files:
      - 'cucumber/target/cucumber-tests.xml'
    discard-paths: yes
    file-format: CUCUMBERJSON # default is JUNITXML
artifacts:
  files:
    - target/messageUtil-1.0.jar
  discard-paths: yes
  secondary-artifacts:
    artifact1:
      files:
        - target/artifact-1.0.jar
      discard-paths: yes
    artifact2:
      files:
        - target/artifact-2.0.jar
      discard-paths: yes
cache:
  paths:
    - '/root/.m2/**/*'
```

Here is an example of the preceding buildspec, expressed as a single string, for use with the AWS CLI, or the AWS SDKs.

```
"version: 0.2\n\nenv:\n variables:\n
                                       JAVA_HOME: \"/usr/lib/jvm/java-8-openjdk-
amd64\\"\n parameter-store:\n
                                LOGIN_PASSWORD: /CodeBuild/dockerLoginPassword\n
                                            - echo Entered the install phase...\n
phases:\n\n install:\n
                           commands:\n
apt-get update -y\n
                           - apt-get install -y maven\n
                                                                          - echo This
                                                          finally:\n
always runs even if the update or install command fails \n pre_build:\n
                                                                           commands:
       - echo Entered the pre_build phase...\n
                                                   - docker login -u User -p
$LOGIN_PASSWORD\n
                     finally:\n
                                    - echo This always runs even if the login command
fails \n build:\n
                      commands:\n
                                      - echo Entered the build phase...\n
Build started on `date`\n
                               - mvn install\n
                                                 finally:\n
                                                                 - echo This always
runs even if the install command fails\n post_build:\n
                                                          commands:\n
Entered the post_build phase...\n
                                      - echo Build completed on `date`\n\n reports:
                                           - \"**/*\"\n
\n reportGroupJunitXml:\n files:\n
                                                          base-directory: 'target/
```

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```
discard-paths: false\n reportGroupCucumberJson:\n
tests/reports'\n
                                                                          files:\n
                                             file-format: CUCUMBERJSON\n\nartifacts:\n
 - 'cucumber/target/cucumber-tests.xml'\n
             - target/messageUtil-1.0.jar\n discard-paths: yes\n secondary-artifacts:
\n
      artifact1:\n
                        files:\n
                                       - target/messageUtil-1.0.jar\n
paths: yes\n
                artifact2:\n
                                  files:\n
                                                 - target/messageUtil-1.0.jar\n
                                            - '/root/.m2/**/*'"
 discard-paths: yes\n cache:\n paths:\n
```

Here is an example of the commands in the build phase, for use with the CodeBuild or CodePipeline consoles.

```
echo Build started on `date` && mvn install
```

In these examples:

- A custom environment variable, in plain text, with the key of JAVA_HOME and the value of /usr/lib/jvm/java-8-openjdk-amd64, is set.
- A custom environment variable named dockerLoginPassword you stored in Amazon EC2
 Systems Manager Parameter Store is referenced later in build commands by using the key LOGIN_PASSWORD.
- You cannot change these build phase names. The commands that are run in this example are apt-get update -y and apt-get install -y maven (to install Apache Maven), mvn install (to compile, test, and package the source code into a build output artifact and to install the build output artifact in its internal repository), docker login (to sign in to Docker with the password that corresponds to the value of the custom environment variable dockerLoginPassword you set in Amazon EC2 Systems Manager Parameter Store), and several echo commands. The echo commands are included here to show how CodeBuild runs commands and the order in which it runs them.
- files represents the files to upload to the build output location. In this example, CodeBuild uploads the single file messageUtil-1.0.jar. The messageUtil-1.0.jar file can be found in the relative directory named target in the build environment. Because discard-paths: yes is specified, messageUtil-1.0.jar is uploaded directly (and not to an intermediate target directory). The file name messageUtil-1.0.jar and the relative directory name of target is based on the way Apache Maven creates and stores build output artifacts for this example only. In your own scenarios, these file names and directories will be different.
- reports represents two report groups that generate reports during the build:
 - arn:aws:codebuild:your-region:your-aws-account-id:report-group/report-group-name-1 specifies the ARN of a report group. Test results generated by the test

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framework are in the target/tests/reports directory. The file format is JunitXml and the path is not removed from the files that contain test results.

reportGroupCucumberJson specifies a new report group. If the name of the project is
my-project, a report group with the name my-project-reportGroupCucumberJson is
created when a build is run. Test results generated by the test framework are in cucumber/
target/cucumber-tests.xml. The test file format is CucumberJson and the path is
removed from the files that contain test results.

Buildspec versions

The following table lists the buildspec versions and the changes between versions.

Version	Changes
0.2	 environment_variables has been renamed to env. plaintext has been renamed to variables . The type property for artifacts has been deprecated. In version 0.1, AWS CodeBuild runs each build command in a separate instance of the default shell in the build environme nt. In version 0.2, CodeBuild runs all build commands in the same instance of the default shell in the build environment.
0.1	This is the initial definition of the build specification format.

Batch build buildspec reference

This topic contains the buildspec reference for batch build properties.

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batch

Optional mapping. The batch build settings for the project.

batch/fast-fail

Optional. Specifies the behavior of the batch build when one or more build tasks fail.

false

The default value. All running builds will complete.

true

All running builds will be stopped when one of the build tasks fails.

By default, all batch build tasks run with the build settings such as env and phases, specified in the buildspec file. You can override the default build settings by specifying different env values or a different buildspec file in the batch/

/batch-type>/buildspec parameter.

The contents of the batch property varies based on the type of batch build being specified. The possible batch build types are:

- batch/build-graph
- batch/build-list
- batch/build-matrix
- batch/build-fanout

batch/build-graph

Defines a *build graph*. A build graph defines a set of tasks that have dependencies on other tasks in the batch. For more information, see Build graph.

This element contains an array of build tasks. Each build task contains the following properties.

identifier

Required. The identifier of the task.

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buildspec

Optional. The path and file name of the buildspec file to use for this task. If this parameter is not specified, the current buildspec file is used.

debug-session

Optional. A Boolean value that indicates whether session debugging is enabled for this batch build. For more information about session debugging, see <u>Debug builds with Session Manager</u>. false

Session debugging is disabled.

true

Session debugging is enabled.

depend-on

Optional. An array of task identifiers that this task depends on. This task will not run until these tasks are completed.

env

Optional. The build environment overrides for the task. This can contain the following properties:

compute-type

The identifier of the compute type to use for the task. See **computeType** in <u>the section</u> called "Build environment compute modes and types" for possible values.

fleet

The identifier of the fleet to use for the task. See <u>the section called "Run builds on reserved capacity fleets"</u> for more information.

image

The identifier of the image to use for the task. See **Image identifier** in <u>the section called</u> "Docker images provided by CodeBuild" for possible values.

privileged-mode

A Boolean value that indicates whether to run the Docker daemon inside a Docker container. Set to true only if the build project is used to build Docker images. Otherwise, a build that attempts to interact with the Docker daemon fails. The default setting is false.

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type

The identifier of the environment type to use for the task. See **Environment type** in the section called "Build environment compute modes and types" for possible values.

variables

The environment variables that will be present in the build environment. See env/variables for more information.



Note

Note that **compute-type** and **fleet** cannot be provided in the same identifer of a single build.

ignore-failure

Optional. A Boolean value that indicates if a failure of this build task can be ignored.

false

The default value. If this build task fails, the batch build will fail.

true

If this build task fails, the batch build can still succeed.

The following is an example of a build graph buildspec entry:

```
batch:
 fast-fail: false
 build-graph:
    - identifier: build1
      env:
        variables:
          BUILD_ID: build1
      ignore-failure: false
    - identifier: build2
      buildspec: build2.yml
        variables:
```

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```
BUILD_ID: build2

depend-on:
    - build1

- identifier: build3
    env:
    variables:
        BUILD_ID: build3

depend-on:
    - build2

- identifier: build4
    env:
    compute-type: ARM_LAMBDA_1GB

- identifier: build5
    env:
    fleet: fleet_name
```

batch/build-list

Defines a *build list*. A build list is used to define a number of tasks that run in parallel. For more information, see Build list.

This element contains an array of build tasks. Each build task contains the following properties.

identifier

Required. The identifier of the task.

buildspec

Optional. The path and file name of the buildspec file to use for this task. If this parameter is not specified, the current buildspec file is used.

debug-session

Optional. A Boolean value that indicates whether session debugging is enabled for this batch build. For more information about session debugging, see Debug builds with Session Manager.

false

Session debugging is disabled.

true

Session debugging is enabled.

batch/build-list API Version 2016-10-06 222

env

Optional. The build environment overrides for the task. This can contain the following properties:

compute-type

The identifier of the compute type to use for the task. See **computeType** in <u>the section</u> called "Build environment compute modes and types" for possible values.

fleet

The identifier of the fleet to use for the task. See <u>the section called "Run builds on reserved</u> capacity fleets" for more information.

image

The identifier of the image to use for the task. See **Image identifier** in <u>the section called</u> "Docker images provided by CodeBuild" for possible values.

privileged-mode

A Boolean value that indicates whether to run the Docker daemon inside a Docker container. Set to true only if the build project is used to build Docker images. Otherwise, a build that attempts to interact with the Docker daemon fails. The default setting is false.

type

The identifier of the environment type to use for the task. See **Environment type** in <u>the</u> section called "Build environment compute modes and types" for possible values.

variables

The environment variables that will be present in the build environment. See env/variables for more information.



Note

Note that **compute-type** and **fleet** cannot be provided in the same identifier of a single build.

ignore-failure

Optional. A Boolean value that indicates if a failure of this build task can be ignored.

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false

The default value. If this build task fails, the batch build will fail.

true

If this build task fails, the batch build can still succeed.

The following is an example of a build list buildspec entry:

```
batch:
  fast-fail: false
  build-list:
    - identifier: build1
      env:
        variables:
          BUILD_ID: build1
      ignore-failure: false
    - identifier: build2
      buildspec: build2.yml
      env:
        variables:
          BUILD_ID: build2
      ignore-failure: true
    - identifier: build3
      env:
        compute-type: ARM_LAMBDA_1GB
    - identifier: build4
      env:
        fleet: fleet_name
    - identifier: build5
      env:
        compute-type: GENERAL_LINUX_XLAGRE
```

batch/build-matrix

Defines a *build matrix*. A build matrix defines tasks with different configurations that run in parallel. CodeBuild creates a separate build for each possible configuration combination. For more information, see <u>Build matrix</u>.

static

The static properties apply to all build tasks.

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ignore-failure

Optional. A Boolean value that indicates if a failure of this build task can be ignored.

false

The default value. If this build task fails, the batch build will fail.

true

If this build task fails, the batch build can still succeed.

env

Optional. The build environment overrides for all tasks.

privileged-mode

A Boolean value that indicates whether to run the Docker daemon inside a Docker container. Set to true only if the build project is used to build Docker images. Otherwise, a build that attempts to interact with the Docker daemon fails. The default setting is false.

type

The identifier of the environment type to use for the task. See **Environment type** in <u>the</u> section called "Build environment compute modes and types" for possible values.

dynamic

The dynamic properties define the build matrix.

buildspec

Optional. An array that contains the path and file names of the buildspec files to use for these tasks. If this parameter is not specified, the current buildspec file is used.

env

Optional. The build environment overrides for these tasks.

compute-type

An array that contains the identifiers of the compute types to use for these tasks. See **computeType** in <u>the section called "Build environment compute modes and types"</u> for possible values.

batch/build-matrix API Version 2016-10-06 225

image

An array that contains the identifiers of the images to use for these tasks. See **Image identifier** in <u>the section called "Docker images provided by CodeBuild"</u> for possible values.

variables

An array that contains the environment variables that will be present in the build environments for these tasks. See env/variables for more information.

The following is an example of a build matrix buildspec entry:

```
batch:
build-matrix:
static:
   ignore-failure: false
   dynamic:
   buildspec:
        - matrix1.yml
        - matrix2.yml
   env:
        variables:
        MY_VAR:
        - VALUE1
        - VALUE3
```

For more information, see Build matrix.

batch/build-fanout

Defines a *build fanout*. A build fanout is used to define a task that is split into multiple builds that runs in parallel. For more information, see Execute parallel tests in batch builds.

This element contains an build task that can be split into multiple builds. The build-fanout section contains the following properties.

parallelism

Required. The number of builds that will run tests in parallel.

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ignore-failure

Optional. A boolean value that indicates if failure in any of the fanout build tasks can be ignored. This value of **ignore-failure** will be applied to all the fanout builds.

false

The default value. If any fanout build task fails, the batch build will fail.

true

If any fanout build task fails, the batch build can still succeed.

The following is an example of a build fanout buildspec entry:

```
version: 0.2
batch:
   fast-fail: false
   build-fanout:
     parallelism: 5
     ignore-failure: false
phases:
  install:
    commands:
      - npm install
   build:
    commands:
      - mkdir -p test-results
      - cd test-results
      - |
        codebuild-tests-run \
         --test-command 'npx jest --runInBand --coverage' \
         --files-search "codebuild-glob-search '**/test/**/*.test.js'" \
         --sharding-strategy 'equal-distribution'
```

For more information, see <u>Build fanout</u> and <u>Use the codebuild-tests-run CLI command</u>.

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Build environment reference for AWS CodeBuild

When you call AWS CodeBuild to run a build, you must provide information about the build environment. A *build environment* represents a combination of operating system, programming language runtime, and tools that CodeBuild uses to run a build. For information about how a build environment works, see How CodeBuild works.

A build environment contains a Docker image. For information, see <u>the Docker glossary</u> on the Docker Docs website.

When you provide information to CodeBuild about the build environment, you specify the identifier of a Docker image in a supported repository type. These include the CodeBuild Docker image repository, publicly available images in Docker Hub, and Amazon Elastic Container Registry (Amazon ECR) repositories that your AWS account has permissions to access.

- We recommend that you use Docker images stored in the CodeBuild Docker image repository, because they are optimized for use with the service. For more information, see <u>Docker images</u> <u>provided by CodeBuild</u>.
- To get the identifier of a publicly available Docker image stored in Docker Hub, see <u>Searching for Repositories</u> on the Docker Docs website.
- To learn how to work with Docker images stored in Amazon ECR repositories in your AWS account, see <u>Amazon ECR sample</u>.

In addition to a Docker image identifier, you also specify a set of computing resources that the build environment uses. For more information, see Build environment compute modes and types.

Topics

- Docker images provided by CodeBuild
- Build environment compute modes and types
- Shells and commands in build environments
- Environment variables in build environments
- · Background tasks in build environments

Docker images provided by CodeBuild

A *supported image* is the latest major version of an image available in CodeBuild and is updated with minor and patch version updates. CodeBuild optimizes the provisioning duration of builds with supported images by caching them in the machine's <u>Amazon Machine Images (AMI)</u>. If you want to benefit from caching and minimize the provisioning duration of your build, select **Always use the latest image for this runtime version** in the **Image version** section of the CodeBuild console instead of a more granular version, such as aws/codebuild/amazonlinux-x86_64-standard:4.0-1.0.0.

Topics

- Obtain the list of current Docker images
- EC2 compute images
- Lambda compute images
- Deprecated CodeBuild images
- Available runtimes
- Runtime versions

Obtain the list of current Docker images

CodeBuild frequently updates the list of Docker images to add the latest images and deprecate old images. To get the most current list, do one of the following:

- In the CodeBuild console, in the Create build project wizard or Edit Build Project page, for
 Environment image, choose Managed image. Choose from the Operating system, Runtime,
 and Runtime version drop-down lists. For more information, see Create a build project (console)
 or Change a build project's settings (console).
- For the AWS CLI, run the list-curated-environment-images command:

aws codebuild list-curated-environment-images

• For the AWS SDKs, call the ListCuratedEnvironmentImages operation for your target programming language. For more information, see the AWS SDKs and tools reference.

EC2 compute images

AWS CodeBuild supports the following Docker images that are available for EC2 compute in CodeBuild.



The base image of the Windows Server Core 2019 platform is only available in the following regions:

- US East (N. Virginia)
- US East (Ohio)
- US West (Oregon)
- Europe (Ireland)

Platform	Image identifier	Definition
Amazon Linux 2	<pre>aws/codebuild/amaz onlinux-x86_64-sta ndard:4.0</pre>	al/standard/4.0
Amazon Linux 2023	<pre>aws/codebuild/amaz onlinux-x86_64-sta ndard:5.0</pre>	al/standard/5.0
Amazon Linux 2	<pre>aws/codebuild/amaz onlinux-x86_64-sta ndard:corretto8</pre>	al/standard/corretto8
Amazon Linux 2	<pre>aws/codebuild/amaz onlinux-x86_64-sta ndard:corretto11</pre>	al/standard/corretto11
Amazon Linux 2	<pre>aws/codebuild/amaz onlinux-aarch64-st andard:2.0</pre>	al/aarch64/standard/2.0

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Platform	Image identifier	Definition
Amazon Linux 2023	<pre>aws/codebuild/amaz onlinux-aarch64-st andard:3.0</pre>	al/aarch64/standard/3.0
Ubuntu 20.04	aws/codebuild/stan dard:5.0	ubuntu/standard/5.0
Ubuntu 22.04	aws/codebuild/stan dard:6.0	ubuntu/standard/6.0
Ubuntu 22.04	aws/codebuild/stan dard:7.0	ubuntu/standard/7.0
Windows Server Core 2019	aws/codebuild/wind ows-base:2019-1.0	N/A
Windows Server Core 2019	<pre>aws/codebuild/wind ows-base:2019-2.0</pre>	N/A
Windows Server Core 2019	<pre>aws/codebuild/wind ows-base:2019-3.0</pre>	N/A
Windows Server Core 2022	aws/codebuild/wind ows-base:2022-1.0	N/A
macOS	<pre>aws/codebuild/macos- arm-base:14</pre>	N/A

Note

On November 22nd, 2024, the aliases for Linux-based standard runtime images were updated from amazonlinux2 to amazonlinux. No manual update is required as the previous aliases are still valid.

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Lambda compute images

AWS CodeBuild supports the following Docker images that are available for AWS Lambda compute in CodeBuild.

aarch64 Architecture

Platform	Image identifier	Definition
Amazon Linux 2	<pre>aws/codebuild/amaz onlinux-aarch64-la mbda-standard:dotn et6</pre>	al-lambda/aarch64/dotnet6
Amazon Linux 2023	<pre>aws/codebuild/amaz onlinux-aarch64-la mbda-standard:dotn et8</pre>	al-lambda/aarch64/dotnet8
Amazon Linux 2	<pre>aws/codebuild/amaz onlinux-aarch64-la mbda-standard:go1. 21</pre>	al-lambda/aarch64/go1.21
Amazon Linux 2023	<pre>aws/codebuild/amaz onlinux-aarch64-la mbda-standard:go1. 24</pre>	al-lambda/aarch64/go1.24
Amazon Linux 2	<pre>aws/codebuild/amaz onlinux-aarch64-la mbda-standard:corr etto11</pre>	al-lambda/aarch64/corretto1 1
Amazon Linux 2	<pre>aws/codebuild/amaz onlinux-aarch64-la mbda-standard:corr etto17</pre>	al-lambda/aarch64/corretto1 7

Platform	Image identifier	Definition
Amazon Linux 2023	<pre>aws/codebuild/amaz onlinux-aarch64-la mbda-standard:corr etto21</pre>	al-lambda/aarch64/corretto2 1
Amazon Linux 2	<pre>aws/codebuild/amaz onlinux-aarch64-la mbda-standard:node js18</pre>	al-lambda/aarch64/nodejs18
Amazon Linux 2023	<pre>aws/codebuild/amaz onlinux-aarch64-la mbda-standard:node js20</pre>	al-lambda/aarch64/nodejs20
Amazon Linux 2023	<pre>aws/codebuild/amaz onlinux-aarch64-la mbda-standard:node js22</pre>	al-lambda/aarch64/nodejs22
Amazon Linux 2	<pre>aws/codebuild/amaz onlinux-aarch64-la mbda-standard:pyth on3.11</pre>	al-lambda/aarch64/ python3.11
Amazon Linux 2023	<pre>aws/codebuild/amaz onlinux-aarch64-la mbda-standard:pyth on3.12</pre>	al-lambda/aarch64/ python3.12
Amazon Linux 2023	<pre>aws/codebuild/amaz onlinux-aarch64-la mbda-standard:pyth on3.13</pre>	al-lambda/aarch64/ python3.13

Platform	Image identifier	Definition
Amazon Linux 2	<pre>aws/codebuild/amaz onlinux-aarch64-la mbda-standard:ruby 3.2</pre>	al-lambda/aarch64/ruby3.2
Amazon Linux 2023	<pre>aws/codebuild/amaz onlinux-aarch64-la mbda-standard:ruby 3.4</pre>	al-lambda/aarch64/ruby3.4

x86_64 Architecture

Platform	Image identifier	Definition
Amazon Linux 2	<pre>aws/codebuild/amaz onlinux-x86_64-lam bda-standard:dotne t6</pre>	al-lambda/x86_64/dotnet6
Amazon Linux 2023	<pre>aws/codebuild/amaz onlinux-x86_64-lam bda-standard:dotne t8</pre>	al-lambda/x86_64/dotnet8
Amazon Linux 2	<pre>aws/codebuild/amaz onlinux-x86_64-lam bda-standard:go1.21</pre>	al-lambda/x86_64/go1.21
Amazon Linux 2023	<pre>aws/codebuild/amaz onlinux-x86_64-lam bda-standard:go1.24</pre>	al-lambda/x86_64/go1.24
Amazon Linux 2	aws/codebuild/amaz onlinux-x86_64-lam	al-lambda/x86_64/c orretto11

Platform	Image identifier	Definition
	<pre>bda-standard:corre tto11</pre>	
Amazon Linux 2	<pre>aws/codebuild/amaz onlinux-x86_64-lam bda-standard:corre tto17</pre>	al-lambda/x86_64/c orretto17
Amazon Linux 2023	<pre>aws/codebuild/amaz onlinux-x86_64-lam bda-standard:corre tto21</pre>	al-lambda/x86_64/c orretto21
Amazon Linux 2	<pre>aws/codebuild/amaz onlinux-x86_64-lam bda-standard:nodej s18</pre>	al-lambda/x86_64/nodejs18
Amazon Linux 2023	<pre>aws/codebuild/amaz onlinux-x86_64-lam bda-standard:nodej s20</pre>	al-lambda/x86_64/nodejs20
Amazon Linux 2023	<pre>aws/codebuild/amaz onlinux-x86_64-lam bda-standard:nodej s22</pre>	al-lambda/x86_64/nodejs22
Amazon Linux 2	<pre>aws/codebuild/amaz onlinux-x86_64-lam bda-standard:pytho n3.11</pre>	al-lambda/x86_64/p ython3.11

Platform	Image identifier	Definition
Amazon Linux 2023	<pre>aws/codebuild/amaz onlinux-x86_64-lam bda-standard:pytho n3.12</pre>	al-lambda/x86_64/p ython3.12
Amazon Linux 2023	<pre>aws/codebuild/amaz onlinux-x86_64-lam bda-standard:pytho n3.13</pre>	al-lambda/x86_64/p ython3.13
Amazon Linux 2	<pre>aws/codebuild/amaz onlinux-x86_64-lam bda-standard:ruby3 .2</pre>	al-lambda/x86_64/ruby3.2
Amazon Linux 2023	<pre>aws/codebuild/amaz onlinux-x86_64-lam bda-standard:ruby3 .4</pre>	al-lambda/x86_64/ruby3.4

Deprecated CodeBuild images

A *deprecated image* is an image that is no longer cached or updated by CodeBuild. A deprecated image no longer receives minor version updates or patch version updates, and because they are no longer updated, using them may not be secure. If your CodeBuild project is configured to use an older image version, the provisioning process will download this docker image and use it to create the containerized runtime environment, which can increase the provisioning duration and overall build duration.

CodeBuild has deprecated the following Docker images. You can still use these images, but they won't be cached on the build host and will result in higher provisioning times.

Platform	Image identifier	Definition	Deprecation date
Amazon Linux 2	<pre>aws/codebuild/ amazonlinux2- x86_64-st andard:3.0</pre>	al2/standard/3.0	May 9, 2023
Ubuntu 18.04	<pre>aws/codebuild/ standard:4.0</pre>	ubuntu/standard/4.0	March 31, 2023
Amazon Linux 2	<pre>aws/codebuild/ amazonlinux2- aarch64-s tandard:1.0</pre>	al2/aarch64/standa rd/1.0	March 31, 2023
Ubuntu 18.04	<pre>aws/codebuild/ standard:3.0</pre>	ubuntu/standard/3.0	June 30, 2022
Amazon Linux 2	<pre>aws/codebuild/ amazonlinux2- x86_64-st andard:2.0</pre>	al2/standard/2.0	June 30, 2022

Topics

- Available runtimes
- Runtime versions

Available runtimes

You can specify one or more runtimes in the runtime-versions section of your buildspec file. If your runtime is dependent upon another runtime, you can also specify its dependent runtime in the buildspec file. If you do not specify any runtimes in the buildspec file, CodeBuild chooses the default runtimes that are available in the image you use. If you specify one or more runtimes, CodeBuild uses only those runtimes. If a dependent runtime is not specified, CodeBuild attempts to choose the dependent runtime for you. For more information, see Specify runtime versions in the buildspec file.

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Topics

- Linux image runtimes
- macOS image runtimes
- Windows image runtimes

Linux image runtimes

The following table contains the available runtimes and the standard Linux images that support them.

Ubuntu and Amazon Linux platform runtimes

Runtime name	Version	Images
dotnet	3.1	Amazon Linux 2 AArch64 standard: 2.0
		Ubuntu standard:5.0
	5.0	Ubuntu standard:5.0
	6.0	Amazon Linux 2 x86_64 Lambda stand dotnet6
		Amazon Linux 2 AArch64 Lambda stan dotnet6
		Amazon Linux 2 x86_64 standard: 4.0
		Amazon Linux 2023 x86_64 standard: 5.0
		Amazon Linux 2023 AArch64 standard 3.0
		Ubuntu standard:6.0

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Ubuntu standard:7.0

Runtime name	Version	Images
	8.0	Amazon Linux 2023 x86_64 standard: 5.0
		Amazon Linux 2023 AArch64 standard
		Ubuntu standard:7.0
golang	1.12	Amazon Linux 2 AArch64 standard: 2.0
	1.13	Amazon Linux 2 AArch64 standard: 2.0
	1.14	Amazon Linux 2 AArch64 standard: 2.0
	1.15	Ubuntu standard:5.0
	1.16	Ubuntu standard:5.0
	1.18	Amazon Linux 2 x86_64 standard: 4.0
		Ubuntu standard:6.0
	1.20	Amazon Linux 2023 x86_64 standard: 5.0
		Amazon Linux 2023 AArch64 standard 3.0
		Ubuntu standard:7.0

Runtime name	Version	Images
	1.21	Amazon Linux 2 x86_64 Lambda st go1.21
		Amazon Linux 2 AArch64 Lambda s go1.21
		Amazon Linux 2023 x86_64 standa 5.0
		Amazon Linux 2023 AArch64 stand 3.0
		Ubuntu standard:7.0
	1.22	Amazon Linux 2023 x86_64 standa 5.0
		Amazon Linux 2023 AArch64 stand
		Ubuntu standard:7.0
	1.23	Amazon Linux 2023 x86_64 standa 5.0
		Amazon Linux 2023 AArch64 stanc
		Ubuntu standard:7.0
	1.24	Amazon Linux 2023 x86_64 Lambo
		Amazon Linux 2023 AArch64 Lamb

Runtime name	Version	Images
java	corretto8	Amazon Linux 2 x86_64 standard: corretto8
		Amazon Linux 2023 x86_64 standard: 5.0
		Amazon Linux 2 AArch64 standard: 2.0
		Amazon Linux 2023 AArch64 standard
		Ubuntu standard:5.0
		Ubuntu standard:7.0
	corretto11	Amazon Linux 2 x86_64 standard: corretto11
		Amazon Linux 2 x86_64 Lambda stand corretto11
		Amazon Linux 2023 x86_64 standard: 5.0
		Amazon Linux 2 AArch64 Lambda star corretto11
		Amazon Linux 2 AArch64 standard: 2.0
		Amazon Linux 2023 AArch64 standard 3.0
		Ubuntu standard:5.0
		Ubuntu standard:7.0

	Runtime name	Version	Images
		corretto17	Amazon Linux 2 x86_64 Lambda stand corretto17
			Amazon Linux 2 AArch64 Lambda star corretto17
			Amazon Linux 2 x86_64 standard: 4.0
			Amazon Linux 2023 x86_64 standard: 5.0
			Amazon Linux 2023 AArch64 standard
			Ubuntu standard:6.0
			Ubuntu standard:7.0
		corretto21	Amazon Linux 2 x86_64 Lambda stand corretto21
			Amazon Linux 2 AArch64 Lambda star corretto21
			Amazon Linux 2023 x86_64 standard: 5.0
			Amazon Linux 2023 AArch64 standard
			Ubuntu standard:7.0
	nodejs	10	Amazon Linux 2 AArch64 standard: 2.0

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Runtime name	Version	Images
	12	Amazon Linux 2 AArch64 standard: 2.0
		Ubuntu standard:5.0
	14	Ubuntu standard:5.0
	16	Amazon Linux 2 x86_64 standard: 4.0
		Ubuntu standard:6.0
	18	Amazon Linux 2 x86_64 Lambda stand nodejs18
		Amazon Linux 2 AArch64 Lambda star nodejs18
		Amazon Linux 2023 x86_64 standard: 5.0
		Amazon Linux 2023 AArch64 standard
		Ubuntu standard:7.0
	20	Amazon Linux 2 x86_64 Lambda stand nodejs20
		Amazon Linux 2 AArch64 Lambda star nodejs20
		Amazon Linux 2023 x86_64 standard: 5.0
		Amazon Linux 2023 AArch64 standard
		Ubuntu standard:7.0

Runtime name	Version	Images
	22	Amazon Linux 2023 x86_64 Lambda st nodejs22
		Amazon Linux 2023 AArch64 Lambda nodejs22
		Amazon Linux 2023 x86_64 standard: 5.0
		Amazon Linux 2023 AArch64 standard 3.0
		Ubuntu standard:7.0
php	7.3	Amazon Linux 2 AArch64 standard: 2.0
		Ubuntu standard:5.0
	7.4	Amazon Linux 2 AArch64 standard: 2.0
		Ubuntu standard:5.0
	8.0	Ubuntu standard:5.0
	8.1	Amazon Linux 2 x86_64 standard: 4.0
		Amazon Linux 2023 AArch64 standard 3.0
		Ubuntu standard:6.0

Runtime name	Version	Images
	8.2	Amazon Linux 2023 x86_64 standard: 5.0
		Amazon Linux 2023 AArch64 standard 3.0
		Ubuntu standard:7.0
	8.3	Amazon Linux 2023 x86_64 standard: 5.0
		Amazon Linux 2023 AArch64 standard 3.0
		Ubuntu standard:7.0
python	3.7	Amazon Linux 2 AArch64 standard: 2.0
		Ubuntu standard:5.0
	3.8	Amazon Linux 2 AArch64 standard: 2.0
		Ubuntu standard:5.0

Runtime name	Version	Images
	3.9	Amazon Linux 2 x86_64 standard: 4.0
		Amazon Linux 2023 x86_64 standa 5.0
		Amazon Linux 2 AArch64 standard
		Amazon Linux 2023 AArch64 stand
		Ubuntu standard:5.0
		Ubuntu standard:7.0
	3.10	Amazon Linux 2023 x86_64 stand 5.0
		Amazon Linux 2023 AArch64 stan
		Ubuntu standard:6.0
		Ubuntu standard:7.0
	3.11	Amazon Linux 2 x86_64 Lambda s python3.11
		Amazon Linux 2 AArch64 Lambda python3.11
		Amazon Linux 2023 x86_64 stand 5.0
		Amazon Linux 2023 AArch64 stan 3.0
		Ubuntu standard:7.0

Runtime name	Version	Images
	3.12	Amazon Linux 2 x86_64 Lambda stand python3.12
		Amazon Linux 2 AArch64 Lambda star python3.12
		Amazon Linux 2023 x86_64 standard: 5.0
		Amazon Linux 2023 AArch64 standard 3.0
		Ubuntu standard:7.0
	3.13	Amazon Linux 2023 x86_64 Lambda s python3.13
		Amazon Linux 2023 AArch64 Lambda python3.13
		Amazon Linux 2023 x86_64 standard: 5.0
		Amazon Linux 2023 AArch64 standard
		Ubuntu standard:7.0
ruby	2.6	Amazon Linux 2 AArch64 standard: 2.0
		Ubuntu standard:5.0
	2.7	Amazon Linux 2 AArch64 standard: 2.0
		Ubuntu standard:5.0

Runtime name	Version	Images
	3.1	Amazon Linux 2 x86_64 standard: 4.0
		Amazon Linux 2023 x86_64 stands 5.0
		Amazon Linux 2023 AArch64 stand
		Ubuntu standard:6.0
		Ubuntu standard:7.0
	3.2	Amazon Linux 2 x86_64 Lambda s ruby3.2
		Amazon Linux 2 AArch64 Lambda ruby3.2
		Amazon Linux 2023 x86_64 standa 5.0
		Amazon Linux 2023 AArch64 stand
		Ubuntu standard:7.0
	3.3	Amazon Linux 2023 x86_64 stands 5.0
		Amazon Linux 2023 AArch64 stand
		Ubuntu standard:7.0

Runtime name	Version	Images
	3.4	Amazon Linux 2023 x86_64 Lambda si ruby3.4
		Amazon Linux 2023 AArch64 Lambda ruby3.4
		Amazon Linux 2023 x86_64 standard: 5.0
		Amazon Linux 2023 AArch64 standard 3.0
		Ubuntu standard:7.0

macOS image runtimes



A Important

The CodeBuild curated images for Mac builds contain macOS and Xcode pre-installed. By using the Xcode software, you acknowledge, understand, and consent to the Xcode and Apple SDKs Agreement. If you do not accept the terms and conditions of the agreement, do not use the Xcode software. Instead, provide your own Amazon Machine Images (AMI). For more information, see How do I configure a reserved capacity macOS fleet?

The following table contains the available runtimes supported by macOS.

macOS platform runtimes

Runtime name	Version	Images	Additional notes
bash	3.2.57	macos-arm-base:14	
		macos-arm-base:15	
clang	15.0.0	macos-arm-base:14	

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Runtime name	Version	Images	Additional notes
	16.0.0	macos-arm-base:15	
dotnet sdk	8.0.406	macos-arm-base:14	
		macos-arm-base:15	
gcc	11.5.0	macos-arm-base:14	Available by using the
		macos-arm-base:15	gcc-11 alias
	12.4.0	macos-arm-base:14	Available by using the
		macos-arm-base:15	gcc-12 alias
	13.3.0	macos-arm-base:14	Available by using the
		macos-arm-base:15	gcc-13 alias
	14.2.0	macos-arm-base:14	Available by using the
		macos-arm-base:15	gcc-14 alias
gnu	11.5.0	macos-arm-base:14	Available by using the
		macos-arm-base:15	gfortran-11 alias
	12.4.0	macos-arm-base:14	Available by using the
		macos-arm-base:15	gfortran-12 alias
	13.3.0	macos-arm-base:14	Available by using the
		macos-arm-base:15	gfortran-13 alias
	14.2.0	macos-arm-base:14	Available by using the
		macos-arm-base:15	gfortran-14 alias

Runtime name	Version	Images	Additional notes
golang	1.22.12	macos-arm-base:14	
		macos-arm-base:15	
	1.23.6	macos-arm-base:14	
		macos-arm-base:15	
	1.24.0	macos-arm-base:14	
		macos-arm-base:15	
java	Corretto8	macos-arm-base:14	
		macos-arm-base:15	
	Corretto11	macos-arm-base:14	
		macos-arm-base:15	
	Corretto17	macos-arm-base:14	
		macos-arm-base:15	
	Corretto21	macos-arm-base:14	
		macos-arm-base:15	
kotlin	2.1.10	macos-arm-base:14	
		macos-arm-base:15	
mono	6.12.0	macos-arm-base:14	
		macos-arm-base:15	
nodejs	18.20.7	macos-arm-base:14	

Runtime name	Version	Images	Additional notes
	20.18.3	macos-arm-base:14	
		macos-arm-base:15	
	22.14.0	macos-arm-base:14	
		macos-arm-base:15	
perl	5.34.1	macos-arm-base:14	
		macos-arm-base:15	
php	8.1.31	macos-arm-base:14	
	8.2.27	macos-arm-base:14	
		macos-arm-base:15	
	8.3.17	macos-arm-base:14	
		macos-arm-base:15	
	8.4.4	macos-arm-base:14	
		macos-arm-base:15	
python	3.9.21	macos-arm-base:14	
	3.10.16	macos-arm-base:14	
		macos-arm-base:15	
	3.11.11	macos-arm-base:14	
		macos-arm-base:15	
	3.12.9	macos-arm-base:14	
		macos-arm-base:15	

Runtime name	Version	Images	Additional notes
	3.13.2	macos-arm-base:14	
		macos-arm-base:15	
ruby	3.1.6	macos-arm-base:14	
	3.2.7	macos-arm-base:14	
		macos-arm-base:15	
	3.3.7	macos-arm-base:14	
		macos-arm-base:15	
	3.4.2	macos-arm-base:14	
		macos-arm-base:15	
rust	1.85.0	macos-arm-base:14	
		macos-arm-base:15	
swift	5.10.0.13	macos-arm-base:14	
	6.0.3.1.10	macos-arm-base:14	
Xcode	15.4	macos-arm-base:14	
	16.2	macos-arm-base:15	

Windows image runtimes

The base image of the Windows Server Core 2019 contains the following runtimes.

Windows platform runtimes

Runtime name	Windows Server Core 20 1.0 versions	Windows Server Core 20 2.0 versions	Windows Server Core 20 3.0 versions)19 st
dotnet	3.1	3.1	8.0	

Runtime name	Windows Server Core 20 1.0 versions	Windows Server Core 20 2.0 versions	Windows Server Core 2019 sta 3.0 versions
	5.0	6.0	
		7.0	
dotnet sdk	3.1	3.1	8.0
	5.0	6.0	
		7.0	
golang	1.14	1.18	1.21
			1.22
			1.23
gradle	6.7	7.6	8.12
java	Corretto11	Corretto11	Corretto8
		Corretto17	Corretto11
			Corretto17
			Corretto21
maven	3.6	3.8	3.9
nodejs	14.15	16.19	20.18
			22.13
php	7.4	8.1	8.3
			8.4
powershell	7.1	7.2	7.4

Runtime name	Windows Server Core 20 1.0 versions	Windows Server Core 20 2.0 versions	Windows Server Core 2019 sta 3.0 versions
python	3.8	3.10	3.10
			3.11
			3.12
			3.13
ruby	2.7	3.1	3.2
			3.3
			3.4

Runtime versions

When you specify a runtime in the <u>runtime-versions</u> section of your buildspec file, you can specify a specific version, a specific major version and the latest minor version, or the latest version. The following table lists the available runtimes and how to specify them. Not all runtime versions are available on all images. Runtime version selection is also not supported for the custom images. For more information, see <u>Available runtimes</u>. If you'd like to install and use a custom runtime version instead of the pre-installed runtime versions, see <u>Custom runtime versions</u>.

Ubuntu and Amazon Linux 2 platform runtime versions

Runtime name	Version	Specific version	Specific major and latest minor version	Latest version
android	28	android: 28	android: 28.x	android: latest
	29	android: 29	android: 29.x	
dotnet	3.1	dotnet: 3.1	dotnet: 3.x	dotnet: latest
	5.0	dotnet: 5.0	dotnet: 5.x	

Runtime name	Version	Specific version	Specific major and latest minor version	Latest version
	6.0	dotnet: 6.0	dotnet: 6.x	
	8.0	dotnet: 8.0	dotnet: 8.x	
golang	1.12	golang: 1.12	golang: 1.x	golang: latest
	1.13	golang: 1.13		
	1.14	golang: 1.14		
	1.15	golang: 1.15		
	1.16	golang: 1.16		
	1.18	golang: 1.18		
	1.20	golang: 1.20		
	1.21	golang: 1.21		
	1.22	golang: 1.22		
	1.23	golang: 1.23		
	1.24	golang: 1.24		
java	corretto8	java: corretto	java: corretto	java: latest
	corretto11	java: corretto 1	java: corretto 1.x	
	corretto17	java: corretto 7	java: corretto 7.x	
	corretto21	java: corretto 1	java: corretto 1.x	

Runtime name	Version	Specific version	Specific major and latest minor version	Latest version
nodejs	10	nodejs: 10	nodejs: 10.x	nodejs: latest
	12	nodejs: 12	nodejs: 12.x	
	14	nodejs: 14	nodejs: 14.x	
	16	nodejs: 16	nodejs: 16.x	
	18	nodejs: 18	nodejs: 18.x	
	20	nodejs: 20	nodejs: 20.x	
	22	nodejs: 22	nodejs: 22.x	
php	7.3	php: 7.3	php: 7.x php: latest	php: latest
	7.4	php: 7.4		
	8.0	php: 8.0	php: 8.x	
	8.1	php: 8.1		
	8.2	php: 8.2		
	8.3	php: 8.3		
python	3.7	python: 3.7	python: 3.x	python: latest
	3.8	python: 3.8		
	3.9	python: 3.9		
	3.10	python: 3.10		
	3.11	python: 3.11		
	3.12	python: 3.12		

Runtime name	Version	Specific version	Specific major and latest minor version	Latest version
	3.13	python: 3.13		
ruby	2.6	ruby: 2.6 ruby: 2.x	ruby: latest	
	2.7	ruby: 2.7		
	3.1	ruby: 3.1	ruby: 3.x	
	3.2	ruby: 3.2		
	3.3	ruby: 3.3		
	3.4	ruby: 3.4		

You can use a build specification to install other components (for example, the AWS CLI, Apache Maven, Apache Ant, Mocha, RSpec, or similar) during the install build phase. For more information, see Buildspec example.

Custom runtime versions

Instead of using the pre-installed runtime versions in CodeBuild-managed images, you can install and use custom versions of your choice. The following table lists the available custom runtimes and how to specify them.



Note

Custom runtime version selection is only supported for Ubuntu and Amazon Linux images.

Custom runtime versions

Runtime name	Syntax	Example
dotnet	<major>.<minor>.<patch></patch></minor></major>	5.0.408
golang	<major>.<minor></minor></major>	1.19

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Runtime name	Syntax	Example
	<pre><major>.<minor>.<patch></patch></minor></major></pre>	1.19.1
java	corretto <major></major>	corretto15
nodejs	<major></major>	14
	<major>.<minor></minor></major>	14.21
	<major>.<minor>.<patch></patch></minor></major>	14.21.3
php	<major>.<minor>.<patch></patch></minor></major>	8.0.30
python	<major></major>	3
	<major>.<minor></minor></major>	3.7
	<pre><major>.<minor>.<patch></patch></minor></major></pre>	3.7.16
ruby	<major>.<minor>.<patch></patch></minor></major>	3.0.6

Custom runtime buildspec example

Here is an example of a buildspec that specifies custom runtime versions.

```
version: 0.2
phases:
  install:
  runtime-versions:
    java: corretto15
    php: 8.0.30
    ruby: 3.0.6
    golang: 1.19
    python: 3.7
    nodejs: 14
    dotnet: 5.0.408
```

Build environment compute modes and types

In CodeBuild, you can specify the compute and runtime environment image that CodeBuild uses to run your builds. *Compute* refers to the computing engine (the CPU, memory, and operating system) that is managed and maintained by CodeBuild. A *runtime environment image* is a container image that runs on top of your chosen compute platform, and includes extra tools that your build might need, such as the AWS CLI.

Topics

- About compute
- About reserved capacity environment types
- About on-demand environment types

About compute

CodeBuild offers EC2 and AWS Lambda compute modes. EC2 offers optimized flexibility during your build and AWS Lambda offers optimized start-up speeds. AWS Lambda supports faster builds due to a lower start-up latency. AWS Lambda also automatically scales, so builds aren't waiting in queue to run. For more information, see Run builds on AWS Lambda compute.

With the EC2 compute mode, you can run your builds with on-demand or reserved capacity fleets. For on-demand fleets, you can select pre-defined compute types such asBUILD_GENERAL1_SMALL or BUILD_GENERAL1_LARGE. For more information, see <u>About on-demand environment types</u>. For reserved capacity fleets, you can select your compute configurations including vCPU, memory and disk space. After specifying the configurations, CodeBuild will choose a supported compute type that matches your requirements. For more information, see <u>About reserved capacity environment</u> types.

About reserved capacity environment types

AWS CodeBuild provides Linux x86, Arm, GPU, Windows and macOS environment types for reserved capacity fleets. The following table shows the available machine type, memory, vCPUs, and disk space sorted by region:

US East (N. Virginia)

Environme nt type	vCPUs	Memory	Disk space	Machine type	Compute instance type
ARM	2	4 GiB	64 GB	GENERAL	reserved. arm.2cpu. 4gib
ARM	4	8 GiB	128 GB	GENERAL	reserved. arm.4cpu. 8gib
ARM	8	16 GiB	128 GB	GENERAL	reserved. arm.8cpu. 16gib
ARM	16	32 GiB	256 GB	GENERAL	reserved. arm.16cpu .32gib
ARM	32	64 GiB	256 GB	GENERAL	reserved. arm.32cpu .64gib
ARM	48	96 GiB	512 GB	GENERAL	reserved. arm.48cpu .96gib
ARM	64	128 GiB	824 GB	GENERAL	reserved. arm.64cpu .128gib
ARM EC2	2	4 GiB	64 GB	GENERAL	reserved. arm.2cpu. 4gib

Environme nt type	vCPUs	Memory	Disk space	Machine type	Compute instance type
ARM EC2	4	8 GiB	128 GB	GENERAL	reserved. arm.4cpu. 8gib
ARM EC2	8	16 GiB	128 GB	GENERAL	reserved. arm.8cpu. 16gib
Linux	2	4 GiB	64 GB	GENERAL	reserved. x86-64.2c pu.4gib
Linux	4	8 GiB	128 GB	GENERAL	reserved. x86-64.4c pu.8gib
Linux	8	16 GiB	128 GB	GENERAL	reserved. x86-64.8c pu.16gib
Linux	16	32 GiB	256 GB	GENERAL	reserved. x86-64.16 cpu.32gib
Linux	36	72 GiB	256 GB	GENERAL	reserved. x86-64.36 cpu.72gib
Linux	48	96 GiB	512 GB	GENERAL	reserved. x86-64.48 cpu.96gib

Environme nt type	vCPUs	Memory	Disk space	Machine type	Compute instance type
Linux	72	144 GiB	824 GB	GENERAL	reserved. x86-64.72 cpu.144gi b
Linux	96	192 GiB	824 GB	GENERAL	reserved. x86-64.96 cpu.192gi b
Linux	48	96 GiB	824 GB (SSD)	NVME	reserved. x86-64.48 cpu.96gib .nvme
Linux	72	144 GiB	824 GB (SSD)	NVME	reserved. x86-64.72 cpu.144gi b.nvme
Linux EC2	2	4 GiB	64 GB	GENERAL	reserved. x86-64.2c pu.4gib
Linux EC2	4	8 GiB	128 GB	GENERAL	reserved. x86-64.4c pu.8gib
Linux EC2	8	16 GiB	128 GB	GENERAL	reserved. x86-64.8c pu.16gib

Environme nt type	vCPUs	Memory	Disk space	Machine type	Compute instance type
Linux GPU	4	16 GiB	235 GB (SSD)	NVME	reserved. gpu.4cpu. 16gib.nvm e
Linux GPU	8	32 GiB	435 GB (SSD)	NVME	reserved. gpu.8cpu. 32gib.nvm e
Linux GPU	16	64 GiB	585 GB (SSD)	NVME	reserved. gpu.16cpu .64gib.nv me
Linux GPU	32	128 GiB	885 GB (SSD)	NVME	reserved. gpu.32cpu .128gib.n vme
Linux GPU	48	192 GiB	3785 GB (SSD)	NVME	reserved. gpu.48cpu .192gib.n vme
Linux GPU	64	256 GiB	1885 GB (SSD)	NVME	reserved. gpu.64cpu .256gib.n vme
Linux GPU	96	384 GiB	3785 GB (SSD)	NVME	reserved. gpu.96cpu .384gib.n vme

Environme nt type	vCPUs	Memory	Disk space	Machine type	Compute instance type
macOS	8	24 GiB	128 GB	GENERAL	reserved. arm.m2.8c pu.24gib
macOS	12	32 GiB	256 GB	GENERAL	reserved. arm.m2.12 cpu.32gib
Windows	2	4 GiB	64 GB	GENERAL	reserved. x86-64.2c pu.4gib
Windows	4	8 GiB	128 GB	GENERAL	reserved. x86-64.4c pu.8gib
Windows	8	16 GiB	128 GB	GENERAL	reserved. x86-64.8c pu.16gib
Windows	16	32 GiB	256 GB	GENERAL	reserved. x86-64.16 cpu.32gib
Windows	36	72 GiB	256 GB	GENERAL	reserved. x86-64.36 cpu.72gib

Environme nt type	vCPUs	Memory	Disk space	Machine type	Compute instance type
Windows	48	96 GiB	512 GB	GENERAL	reserved. x86-64.48 cpu.96gib
Windows	72	144 GiB	824 GB	GENERAL	reserved. x86-64.72 cpu.144gi b
Windows	96	192 GiB	824 GB	GENERAL	reserved. x86-64.96 cpu.192gi b
Windows EC2	4	8 GiB	128 GB	GENERAL	reserved. x86-64.4c pu.8gib
Windows EC2	8	16 GiB	128 GB	GENERAL	reserved. x86-64.8c pu.16gib

For more information on the pricing identifier, see https://aws.amazon.com/codebuild/pricing/.

US East (Ohio)

Environme nt type	vCPUs	Memory	Disk space	Machine type	Compute instance type
ARM	2	4 GiB	64 GB	GENERAL	reserved. arm.2cpu. 4gib
ARM	4	8 GiB	128 GB	GENERAL	reserved. arm.4cpu. 8gib
ARM	8	16 GiB	128 GB	GENERAL	reserved. arm.8cpu. 16gib
ARM	16	32 GiB	256 GB	GENERAL	reserved. arm.16cpu .32gib
ARM	32	64 GiB	256 GB	GENERAL	reserved. arm.32cpu .64gib
ARM	48	96 GiB	512 GB	GENERAL	reserved. arm.48cpu .96gib
ARM	64	128 GiB	824 GB	GENERAL	reserved. arm.64cpu .128gib
ARM EC2	2	4 GiB	64 GB	GENERAL	reserved. arm.2cpu. 4gib

Environme nt type	vCPUs	Memory	Disk space	Machine type	Compute instance type
ARM EC2	4	8 GiB	128 GB	GENERAL	reserved. arm.4cpu. 8gib
ARM EC2	8	16 GiB	128 GB	GENERAL	reserved. arm.8cpu. 16gib
Linux	2	4 GiB	64 GB	GENERAL	reserved. x86-64.2c pu.4gib
Linux	4	8 GiB	128 GB	GENERAL	reserved. x86-64.4c pu.8gib
Linux	8	16 GiB	128 GB	GENERAL	reserved. x86-64.8c pu.16gib
Linux	16	32 GiB	256 GB	GENERAL	reserved. x86-64.16 cpu.32gib
Linux	36	72 GiB	256 GB	GENERAL	reserved. x86-64.36 cpu.72gib
Linux	48	96 GiB	512 GB	GENERAL	reserved. x86-64.48 cpu.96gib

Environme nt type	vCPUs	Memory	Disk space	Machine type	Compute instance type
Linux	48	96 GiB	824 GB (SSD)	NVME	reserved. x86-64.48 cpu.96gib .nvme
Linux	72	144 GiB	824 GB (SSD)	NVME	reserved. x86-64.72 cpu.144gi b.nvme
Linux EC2	2	4 GiB	64 GB	GENERAL	reserved. x86-64.2c pu.4gib
Linux EC2	4	8 GiB	128 GB	GENERAL	reserved. x86-64.4c pu.8gib
Linux EC2	8	16 GiB	128 GB	GENERAL	reserved. x86-64.8c pu.16gib
Linux GPU	4	16 GiB	235 GB (SSD)	NVME	reserved. gpu.4cpu. 16gib.nvm e
Linux GPU	8	32 GiB	435 GB (SSD)	NVME	reserved. gpu.8cpu. 32gib.nvm e

Environme nt type	vCPUs	Memory	Disk space	Machine type	Compute instance type
Linux GPU	16	64 GiB	585 GB (SSD)	NVME	reserved. gpu.16cpu .64gib.nv me
Linux GPU	32	128 GiB	885 GB (SSD)	NVME	reserved. gpu.32cpu .128gib.n vme
Linux GPU	48	192 GiB	3785 GB (SSD)	NVME	reserved. gpu.48cpu .192gib.n vme
macOS	8	24 GiB	128 GB	GENERAL	reserved. arm.m2.8c pu.24gib
macOS	12	32 GiB	256 GB	GENERAL	reserved. arm.m2.12 cpu.32gib
Windows	2	4 GiB	64 GB	GENERAL	reserved. x86-64.2c pu.4gib
Windows	4	8 GiB	128 GB	GENERAL	reserved. x86-64.4c pu.8gib

Environme nt type	vCPUs	Memory	Disk space	Machine type	Compute instance type
Windows	8	16 GiB	128 GB	GENERAL	reserved. x86-64.8c pu.16gib
Windows	16	32 GiB	256 GB	GENERAL	reserved. x86-64.16 cpu.32gib
Windows	36	72 GiB	256 GB	GENERAL	reserved. x86-64.36 cpu.72gib
Windows	48	96 GiB	512 GB	GENERAL	reserved. x86-64.48 cpu.96gib
Windows EC2	4	8 GiB	128 GB	GENERAL	reserved. x86-64.4c pu.8gib
Windows EC2	8	16 GiB	128 GB	GENERAL	reserved. x86-64.8c pu.16gib

For more information on the pricing identifier, see https://aws.amazon.com/codebuild/pricing/.

US West (Oregon)

Environme nt type	vCPUs	Memory	Disk space	Machine type	Compute instance type
ARM	2	4 GiB	64 GB	GENERAL	reserved. arm.2cpu. 4gib
ARM	4	8 GiB	128 GB	GENERAL	reserved. arm.4cpu. 8gib
ARM	8	16 GiB	128 GB	GENERAL	reserved. arm.8cpu. 16gib
ARM	16	32 GiB	256 GB	GENERAL	reserved. arm.16cpu .32gib
ARM	32	64 GiB	256 GB	GENERAL	reserved. arm.32cpu .64gib
ARM	48	96 GiB	512 GB	GENERAL	reserved. arm.48cpu .96gib
ARM	64	128 GiB	824 GB	GENERAL	reserved. arm.64cpu .128gib
ARM EC2	2	4 GiB	64 GB	GENERAL	reserved. arm.2cpu. 4gib

Environme nt type	vCPUs	Memory	Disk space	Machine type	Compute instance type
ARM EC2	4	8 GiB	128 GB	GENERAL	reserved. arm.4cpu. 8gib
ARM EC2	8	16 GiB	128 GB	GENERAL	reserved. arm.8cpu. 16gib
Linux	2	4 GiB	64 GB	GENERAL	reserved. x86-64.2c pu.4gib
Linux	4	8 GiB	128 GB	GENERAL	reserved. x86-64.4c pu.8gib
Linux	8	16 GiB	128 GB	GENERAL	reserved. x86-64.8c pu.16gib
Linux	16	32 GiB	256 GB	GENERAL	reserved. x86-64.16 cpu.32gib
Linux	36	72 GiB	256 GB	GENERAL	reserved. x86-64.36 cpu.72gib
Linux	48	96 GiB	512 GB	GENERAL	reserved. x86-64.48 cpu.96gib

Environme nt type	vCPUs	Memory	Disk space	Machine type	Compute instance type
Linux	72	144 GiB	824 GB	GENERAL	reserved. x86-64.72 cpu.144gi b
Linux	96	192 GiB	824 GB	GENERAL	reserved. x86-64.96 cpu.192gi b
Linux	48	96 GiB	824 GB (SSD)	NVME	reserved. x86-64.48 cpu.96gib .nvme
Linux	72	144 GiB	824 GB (SSD)	NVME	reserved. x86-64.72 cpu.144gi b.nvme
Linux EC2	2	4 GiB	64 GB	GENERAL	reserved. x86-64.2c pu.4gib
Linux EC2	4	8 GiB	128 GB	GENERAL	reserved. x86-64.4c pu.8gib
Linux EC2	8	16 GiB	128 GB	GENERAL	reserved. x86-64.8c pu.16gib

Environme nt type	vCPUs	Memory	Disk space	Machine type	Compute instance type
Linux GPU	4	16 GiB	235 GB (SSD)	NVME	reserved. gpu.4cpu. 16gib.nvm e
Linux GPU	8	32 GiB	435 GB (SSD)	NVME	reserved. gpu.8cpu. 32gib.nvm e
Linux GPU	16	64 GiB	585 GB (SSD)	NVME	reserved. gpu.16cpu .64gib.nv me
Linux GPU	32	128 GiB	885 GB (SSD)	NVME	reserved. gpu.32cpu .128gib.n vme
Linux GPU	48	192 GiB	3785 GB (SSD)	NVME	reserved. gpu.48cpu .192gib.n vme
Linux GPU	64	256 GiB	1885 GB (SSD)	NVME	reserved. gpu.64cpu .256gib.n vme
macOS	8	24 GiB	128 GB	GENERAL	reserved. arm.m2.8c pu.24gib

Environme nt type	vCPUs	Memory	Disk space	Machine type	Compute instance type
macOS	12	32 GiB	256 GB	GENERAL	reserved. arm.m2.12 cpu.32gib
Windows	2	4 GiB	64 GB	GENERAL	reserved. x86-64.2c pu.4gib
Windows	4	8 GiB	128 GB	GENERAL	reserved. x86-64.4c pu.8gib
Windows	8	16 GiB	128 GB	GENERAL	reserved. x86-64.8c pu.16gib
Windows	16	32 GiB	256 GB	GENERAL	reserved. x86-64.16 cpu.32gib
Windows	36	72 GiB	256 GB	GENERAL	reserved. x86-64.36 cpu.72gib
Windows	48	96 GiB	512 GB	GENERAL	reserved. x86-64.48 cpu.96gib

Environme nt type	vCPUs	Memory	Disk space	Machine type	Compute instance type
Windows	72	144 GiB	824 GB	GENERAL	reserved. x86-64.72 cpu.144gi b
Windows	96	192 GiB	824 GB	GENERAL	reserved. x86-64.96 cpu.192gi b
Windows EC2	4	8 GiB	128 GB	GENERAL	reserved. x86-64.4c pu.8gib
Windows EC2	8	16 GiB	128 GB	GENERAL	reserved. x86-64.8c pu.16gib

For more information on the pricing identifier, see https://aws.amazon.com/codebuild/pricing/.
Asia Pacific (Tokyo)

Environme nt type	vCPUs	Memory	Disk space	Machine type	Compute instance type
ARM	2	4 GiB	64 GB	GENERAL	reserved. arm.2cpu. 4gib
ARM	4	8 GiB	128 GB	GENERAL	reserved. arm.4cpu. 8gib

Environme nt type	vCPUs	Memory	Disk space	Machine type	Compute instance type
ARM	8	16 GiB	128 GB	GENERAL	reserved. arm.8cpu. 16gib
ARM	16	32 GiB	256 GB	GENERAL	reserved. arm.16cpu .32gib
ARM	32	64 GiB	256 GB	GENERAL	reserved. arm.32cpu .64gib
ARM	48	96 GiB	512 GB	GENERAL	reserved. arm.48cpu .96gib
ARM	64	128 GiB	824 GB	GENERAL	reserved. arm.64cpu .128gib
ARM EC2	2	4 GiB	64 GB	GENERAL	reserved. arm.2cpu. 4gib
ARM EC2	4	8 GiB	128 GB	GENERAL	reserved. arm.4cpu. 8gib
ARM EC2	8	16 GiB	128 GB	GENERAL	reserved. arm.8cpu. 16gib

Environme nt type	vCPUs	Memory	Disk space	Machine type	Compute instance type
Linux	2	4 GiB	64 GB	GENERAL	reserved. x86-64.2c pu.4gib
Linux	4	8 GiB	128 GB	GENERAL	reserved. x86-64.4c pu.8gib
Linux	8	16 GiB	128 GB	GENERAL	reserved. x86-64.8c pu.16gib
Linux	16	32 GiB	256 GB	GENERAL	reserved. x86-64.16 cpu.32gib
Linux	36	72 GiB	256 GB	GENERAL	reserved. x86-64.36 cpu.72gib
Linux	48	96 GiB	512 GB	GENERAL	reserved. x86-64.48 cpu.96gib
Linux	72	144 GiB	824 GB	GENERAL	reserved. x86-64.72 cpu.144gi b

Environme nt type	vCPUs	Memory	Disk space	Machine type	Compute instance type
Linux	96	192 GiB	824 GB	GENERAL	reserved. x86-64.96 cpu.192gi b
Linux	72	144 GiB	824 GB (SSD)	NVME	reserved. x86-64.72 cpu.144gi b.nvme
Linux EC2	2	4 GiB	64 GB	GENERAL	reserved. x86-64.2c pu.4gib
Linux EC2	4	8 GiB	128 GB	GENERAL	reserved. x86-64.4c pu.8gib
Linux EC2	8	16 GiB	128 GB	GENERAL	reserved. x86-64.8c pu.16gib
Linux GPU	4	16 GiB	235 GB (SSD)	NVME	reserved. gpu.4cpu. 16gib.nvm e
Linux GPU	8	32 GiB	435 GB (SSD)	NVME	reserved. gpu.8cpu. 32gib.nvm e

Environme nt type	vCPUs	Memory	Disk space	Machine type	Compute instance type
Linux GPU	48	192 GiB	3785 GB (SSD)	NVME	reserved. gpu.48cpu .192gib.n vme
Windows	2	4 GiB	64 GB	GENERAL	reserved. x86-64.2c pu.4gib
Windows	4	8 GiB	128 GB	GENERAL	reserved. x86-64.4c pu.8gib
Windows	8	16 GiB	128 GB	GENERAL	reserved. x86-64.8c pu.16gib
Windows	16	32 GiB	256 GB	GENERAL	reserved. x86-64.16 cpu.32gib
Windows	36	72 GiB	256 GB	GENERAL	reserved. x86-64.36 cpu.72gib
Windows	48	96 GiB	512 GB	GENERAL	reserved. x86-64.48 cpu.96gib

Environme nt type	vCPUs	Memory	Disk space	Machine type	Compute instance type
Windows	72	144 GiB	824 GB	GENERAL	reserved. x86-64.72 cpu.144gi b
Windows	96	192 GiB	824 GB	GENERAL	reserved. x86-64.96 cpu.192gi b
Windows EC2	4	8 GiB	128 GB	GENERAL	reserved. x86-64.4c pu.8gib
Windows EC2	8	16 GiB	128 GB	GENERAL	reserved. x86-64.8c pu.16gib

For more information on the pricing identifier, see https://aws.amazon.com/codebuild/pricing/.
Asia Pacific (Mumbai)

Environme nt type	vCPUs	Memory	Disk space	Machine type	Compute instance type
ARM	2	4 GiB	64 GB	GENERAL	reserved. arm.2cpu. 4gib
ARM	4	8 GiB	128 GB	GENERAL	reserved. arm.4cpu. 8gib

Environme nt type	vCPUs	Memory	Disk space	Machine type	Compute instance type
ARM	8	16 GiB	128 GB	GENERAL	reserved. arm.8cpu. 16gib
ARM	16	32 GiB	256 GB	GENERAL	reserved. arm.16cpu .32gib
ARM	32	64 GiB	256 GB	GENERAL	reserved. arm.32cpu .64gib
ARM	48	96 GiB	512 GB	GENERAL	reserved. arm.48cpu .96gib
ARM	64	128 GiB	824 GB	GENERAL	reserved. arm.64cpu .128gib
ARM EC2	2	4 GiB	64 GB	GENERAL	reserved. arm.2cpu. 4gib
ARM EC2	4	8 GiB	128 GB	GENERAL	reserved. arm.4cpu. 8gib
ARM EC2	8	16 GiB	128 GB	GENERAL	reserved. arm.8cpu. 16gib

Environme nt type	vCPUs	Memory	Disk space	Machine type	Compute instance type
Linux	2	4 GiB	64 GB	GENERAL	reserved. x86-64.2c pu.4gib
Linux	4	8 GiB	128 GB	GENERAL	reserved. x86-64.4c pu.8gib
Linux	8	16 GiB	128 GB	GENERAL	reserved. x86-64.8c pu.16gib
Linux	16	32 GiB	256 GB	GENERAL	reserved. x86-64.16 cpu.32gib
Linux	36	72 GiB	256 GB	GENERAL	reserved. x86-64.36 cpu.72gib
Linux	48	96 GiB	512 GB	GENERAL	reserved. x86-64.48 cpu.96gib
Linux	72	144 GiB	824 GB	GENERAL	reserved. x86-64.72 cpu.144gi b

Environme nt type	vCPUs	Memory	Disk space	Machine type	Compute instance type
Linux	96	192 GiB	824 GB	GENERAL	reserved. x86-64.96 cpu.192gi b
Linux	72	144 GiB	824 GB (SSD)	NVME	reserved. x86-64.72 cpu.144gi b.nvme
Linux EC2	2	4 GiB	64 GB	GENERAL	reserved. x86-64.2c pu.4gib
Linux EC2	4	8 GiB	128 GB	GENERAL	reserved. x86-64.4c pu.8gib
Linux EC2	8	16 GiB	128 GB	GENERAL	reserved. x86-64.8c pu.16gib
Linux GPU	4	16 GiB	235 GB (SSD)	NVME	reserved. gpu.4cpu. 16gib.nvm e
Linux GPU	8	32 GiB	435 GB (SSD)	NVME	reserved. gpu.8cpu. 32gib.nvm e

Environme nt type	vCPUs	Memory	Disk space	Machine type	Compute instance type
Linux GPU	16	64 GiB	585 GB (SSD)	NVME	reserved. gpu.16cpu .64gib.nv me
Windows	2	4 GiB	64 GB	GENERAL	reserved. x86-64.2c pu.4gib
Windows	4	8 GiB	128 GB	GENERAL	reserved. x86-64.4c pu.8gib
Windows	8	16 GiB	128 GB	GENERAL	reserved. x86-64.8c pu.16gib
Windows	16	32 GiB	256 GB	GENERAL	reserved. x86-64.16 cpu.32gib
Windows	36	72 GiB	256 GB	GENERAL	reserved. x86-64.36 cpu.72gib
Windows	48	96 GiB	512 GB	GENERAL	reserved. x86-64.48 cpu.96gib

Environme nt type	vCPUs	Memory	Disk space	Machine type	Compute instance type
Windows	72	144 GiB	824 GB	GENERAL	reserved. x86-64.72 cpu.144gi b
Windows	96	192 GiB	824 GB	GENERAL	reserved. x86-64.96 cpu.192gi b
Windows EC2	4	8 GiB	128 GB	GENERAL	reserved. x86-64.4c pu.8gib
Windows EC2	8	16 GiB	128 GB	GENERAL	reserved. x86-64.8c pu.16gib

For more information on the pricing identifier, see https://aws.amazon.com/codebuild/pricing/.
Asia Pacific (Singapore)

Environme nt type	vCPUs	Memory	Disk space	Machine type	Compute instance type
ARM	2	4 GiB	64 GB	GENERAL	reserved. arm.2cpu. 4gib
ARM	4	8 GiB	128 GB	GENERAL	reserved. arm.4cpu. 8gib

Environme nt type	vCPUs	Memory	Disk space	Machine type	Compute instance type
ARM	8	16 GiB	128 GB	GENERAL	reserved. arm.8cpu. 16gib
ARM	16	32 GiB	256 GB	GENERAL	reserved. arm.16cpu .32gib
ARM	32	64 GiB	256 GB	GENERAL	reserved. arm.32cpu .64gib
ARM	48	96 GiB	512 GB	GENERAL	reserved. arm.48cpu .96gib
ARM	64	128 GiB	824 GB	GENERAL	reserved. arm.64cpu .128gib
ARM EC2	2	4 GiB	64 GB	GENERAL	reserved. arm.2cpu. 4gib
ARM EC2	4	8 GiB	128 GB	GENERAL	reserved. arm.4cpu. 8gib
ARM EC2	8	16 GiB	128 GB	GENERAL	reserved. arm.8cpu. 16gib

Environme nt type	vCPUs	Memory	Disk space	Machine type	Compute instance type
Linux	2	4 GiB	64 GB	GENERAL	reserved. x86-64.2c pu.4gib
Linux	4	8 GiB	128 GB	GENERAL	reserved. x86-64.4c pu.8gib
Linux	8	16 GiB	128 GB	GENERAL	reserved. x86-64.8c pu.16gib
Linux	16	32 GiB	256 GB	GENERAL	reserved. x86-64.16 cpu.32gib
Linux	36	72 GiB	256 GB	GENERAL	reserved. x86-64.36 cpu.72gib
Linux	48	96 GiB	512 GB	GENERAL	reserved. x86-64.48 cpu.96gib
Linux	72	144 GiB	824 GB	GENERAL	reserved. x86-64.72 cpu.144gi b

Environme nt type	vCPUs	Memory	Disk space	Machine type	Compute instance type
Linux	96	192 GiB	824 GB	GENERAL	reserved. x86-64.96 cpu.192gi b
Linux	48	96 GiB	824 GB (SSD)	NVME	reserved. x86-64.48 cpu.96gib .nvme
Linux	72	144 GiB	824 GB (SSD)	NVME	reserved. x86-64.72 cpu.144gi b.nvme
Linux EC2	2	4 GiB	64 GB	GENERAL	reserved. x86-64.2c pu.4gib
Linux EC2	4	8 GiB	128 GB	GENERAL	reserved. x86-64.4c pu.8gib
Linux EC2	8	16 GiB	128 GB	GENERAL	reserved. x86-64.8c pu.16gib
Windows	2	4 GiB	64 GB	GENERAL	reserved. x86-64.2c pu.4gib
Windows	4	8 GiB	128 GB	GENERAL	reserved. x86-64.4c pu.8gib

Environme nt type	vCPUs	Memory	Disk space	Machine type	Compute instance type
Windows	8	16 GiB	128 GB	GENERAL	reserved. x86-64.8c pu.16gib
Windows	16	32 GiB	256 GB	GENERAL	reserved. x86-64.16 cpu.32gib
Windows	36	72 GiB	256 GB	GENERAL	reserved. x86-64.36 cpu.72gib
Windows	48	96 GiB	512 GB	GENERAL	reserved. x86-64.48 cpu.96gib
Windows	72	144 GiB	824 GB	GENERAL	reserved. x86-64.72 cpu.144gi b
Windows	96	192 GiB	824 GB	GENERAL	reserved. x86-64.96 cpu.192gi b
Windows EC2	4	8 GiB	128 GB	GENERAL	reserved. x86-64.4c pu.8gib

Environme nt type	vCPUs	Memory	Disk space	Machine type	Compute instance type
Windows EC2	8	16 GiB	128 GB	GENERAL	reserved. x86-64.8c pu.16gib

For more information on the pricing identifier, see https://aws.amazon.com/codebuild/pricing/.
Asia Pacific (Sydney)

Environme nt type	vCPUs	Memory	Disk space	Machine type	Compute instance type
ARM	2	4 GiB	64 GB	GENERAL	reserved. arm.2cpu. 4gib
ARM	4	8 GiB	128 GB	GENERAL	reserved. arm.4cpu. 8gib
ARM	8	16 GiB	128 GB	GENERAL	reserved. arm.8cpu. 16gib
ARM	16	32 GiB	256 GB	GENERAL	reserved. arm.16cpu .32gib
ARM	32	64 GiB	256 GB	GENERAL	reserved. arm.32cpu .64gib

Environme nt type	vCPUs	Memory	Disk space	Machine type	Compute instance type
ARM	48	96 GiB	512 GB	GENERAL	reserved. arm.48cpu .96gib
ARM	64	128 GiB	824 GB	GENERAL	reserved. arm.64cpu .128gib
ARM EC2	2	4 GiB	64 GB	GENERAL	reserved. arm.2cpu. 4gib
ARM EC2	4	8 GiB	128 GB	GENERAL	reserved. arm.4cpu. 8gib
ARM EC2	8	16 GiB	128 GB	GENERAL	reserved. arm.8cpu. 16gib
Linux	2	4 GiB	64 GB	GENERAL	reserved. x86-64.2c pu.4gib
Linux	4	8 GiB	128 GB	GENERAL	reserved. x86-64.4c pu.8gib
Linux	8	16 GiB	128 GB	GENERAL	reserved. x86-64.8c pu.16gib

Environme nt type	vCPUs	Memory	Disk space	Machine type	Compute instance type
Linux	16	32 GiB	256 GB	GENERAL	reserved. x86-64.16 cpu.32gib
Linux	36	72 GiB	256 GB	GENERAL	reserved. x86-64.36 cpu.72gib
Linux	48	96 GiB	512 GB	GENERAL	reserved. x86-64.48 cpu.96gib
Linux	72	144 GiB	824 GB	GENERAL	reserved. x86-64.72 cpu.144gi b
Linux	96	192 GiB	824 GB	GENERAL	reserved. x86-64.96 cpu.192gi b
Linux	72	144 GiB	824 GB (SSD)	NVME	reserved. x86-64.72 cpu.144gi b.nvme
Linux EC2	2	4 GiB	64 GB	GENERAL	reserved. x86-64.2c pu.4gib

Environme nt type	vCPUs	Memory	Disk space	Machine type	Compute instance type
Linux EC2	4	8 GiB	128 GB	GENERAL	reserved. x86-64.4c pu.8gib
Linux EC2	8	16 GiB	128 GB	GENERAL	reserved. x86-64.8c pu.16gib
Linux GPU	4	16 GiB	235 GB (SSD)	NVME	reserved. gpu.4cpu. 16gib.nvm e
Linux GPU	8	32 GiB	435 GB (SSD)	NVME	reserved. gpu.8cpu. 32gib.nvm e
Linux GPU	16	64 GiB	585 GB (SSD)	NVME	reserved. gpu.16cpu .64gib.nv me
Linux GPU	48	192 GiB	3785 GB (SSD)	NVME	reserved. gpu.48cpu .192gib.n vme
macOS	8	24 GiB	128 GB	GENERAL	reserved. arm.m2.8c pu.24gib

Environme nt type	vCPUs	Memory	Disk space	Machine type	Compute instance type
macOS	12	32 GiB	256 GB	GENERAL	reserved. arm.m2.12 cpu.32gib
Windows	2	4 GiB	64 GB	GENERAL	reserved. x86-64.2c pu.4gib
Windows	4	8 GiB	128 GB	GENERAL	reserved. x86-64.4c pu.8gib
Windows	8	16 GiB	128 GB	GENERAL	reserved. x86-64.8c pu.16gib
Windows	16	32 GiB	256 GB	GENERAL	reserved. x86-64.16 cpu.32gib
Windows	36	72 GiB	256 GB	GENERAL	reserved. x86-64.36 cpu.72gib
Windows	48	96 GiB	512 GB	GENERAL	reserved. x86-64.48 cpu.96gib

Environme nt type	vCPUs	Memory	Disk space	Machine type	Compute instance type
Windows	72	144 GiB	824 GB	GENERAL	reserved. x86-64.72 cpu.144gi b
Windows	96	192 GiB	824 GB	GENERAL	reserved. x86-64.96 cpu.192gi b
Windows EC2	4	8 GiB	128 GB	GENERAL	reserved. x86-64.4c pu.8gib
Windows EC2	8	16 GiB	128 GB	GENERAL	reserved. x86-64.8c pu.16gib

For more information on the pricing identifier, see https://aws.amazon.com/codebuild/pricing/.

Europe (Frankfurt)

Environme nt type	vCPUs	Memory	Disk space	Machine type	Compute instance type
ARM	2	4 GiB	64 GB	GENERAL	reserved. arm.2cpu. 4gib
ARM	4	8 GiB	128 GB	GENERAL	reserved. arm.4cpu. 8gib

Environme nt type	vCPUs	Memory	Disk space	Machine type	Compute instance type
ARM	8	16 GiB	128 GB	GENERAL	reserved. arm.8cpu. 16gib
ARM	16	32 GiB	256 GB	GENERAL	reserved. arm.16cpu .32gib
ARM	32	64 GiB	256 GB	GENERAL	reserved. arm.32cpu .64gib
ARM	48	96 GiB	512 GB	GENERAL	reserved. arm.48cpu .96gib
ARM	64	128 GiB	824 GB	GENERAL	reserved. arm.64cpu .128gib
ARM EC2	2	4 GiB	64 GB	GENERAL	reserved. arm.2cpu. 4gib
ARM EC2	4	8 GiB	128 GB	GENERAL	reserved. arm.4cpu. 8gib
ARM EC2	8	16 GiB	128 GB	GENERAL	reserved. arm.8cpu. 16gib

Environme nt type	vCPUs	Memory	Disk space	Machine type	Compute instance type
Linux	2	4 GiB	64 GB	GENERAL	reserved. x86-64.2c pu.4gib
Linux	4	8 GiB	128 GB	GENERAL	reserved. x86-64.4c pu.8gib
Linux	8	16 GiB	128 GB	GENERAL	reserved. x86-64.8c pu.16gib
Linux	16	32 GiB	256 GB	GENERAL	reserved. x86-64.16 cpu.32gib
Linux	36	72 GiB	256 GB	GENERAL	reserved. x86-64.36 cpu.72gib
Linux	48	96 GiB	512 GB	GENERAL	reserved. x86-64.48 cpu.96gib
Linux	72	144 GiB	824 GB	GENERAL	reserved. x86-64.72 cpu.144gi b

Environme nt type	vCPUs	Memory	Disk space	Machine type	Compute instance type
Linux	96	192 GiB	824 GB	GENERAL	reserved. x86-64.96 cpu.192gi b
Linux	72	144 GiB	824 GB (SSD)	NVME	reserved. x86-64.72 cpu.144gi b.nvme
Linux EC2	2	4 GiB	64 GB	GENERAL	reserved. x86-64.2c pu.4gib
Linux EC2	4	8 GiB	128 GB	GENERAL	reserved. x86-64.4c pu.8gib
Linux EC2	8	16 GiB	128 GB	GENERAL	reserved. x86-64.8c pu.16gib
Linux GPU	4	16 GiB	235 GB (SSD)	NVME	reserved. gpu.4cpu. 16gib.nvm e
Linux GPU	8	32 GiB	435 GB (SSD)	NVME	reserved. gpu.8cpu. 32gib.nvm e

Environme nt type	vCPUs	Memory	Disk space	Machine type	Compute instance type
Linux GPU	16	64 GiB	585 GB (SSD)	NVME	reserved. gpu.16cpu .64gib.nv me
Linux GPU	32	128 GiB	885 GB (SSD)	NVME	reserved. gpu.32cpu .128gib.n vme
Linux GPU	48	192 GiB	3785 GB (SSD)	NVME	reserved. gpu.48cpu .192gib.n vme
macOS	8	24 GiB	128 GB	GENERAL	reserved. arm.m2.8c pu.24gib
Windows	2	4 GiB	64 GB	GENERAL	reserved. x86-64.2c pu.4gib
Windows	4	8 GiB	128 GB	GENERAL	reserved. x86-64.4c pu.8gib
Windows	8	16 GiB	128 GB	GENERAL	reserved. x86-64.8c pu.16gib

Environme nt type	vCPUs	Memory	Disk space	Machine type	Compute instance type
Windows	16	32 GiB	256 GB	GENERAL	reserved. x86-64.16 cpu.32gib
Windows	36	72 GiB	256 GB	GENERAL	reserved. x86-64.36 cpu.72gib
Windows	48	96 GiB	512 GB	GENERAL	reserved. x86-64.48 cpu.96gib
Windows	72	144 GiB	824 GB	GENERAL	reserved. x86-64.72 cpu.144gi b
Windows	96	192 GiB	824 GB	GENERAL	reserved. x86-64.96 cpu.192gi b
Windows EC2	4	8 GiB	128 GB	GENERAL	reserved. x86-64.4c pu.8gib
Windows EC2	8	16 GiB	128 GB	GENERAL	reserved. x86-64.8c pu.16gib

For more information on the pricing identifier, see https://aws.amazon.com/codebuild/pricing/. Europe (Ireland)

Environme nt type	vCPUs	Memory	Disk space	Machine type	Compute instance type
ARM	2	4 GiB	64 GB	GENERAL	reserved. arm.2cpu. 4gib
ARM	4	8 GiB	128 GB	GENERAL	reserved. arm.4cpu. 8gib
ARM	8	16 GiB	128 GB	GENERAL	reserved. arm.8cpu. 16gib
ARM	16	32 GiB	256 GB	GENERAL	reserved. arm.16cpu .32gib
ARM	32	64 GiB	256 GB	GENERAL	reserved. arm.32cpu .64gib
ARM	48	96 GiB	512 GB	GENERAL	reserved. arm.48cpu .96gib
ARM	64	128 GiB	824 GB	GENERAL	reserved. arm.64cpu .128gib
ARM EC2	2	4 GiB	64 GB	GENERAL	reserved. arm.2cpu. 4gib

Environme nt type	vCPUs	Memory	Disk space	Machine type	Compute instance type
ARM EC2	4	8 GiB	128 GB	GENERAL	reserved. arm.4cpu. 8gib
ARM EC2	8	16 GiB	128 GB	GENERAL	reserved. arm.8cpu. 16gib
Linux	2	4 GiB	64 GB	GENERAL	reserved. x86-64.2c pu.4gib
Linux	4	8 GiB	128 GB	GENERAL	reserved. x86-64.4c pu.8gib
Linux	8	16 GiB	128 GB	GENERAL	reserved. x86-64.8c pu.16gib
Linux	16	32 GiB	256 GB	GENERAL	reserved. x86-64.16 cpu.32gib
Linux	36	72 GiB	256 GB	GENERAL	reserved. x86-64.36 cpu.72gib
Linux	48	96 GiB	512 GB	GENERAL	reserved. x86-64.48 cpu.96gib

Environme nt type	vCPUs	Memory	Disk space	Machine type	Compute instance type
Linux	72	144 GiB	824 GB	GENERAL	reserved. x86-64.72 cpu.144gi b
Linux	96	192 GiB	824 GB	GENERAL	reserved. x86-64.96 cpu.192gi b
Linux	48	96 GiB	824 GB (SSD)	NVME	reserved. x86-64.48 cpu.96gib .nvme
Linux	72	144 GiB	824 GB (SSD)	NVME	reserved. x86-64.72 cpu.144gi b.nvme
Linux EC2	2	4 GiB	64 GB	GENERAL	reserved. x86-64.2c pu.4gib
Linux EC2	4	8 GiB	128 GB	GENERAL	reserved. x86-64.4c pu.8gib
Linux EC2	8	16 GiB	128 GB	GENERAL	reserved. x86-64.8c pu.16gib

Environme nt type	vCPUs	Memory	Disk space	Machine type	Compute instance type
Linux GPU	4	16 GiB	235 GB (SSD)	NVME	reserved. gpu.4cpu. 16gib.nvm e
Linux GPU	8	32 GiB	435 GB (SSD)	NVME	reserved. gpu.8cpu. 32gib.nvm e
Linux GPU	16	64 GiB	585 GB (SSD)	NVME	reserved. gpu.16cpu .64gib.nv me
Linux GPU	32	128 GiB	885 GB (SSD)	NVME	reserved. gpu.32cpu .128gib.n vme
Linux GPU	48	192 GiB	3785 GB (SSD)	NVME	reserved. gpu.48cpu .192gib.n vme
Windows	2	4 GiB	64 GB	GENERAL	reserved. x86-64.2c pu.4gib
Windows	4	8 GiB	128 GB	GENERAL	reserved. x86-64.4c pu.8gib

Environme nt type	vCPUs	Memory	Disk space	Machine type	Compute instance type
Windows	8	16 GiB	128 GB	GENERAL	reserved. x86-64.8c pu.16gib
Windows	16	32 GiB	256 GB	GENERAL	reserved. x86-64.16 cpu.32gib
Windows	36	72 GiB	256 GB	GENERAL	reserved. x86-64.36 cpu.72gib
Windows	48	96 GiB	512 GB	GENERAL	reserved. x86-64.48 cpu.96gib
Windows	72	144 GiB	824 GB	GENERAL	reserved. x86-64.72 cpu.144gi b
Windows	96	192 GiB	824 GB	GENERAL	reserved. x86-64.96 cpu.192gi b
Windows EC2	4	8 GiB	128 GB	GENERAL	reserved. x86-64.4c pu.8gib

Environme nt type	vCPUs	Memory	Disk space	Machine type	Compute instance type
Windows EC2	8	16 GiB	128 GB	GENERAL	reserved. x86-64.8c pu.16gib

For more information on the pricing identifier, see https://aws.amazon.com/codebuild/pricing/.

South America (São Paulo)

Environme nt type	vCPUs	Memory	Disk space	Machine type	Compute instance type
ARM	2	4 GiB	64 GB	GENERAL	reserved. arm.2cpu. 4gib
ARM	4	8 GiB	128 GB	GENERAL	reserved. arm.4cpu. 8gib
ARM	8	16 GiB	128 GB	GENERAL	reserved. arm.8cpu. 16gib
ARM	16	32 GiB	256 GB	GENERAL	reserved. arm.16cpu .32gib
ARM	32	64 GiB	256 GB	GENERAL	reserved. arm.32cpu .64gib

Environme nt type	vCPUs	Memory	Disk space	Machine type	Compute instance type
ARM	48	96 GiB	512 GB	GENERAL	reserved. arm.48cpu .96gib
ARM EC2	2	4 GiB	64 GB	GENERAL	reserved. arm.2cpu. 4gib
ARM EC2	4	8 GiB	128 GB	GENERAL	reserved. arm.4cpu. 8gib
ARM EC2	8	16 GiB	128 GB	GENERAL	reserved. arm.8cpu. 16gib
Linux	2	4 GiB	64 GB	GENERAL	reserved. x86-64.2c pu.4gib
Linux	4	8 GiB	128 GB	GENERAL	reserved. x86-64.4c pu.8gib
Linux	8	16 GiB	128 GB	GENERAL	reserved. x86-64.8c pu.16gib
Linux	16	32 GiB	256 GB	GENERAL	reserved. x86-64.16 cpu.32gib

Environme nt type	vCPUs	Memory	Disk space	Machine type	Compute instance type
Linux	36	72 GiB	256 GB	GENERAL	reserved. x86-64.36 cpu.72gib
Linux	48	96 GiB	512 GB	GENERAL	reserved. x86-64.48 cpu.96gib
Linux	72	144 GiB	824 GB	GENERAL	reserved. x86-64.72 cpu.144gi b
Linux	72	144 GiB	824 GB (SSD)	NVME	reserved. x86-64.72 cpu.144gi b.nvme
Linux EC2	2	4 GiB	64 GB	GENERAL	reserved. x86-64.2c pu.4gib
Linux EC2	4	8 GiB	128 GB	GENERAL	reserved. x86-64.4c pu.8gib
Linux EC2	8	16 GiB	128 GB	GENERAL	reserved. x86-64.8c pu.16gib

Environme nt type	vCPUs	Memory	Disk space	Machine type	Compute instance type
Windows	2	4 GiB	64 GB	GENERAL	reserved. x86-64.2c pu.4gib
Windows	4	8 GiB	128 GB	GENERAL	reserved. x86-64.4c pu.8gib
Windows	8	16 GiB	128 GB	GENERAL	reserved. x86-64.8c pu.16gib
Windows	16	32 GiB	256 GB	GENERAL	reserved. x86-64.16 cpu.32gib
Windows	36	72 GiB	256 GB	GENERAL	reserved. x86-64.36 cpu.72gib
Windows	48	96 GiB	512 GB	GENERAL	reserved. x86-64.48 cpu.96gib
Windows	72	144 GiB	824 GB	GENERAL	reserved. x86-64.72 cpu.144gi b

Environme nt type	vCPUs	Memory	Disk space	Machine type	Compute instance type
Windows EC2	4	8 GiB	128 GB	GENERAL	reserved. x86-64.4c pu.8gib
Windows EC2	8	16 GiB	128 GB	GENERAL	reserved. x86-64.8c pu.16gib

For more information on the pricing identifier, see https://aws.amazon.com/codebuild/pricing/.

To choose a compute type:

- In the CodeBuild console, in the **Compute fleet configuration** page, choose one of the options from **vCPUs**, **Memory**, and **Disk**. For more information, see Create a reserved capacity fleet.
- For the AWS CLI, run the create-fleet or update-fleet command, specifying the value of computeType to ATTRIBUTE_BASED_COMPUTE. For more information, see create-fleet or update-fleet.
- For the AWS SDKs, call the equivalent of the CreateFleet or UpdateFleet operation for your target programming language, specifying the value of computeType to ATTRIBUTE_BASED_COMPUTE. For more information, see the AWS SDKs and tools reference.



For the AWS CLI and AWS SDKs, you can still use computeType inputs such as BUILD_GENERAL1_SMALL, to choose the compute types instead of ATTRIBUTE_BASED_COMPUTE. For more information, see About on-demand environment types.

Supported instance families

AWS CodeBuild supports the following instances for reserved capacity fleets.:

General purpose: M5 | M5a | M5ad | M5d | M5dn | M5n | M5zn | M6a | M6g | M6gd | M6i | M6id | M6idn | M6in | M7a | M7g | M7gd | M7i | M7i-flex | M8g | T3 | T3a | T4g

- Compute optimized: C5 | C5a | C5ad | C5d | C5n | C6a | C6g | C6gd | C6gn | C6i | C6id | C6in | C7a | C7g | C7gd | C7gn | C7i | C7i-flex | C8g
- Memory optimized: R5 | R5a | R5ad | R5b | R5d | R5dn | R5n | R6a | R6g | R6gd | R6i | R6idn | R6in | R6id | R7a | R7g | R7gd | R7i | R7iz | R8g | U-3tb1 | U-6tb1 | U-9tb1 | U-12tb1 | U-18tb1 | U-24tb1 | U7i-6tb | U7i-8tb | U7i-12tb | U7in-16tb | U7in-24tb | U7in-32tb | X1 | X1e | X2gd | X2idn | X2iedn | X2iezn | X8g | z1d
- Storage optimized: D3 | D3en | I3 | I3en | I4g | I4i | I7ie | I8g | Im4gn | Is4gen
- Accelerated computing: DL1 | DL2q | F1 | F2 | G4ad | G4dn | G5 | G5g | G6 | G6e | Gr6 | Inf1 | Inf2 | P3 | P3dn | P4d | P5 | P5e | P5en | Trn1 | Trn1n | Trn2 | VT1
- High-performance computing: Hpc6a | Hpc6id | Hpc7a | Hpc7g
- Previous generation: A1

To create a reserved capacity fleet with a specific instance type:

- In the CodeBuild console, in the Compute fleet configuration page, navigate to the Capacity configuration section. In Compute selection mode, select Manual input and in Compute instance type choose one of the instance types from the drop-down menu. For more information, see Create a reserved capacity fleet.
- For the AWS CLI, run the create-fleet or update-fleet command, specifying the value of computeType to CUSTOM_INSTANCE_TYPE and the ComputeConfiguration instanceType to the specified instance type. For more information, see <u>create-fleet</u> or <u>update-fleet</u>.
- For the AWS SDKs, call the equivalent of the CreateFleet or UpdateFleet operation
 for your target programming language, specifying the value of computeType to
 CUSTOM_INSTANCE_TYPE and the ComputeConfiguration instanceType to the specified
 instance type. For more information, see the AWS SDKs and tools reference.

About on-demand environment types

AWS CodeBuild provides build environments with the following available memory, vCPUs, and disk space for EC2 compute mode:

Compute type	Environment computeTy pe value	Environment type value	Memory	vCPUs	Disk space
ARM Small ¹	BUILD_GEN ERAL1_SMA	ARM_CONTA INER	4 GiB	2	64 GB
	LL	ARM_EC2			
ARM Medium	BUILD_GEN ERAL1_MED	ARM_CONTA INER	8 GiB	4	128 GB
	IUM	ARM_EC2			
ARM Large ¹	BUILD_GEN ERAL1_LAR GE	ARM_CONTA INER	16 GiB	8	128 GB
	GE	ARM_EC2			
ARM XLarge ¹	BUILD_GEN ERAL1_XLA RGE	ARM_CONTA INER	64 GiB	32	256 GB
ARM 2XLarge	BUILD_GEN ERAL1_2XL ARGE	ARM_CONTA INER	96 GiB	48	824 GB
Linux Small ¹	BUILD_GEN ERAL1_SMA LL	LINUX_CON TAINER LINUX_EC2	4 GiB	2	64 GB
Linux Medium	BUILD_GEN ERAL1_MED IUM	LINUX_CON TAINER	8 GiB	4	128 GB
		LINUX_EC2	46.05		400.55
Linux Large ¹	BUILD_GEN ERAL1_LAR GE	LINUX_CON TAINER	16 GiB	8	128 GB

Compute type	Environment computeTy pe value	Environment type value	Memory	vCPUs	Disk space
		LINUX_EC2			
Linux XLarge	BUILD_GEN ERAL1_XLA RGE	LINUX_CON TAINER	72 GiB	36	256 GB
Linux 2XLarge	BUILD_GEN ERAL1_2XL ARGE	LINUX_CON TAINER	144 GiB	72	824 GB (SSD)
Linux GPU Sma	BUILD_GEN ERAL1_SMA LL	LINUX_GPU _CONTAINE R	16 GiB	4	235 GB (SSD)
Linux GPU Larg	BUILD_GEN ERAL1_LAR GE	LINUX_GPU _CONTAINE R	255 GiB	32	50 GB
Windows Mediu	BUILD_GEN ERAL1_MED IUM	WINDOWS_S ERVER_201 9_CONTAIN ER WINDOWS_S ERVER_202 2_CONTAIN ER WINDOWS_E C2	8 GiB	4	128 GB

Compute type	Environment computeTy pe value	Environment type value	Memory	vCPUs	Disk space
Windows Large	BUILD_GEN ERAL1_LAR GE	WINDOWS_S ERVER_201 9_CONTAIN ER	16 GiB	8	128 GB
		WINDOWS_S ERVER_202 2_CONTAIN ER WINDOWS_E C2			
Windows XLarg	BUILD_GEN ERAL1_XLA RGE	WINDOWS_S ERVER_202 2_CONTAIN ER	72 GiB	36	256 GB
Windows 2XLar	BUILD_GEN ERAL1_2XL ARGE	WINDOWS_S ERVER_202 2_CONTAIN ER	144 GiB	72	824 GB

The latest version of this image type is cached. If you specify a more specific version, then CodeBuild provisions that version instead of the cached version. This can result in longer build times. For example, to benefit from caching, specify aws/codebuild/amazonlinux-x86_64-standard:5.0 instead of a more granular version, such as aws/codebuild/amazonlinux-x86_64-standard:5.0-1.0.0.

AWS CodeBuild provides build environments with the following available memory and disk space for AWS Lambda compute mode:

Compute type	Environment computeType value	Environment type value	Memory	Disk space
ARM Lambda 1GB	BUILD_LAM BDA_1GB	ARM_LAMBD A_CONTAIN ER	1 GiB	10 GB
ARM Lambda 2GB	BUILD_LAM BDA_2GB	ARM_LAMBD A_CONTAIN ER	2 GiB	10 GB
ARM Lambda 4GB	BUILD_LAM BDA_4GB	ARM_LAMBD A_CONTAIN ER	4 GiB	10 GB
ARM Lambda 8GB	BUILD_LAM BDA_8GB	ARM_LAMBD A_CONTAIN ER	8 GiB	10 GB
ARM Lambda 10GI	BUILD_LAM BDA_10GB	ARM_LAMBD A_CONTAIN ER	10 GiB	10 GB
Linux Lambda 1GB	BUILD_LAM BDA_1GB	LINUX_LAM BDA_CONTA INER	1 GiB	10 GB
Linux Lambda 2GB	BUILD_LAM BDA_2GB	LINUX_LAM BDA_CONTA INER	2 GiB	10 GB
Linux Lambda 4GB	BUILD_LAM BDA_4GB	LINUX_LAM BDA_CONTA INER	4 GiB	10 GB

Compute type	Environment computeType value	Environment type value	Memory	Disk space
Linux Lambda 8GB	BUILD_LAM BDA_8GB	LINUX_LAM BDA_CONTA INER	8 GiB	10 GB
Linux Lambda 10G	BUILD_LAM BDA_10GB	LINUX_LAM BDA_CONTA INER	10 GiB	10 GB

When using other environment types, it is recommended that you use a cached image to reduce build times.

The disk space listed for each build environment is available only in the directory specified by the CODEBUILD_SRC_DIR environment variable.

To choose a compute type:

- In the CodeBuild console, in the Create build project wizard or Edit Build Project page, in
 Environment expand Additional configuration, and then choose one of the options from
 Compute type. For more information, see Create a build project (console) or Change a build
 project's settings (console).
- For the AWS CLI, run the create-project or update-project command, specifying the computeType value of the environment object. For more information, see Create a build project (AWS CLI) or Change a build project's settings (AWS CLI).
- For the AWS SDKs, call the equivalent of the CreateProject or UpdateProject operation for your target programming language, specifying the equivalent of computeType value of the environment object. For more information, see the AWS SDKs and tools reference.

Some environment and compute types have Region availability limitations:

- The compute type Linux GPU Small (LINUX_GPU_CONTAINER) is only available in these Regions:
 - US East (N. Virginia)
 - US West (Oregon)

- Asia Pacific (Tokyo)
- · Canada (Central)
- Europe (Frankfurt)
- Europe (Ireland)
- Europe (London)
- The compute type Linux GPU Large (LINUX_GPU_CONTAINER) is only available in these Regions:
 - US East (Ohio)
 - US East (N. Virginia)
 - US West (Oregon)
 - Asia Pacific (Seoul)
 - Asia Pacific (Sydney)
 - Asia Pacific (Tokyo)
 - · Canada (Central)
 - · China (Beijing)
 - China (Ningxia)
 - Europe (Frankfurt)
 - Europe (Ireland)
 - Europe (London)
- The compute type BUILD_GENERAL1_2XLARGE is only available in these Regions:
 - US East (Ohio)
 - US East (N. Virginia)
 - US West (N. California)
 - US West (Oregon)
 - Asia Pacific (Hyderabad)
 - Asia Pacific (Hong Kong)
 - Asia Pacific (Jakarta)
 - Asia Pacific (Melbourne)
 - Asia Pacific (Mumbai)
 - Asia Pacific (Seoul)

- Asia Pacific (Sydney)
- Asia Pacific (Tokyo)
- · Canada (Central)
- · China (Beijing)
- China (Ningxia)
- Europe (Frankfurt)
- Europe (Ireland)
- Europe (London)
- Europe (Paris)
- Europe (Spain)
- Europe (Stockholm)
- Europe (Zurich)
- Israel (Tel Aviv)
- Middle East (Bahrain)
- Middle East (UAE)
- South America (São Paulo)
- The environment type ARM_CONTAINER is only available in these Regions:
 - US East (Ohio)
 - US East (N. Virginia)
 - US West (N. California)
 - US West (Oregon)
 - Asia Pacific (Hong Kong)
 - Asia Pacific (Jakarta)
 - Asia Pacific (Hyderabad)
 - Asia Pacific (Mumbai)
 - Asia Pacific (Osaka)
 - Asia Pacific (Seoul)
 - Asia Pacific (Singapore)
 - Asia Pacific (Sydney)

- Canada (Central)
- China (Beijing)
- China (Ningxia)
- Europe (Frankfurt)
- Europe (Ireland)
- Europe (London)
- Europe (Milan)
- Europe (Paris)
- Europe (Spain)
- Europe (Stockholm)
- Israel (Tel Aviv)
- Middle East (Bahrain)
- Middle East (UAE)
- South America (São Paulo)
- The environment type WINDOWS_SERVER_2022_CONTAINER is only available in these Regions:
 - US East (Ohio)
 - US East (N. Virginia)
 - US West (Oregon)
 - Asia Pacific (Sydney)
 - Asia Pacific (Tokyo)
 - Europe (Frankfurt)
 - Europe (Ireland)
 - South America (São Paulo)
- The environment type LINUX_EC2 (BUILD_GENERAL1_SMALL, BUILD_GENERAL1_MEDIUM, BUILD_GENERAL1_LARGE) is only available in these Regions:
 - US East (Ohio)
 - US East (N. Virginia)
 - US West (N. California)
 - US West (Oregon)

- · Asia Pacific (Hong Kong)
- Asia Pacific (Jakarta)
- Asia Pacific (Melbourne)
- Europe (Zurich)
- Asia Pacific (Hyderabad)
- Asia Pacific (Mumbai)
- Asia Pacific (Osaka)
- Asia Pacific (Seoul)
- Asia Pacific (Singapore)
- Asia Pacific (Sydney)
- Asia Pacific (Tokyo)
- Canada (Central)
- · China (Beijing)
- China (Ningxia)
- Europe (Frankfurt)
- Europe (Ireland)
- Europe (London)
- Europe (Milan)
- Europe (Paris)
- Europe (Spain)
- Europe (Stockholm)
- Israel (Tel Aviv)
- Middle East (Bahrain)
- Middle East (UAE)
- South America (São Paulo)
- AWS GovCloud (US-West)
- AWS GovCloud (US-East)
- The environment type ARM_EC2 (BUILD_GENERAL1_SMALL, BUILD_GENERAL1_MEDIUM, BUILD_GENERAL1_LARGE) is only available in these Regions:

- US East (N. Virginia)
- US West (N. California)
- US West (Oregon)
- Asia Pacific (Hong Kong)
- Asia Pacific (Jakarta)
- Europe (Zurich)
- Asia Pacific (Hyderabad)
- Asia Pacific (Mumbai)
- Asia Pacific (Osaka)
- Asia Pacific (Seoul)
- Asia Pacific (Singapore)
- Asia Pacific (Sydney)
- Asia Pacific (Tokyo)
- · Canada (Central)
- · China (Beijing)
- China (Ningxia)
- Europe (Frankfurt)
- Europe (Ireland)
- Europe (London)
- Europe (Milan)
- Europe (Paris)
- Europe (Spain)
- Europe (Stockholm)
- Israel (Tel Aviv)
- Middle East (Bahrain)
- South America (São Paulo)
- AWS GovCloud (US-West)
- AWS GovCloud (US-East)

- US East (Ohio)
- US East (N. Virginia)
- US West (Oregon)
- Asia Pacific (Sydney)
- Asia Pacific (Tokyo)
- Europe (Frankfurt)
- Europe (Ireland)
- South America (São Paulo)
- The compute mode AWS Lambda (ARM_LAMBDA_CONTAINER and LINUX_LAMBDA_CONTAINER)
 is only available in these Regions:
 - US East (N. Virginia)
 - US East (Ohio)
 - US West (Oregon)
 - Asia Pacific (Mumbai)
 - Asia Pacific (Singapore)
 - Asia Pacific (Sydney)
 - Asia Pacific (Tokyo)
 - Europe (Frankfurt)
 - Europe (Ireland)
 - South America (São Paulo)
- The compute mode MAC_ARM is only available in these Regions:
 - US East (N. Virginia)
 - US East (Ohio)
 - US West (Oregon)
 - Asia Pacific (Sydney)
 - Europe (Frankfurt)

For the compute type BUILD_GENERAL1_2XLARGE, Docker images up to 100 GB uncompressed are supported.



Note

For custom build environment images, CodeBuild supports Docker images up to 50 GB uncompressed in Linux and Windows, regardless of the compute type. To check your build image's size, use Docker to run the docker images REPOSITORY: TAG command.

You can use Amazon EFS to access more space in your build container. For more information, see Amazon Elastic File System sample for AWS CodeBuild. If you want to manipulate container disk space during a build, then the build must run in privileged mode.



Note

By default, Docker daemon is enabled for non-VPC builds. If you would like to use Docker containers for VPC builds, see Runtime Privilege and Linux Capabilities on the Docker Docs website and enable privileged mode. Also, Windows does not support privileged mode.

Shells and commands in build environments

You provide a set of commands for AWS CodeBuild to run in a build environment during the lifecycle of a build (for example, installing build dependencies and testing and compiling your source code). There are several ways to specify these commands:

- Create a build specification file and include it with your source code. In this file, specify the commands you want to run in each phase of the build lifecycle. For more information, see the Build specification reference for CodeBuild.
- Use the CodeBuild console to create a build project. In Insert build commands, for Build **commands**, enter the commands you want to run in the build phase. For more information, see Create a build project (console).
- Use the CodeBuild console to change the settings of a build project. In Insert build commands, for **Build commands**, enter the commands you want to run in the build phase. For more information, see Change a build project's settings (console).
- Use the AWS CLI or AWS SDKs to create a build project or change the settings of a build project. Reference the source code that contains a buildspec file with your commands, or specify a single string that includes the contents of an equivalent buildspec file. For more information, see Create a build project or Change build project settings.

• Use the AWS CLI or AWS SDKs to start a build, specifying a buildspec file or a single string that includes the contents of an equivalent buildspec file. For more information, see the description for the buildspecOverride value in Run builds manually.

You can specify any Shell Command Language (sh) command. In buildspec version 0.1, CodeBuild runs each Shell command in a separate instance in the build environment. This means that each command runs in isolation from all other commands. Therefore, by default, you cannot run a single command that relies on the state of any previous commands (for example, changing directories or setting environment variables). To get around this limitation, we recommend that you use version 0.2, which solves this issue. If you must use version 0.1, we recommend the following approaches:

- Include a shell script in your source code that contains the commands you want to run in a single instance of the default shell. For example, you could include a file named my-script.sh in your source code that contains commands such as cd MyDir; mkdir -p mySubDir; cd mySubDir; pwd;. Then, in your buildspec file, specify the command ./my-script.sh.
- In your buildspec file or on the **Build commands** setting for the build phase only, enter a single command that includes all of the commands you want to run in a single instance of the default shell (for example, cd MyDir && mkdir -p mySubDir && cd mySubDir && pwd).

If CodeBuild encounters an error, the error might be more difficult to troubleshoot compared to running a single command in its own instance of the default shell.

Commands that are run in a Windows Server Core image use the PowerShell shell.

Environment variables in build environments

AWS CodeBuild provides several environment variables that you can use in your build commands:

AWS_DEFAULT_REGION

The AWS Region where the build is running (for example, us-east-1). This environment variable is used primarily by the AWS CLI.

AWS_REGION

The AWS Region where the build is running (for example, us-east-1). This environment variable is used primarily by the AWS SDKs.

CODEBUILD_BATCH_BUILD_IDENTIFIER

The identifier of the build in a batch build. This is specified in the batch buildspec. For more information, see the section called "Batch buildspec reference".

CODEBUILD_BUILD_ARN

The Amazon Resource Name (ARN) of the build (for example, arn:aws:codebuild:region-ID:account-ID:build/codebuild-demo-project:b1e6661e-e4f2-4156-9ab9-82a19EXAMPLE).

CODEBUILD_BUILD_ID

The CodeBuild ID of the build (for example, codebuild-demo-project:b1e6661e-e4f2-4156-9ab9-82a19EXAMPLE).

CODEBUILD_BUILD_IMAGE

The CodeBuild build image identifier (for example, aws/codebuild/standard:2.0).

CODEBUILD_BUILD_NUMBER

The current build number for the project.

CODEBUILD_BUILD_SUCCEEDING

Whether the current build is succeeding. Set to 0 if the build is failing, or 1 if the build is succeeding.

CODEBUILD_INITIATOR

The entity that started the build. If CodePipeline started the build, this is the pipeline's name (for example, codepipeline/my-demo-pipeline). If an user started the build, this is the user's name (for example, MyUserName). If the Jenkins plugin for CodeBuild started the build, this is the string CodeBuild-Jenkins-Plugin.

CODEBUILD_KMS_KEY_ID

The identifier of the AWS KMS key that CodeBuild is using to encrypt the build output artifact (for example, arn: aws:kms:region-ID:account-ID:key/key-ID or alias/key-alias).

CODEBUILD_PROJECT_ARN

The Amazon Resource Name (ARN) of the project (for example, arn:aws:codebuild:region-ID:account-ID:project/project-name).

CODEBUILD_PUBLIC_BUILD_URL

The URL of the build results for this build on the public builds website. This variable is only set if the build project has public builds enabled. For more information, see <u>Get public build project URLs</u>.

CODEBUILD_RESOLVED_SOURCE_VERSION

The version identifier of a build's source code. The contents depends on the source code repository:

CodeCommit, GitHub, GitHub Enterprise Server, and Bitbucket

This variable contains the commit ID.

CodePipeline

This variable contains the source revision provided by CodePipeline.

If CodePipeline is not able to resolve the source revision, such as when the source is an Amazon S3 bucket that does not have versioning enabled, this environment variable is not set.

Amazon S3

This variable is not set.

When applicable, the CODEBUILD_RESOLVED_SOURCE_VERSION variable is only available after the DOWNLOAD_SOURCE phase.

CODEBUILD_SOURCE_REPO_URL

The URL to the input artifact or source code repository. For Amazon S3, this is s3:// followed by the bucket name and path to the input artifact. For CodeCommit and GitHub, this is the repository's clone URL. If a build originates from CodePipeline, this environment variable may be empty.

For secondary sources, the environment variable for the secondary source repository URL is CODEBUILD_SOURCE_REPO_URL_<sourceIdentifier>, where <sourceIdentifier> is the source identifier you create.

CODEBUILD_SOURCE_VERSION

The value's format depends on the source repository.

- For Amazon S3, it is the version ID associated with the input artifact.
- For CodeCommit, it is the commit ID or branch name associated with the version of the source code to be built.

 For GitHub, GitHub Enterprise Server, and Bitbucket it is the commit ID, branch name, or tag name associated with the version of the source code to be built.



Note

For a GitHub or GitHub Enterprise Server build that is triggered by a webhook pull request event, it is pr/pull-request-number.

For secondary sources, the environment variable for the secondary source version is CODEBUILD_SOURCE_VERSION_<sourceIdentifier>, where <sourceIdentifier> is the source identifier you create. For more information, see Multiple input sources and output artifacts sample.

CODEBUILD_SRC_DIR

The directory path that CodeBuild uses for the build (for example, /tmp/src123456789/src).

For secondary sources, the environment variable for the secondary source directory path is CODEBUILD_SRC_DIR_<sourceIdentifier>, where <sourceIdentifier> is the source identifier you create. For more information, see Multiple input sources and output artifacts sample.

CODEBUILD_START_TIME

The start time of the build specified as a Unix timestamp in milliseconds.

CODEBUILD_WEBHOOK_ACTOR_ACCOUNT_ID

The account ID of the user that triggered the webhook event.

CODEBUILD_WEBHOOK_BASE_REF

The base reference name of the webhook event that triggers the current build. For a pull request, this is the branch reference.

CODEBUILD WEBHOOK EVENT

The webhook event that triggers the current build.

CODEBUILD_WEBHOOK_MERGE_COMMIT

The identifier of the merge commit used for the build. This variable is set when a Bitbucket pull request is merged with the squash strategy and the pull request branch is closed. In this case, the original pull request commit no longer exists, so this environment variable contains the identifier of the squashed merge commit.

CODEBUILD_WEBHOOK_PREV_COMMIT

The ID of the most recent commit before the webhook push event that triggers the current build.

CODEBUILD_WEBHOOK_HEAD_REF

The head reference name of the webhook event that triggers the current build. It can be a branch reference or a tag reference.

CODEBUILD_WEBHOOK_TRIGGER

Shows the webhook event that triggered the build. This variable is available only for builds triggered by a webhook. The value is parsed from the payload sent to CodeBuild by GitHub, GitHub Enterprise Server, or Bitbucket. The value's format depends on what type of event triggered the build.

- For builds triggered by a pull request, it is pr/pull-request-number.
- For builds triggered by creating a new branch or pushing a commit to a branch, it is branch/branch-name.
- For builds triggered by a pushing a tag to a repository, it is tag/tag-name.

HOME

This environment variable is always set to /root.

AWS CodeBuild also supports a set of environment variables for self-hosted runner builds. To learn more about CodeBuild self-hosted runner, see <u>Tutorial: Configure a CodeBuild-hosted GitHub</u> Actions runner.

CODEBUILD_RUNNER_OWNER

The owner of the repository that triggers the self-hosted runner build.

CODEBUILD_RUNNER_REPO

The name of the repository that triggers the self-hosted runner build.

CODEBUILD_RUNNER_REPO_DOMAIN

The domain of the repository that triggers the self-hosted runner build. Only specified GitHub Enterprise builds.

CODEBUILD WEBHOOK LABEL

The label used to configure build overrides and the self-hosted runner during the build.

CODEBUILD_WEBHOOK_RUN_ID

The run ID of the workflow associated with the build.

CODEBUILD_WEBHOOK_JOB_ID

The job ID of the job associated with the build.

CODEBUILD_WEBHOOK_WORKFLOW_NAME

The name of the workflow associated with the build if it exists in the webhook request payload. CODEBUILD_RUNNER_WITH_BUILDSPEC

If a buildspec override is configured in the self-hosted runner request labels, this is set to true.

You can also provide build environments with your own environment variables. For more information, see the following topics:

- Use CodeBuild with CodePipeline
- Create a build project
- Change build project settings
- Run builds manually
- Buildspec reference

To list all of the available environment variables in a build environment, you can run the printenv command (for Linux-based build environment) or "Get-ChildItem Env:" (for Windows-based build environments) during a build. Except for those previously listed, environment variables that start with CODEBUILD_ are for CodeBuild internal use. They should not be used in your build commands.

Important

We strongly discourage the use of environment variables to store sensitive values, especially AWS access key IDs. Environment variables can be displayed in plain text using tools such as the CodeBuild console and the AWS CLI.

We recommend you store sensitive values in the Amazon EC2 Systems Manager Parameter Store and then retrieve them from your buildspec. To store sensitive values, see Systems Manager Parameter Store and Walkthrough: Create and test a String parameter (console) in the Amazon EC2 Systems Manager User Guide. To retrieve them, see the parameter-store mapping in Buildspec syntax.

CODEBUILD_BUILD_URL

The URL of the build results for this build.

Background tasks in build environments

You can run background tasks in build environments. To do this, in your buildspec, use the nohup command to run a command as a task in the background, even if the build process exits the shell. Use the **disown** command to forcibly stop a running background task.

Examples:

• Start a background process and wait for it to complete later:

```
nohup sleep 30 & echo $! > pidfile
wait $(cat pidfile)
```

Start a background process and do not wait for it to ever complete:

```
nohup sleep 30 & disown $!
```

Start a background process and kill it later:

```
nohup sleep 30 & echo $! > pidfile
...
kill $(cat pidfile)
```

Build projects

A *build project* includes information about how to run a build, including where to get the source code, which build environment to use, which build commands to run, and where to store the build output.

You can perform these tasks when working with build projects:

Topics

- Create a build project in AWS CodeBuild
- Create a notification rule
- Change build project settings in AWS CodeBuild
- Multiple access tokens in CodeBuild
- Delete build projects in AWS CodeBuild
- Get public build project URLs
- Share build projects
- Tag build projects
- Use runners with AWS CodeBuild
- Use webhooks with AWS CodeBuild
- View a build project's details in AWS CodeBuild
- View build project names in AWS CodeBuild

Create a build project in AWS CodeBuild

You can use the AWS CodeBuild console, AWS CLI, or AWS SDKs to create a build project.

Topics

- Prerequisites
- Create a build project (console)
- Create a build project (AWS CLI)
- Create a build project (AWS SDKs)

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Create a build project (AWS CloudFormation)

Prerequisites

Before creating a build project, answer the questions in Plan a build.

Create a build project (console)

Open the AWS CodeBuild console at https://console.aws.amazon.com/codesuite/codebuild/home.

If a CodeBuild information page is displayed, choose **Create build project**. Otherwise, on the navigation pane, expand **Build**, choose **Build projects**, and then choose **Create build project**.

Choose Create build project.

Fill in the following sections. Once complete, choose **Create build project** at the bottom of the page.

Sections:

- Project configuration
- Source
- Environment
- Buildspec
- Batch configuration
- Artifacts
- Logs

Project configuration

Project name

Enter a name for this build project. Build project names must be unique across each AWS account.

Description

Enter an optional description of the build project to help other users understand what this project is used for.

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Build badge

(Optional) Select Enable build badge to make your project's build status visible and embeddable. For more information, see Build badges sample.



Note

Build badge does not apply if your source provider is Amazon S3.

Enable concurrent build limit

(Optional) If you want to limit the number of concurrent builds for this project, perform the following steps:

- Select Restrict number of concurrent builds this project can start.
- In Concurrent build limit, enter the maximum number of concurrent builds that are allowed for this project. This limit cannot be greater than the concurrent build limit set for the account. If you try to enter a number greater than the account limit, an error message is displayed.

New builds are only started if the current number of builds is less than or equal to this limit. If the current build count meets this limit, new builds are throttled and are not run.

Additional information

(Optional) For Tags, enter the name and value of any tags that you want supporting AWS services to use. Use **Add row** to add a tag. You can add up to 50 tags.

Source

Source provider

Choose the source code provider type. Use the following lists to make selections appropriate for your source provider:



(i) Note

CodeBuild does not support Bitbucket Server.

Amazon S3

Bucket

Choose the name of the input bucket that contains the source code.

S3 object key or S3 folder

Enter the name of the ZIP file or the path to the folder that contains the source code. Enter a forward slash (/) to download everything in the S3 bucket.

Source version

Enter the version ID of the object that represents the build of your input file. For more information, seeSource version sample with AWS CodeBuild.

CodeCommit

Repository

Choose the repository you want to use.

Reference type

Choose **Branch**, **Git tag**, or **Commit ID** to specify the version of your source code. For more information, see Source version sample with AWS CodeBuild.



Note

We recommend that you choose Git branch names that don't look like commit IDs, such as 811dd1ba1aba14473856cee38308caed7190c0d or 5392f7. This helps you avoid Git checkout collisions with actual commits.

Git clone depth

Choose to create a shallow clone with a history truncated to the specified number of commits. If you want a full clone, choose Full.

Git submodules

Select **Use Git submodules** if you want to include Git submodules in your repository.

Bitbucket

Credential

Choose **Default source credential** or **Custom source credential** and follow the instructions to manage the default source credential or customize the source credential.

Connection type

Choose CodeConnections, OAuth, App password, or Personal access token to connect to CodeBuild.

Connection

Select a Bitbucket connection or a Secrets Manager secret to connect through your specified connection type.

Repository

Choose **Repository in my Bitbucket account** or **Public repository** and enter the repository URL.

Source version

Enter a branch, commit ID, tag, or reference and a commit ID. For more information, see Source version sample with AWS CodeBuild



Note

We recommend that you choose Git branch names that don't look like commit IDs, such as 811dd1ba1aba14473856cee38308caed7190c0d or 5392f7. This helps you avoid Git checkout collisions with actual commits.

Git clone depth

Choose Git clone depth to create a shallow clone with a history truncated to the specified number of commits. If you want a full clone, choose Full.

Git submodules

Select **Use Git submodules** if you want to include Git submodules in your repository.

Build status

Select **Report build statuses to source provider when your builds start and finish** if you want the status of your build's start and completion reported to your source provider.

To be able to report the build status to the source provider, the user associated with the source provider must have write access to the repo. If the user does not have write access, the build status cannot be updated. For more information, see Source provider access.

For **Status context**, enter the value to be used for the name parameter in the Bitbucket commit status. For more information, see build in the Bitbucket API documentation.

For **Target URL**, enter the value to be used for the url parameter in the Bitbucket commit status. For more information, see build in the Bitbucket API documentation.

The status of a build triggered by a webhook is always reported to the source provider. To have the status of a build that is started from the console or an API call reported to the source provider, you must select this setting.

If your project's builds are triggered by a webhook, you must push a new commit to the repo for a change to this setting to take effect.

In **Primary source webhook events**, select **Rebuild every time a code change is pushed to this repository** if you want CodeBuild to build the source code every time a code change is pushed to this repository. For more information about webhooks and filter groups, see <u>Bitbucket</u> webhook events.

GitHub

Credential

Choose **Default source credential** or **Custom source credential** and follow the instructions to manage the default source credential or customize the source credential.

Connection type

Choose GitHub App, OAuth, or Personal access token to connect to CodeBuild.

Connection

Select a GitHub connection or a Secrets Manager secret to connect through your specified connection type.

Repository

Choose Repository in my GitHub account, Public repository, or GitHub scoped webhook and enter the repository URL.

Source version

Enter a branch, commit ID, tag, or reference and a commit ID. For more information, see Source version sample with AWS CodeBuild



Note

We recommend that you choose Git branch names that don't look like commit IDs, such as 811dd1ba1aba14473856cee38308caed7190c0d or 5392f7. This helps you avoid Git checkout collisions with actual commits.

Git clone depth

Choose **Git clone depth** to create a shallow clone with a history truncated to the specified number of commits. If you want a full clone, choose Full.

Git submodules

Select **Use Git submodules** if you want to include Git submodules in your repository.

Build status

Select Report build statuses to source provider when your builds start and finish if you want the status of your build's start and completion reported to your source provider.

To be able to report the build status to the source provider, the user associated with the source provider must have write access to the repo. If the user does not have write access, the build status cannot be updated. For more information, see Source provider access.

For **Status context**, enter the value to be used for the context parameter in the GitHub commit status. For more information, see Create a commit status in the GitHub developer guide.

For **Target URL**, enter the value to be used for the target_url parameter in the GitHub commit status. For more information, see Create a commit status in the GitHub developer guide.

The status of a build triggered by a webhook is always reported to the source provider. To have the status of a build that is started from the console or an API call reported to the source provider, you must select this setting.

If your project's builds are triggered by a webhook, you must push a new commit to the repo for a change to this setting to take effect.

In Primary source webhook events, select Rebuild every time a code change is pushed to this **repository** if you want CodeBuild to build the source code every time a code change is pushed to this repository. For more information about webhooks and filter groups, see GitHub webhook events.

GitHub Enterprise Server

Credential

Choose **Default source credential** or **Custom source credential** and follow the instructions to manage the default source credential or customize the source credential.

Connection type

Choose **CodeConnections** or **Personal access token** to connect to CodeBuild.

Connection

Select a GitHub Enterprise connection or a Secrets Manager secret to connect through your specified connection type.

Repository

Choose Repository in my GitHub Enterprise account or GitHub Enterprise scoped webhook and enter the repository URL.

Source version

Enter a pull request, branch, commit ID, tag, or reference and a commit ID. For more information, see Source version sample with AWS CodeBuild.



Note

We recommend that you choose Git branch names that don't look like commit IDs, such as 811dd1ba1aba14473856cee38308caed7190c0d or 5392f7. This helps you avoid Git checkout collisions with actual commits.

Git clone depth

Choose **Git clone depth** to create a shallow clone with a history truncated to the specified number of commits. If you want a full clone, choose **Full**.

Git submodules

Select **Use Git submodules** if you want to include Git submodules in your repository.

Build status

Select **Report build statuses to source provider when your builds start and finish** if you want the status of your build's start and completion reported to your source provider.

To be able to report the build status to the source provider, the user associated with the source provider must have write access to the repo. If the user does not have write access, the build status cannot be updated. For more information, see Source provider access.

For **Status context**, enter the value to be used for the context parameter in the GitHub commit status. For more information, see <u>Create a commit status</u> in the GitHub developer guide.

For **Target URL**, enter the value to be used for the target_url parameter in the GitHub commit status. For more information, see <u>Create a commit status</u> in the GitHub developer guide.

The status of a build triggered by a webhook is always reported to the source provider. To have the status of a build that is started from the console or an API call reported to the source provider, you must select this setting.

If your project's builds are triggered by a webhook, you must push a new commit to the repo for a change to this setting to take effect.

Insecure SSL

Select **Enable insecure SSL** to ignore SSL warnings while connecting to your GitHub Enterprise project repository.

In **Primary source webhook events**, select **Rebuild every time a code change is pushed to this repository** if you want CodeBuild to build the source code every time a code change is pushed to this repository. For more information about webhooks and filter groups, see <u>GitHub webhook events</u>.

GitLab

Credential

Choose Default source credential or Custom source credential and follow the instructions to manage the default source credential or customize the source credential.

Connection type

CodeConnections is used to connect GitLab to CodeBuild.

Connection

Select a GitLab connection to connect through CodeConnections.

Repository

Choose the repository you want to use.

Source version

Enter a pull request ID, branch, commit ID, tag, or reference and a commit ID. For more information, see Source version sample with AWS CodeBuild.



Note

We recommend that you choose Git branch names that don't look like commit IDs, such as 811dd1ba1aba14473856cee38308caed7190c0d or 5392f7. This helps you avoid Git checkout collisions with actual commits.

Git clone depth

Choose **Git clone depth** to create a shallow clone with a history truncated to the specified number of commits. If you want a full clone, choose Full.

Build status

Select Report build statuses to source provider when your builds start and finish if you want the status of your build's start and completion reported to your source provider.

To be able to report the build status to the source provider, the user associated with the source provider must have write access to the repo. If the user does not have write access, the build status cannot be updated. For more information, see Source provider access.

GitLab Self Managed

Credential

Choose Default source credential or Custom source credential and follow the instructions to manage the default source credential or customize the source credential.

Connection type

CodeConnections is used to connect GitLab Self Managed to CodeBuild.

Connection

Select a GitLab Self Managed connection to connect through CodeConnections.

Repository

Choose the repository you want to use.

Source version

Enter a pull request ID, branch, commit ID, tag, or reference and a commit ID. For more information, see Source version sample with AWS CodeBuild.



Note

We recommend that you choose Git branch names that don't look like commit IDs, such as 811dd1ba1aba14473856cee38308caed7190c0d or 5392f7. This helps you avoid Git checkout collisions with actual commits.

Git clone depth

Choose **Git clone depth** to create a shallow clone with a history truncated to the specified number of commits. If you want a full clone, choose Full.

Build status

Select Report build statuses to source provider when your builds start and finish if you want the status of your build's start and completion reported to your source provider.

To be able to report the build status to the source provider, the user associated with the source provider must have write access to the repo. If the user does not have write access, the build status cannot be updated. For more information, see Source provider access.

Environment

Provisioning model

Do one of the following:

• To use on-demand fleets managed by AWS CodeBuild, choose **On-demand**. With on-demand fleets, CodeBuild provides compute for your builds. The machines are destroyed when the build finishes. On-demand fleets are fully managed, and includes automatic scaling capabilities to handle spikes in demand.

• To use reserved capacity fleets managed by AWS CodeBuild, choose Reserved capacity, and then select a Fleet name. With reserved capacity fleets, you configure a set of dedicated instances for your build environment. These machines remain idle, ready to process builds or tests immediately and reduces build durations. With reserved capacity fleets, your machines are always running and will continue to incur costs as long they're provisioned.

For information, see Run builds on reserved capacity fleets.

Environment image

Do one of the following:

- To use a Docker image managed by AWS CodeBuild, choose Managed image, and then make selections from Operating system, Runtime(s), Image, and Image version. Make a selection from **Environment type** if it is available.
- To use another Docker image, choose Custom image. For Environment type, choose ARM, Linux, Linux GPU, or Windows. If you choose Other registry, for External registry URL, enter the name and tag of the Docker image in Docker Hub, using the format docker repository/docker image name. If you choose Amazon ECR, use Amazon ECR **repository** and **Amazon ECR image** to choose the Docker image in your AWS account.
- To use a private Docker image, choose **Custom image**. For **Environment type**, choose **ARM**, Linux, Linux GPU, or Windows. For Image registry, choose Other registry, and then enter the ARN of the credentials for your private Docker image. The credentials must be created by Secrets Manager. For more information, see What Is AWS Secrets Manager? in the AWS Secrets Manager User Guide.



Note

CodeBuild overrides the ENTRYPOINT for custom Docker images.

Compute

Do one of the following:

• To use EC2 compute, choose EC2. EC2 compute offers optimized flexibility during action runs.

• To use Lambda compute, choose **Lambda**. Lambda compute offers optimized start-up speeds for your builds. Lambda supports faster builds due to a lower start-up latency. Lambda also automatically scales, so builds aren't waiting in queue to run. For information, see Run builds on AWS Lambda compute.

Service role

Do one of the following:

- If you do not have a CodeBuild service role, choose New service role. In Role name, enter a name for the new role.
- If you have a CodeBuild service role, choose **Existing service role**. In **Role ARN**, choose the service role.



Note

When you use the console to create a build project, you can create a CodeBuild service role at the same time. By default, the role works with that build project only. If you use the console to associate this service role with another build project, the role is updated to work with the other build project. A service role can work with up to 10 build projects.

Additional configuration

Auto-retry limit

Specify the number of additional automatic retries after a failed build. For example, if the auto-retry limit is set to 2, CodeBuild will call the RetryBuild API to automatically retry your build for up to 2 additional times.

Timeout

Specify a value, between 5 minutes and 36 hours, after which CodeBuild stops the build if it is not complete. If **hours** and **minutes** are left blank, the default value of 60 minutes is used.

Privileged

(Optional) Select Enable this flag if you want to build Docker images or want your builds to get elevated privileges only if you plan to use this build project to build Docker images. Otherwise, all associated builds that attempt to interact with the Docker daemon fail. You must also start the Docker daemon so that your builds can interact with it. One way to do this is to initialize the Docker daemon in the install phase of your build spec by running the following build commands. Do not run these commands if you chose a build environment image provided by CodeBuild with Docker support.



Note

By default, Docker daemon is enabled for non-VPC builds. If you would like to use Docker containers for VPC builds, see Runtime Privilege and Linux Capabilities on the Docker Docs website and enable privileged mode. Also, Windows does not support privileged mode.

```
- nohup /usr/local/bin/dockerd --host=unix:///var/run/docker.sock --
host=tcp://127.0.0.1:2375 --storage-driver=overlay2 &
- timeout 15 sh -c "until docker info; do echo .; sleep 1; done"
```

VPC

If you want CodeBuild to work with your VPC:

- For VPC, choose the VPC ID that CodeBuild uses.
- For VPC Subnets, choose the subnets that include resources that CodeBuild uses.
- For **VPC Security groups**, choose the security groups that CodeBuild uses to allow access to resources in the VPCs.

For more information, see Use AWS CodeBuild with Amazon Virtual Private Cloud.

Compute

Choose one of the available options.

Registry credential

Specify a registry credential when the project is configured with a non-private registry image.



Note

This credential will only be utilized if the images are overridden with those from private registries.

Environment variables

Enter the name and value, and then choose the type of each environment variable for builds to use.



Note

CodeBuild sets the environment variable for your AWS Region automatically. You must set the following environment variables if you haven't added them to your buildspec.yml:

- AWS ACCOUNT ID
- IMAGE_REPO_NAME
- IMAGE TAG

Console and AWS CLI users can see environment variables. If you have no concerns about the visibility of your environment variable, set the **Name** and **Value** fields, and then set **Type** to Plaintext.

We recommend that you store an environment variable with a sensitive value, such as an AWS access key ID, an AWS secret access key, or a password as a parameter in Amazon EC2 Systems Manager Parameter Store or AWS Secrets Manager.

If you use Amazon EC2 Systems Manager Parameter Store, then for **Type**, choose **Parameter**. For **Name**, enter an identifier for CodeBuild to reference. For **Value**, enter the parameter's name as stored in Amazon EC2 Systems Manager Parameter Store. Using a parameter named /CodeBuild/dockerLoginPassword as an example, for Type, choose **Parameter**. For **Name**, enter LOGIN_PASSWORD. For **Value**, enter /CodeBuild/ dockerLoginPassword.

Important

If you use Amazon EC2 Systems Manager Parameter Store, we recommend that you store parameters with parameter names that start with /CodeBuild/ (for example, /CodeBuild/dockerLoginPassword). You can use the CodeBuild console to create a parameter in Amazon EC2 Systems Manager. Choose Create parameter, and then follow the instructions in the dialog box. (In that dialog box, for KMS key, you can specify the ARN of an AWS KMS key in your account. Amazon EC2 Systems Manager uses this key to encrypt the parameter's value during storage and decrypt it during retrieval.) If you use the CodeBuild console to create a parameter, the console starts the parameter name with /CodeBuild/ as it is being stored. For more information, see Systems Manager Parameter Store and Systems Manager Parameter Store Console Walkthrough in the Amazon EC2 Systems Manager User Guide.

If your build project refers to parameters stored in Amazon EC2 Systems Manager Parameter Store, the build project's service role must allow the ssm: GetParameters action. If you chose New service role earlier, CodeBuild includes this action in the default service role for your build project. However, if you chose Existing service role, you must include this action to your service role separately.

If your build project refers to parameters stored in Amazon EC2 Systems Manager Parameter Store with parameter names that do not start with /CodeBuild/, and you chose **New service role**, you must update that service role to allow access to parameter names that do not start with /CodeBuild/. This is because that service role allows access only to parameter names that start with /CodeBuild/. If you choose **New service role**, the service role includes permission to decrypt all parameters under the /CodeBuild/ namespace in the Amazon EC2 Systems Manager Parameter Store.

Environment variables you set replace existing environment variables. For example, if the Docker image already contains an environment variable named MY_VAR with a value of my_value, and you set an environment variable named MY_VAR with a value of other_value, then my_value is replaced by other_value. Similarly, if the Docker image already contains an environment variable named PATH with a value of /usr/local/sbin:/usr/local/bin, and you set an environment variable named PATH with a value of \$PATH:/usr/share/ant/bin, then /usr/

> local/sbin:/usr/local/bin is replaced by the literal value \$PATH:/usr/ share/ant/bin.

Do not set any environment variable with a name that begins with CODEBUILD_. This prefix is reserved for internal use.

If an environment variable with the same name is defined in multiple places, the value is determined as follows:

- The value in the start build operation call takes highest precedence.
- The value in the build project definition takes next precedence.
- The value in the buildspec declaration takes lowest precedence.

If you use Secrets Manager, for **Type**, choose **Secrets Manager**. For **Name**, enter an identifier for CodeBuild to reference. For Value, enter a reference-key using the pattern secretid:json-key:version-stage:version-id. For information, see Secrets Manager reference-key in the buildspec file.

Important

If you use Secrets Manager, we recommend that you store secrets with names that start with /CodeBuild/ (for example, /CodeBuild/dockerLoginPassword). For more information, see What Is AWS Secrets Manager? in the AWS Secrets Manager User Guide.

If your build project refers to secrets stored in Secrets Manager, the build project's service role must allow the secretsmanager: GetSecretValue action. If you chose **New service role** earlier, CodeBuild includes this action in the default service role for your build project. However, if you chose Existing service role, you must include this action to your service role separately.

If your build project refers to secrets stored in Secrets Manager with secret names that do not start with /CodeBuild/, and you chose **New service role**, you must update the service role to allow access to secret names that do not start with / CodeBuild/. This is because the service role allows access only to secret names that start with /CodeBuild/.

If you choose **New service role**, the service role includes permission to decrypt all secrets under the /CodeBuild/ namespace in the Secrets Manager.

Buildspec

Build specifications

Do one of the following:

• If your source code includes a buildspec file, choose **Use a buildspec file**. By default, CodeBuild looks for a file named buildspec.yml in the source code root directory. If your buildspec file uses a different name or location, enter its path from the source root in **Buildspec name** (for example, buildspec-two.yml or configuration/buildspec.yml. If the buildspec file is in an S3 bucket, it must be in the same AWS Region as your build project. Specify the buildspec file using its ARN (for example, arn:aws:s3:::<my-codebuild-sample2>/buildspec.yml).

• If your source code does not include a buildspec file, or if you want to run build commands different from the ones specified for the build phase in the buildspec.yml file in the source code's root directory, choose Insert build commands. For Build commands, enter the commands you want to run in the build phase. For multiple commands, separate each command by && (for example, mvn test && mvn package). To run commands in other phases, or if you have a long list of commands for the build phase, add a buildspec.yml file to the source code root directory, add the commands to the file, and then choose Use the buildspec.yml in the source code root directory.

For more information, see the Buildspec reference.

Batch configuration

You can run a group of builds as a single operation. For more information, see <u>Run builds in batches</u>.

Define batch configuration

Select to allow batch builds in this project.

Batch service role

Provides the service role for batch builds.

Choose one of the following:

If you do not have a batch service role, choose New service role. In Service role, enter a
name for the new role.

• If you have a batch service role, choose **Existing service role**. In **Service role**, choose the service role.

Batch builds introduce a new security role in the batch configuration. This new role is required as CodeBuild must be able to call the StartBuild, StopBuild, and RetryBuild actions on your behalf to run builds as part of a batch. Customers should use a new role, and not the same role they use in their build, for two reasons:

- Giving the build role StartBuild, StopBuild, and RetryBuild permissions would allow a single build to start more builds via the buildspec.
- CodeBuild batch builds provide restrictions that restrict the number of builds and compute types that can be used for the builds in the batch. If the build role has these permissions, it is possible the builds themselves could bypass these restrictions.

Allowed compute types for batch

Select the compute types allowed for the batch. Select all that apply.

Allowed fleets for batch

Select the fleets allowed for the batch. Select all that apply.

Maximum builds allowed in batch

Enter the maximum number of builds allowed in the batch. If a batch exceeds this limit, the batch will fail.

Batch timeout

Enter the maximum amount of time for the batch build to complete.

Combine artifacts

Select **Combine all artifacts from batch into a single location** to have all of the artifacts from the batch combined into a single location.

Batch report mode

Select the desired build status report mode for batch builds.



Note

This field is only available when the project source is Bitbucket, GitHub, or GitHub Enterprise, and Report build statuses to source provider when your builds start and finish is selected under Source.

Aggregated builds

Select to have the statuses for all builds in the batch combined into a single status report.

Individual builds

Select to have the build statuses for all builds in the batch reported separately.

Artifacts

Type

Do one of the following:

- If you do not want to create any build output artifacts, choose **No artifacts**. You might want to do this if you're only running build tests or you want to push a Docker image to an Amazon ECR repository.
- To store the build output in an S3 bucket, choose **Amazon S3**, and then do the following:
 - If you want to use your project name for the build output ZIP file or folder, leave **Name** blank. Otherwise, enter the name. (If you want to output a ZIP file, and you want the ZIP file to have a file extension, be sure to include it after the ZIP file name.)
 - Select **Enable semantic versioning** if you want a name specified in the buildspec file to override any name that is specified in the console. The name in a buildspec file is calculated at build time and uses the Shell command language. For example, you can append a date and time to your artifact name so that it is always unique. Unique artifact names prevent artifacts from being overwritten. For more information, see Buildspec syntax.
 - For **Bucket name**, choose the name of the output bucket.
 - If you chose **Insert build commands** earlier in this procedure, then for **Output files**, enter the locations of the files from the build that you want to put into the build output ZIP file or folder. For multiple locations, separate each location with a comma (for example, appspec.yml, target/my-app.jar). For more information, see the description of files in Buildspec syntax.
 - If you do not want your build artifacts encrypted, select **Remove artifacts encryption**.

For each secondary set of artifacts you want:

- 1. For **Artifact identifier**, enter a value that is fewer than 128 characters and contains only alphanumeric characters and underscores.
- 2. Choose Add artifact.

- Follow the previous steps to configure your secondary artifacts. 3.
- 4. Choose Save artifact.

Additional configuration

Encryption key

(Optional) Do one of the following:

- To use the AWS managed key for Amazon S3 in your account to encrypt the build output artifacts, leave **Encryption key** blank. This is the default.
- To use a customer managed key to encrypt the build output artifacts, in **Encryption key**, enter the ARN of the KMS key. Use the format arn: aws:kms:region-ID:account-ID: key/key-ID.

Cache type

For **Cache type**, choose one of the following:

- If you do not want to use a cache, choose **No cache**.
- If you want to use an Amazon S3 cache, choose **Amazon S3**, and then do the following:
 - For Bucket, choose the name of the S3 bucket where the cache is stored.
 - (Optional) For Cache path prefix, enter an Amazon S3 path prefix. The Cache path prefix value is similar to a directory name. It makes it possible for you to store the cache under the same directory in a bucket.

Do not append a trailing slash (/) to the end of the path prefix.

• If you want to use a local cache, choose Local, and then choose one or more local cache modes.



Note

Docker layer cache mode is available for Linux only. If you choose it, your project must run in privileged mode.

Using a cache saves considerable build time because reusable pieces of the build environment are stored in the cache and used across builds. For information about

specifying a cache in the buildspec file, see <u>Buildspec syntax</u>. For more information about caching, see <u>Cache builds</u> to improve performance.

Logs

Choose the logs you want to create. You can create Amazon CloudWatch Logs, Amazon S3 logs, or both.

CloudWatch

If you want Amazon CloudWatch Logs logs:

CloudWatch logs

Select CloudWatch logs.

Group name

Enter the name of your Amazon CloudWatch Logs log group.

Stream name

Enter your Amazon CloudWatch Logs log stream name.

S3

If you want Amazon S3 logs:

S3 logs

Select S3 logs.

Bucket

Choose the name of the S3 bucket for your logs.

Path prefix

Enter the prefix for your logs.

Disable S3 log encryption

Select if you do not want your S3 logs encrypted.

Create a build project (AWS CLI)

For more information about using the AWS CLI with CodeBuild, see the Command line reference.

To create a CodeBuild build project using the AWS CLI, you create a JSON-formatted Project structure, fill in the structure, and call the create-project command to create the project.

Create the JSON file

Create a skeleton JSON file with the <u>create-project</u> command, using the --generate-cli-skeleton option:

```
aws codebuild create-project --generate-cli-skeleton > <json-file>
```

This creates a JSON file with the path and file name specified by < json-file>.

Fill in the JSON file

Modify the JSON data as follows and save your results.

```
{
  "name": "roject-name>",
  "description": "<description>",
  "source": {
    "type": "CODECOMMIT" | "CODEPIPELINE" | "GITHUB" | "GITHUB_ENTERPRISE" | "GITLAB" |
 "GITLAB_SELF_MANAGED" | "BITBUCKET" | "S3" | "NO_SOURCE",
    "location": "<source-location>",
    "gitCloneDepth": "<git-clone-depth>",
    "buildspec": "<buildspec>",
    "InsecureSsl": "<insecure-ssl>",
    "reportBuildStatus": "<report-build-status>",
    "buildStatusConfig": {
      "context": "<context>",
      "targetUrl": "<target-url>"
    },
    "gitSubmodulesConfig": {
      "fetchSubmodules": "<fetch-submodules>"
    },
    "auth": {
      "type": "<auth-type>",
      "resource": "<auth-resource>"
    },
    "sourceIdentifier": "<source-identifier>"
  },
  "secondarySources": [
```

```
"type": "CODECOMMIT" | "CODEPIPELINE" | "GITHUB" | "GITHUB_ENTERPRISE" |
"GITLAB" | "GITLAB_SELF_MANAGED" | "BITBUCKET" | "S3" | "NO_SOURCE",
       "location": "<source-location>",
       "gitCloneDepth": "<git-clone-depth>",
       "buildspec": "<buildspec>",
       "InsecureSsl": "<insecure-ssl>",
       "reportBuildStatus": "<report-build-status>",
       "auth": {
         "type": "<auth-type>",
        "resource": "<auth-resource>"
       },
       "sourceIdentifier": "<source-identifier>"
  }
],
 "secondarySourceVersions": [
  {
     "sourceIdentifier": "<secondary-source-identifier>",
     "sourceVersion": "<secondary-source-version>"
  }
],
 "sourceVersion": "<source-version>",
 "artifacts": {
   "type": "CODEPIPELINE" | "S3" | "NO_ARTIFACTS",
   "location": "<artifacts-location>",
   "path": "<artifacts-path>",
   "namespaceType": "<artifacts-namespacetype>",
   "name": "<artifacts-name>",
   "overrideArtifactName": "<override-artifact-name>",
   "packaging": "<artifacts-packaging>"
},
 "secondaryArtifacts": [
  {
     "type": "CODEPIPELINE" | "S3" | "NO_ARTIFACTS",
     "location": "<secondary-artifact-location>",
     "path": "<secondary-artifact-path>",
     "namespaceType": "<secondary-artifact-namespaceType>",
     "name": "<secondary-artifact-name>",
     "packaging": "<secondary-artifact-packaging>",
     "artifactIdentifier": "<secondary-artifact-identifier>"
   }
],
 "cache": {
   "type": "<cache-type>",
   "location": "<cache-location>",
```

```
"mode": [
     "<cache-mode>"
   1
 },
 "environment": {
   "type": "LINUX_CONTAINER" | "LINUX_GPU_CONTAINER" | "ARM_CONTAINER" |
"WINDOWS_SERVER_2019_CONTAINER" | "WINDOWS_SERVER_2022_CONTAINER",
   "image": "<image>",
   "computeType": "BUILD_GENERAL1_SMALL" | "BUILD_GENERAL1_MEDIUM" |
"BUILD_GENERAL1_LARGE" | "BUILD_GENERAL1_2XLARGE",
   "certificate": "<certificate>",
   "environmentVariables": [
     {
       "name": "<environmentVariable-name>",
       "value": "<environmentVariable-value>",
       "type": "<environmentVariable-type>"
     }
   ],
   "registryCredential": [
     {
       "credential": "<credential-arn-or-name>",
       "credentialProvider": "<credential-provider>"
     }
   ],
   "imagePullCredentialsType": "CODEBUILD" | "SERVICE_ROLE",
   "privilegedMode": "<privileged-mode>"
 },
 "serviceRole": "<service-role>",
 "autoRetryLimit": <auto-retry-limit>,
 "timeoutInMinutes": <timeout>,
 "queuedTimeoutInMinutes": <queued-timeout>,
 "encryptionKey": "<encryption-key>",
 "tags": [
   {
     "key": "<tag-key>",
     "value": "<tag-value>"
   }
 ],
 "vpcConfig": {
   "securityGroupIds": [
        "<security-group-id>"
   ],
   "subnets": [
        "<subnet-id>"
```

```
],
    "vpcId": "<vpc-id>"
  },
  "badgeEnabled": "<badge-enabled>",
  "logsConfig": {
    "cloudWatchLogs": {
      "status": "<cloudwatch-logs-status>",
      "groupName": "<group-name>",
      "streamName": "<stream-name>"
    },
    "s3Logs": {
      "status": "<s3-logs-status>",
      "location": "<s3-logs-location>",
      "encryptionDisabled": "<s3-logs-encryption-disabled>"
    }
  },
  "fileSystemLocations": [
      "type": "EFS",
      "location": "<EFS-DNS-name-1>:/<directory-path>",
      "mountPoint": "<mount-point>",
      "identifier": "<efs-identifier>",
      "mountOptions": "<efs-mount-options>"
    }
  ],
  "buildBatchConfig": {
    "serviceRole": "<batch-service-role>",
    "combineArtifacts": <combine-artifacts>,
    "restrictions": {
      "maximumBuildsAllowed": <max-builds>,
      "computeTypesAllowed": [
        "<compute-type>"
      ],
      "fleetsAllowed": [
        "<fleet-name>"
      1
    },
    "timeoutInMins": <batch-timeout>,
    "batchReportMode": "REPORT_AGGREGATED_BATCH" | "REPORT_INDIVIDUAL_BUILDS"
  },
  "concurrentBuildLimit": <concurrent-build-limit>
}
```

Replace the following:

name

Required. The name for this build project. This name must be unique across all of the build projects in your AWS account.

description

Optional. The description for this build project.

source

Required. A <u>ProjectSource</u> object that contains information about this build project's source code settings. After you add a source object, you can add up to 12 more sources using the . These settings include the following:

source/type

Required. The type of repository that contains the source code to build. Valid values include:

- CODECOMMIT
- CODEPIPELINE
- GITHUB
- GITHUB_ENTERPRISE
- GITLAB
- GITLAB_SELF_MANAGED
- BITBUCKET
- S3
- NO_SOURCE

If you use NO_SOURCE, the buildspec cannot be a file because the project does not have a source. Instead, you must use the buildspec attribute to specify a YAML-formatted string for your buildspec. For more information, see Create a build project without a source.

source/location

Required unless you set *source-type* to CODEPIPELINE. The location of the source code for the specified repository type.

For CodeCommit, the HTTPS clone URL to the repository that contains the source code and the buildspec file (for example, https://git-codecommit.
 id>.amazonaws.com/v1/repos/<repo-name>).

- For Amazon S3, the build input bucket name, followed by the path and name of the ZIP file that contains the source code and the buildspec. For example:
 - For a ZIP file located at the root of the input bucket: <bucket-name>/<object-name>.zip.
 - For a ZIP file located in a subfolder in the input bucket: <bucket-name>/<subfoler-path>/<object-name>.zip.
- For GitHub, the HTTPS clone URL to the repository that contains the source code and the buildspec file. The URL must contain github.com. You must connect your AWS account to your GitHub account. To do this, use the CodeBuild console to create a build project.
 - Choose **Authorize application**. (After you have connected to your GitHub account, you do not need to finish creating the build project. You can close the CodeBuild console.)
- For GitHub Enterprise Server, the HTTP or HTTPS clone URL to the repository that contains
 the source code and the buildspec file. You must also connect your AWS account to your
 GitHub Enterprise Server account. To do this, use the CodeBuild console to create a build
 project.
 - 1. Create a personal access token in GitHub Enterprise Server.
 - 2. Copy this token to your clipboard so you can use it when you create your CodeBuild project. For more information, see <u>Creating a personal access token for the command line</u> on the GitHub Help website.
 - 3. When you use the console to create your CodeBuild project, in **Source**, for **Source provider**, choose **GitHub Enterprise**.
 - 4. For **Personal Access Token**, paste the token that was copied to your clipboard. Choose **Save Token**. Your CodeBuild account is now connected to your GitHub Enterprise Server account.
- For GitLab and GitLab self-managed, the HTTPS clone URL to the repository that contains the source code and the buildspec file. Note that if you use GitLab, the URL must contain gitlab.com. If you use GitLab self-managed, the URL does not need to contain gitlab.com. You must connect your AWS account to your GitLab or GitLab self-managed account. To do this, use the CodeBuild console to create a build project.

• In the Developer Tools navigation pane, choose **Settings**, **Connections**, and then **Create connection**. On this page, create either a GitLab or GitLab self-managed connection, and then choose **Connect to GitLab**.

- For Bitbucket, the HTTPS clone URL to the repository that contains the source code and the buildspec file. The URL must contain bitbucket.org. You must also connect your AWS account to your Bitbucket account. To do this, use the CodeBuild console to create a build project.
 - 1. When you use the console to connect (or reconnect) with Bitbucket, on the Bitbucket **Confirm access to your account** page, choose **Grant access**. (After you have connected to your Bitbucket account, you do not need to finish creating the build project. You can close the CodeBuild console.)
- For AWS CodePipeline, do not specify a location value for source. CodePipeline ignores this value because when you create a pipeline in CodePipeline, you specify the source code location in the Source stage of the pipeline.

source/gitCloneDepth

Optional. The depth of history to download. Minimum value is 0. If this value is 0, greater than 25, or not provided, then the full history is downloaded with each build project. If your source type is Amazon S3, this value is not supported.

source/buildspec

Optional. The build specification definition or file to use. If this value is not provided or is set to an empty string, the source code must contain a buildspec.yml file in its root directory. If this value is set, it can be either an inline buildspec definition, the path to an alternate buildspec file relative to the root directory of your primary source, or the path to an S3 bucket. The bucket must be in the same AWS Region as the build project. Specify the buildspec file using its ARN (for example, arn:aws:s3:::<my-codebuild-sample2>/buildspec.yml). For more information, see Buildspec file name and storage location.

source/auth

Contains information about the authorization settings for CodeBuild to access the source code to be built.

source/auth/type

Required. The authorization type to use. Valid values are:

• OAUTH

- CODECONNECTIONS
- SECRETS_MANAGER

source/auth/resource

Optional. The resource value that applies to the specified authorization type. This can be the Secrets Manager ARN or the CodeConnections ARN.

source/reportBuildStatus

Specifies whether to send your source provider the status of a build's start and completion. If you set this with a source provider other than GitHub, GitHub Enterprise Server, or Bitbucket, an invalidInputException is thrown.

To be able to report the build status to the source provider, the user associated with the source provider must have write access to the repo. If the user does not have write access, the build status cannot be updated. For more information, see <u>Source provider access</u>.

source/buildStatusConfig

Contains information that defines how the CodeBuild build project reports the build status to the source provider. This option is only used when the source type is GITHUB, GITHUB_ENTERPRISE, or BITBUCKET.

source/buildStatusConfig/context

For Bitbucket sources, this parameter is used for the name parameter in the Bitbucket commit status. For GitHub sources, this parameter is used for the context parameter in the GitHub commit status.

For example, you can have the context contain the build number and the webhook trigger using the CodeBuild environment variables:

```
AWS CodeBuild sample-project Build #$CODEBUILD_BUILD_NUMBER - $CODEBUILD_WEBHOOK_TRIGGER
```

This results in the context appearing like this for build #24 triggered by a webhook pull request event:

```
AWS CodeBuild sample-project Build #24 - pr/8
```

source/buildStatusConfig/targetUrl

For Bitbucket sources, this parameter is used for the url parameter in the Bitbucket commit status. For GitHub sources, this parameter is used for the target_url parameter in the GitHub commit status.

For example, you can set the targetUrl to https://aws.amazon.com/codebuild/<path to build> and the commit status will link to this URL.

You can also include CodeBuild environment variables in the targetUrl to add additional information to the URL. For example, to add the build region to the URL, set the targetUrl to:

```
"targetUrl": "https://aws.amazon.com/codebuild/<path to build>?region=
$AWS_REGION"
```

If the build region is us-east-2, this will expand to:

```
https://aws.amazon.com/codebuild/<path to build>?region=us-east-2
```

source/gitSubmodulesConfig

Optional. Information about the Git submodules configuration. Used with CodeCommit, GitHub, GitHub Enterprise Server, and Bitbucket only.

source/gitSubmodulesConfig/fetchSubmodules

Set fetchSubmodules to true if you want to include the Git submodules in your repository. Git submodules that are included must be configured as HTTPS.

source/InsecureSsl

Optional. Used with GitHub Enterprise Server only. Set this value to true to ignore TLS warnings while connecting to your GitHub Enterprise Server project repository. The default value is false. InsecureSsl should be used for testing purposes only. It should not be used in a production environment.

source/sourceIdentifier

A user-defined identifier for the project source. Optional for the primary source. Required for secondary sources.

secondarySources

Optional. An array of <u>ProjectSource</u> objects that contain information about the secondary sources for a build project. You can add up to 12 secondary sources. The secondarySources objects use the same properties used by the object. In a secondary source object, the sourceIdentifier is required.

secondarySourceVersions

Optional. An array of <u>ProjectSourceVersion</u> objects. If secondarySourceVersions is specified at the build level, then they take precedence over this.

sourceVersion

Optional. The version of the build input to be built for this project. If not specified, the latest version is used. If specified, it must be one of:

- For CodeCommit, the commit ID, branch, or Git tag to use.
- For GitHub, the commit ID, pull request ID, branch name, or tag name that corresponds to the
 version of the source code you want to build. If a pull request ID is specified, it must use the
 format pr/pull-request-ID (for example pr/25). If a branch name is specified, the branch's
 HEAD commit ID is used. If not specified, the default branch's HEAD commit ID is used.
- For GitLab, the commit ID, pull request ID, branch name, tag name, or reference and a commit ID. For more information, see Source version sample with AWS CodeBuild.
- For Bitbucket, the commit ID, branch name, or tag name that corresponds to the version of the source code you want to build. If a branch name is specified, the branch's HEAD commit ID is used. If not specified, the default branch's HEAD commit ID is used.
- For Amazon S3, the version ID of the object that represents the build input ZIP file to use.

If sourceVersion is specified at the build level, then that version takes precedence over this sourceVersion (at the project level). For more information, see Source version sample with AWS CodeBuild.

artifacts

Required. A <u>ProjectArtifacts</u> object that contains information about this build project's output artifact settings. After you add an artifacts object, you can add up to 12 more artifacts using the . These settings include the following:

artifacts/type

Required. The type of build output artifact. Valid values are:

- CODEPIPELINE
- NO_ARTIFACTS
- S3

artifacts/location

Only used with the S3 artifact type. Not used for other artifact types.

The name of the output bucket you created or identified in the prerequisites.

artifacts/path

Only used with the S3 artifact type. Not used for other artifact types.

The path in of the output bucket to place ZIP file or folder. If you do not specify a value for path, CodeBuild uses namespaceType (if specified) and name to determine the path and name of the build output ZIP file or folder. For example, if you specify MyPath for path and MyArtifact.zip for name, the path and name would be MyPath/MyArtifact.zip.

artifacts/namespaceType

Only used with the S3 artifact type. Not used for other artifact types.

The namespace of the build output ZIP file or folder. Valid values include BUILD_ID and NONE. Use BUILD_ID to insert the build ID into the path of the build output ZIP file or folder. Otherwise, use NONE. If you do not specify a value for namespaceType, CodeBuild uses path (if specified) and name to determine the path and name of the build output ZIP file or folder. For example, if you specify MyPath for path, BUILD_ID for namespaceType, and MyArtifact.zip for name, the path and name would be MyPath/build-ID/MyArtifact.zip.

artifacts/name

Only used with the S3 artifact type. Not used for other artifact types.

The name of the build output ZIP file or folder inside of location. For example, if you specify MyPath for path and MyArtifact.zip for name, the path and name would be MyPath/MyArtifact.zip.

artifacts/overrideArtifactName

Only used with the S3 artifact type. Not used for other artifact types.

Optional. If set to true, the name specified in the artifacts block of the buildspec file overrides name. For more information, see <u>Build specification reference for CodeBuild</u>.

artifacts/packaging

Only used with the S3 artifact type. Not used for other artifact types.

Optional. Specifies how to package the artifacts. Allowed values are:

NONE

Create a folder that contains the build artifacts. This is the default value.

ZIP

Create a ZIP file that contains the build artifacts.

secondaryArtifacts

Optional. An array of <u>ProjectArtifacts</u> objects that contain information about the secondary artifacts settings for a build project. You can add up to 12 secondary artifacts. The secondaryArtifacts uses many of the same settings used by the object.

cache

Required. A <u>ProjectCache</u> object that contains information about this build project's cache settings. For more information, see <u>Cache builds</u>.

environment

Required. A <u>ProjectEnvironment</u> object that contains information about this project's build environment settings. These settings include:

environment/type

Required. The type of build environment. For more information, see <u>type</u> in the *CodeBuild API Reference*.

environment/image

Required. The Docker image identifier used by this build environment. Typically, this identifier is expressed as image-name:tag. For example, in the Docker repository that CodeBuild

uses to manage its Docker images, this could be aws/codebuild/standard:5.0. In Docker Hub, maven: 3.3.9-jdk-8. In Amazon ECR, account-id.dkr.ecr.regionid.amazonaws.com/your-Amazon-ECR-repo-name:tag. For more information, see Docker images provided by CodeBuild.

environment/computeType

Required. Specifies the compute resources used by this build environment. For more information, see computeType in the CodeBuild API Reference.

environment/certificate

Optional. The ARN of the Amazon S3 bucket, path prefix, and object key that contains the PEM-encoded certificate. The object key can be either just the .pem file or a .zip file containing the PEM-encoded certificate. For example, if your Amazon S3 bucket name is <mybucket>, your path prefix is <cert>, and your object key name is <certificate.pem>, then acceptable formats for certificate are <my-bucket/cert/certificate.pem> or arn:aws:s3:::<my-bucket/cert/certificate.pem>.

environment/environmentVariables

Optional. An array of Environment Variable objects that contains the environment variables you want to specify for this build environment. Each environment variable is expressed as an object that contains a name, value, and type of name, value, and type.

Console and AWS CLI users can see all environment variables. If you have no concerns about the visibility of your environment variable, set name and value, and set type to PLAINTEXT.

We recommend you store environment variables with sensitive values, such as an AWS access key ID, an AWS secret access key, or a password, as a parameter in Amazon EC2 Systems Manager Parameter Store or AWS Secrets Manager. For name, for that stored parameter, set an identifier for CodeBuild to reference.

If you use Amazon EC2 Systems Manager Parameter Store, for value, set the parameter's name as stored in the Parameter Store. Set type to PARAMETER STORE. Using a parameter named /CodeBuild/dockerLoginPassword as an example, set name to LOGIN_PASSWORD. Set value to /CodeBuild/dockerLoginPassword. Set type to PARAMETER_STORE.

Important

If you use Amazon EC2 Systems Manager Parameter Store, we recommend that you store parameters with parameter names that start with /CodeBuild/ (for example, /

CodeBuild/dockerLoginPassword). You can use the CodeBuild console to create a parameter in Amazon EC2 Systems Manager. Choose **Create parameter**, and then follow the instructions in the dialog box. (In that dialog box, for **KMS key**, you can specify the ARN of an AWS KMS key in your account. Amazon EC2 Systems Manager uses this key to encrypt the parameter's value during storage and decrypt it during retrieval.) If you use the CodeBuild console to create a parameter, the console starts the parameter name with /CodeBuild/ as it is being stored. For more information, see <u>Systems Manager Parameter Store Console Walkthrough</u> in the *Amazon EC2 Systems Manager User Guide*.

If your build project refers to parameters stored in Amazon EC2 Systems Manager Parameter Store, the build project's service role must allow the ssm:GetParameters action. If you chose **New service role** earlier, CodeBuild includes this action in the default service role for your build project. However, if you chose **Existing service role**, you must include this action to your service role separately.

If your build project refers to parameters stored in Amazon EC2 Systems Manager Parameter Store with parameter names that do not start with /CodeBuild/, and you chose **New service role**, you must update that service role to allow access to parameter names that do not start with /CodeBuild/. This is because that service role allows access only to parameter names that start with /CodeBuild/.

If you choose **New service role**, the service role includes permission to decrypt all parameters under the /CodeBuild/ namespace in the Amazon EC2 Systems Manager Parameter Store.

Environment variables you set replace existing environment variables. For example, if the Docker image already contains an environment variable named MY_VAR with a value of my_value, and you set an environment variable named MY_VAR with a value of other_value, then my_value is replaced by other_value. Similarly, if the Docker image already contains an environment variable named PATH with a value of /usr/local/sbin:/usr/local/bin, and you set an environment variable named PATH with a value of \$PATH:/usr/share/ant/bin, then /usr/local/sbin:/usr/local/bin is replaced by the literal value \$PATH:/usr/share/ant/bin.

Do not set any environment variable with a name that begins with CODEBUILD_. This prefix is reserved for internal use.

If an environment variable with the same name is defined in multiple places, the value is determined as follows:

- The value in the start build operation call takes highest precedence.
- The value in the build project definition takes next precedence.

• The value in the buildspec declaration takes lowest precedence.

If you use Secrets Manager, for value, set the parameter's name as stored in Secrets Manager. Set type to SECRETS MANAGER. Using a secret named /CodeBuild/ dockerLoginPassword as an example, set name to LOGIN_PASSWORD. Set value to / CodeBuild/dockerLoginPassword. Set type to SECRETS_MANAGER.

Important

If you use Secrets Manager, we recommend that you store secrets with names that start with /CodeBuild/ (for example, /CodeBuild/dockerLoginPassword). For more information, see What Is AWS Secrets Manager? in the AWS Secrets Manager User Guide. If your build project refers to secrets stored in Secrets Manager, the build project's service role must allow the secretsmanager: GetSecretValue action. If you chose New service role earlier, CodeBuild includes this action in the default service role for your build project. However, if you chose **Existing service role**, you must include this action to your service role separately.

If your build project refers to secrets stored in Secrets Manager with secret names that do not start with /CodeBuild/, and you chose **New service role**, you must update the service role to allow access to secret names that do not start with /CodeBuild/. This is because the service role allows access only to secret names that start with / CodeBuild/.

If you choose **New service role**, the service role includes permission to decrypt all secrets under the /CodeBuild/ namespace in the Secrets Manager.

environment/registryCredential

Optional. A RegistryCredential object that specifies the credentials that provide access to a private Docker registry.

environment/registryCredential/credential

Specifies the ARN or name of credentials created using AWS Managed Services. You can use the name of the credentials only if they exist in your current Region.

environment/registryCredential/credentialProvider

The only valid value is SECRETS_MANAGER.

When this is set:

- imagePullCredentials must be set to SERVICE_ROLE.
- The image cannot be a curated image or an Amazon ECR image.

environment/imagePullCredentialsType

Optional. The type of credentials CodeBuild uses to pull images in your build. There are two valid values:

CODEBUILD

CODEBUILD specifies that CodeBuild uses its own credentials. You must edit your Amazon ECR repository policy to trust the CodeBuild service principal.

SERVICE_ROLE

Specifies that CodeBuild uses your build project's service role.

When you use a cross-account or private registry image, you must use SERVICE_ROLE credentials. When you use a CodeBuild curated image, you must use CODEBUILD credentials.

environment/privilegedMode

Set to true only if you plan to use this build project to build Docker images. Otherwise, all associated builds that attempt to interact with the Docker daemon fail. You must also start the Docker daemon so that your builds can interact with it. One way to do this is to initialize the Docker daemon in the install phase of your buildspec file by running the following build commands. Do not run these commands if you specified a build environment image provided by CodeBuild with Docker support.

Note

By default, Docker daemon is enabled for non-VPC builds. If you would like to use Docker containers for VPC builds, see <u>Runtime Privilege and Linux Capabilities</u> on the Docker Docs website and enable privileged mode. Also, Windows does not support privileged mode.

```
- nohup /usr/local/bin/dockerd --host=unix:///var/run/docker.sock --
host=tcp://127.0.0.1:2375 --storage-driver=overlay2 &
- timeout 15 sh -c "until docker info; do echo .; sleep 1; done"
```

serviceRole

Required. The ARN of the service role CodeBuild uses to interact with services on behalf of the user (for example, arn:aws:iam::account-id:role/role-name).

autoRetryLimit

Optional. The number of additional automatic retries after a failed build. For example, if the autoretry limit is set to 2, CodeBuild will call the RetryBuild API to automatically retry your build for up to 2 additional times.

timeoutInMinutes

Optional. The number of minutes, between 5 to 2160 (36 hours), after which CodeBuild stops the build if it is not complete. If not specified, the default of 60 is used. To determine if and when CodeBuild stopped a build due to a timeout, run the batch-get-builds command. To determine if the build has stopped, look in the output for a buildStatus value of FAILED. To determine when the build timed out, look in the output for the endTime value associated with a phaseStatus value of TIMED_OUT.

queuedTimeoutInMinutes

Optional. The number of minutes, between 5 to 480 (8 hours), after which CodeBuild stops the build if it is is still queued. If not specified, the default of 60 is used.

encryptionKey

Optional. The alias or ARN of the AWS KMS key used by CodeBuild to encrypt the build output. If you specify an alias, use the format arn:aws:kms:region-ID:account-ID:key/key-ID or, if an alias exists, use the format alias/key-alias. If not specified, the AWS-managed KMS key for Amazon S3 is used.

tags

Optional. An array of <u>Tag</u> objects that provide the tags you want to associate with this build project. You can specify up to 50 tags. These tags can be used by any AWS service that supports CodeBuild build project tags. Each tag is expressed as an object with a key and a value.

vpcConfig

Optional. A <u>VpcConfig</u> object that contains information information about the VPC configuration for your project. For more information, see Use AWS CodeBuild with Amazon Virtual Private Cloud.

These properties include:

vpcld

Required. The VPC ID that CodeBuild uses. Run this command to get a list of all VPC IDs in your Region:

```
aws ec2 describe-vpcs --region <region-ID>
```

subnets

Required. An array of subnet IDs that include resources used by CodeBuild. Run this command to get these IDs:

```
aws ec2 describe-subnets --filters "Name=vpc-id, Values=<vpc-id>" --region <region-
ID>
```

securityGroupIds

Required. An array of security group IDs used by CodeBuild to allow access to resources in the VPC. Run this command to get these IDs:

```
aws ec2 describe-security-groups --filters "Name=vpc-id, Values=<vpc-id>" --<region-
ID>
```

badgeEnabled

Optional. Specifies whether to include build badges with your CodeBuild project. Set to true to enable build badges, or false otherwise. For more information, see <u>Build badges sample with CodeBuild</u>.

logsConfig

A <u>LogsConfig</u> object that contains information about where this build's logs are located.

logsConfig/cloudWatchLogs

A <u>CloudWatchLogsConfig</u> object that contains information about pushing logs to CloudWatch Logs.

logsConfig/s3Logs

An S3LogsConfig object that contains information about pushing logs to Amazon S3.

fileSystemLocations

Optional. An array of <u>ProjectFileSystemsLocation</u> objects that contains informationabout your Amazon EFS configuration.

buildBatchConfig

Optional. The buildBatchConfig object is a <u>ProjectBuildBatchConfig</u> structure that contains the batch build configuration information for the project.

buildBatchConfig/serviceRole

The service role ARN for the batch build project.

buildBatchConfig/combineArtifacts

A Boolean value that specifies whether to combine the build artifacts for the batch build into a single artifact location.

buildBatchConfig/restrictions/maximumBuildsAllowed

The maximum number of builds allowed.

buildBatchConfig/restrictions/computeTypesAllowed

An array of strings that specify the compute types that are allowed for the batch build. See Build environment compute types for these values.

buildBatchConfig/restrictions/fleetsAllowed

An array of strings that specify the fleets that are allowed for the batch build. See <u>Run builds on reserved capacity fleets</u> for more information.

buildBatchConfig/timeoutInMinutes

The maximum amount of time, in minutes, that the batch build must be completed in.

build Batch Config/batchReportMode

Specifies how build status reports are sent to the source provider for the batch build. Valid values include:

REPORT AGGREGATED BATCH

(Default) Aggregate all of the build statuses into a single status report.

REPORT_INDIVIDUAL_BUILDS

Send a separate status report for each individual build.

concurrentBuildLimit

The maximum number of concurrent builds that are allowed for this project.

New builds are only started if the current number of builds is less than or equal to this limit. If the current build count meets this limit, new builds are throttled and are not run.

Create the project

To create the project, run the **create-project** command again, passing your JSON file:

```
aws codebuild create-project --cli-input-json file://<json-file>
```

If successful, the JSON representation of a <u>Project</u> object appears in the console output. See the <u>CreateProject Response Syntax</u> for an example of this data.

Except for the build project name, you can change any of the build project's settings later. For more information, see Change a build project's settings (AWS CLI).

To start running a build, see Run a build (AWS CLI).

If your source code is stored in a GitHub repository, and you want CodeBuild to rebuild the source code every time a code change is pushed to the repository, see Start running builds automatically (AWS CLI).

Create a build project (AWS SDKs)

For information about using AWS CodeBuild with the AWS SDKs, see the <u>AWS SDKs and tools</u> reference.

Create a build project (AWS CloudFormation)

For information about using AWS CodeBuild with AWS CloudFormation, see <u>the AWS</u> CloudFormation template for CodeBuild in the AWS CloudFormation User Guide.

Create a notification rule

You can use notification rules to notify users when important changes, such as build successes and failures, occur. Notification rules specify both the events and the Amazon SNS topic that is used to send notifications. For more information, see What are notifications?

You can use the console or the AWS CLI to create notification rules for AWS CodeBuild.

To create a notification rule (console)

- 1. Sign in to the AWS Management Console and open the CodeBuild console at https://console.aws.amazon.com/codebuild/.
- Choose Build, choose Build projects, and then choose a build project where you want to add notifications.
- 3. On the build project page, choose **Notify**, and then choose **Create notification rule**. You can also go to the **Settings** page for the build project and choose **Create notification rule**.
- 4. In **Notification name**, enter a name for the rule.
- 5. In **Detail type**, choose **Basic** if you want only the information provided to Amazon EventBridge included in the notification. Choose **Full** if you want to include information provided to Amazon EventBridge and information that might be supplied by the CodeBuild or the notification manager.
 - For more information, see <u>Understanding Notification Contents and Security</u>.
- 6. In **Events that trigger notifications**, select the events for which you want to send notifications. For more information, see Events for Notification Rules on Build Projects.
- 7. In Targets, do one of the following:
 - If you have already configured a resource to use with notifications, in Choose target type, choose either Amazon Q Developer in chat applications (Slack) or SNS topic. In Choose target, choose the name of the client (for a Slack client configured in Amazon Q Developer in chat applications) or the Amazon Resource Name (ARN) of the Amazon SNS topic (for Amazon SNS topics already configured with the policy required for notifications).
 - If you have not configured a resource to use with notifications, choose **Create target**, and then choose **SNS topic**. Provide a name for the topic after **codestar-notifications-**, and then choose **Create**.

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Note

• If you create the Amazon SNS topic as part of creating the notification rule, the policy that allows the notifications feature to publish events to the topic is applied for you. Using a topic created for notification rules helps ensure that you subscribe only those users that you want to receive notifications about this resource.

- You cannot create an Amazon Q Developer in chat applications client as part of creating a notification rule. If you choose Amazon Q Developer in chat applications (Slack), you will see a button directing you to configure a client in Amazon Q Developer in chat applications. Choosing that option opens the Amazon Q Developer in chat applications console. For more information, see Configure Integrations
 Between Notifications and Amazon Q Developer in chat applications.
- If you want to use an existing Amazon SNS topic as a target, you must add the
 required policy for AWS CodeStar Notifications in addition to any other policies that
 might exist for that topic. For more information, see <u>Configure Amazon SNS Topics</u>
 for Notifications and <u>Understanding Notification Contents and Security</u>.
- 8. To finish creating the rule, choose **Submit**.
- 9. You must subscribe users to the Amazon SNS topic for the rule before they can receive notifications. For more information, see <u>Subscribe Users to Amazon SNS Topics That Are Targets</u>. You can also set up integration between notifications and Amazon Q Developer in chat applications to send notifications to Amazon Chime chatrooms. For more information, see <u>Configure Integration Between Notifications and Amazon Q Developer in chat applications</u>.

To create a notification rule (AWS CLI)

1. At a terminal or command prompt, run the **create-notification rule** command to generate the JSON skeleton:

```
aws codestarnotifications create-notification-rule --generate-cli-skeleton
> rule.json
```

You can name the file anything you want. In this example, the file is named *rule.json*.

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2. Open the JSON file in a plain-text editor and edit it to include the resource, event types, and target you want for the rule. The following example shows a notification rule named **MyNotificationRule** for a build project named **MyBuildProject** in an AWS account with the ID 123456789012. Notifications are sent with the full detail type to an Amazon SNS topic named codestar-notifications-MyNotificationTopic when builds are successful:

Save the file.

3. Using the file you just edited, at the terminal or command line, run the **create-notification-rule** command again to create the notification rule:

```
aws codestarnotifications create-notification-rule --cli-input-json
file://rule.json
```

4. If successful, the command returns the ARN of the notification rule, similar to the following:

```
{
    "Arn": "arn:aws:codestar-notifications:us-east-1:123456789012:notificationrule/
dc82df7a-EXAMPLE"
}
```

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Change build project settings in AWS CodeBuild

You can use the AWS CodeBuild console, AWS CLI, or AWS SDKs to change a build project's settings.

If you add test reporting to a build project, make sure your IAM role has the permissions described in <u>Test report permissions</u>.

Topics

- Change a build project's settings (console)
- Change a build project's settings (AWS CLI)
- Change a build project's settings (AWS SDKs)

Change a build project's settings (console)

To change the settings for a build project, perform the following procedure:

- 1. Open the AWS CodeBuild console at https://console.aws.amazon.com/codesuite/codebuild/ home.
- 2. In the navigation pane, choose **Build projects**.
- 3. Do one of the following:
 - Choose the link for the build project you want to change, and then choose Build details.
 - Choose the button next to the build project you want to change, choose View details, and then choose Build details.

You can modify the following sections:

Sections

- Project configuration
- Source
- Environment
- Buildspec
- Batch configuration
- Artifacts
- Logs

Project configuration

In the **Project configuration** section, choose **Edit**. When your changes are complete, choose **Update configuration** to save the new configuration.

You can modify the following properties.

Description

Enter an optional description of the build project to help other users understand what this project is used for.

Build badge

Select **Enable build badge** to make your project's build status visible and embeddable. For more information, see Build badges sample.



Note

Build badge does not apply if your source provider is Amazon S3.

Enable concurrent build limit

If you want to limit the number of concurrent builds for this project, perform the following steps:

- Select Restrict number of concurrent builds this project can start.
- In Concurrent build limit, enter the maximum number of concurrent builds that are allowed for this project. This limit cannot be greater than the concurrent build limit set for the account. If you try to enter a number greater than the account limit, an error message is displayed.

New builds are only started if the current number of builds is less than or equal to this limit. If the current build count meets this limit, new builds are throttled and are not run.

Enable public build access

To make your project's build results available to the public, including users without access to an AWS account, select **Enable public build access** and confirm that you want to make the build results public. The following properties are used for public build projects:

Public build service role

Select **New service role** if you want to have CodeBuild create a new service role for you, or **Existing service role** if you want to use an existing service role.

The public build service role enables CodeBuild to read the CloudWatch Logs and download the Amazon S3 artifacts for the project's builds. This is required to make the project's build logs and artifacts available to the public.

Service role

Enter the name of the new service role or an existing service role.

To make your project's build results private, clear **Enable public build access**.

For more information, see Get public build project URLs.

Marning

The following should be kept in mind when making your project's build results public:

- All of a project's build results, logs, and artifacts, including builds that were run when the project was private, are available to the public.
- All build logs and artifacts are available to the public. Environment variables, source
 code, and other sensitive information may have been output to the build logs and
 artifacts. You must be careful about what information is output to the build logs.
 Some best practices are:
 - Do not store sensitive values, especially AWS access key IDs and secret access keys, in environment variables. We recommend that you use an Amazon EC2 Systems Manager Parameter Store or AWS Secrets Manager to store sensitive values.
 - Follow <u>Best practices for using webhooks</u> to limit which entities can trigger a build, and do not store the buildspec in the project itself, to ensure that your webhooks are as secure as possible.
- A malicious user can use public builds to distribute malicious artifacts. We recommend that project administrators review all pull requests to verify that the pull request is a legitimate change. We also recommend that you validate any artifacts with their checksums to make sure that the correct artifacts are being downloaded.

Additional information

For **Tags**, enter the name and value of any tags that you want supporting AWS services to use. Use **Add row** to add a tag. You can add up to 50 tags.

Source

In the **Source** section, choose **Edit**. When your changes are complete, choose **Update configuration** to save the new configuration.

You can modify the following properties:

Source provider

Choose the source code provider type. Use the following lists to make selections appropriate for your source provider:



Note

CodeBuild does not support Bitbucket Server.

Amazon S3

Bucket

Choose the name of the input bucket that contains the source code.

S3 object key or S3 folder

Enter the name of the ZIP file or the path to the folder that contains the source code. Enter a forward slash (/) to download everything in the S3 bucket.

Source version

Enter the version ID of the object that represents the build of your input file. For more information, seeSource version sample with AWS CodeBuild.

CodeCommit

Repository

Choose the repository you want to use.

Reference type

Choose **Branch**, **Git tag**, or **Commit ID** to specify the version of your source code. For more information, see Source version sample with AWS CodeBuild.



Note

We recommend that you choose Git branch names that don't look like commit IDs, such as 811dd1ba1aba14473856cee38308caed7190c0d or 5392f7. This helps you avoid Git checkout collisions with actual commits.

Git clone depth

Choose to create a shallow clone with a history truncated to the specified number of commits. If you want a full clone, choose Full.

Git submodules

Select **Use Git submodules** if you want to include Git submodules in your repository.

Bitbucket

Credential

Choose Default source credential or Custom source credential and follow the instructions to manage the default source credential or customize the source credential.

Connection type

Choose CodeConnections, OAuth, App password, or Personal access token to connect to CodeBuild.

Connection

Select a Bitbucket connection or a Secrets Manager secret to connect through your specified connection type.

Repository

Choose **Repository in my Bitbucket account** or **Public repository** and enter the repository URL.

Source version

Enter a branch, commit ID, tag, or reference and a commit ID. For more information, see Source version sample with AWS CodeBuild



Note

We recommend that you choose Git branch names that don't look like commit IDs, such as 811dd1ba1aba14473856cee38308caed7190c0d or 5392f7. This helps you avoid Git checkout collisions with actual commits.

Git clone depth

Choose Git clone depth to create a shallow clone with a history truncated to the specified number of commits. If you want a full clone, choose Full.

Git submodules

Select **Use Git submodules** if you want to include Git submodules in your repository.

Build status

Select Report build statuses to source provider when your builds start and finish if you want the status of your build's start and completion reported to your source provider.

To be able to report the build status to the source provider, the user associated with the source provider must have write access to the repo. If the user does not have write access, the build status cannot be updated. For more information, see Source provider access.

For **Status context**, enter the value to be used for the name parameter in the Bitbucket commit status. For more information, see build in the Bitbucket API documentation.

For **Target URL**, enter the value to be used for the url parameter in the Bitbucket commit status. For more information, see build in the Bitbucket API documentation.

The status of a build triggered by a webhook is always reported to the source provider. To have the status of a build that is started from the console or an API call reported to the source provider, you must select this setting.

If your project's builds are triggered by a webhook, you must push a new commit to the repo for a change to this setting to take effect.

In Primary source webhook events, select Rebuild every time a code change is pushed to this **repository** if you want CodeBuild to build the source code every time a code change is pushed to this repository. For more information about webhooks and filter groups, see Bitbucket webhook events.

GitHub

Credential

Choose **Default source credential** or **Custom source credential** and follow the instructions to manage the default source credential or customize the source credential.

Connection type

Choose **GitHub App**, **OAuth**, or **Personal access token** to connect to CodeBuild.

Connection

Select a GitHub connection or a Secrets Manager secret to connect through your specified connection type.

Repository

Choose Repository in my GitHub account, Public repository, or GitHub scoped webhook and enter the repository URL.

Source version

Enter a branch, commit ID, tag, or reference and a commit ID. For more information, see Source version sample with AWS CodeBuild



Note

We recommend that you choose Git branch names that don't look like commit IDs, such as 811dd1ba1aba14473856cee38308caed7190c0d or 5392f7. This helps you avoid Git checkout collisions with actual commits.

Git clone depth

Choose **Git clone depth** to create a shallow clone with a history truncated to the specified number of commits. If you want a full clone, choose **Full**.

Git submodules

Select **Use Git submodules** if you want to include Git submodules in your repository.

Build status

Select **Report build statuses to source provider when your builds start and finish** if you want the status of your build's start and completion reported to your source provider.

To be able to report the build status to the source provider, the user associated with the source provider must have write access to the repo. If the user does not have write access, the build status cannot be updated. For more information, see Source provider access.

For **Status context**, enter the value to be used for the context parameter in the GitHub commit status. For more information, see <u>Create a commit status</u> in the GitHub developer guide.

For **Target URL**, enter the value to be used for the target_url parameter in the GitHub commit status. For more information, see <u>Create a commit status</u> in the GitHub developer guide.

The status of a build triggered by a webhook is always reported to the source provider. To have the status of a build that is started from the console or an API call reported to the source provider, you must select this setting.

If your project's builds are triggered by a webhook, you must push a new commit to the repo for a change to this setting to take effect.

In **Primary source webhook events**, select **Rebuild every time a code change is pushed to this repository** if you want CodeBuild to build the source code every time a code change is pushed to this repository. For more information about webhooks and filter groups, see <u>GitHub webhook</u> events.

GitHub Enterprise Server

Credential

Choose **Default source credential** or **Custom source credential** and follow the instructions to manage the default source credential or customize the source credential.

Connection type

Choose CodeConnections or Personal access token to connect to CodeBuild.

Connection

Select a GitHub Enterprise connection or a Secrets Manager secret to connect through your specified connection type.

Repository

Choose Repository in my GitHub Enterprise account or GitHub Enterprise scoped webhook and enter the repository URL.

Source version

Enter a pull request, branch, commit ID, tag, or reference and a commit ID. For more information, see Source version sample with AWS CodeBuild.



Note

We recommend that you choose Git branch names that don't look like commit IDs, such as 811dd1ba1aba14473856cee38308caed7190c0d or 5392f7. This helps you avoid Git checkout collisions with actual commits.

Git clone depth

Choose Git clone depth to create a shallow clone with a history truncated to the specified number of commits. If you want a full clone, choose Full.

Git submodules

Select **Use Git submodules** if you want to include Git submodules in your repository.

Build status

Select Report build statuses to source provider when your builds start and finish if you want the status of your build's start and completion reported to your source provider.

To be able to report the build status to the source provider, the user associated with the source provider must have write access to the repo. If the user does not have write access, the build status cannot be updated. For more information, see Source provider access.

For **Status context**, enter the value to be used for the context parameter in the GitHub commit status. For more information, see <u>Create a commit status</u> in the GitHub developer guide.

For **Target URL**, enter the value to be used for the target_url parameter in the GitHub commit status. For more information, see <u>Create a commit status</u> in the GitHub developer guide.

The status of a build triggered by a webhook is always reported to the source provider. To have the status of a build that is started from the console or an API call reported to the source provider, you must select this setting.

If your project's builds are triggered by a webhook, you must push a new commit to the repo for a change to this setting to take effect.

Insecure SSL

Select **Enable insecure SSL** to ignore SSL warnings while connecting to your GitHub Enterprise project repository.

In **Primary source webhook events**, select **Rebuild every time a code change is pushed to this repository** if you want CodeBuild to build the source code every time a code change is pushed to this repository. For more information about webhooks and filter groups, see <u>GitHub webhook events</u>.

GitLab

Credential

Choose **Default source credential** or **Custom source credential** and follow the instructions to manage the default source credential or customize the source credential.

Connection type

CodeConnections is used to connect GitLab to CodeBuild.

Connection

Select a GitLab connection to connect through CodeConnections.

Repository

Choose the repository you want to use.

Source version

Enter a pull request ID, branch, commit ID, tag, or reference and a commit ID. For more information, see Source version sample with AWS CodeBuild.



Note

We recommend that you choose Git branch names that don't look like commit IDs, such as 811dd1ba1aba14473856cee38308caed7190c0d or 5392f7. This helps you avoid Git checkout collisions with actual commits.

Git clone depth

Choose **Git clone depth** to create a shallow clone with a history truncated to the specified number of commits. If you want a full clone, choose Full.

Build status

Select Report build statuses to source provider when your builds start and finish if you want the status of your build's start and completion reported to your source provider.

To be able to report the build status to the source provider, the user associated with the source provider must have write access to the repo. If the user does not have write access, the build status cannot be updated. For more information, see Source provider access.

GitLab Self Managed

Credential

Choose **Default source credential** or **Custom source credential** and follow the instructions to manage the default source credential or customize the source credential.

Connection type

CodeConnections is used to connect GitLab Self Managed to CodeBuild.

Connection

Select a GitLab Self Managed connection to connect through CodeConnections.

Repository

Choose the repository you want to use.

Source version

Enter a pull request ID, branch, commit ID, tag, or reference and a commit ID. For more information, see Source version sample with AWS CodeBuild.



Note

We recommend that you choose Git branch names that don't look like commit IDs, such as 811dd1ba1aba14473856cee38308caed7190c0d or 5392f7. This helps you avoid Git checkout collisions with actual commits.

Git clone depth

Choose Git clone depth to create a shallow clone with a history truncated to the specified number of commits. If you want a full clone, choose Full.

Build status

Select Report build statuses to source provider when your builds start and finish if you want the status of your build's start and completion reported to your source provider.

To be able to report the build status to the source provider, the user associated with the source provider must have write access to the repo. If the user does not have write access, the build status cannot be updated. For more information, see Source provider access.

Environment

In the **Environment** section, choose **Edit**. When your changes are complete, choose **Update configuration** to save the new configuration.

You can modify the following properties:

Provisioning model

To change the provisioning model, choose **Change provisioning model** and do one of the following:

• To use on-demand fleets managed by AWS CodeBuild, choose **On-demand**. With on-demand fleets, CodeBuild provides compute for your builds. The machines are destroyed when the build finishes. On-demand fleets are fully managed, and includes automatic scaling capabilities to handle spikes in demand.

• To use reserved capacity fleets managed by AWS CodeBuild, choose Reserved capacity, and then select a **Fleet name**. With reserved capacity fleets, you configure a set of dedicated instances for your build environment. These machines remain idle, ready to process builds or tests immediately and reduces build durations. With reserved capacity fleets, your machines are always running and will continue to incur costs as long they're provisioned.

For information, see Run builds on reserved capacity fleets.

Environment image

To change the build image, choose **Override image** and do one of the following:

- To use a Docker image managed by AWS CodeBuild, choose Managed image, and then make selections from Operating system, Runtime(s), Image, and Image version. Make a selection from **Environment type** if it is available.
- To use another Docker image, choose Custom image. For Environment type, choose ARM, Linux, Linux GPU, or Windows. If you choose Other registry, for External registry URL, enter the name and tag of the Docker image in Docker Hub, using the format docker repository/docker image name. If you choose Amazon ECR, use Amazon ECR **repository** and **Amazon ECR image** to choose the Docker image in your AWS account.
- To use a private Docker image, choose **Custom image**. For **Environment type**, choose **ARM**, Linux, Linux GPU, or Windows. For Image registry, choose Other registry, and then enter the ARN of the credentials for your private Docker image. The credentials must be created by Secrets Manager. For more information, see What Is AWS Secrets Manager? in the AWS Secrets Manager User Guide.



Note

CodeBuild overrides the ENTRYPOINT for custom Docker images.

Service role

Do one of the following:

• If you do not have a CodeBuild service role, choose **New service role**. In **Role name**, enter a name for the new role.

• If you have a CodeBuild service role, choose **Existing service role**. In **Role ARN**, choose the service role.



Note

When you use the console to create a build project, you can create a CodeBuild service role at the same time. By default, the role works with that build project only. If you use the console to associate this service role with another build project, the role is updated to work with the other build project. A service role can work with up to 10 build projects.

Additional configuration

Timeout

Specify a value, between 5 minutes and 36 hours, after which CodeBuild stops the build if it is not complete. If **hours** and **minutes** are left blank, the default value of 60 minutes is used.

Privileged

Select Enable this flag if you want to build Docker images or want your builds to get elevated privileges. only if you plan to use this build project to build Docker images. Otherwise, all associated builds that attempt to interact with the Docker daemon fail. You must also start the Docker daemon so that your builds can interact with it. One way to do this is to initialize the Docker daemon in the install phase of your build spec by running the following build commands. Do not run these commands if you chose a build environment image provided by CodeBuild with Docker support.



(i) Note

By default, Docker daemon is enabled for non-VPC builds. If you would like to use Docker containers for VPC builds, see Runtime Privilege and Linux Capabilities on the Docker Docs website and enable privileged mode. Also, Windows does not support privileged mode.

```
- nohup /usr/local/bin/dockerd --host=unix:///var/run/docker.sock --
host=tcp://127.0.0.1:2375 --storage-driver=overlay2 &
- timeout 15 sh -c "until docker info; do echo .; sleep 1; done"
```

VPC

If you want CodeBuild to work with your VPC:

- For VPC, choose the VPC ID that CodeBuild uses.
- For VPC Subnets, choose the subnets that include resources that CodeBuild uses.
- For **VPC Security groups**, choose the security groups that CodeBuild uses to allow access to resources in the VPCs.

For more information, see Use AWS CodeBuild with Amazon Virtual Private Cloud.

Compute

Choose one of the available options.

Registry credential

Specify a registry credential when the project is configured with a non-private registry image.



Note

This credential will only be utilized if the images are overridden with those from private registries.

Environment variables

Enter the name and value, and then choose the type of each environment variable for builds to use.



Note

CodeBuild sets the environment variable for your AWS Region automatically. You must set the following environment variables if you haven't added them to your buildspec.yml:

- AWS_ACCOUNT_ID
- IMAGE_REPO_NAME

IMAGE TAG

Console and AWS CLI users can see environment variables. If you have no concerns about the visibility of your environment variable, set the **Name** and **Value** fields, and then set **Type** to Plaintext.

We recommend that you store an environment variable with a sensitive value, such as an AWS access key ID, an AWS secret access key, or a password as a parameter in Amazon EC2 Systems Manager Parameter Store or AWS Secrets Manager.

If you use Amazon EC2 Systems Manager Parameter Store, then for **Type**, choose Parameter. For Name, enter an identifier for CodeBuild to reference. For Value, enter the parameter's name as stored in Amazon EC2 Systems Manager Parameter Store. Using a parameter named /CodeBuild/dockerLoginPassword as an example, for Type, choose **Parameter**. For **Name**, enter LOGIN_PASSWORD. For **Value**, enter /CodeBuild/ dockerLoginPassword.

Important

If you use Amazon EC2 Systems Manager Parameter Store, we recommend that you store parameters with parameter names that start with /CodeBuild/ (for example, /CodeBuild/dockerLoginPassword). You can use the CodeBuild console to create a parameter in Amazon EC2 Systems Manager. Choose Create parameter, and then follow the instructions in the dialog box. (In that dialog box, for KMS key, you can specify the ARN of an AWS KMS key in your account. Amazon EC2 Systems Manager uses this key to encrypt the parameter's value during storage and decrypt it during retrieval.) If you use the CodeBuild console to create a parameter, the console starts the parameter name with /CodeBuild/ as it is being stored. For more information, see Systems Manager Parameter Store and Systems Manager Parameter Store Console Walkthrough in the Amazon EC2 Systems Manager User Guide.

If your build project refers to parameters stored in Amazon EC2 Systems Manager Parameter Store, the build project's service role must allow the ssm: GetParameters action. If you chose New service role earlier, CodeBuild includes this action in the default service role for your build project. However, if you chose **Existing service role**, you must include this action to your service role separately.

> If your build project refers to parameters stored in Amazon EC2 Systems Manager Parameter Store with parameter names that do not start with /CodeBuild/, and you chose **New service role**, you must update that service role to allow access to parameter names that do not start with /CodeBuild/. This is because that service role allows access only to parameter names that start with /CodeBuild/. If you choose **New service role**, the service role includes permission to decrypt all parameters under the /CodeBuild/ namespace in the Amazon EC2 Systems Manager Parameter Store.

> Environment variables you set replace existing environment variables. For example, if the Docker image already contains an environment variable named MY_VAR with a value of my_value, and you set an environment variable named MY_VAR with a value of other value, then my value is replaced by other value. Similarly, if the Docker image already contains an environment variable named PATH with a value of /usr/local/sbin:/usr/local/bin, and you set an environment variable named PATH with a value of \$PATH:/usr/share/ant/bin, then /usr/ local/sbin:/usr/local/bin is replaced by the literal value \$PATH:/usr/ share/ant/bin.

Do not set any environment variable with a name that begins with CODEBUILD_. This prefix is reserved for internal use.

If an environment variable with the same name is defined in multiple places, the value is determined as follows:

- The value in the start build operation call takes highest precedence.
- The value in the build project definition takes next precedence.
- The value in the buildspec declaration takes lowest precedence.

If you use Secrets Manager, for **Type**, choose **Secrets Manager**. For **Name**, enter an identifier for CodeBuild to reference. For Value, enter a reference-key using the pattern secretid:json-key:version-stage:version-id. For information, see Secrets Manager reference-key in the buildspec file.



Important

If you use Secrets Manager, we recommend that you store secrets with names that start with /CodeBuild/ (for example, /CodeBuild/dockerLoginPassword). For

more information, see <u>What Is AWS Secrets Manager?</u> in the AWS Secrets Manager User Guide.

If your build project refers to secrets stored in Secrets Manager, the build project's service role must allow the secretsmanager: GetSecretValue action. If you chose **New service role** earlier, CodeBuild includes this action in the default service role for your build project. However, if you chose **Existing service role**, you must include this action to your service role separately.

If your build project refers to secrets stored in Secrets Manager with secret names that do not start with /CodeBuild/, and you chose **New service role**, you must update the service role to allow access to secret names that do not start with / CodeBuild/. This is because the service role allows access only to secret names that start with /CodeBuild/.

If you choose **New service role**, the service role includes permission to decrypt all secrets under the /CodeBuild/ namespace in the Secrets Manager.

Buildspec

In the **Buildspec** section, choose **Edit**. When your changes are complete, choose **Update configuration** to save the new configuration.

You can modify the following properties:

Build specifications

Do one of the following:

- If your source code includes a buildspec file, choose **Use a buildspec file**. By default, CodeBuild looks for a file named buildspec.yml in the source code root directory. If your buildspec file uses a different name or location, enter its path from the source root in **Buildspec name** (for example, buildspec-two.yml or configuration/buildspec.yml. If the buildspec file is in an S3 bucket, it must be in the same AWS Region as your build project. Specify the buildspec file using its ARN (for example, arn:aws:s3:::<my-codebuild-sample2>/buildspec.yml).
- If your source code does not include a buildspec file, or if you want to run build commands different from the ones specified for the build phase in the buildspec.yml file in the source code's root directory, choose **Insert build commands**. For **Build commands**, enter the commands you want to run in the build phase. For multiple commands, separate each

command by && (for example, mvn test && mvn package). To run commands in other phases, or if you have a long list of commands for the build phase, add a buildspec.yml file to the source code root directory, add the commands to the file, and then choose **Use the buildspec.yml in the source code root directory**.

For more information, see the Buildspec reference.

Batch configuration

In the **Batch configuration** section, choose **Edit**. When your changes are complete, choose **Update configuration** to save the new configuration. For more information, see <u>Run builds in batches</u>.

You can modify the following properties:

Batch service role

Provides the service role for batch builds.

Choose one of the following:

- If you do not have a batch service role, choose New service role. In Service role, enter a
 name for the new role.
- If you have a batch service role, choose **Existing service role**. In **Service role**, choose the service role.

Batch builds introduce a new security role in the batch configuration. This new role is required as CodeBuild must be able to call the StartBuild, StopBuild, and RetryBuild actions on your behalf to run builds as part of a batch. Customers should use a new role, and not the same role they use in their build, for two reasons:

- Giving the build role StartBuild, StopBuild, and RetryBuild permissions would allow a single build to start more builds via the buildspec.
- CodeBuild batch builds provide restrictions that restrict the number of builds and compute types that can be used for the builds in the batch. If the build role has these permissions, it is possible the builds themselves could bypass these restrictions.

Allowed compute types for batch

Select the compute types allowed for the batch. Select all that apply.

Allowed fleets for batch

Select the fleets allowed for the batch. Select all that apply.

Maximum builds allowed in batch

Enter the maximum number of builds allowed in the batch. If a batch exceeds this limit, the batch will fail.

Batch timeout

Enter the maximum amount of time for the batch build to complete.

Combine artifacts

Select Combine all artifacts from batch into a single location to have all of the artifacts from the batch combined into a single location.

Batch report mode

Select the desired build status report mode for batch builds.



Note

This field is only available when the project source is Bitbucket, GitHub, or GitHub Enterprise, and Report build statuses to source provider when your builds start and finish is selected under Source.

Aggregated builds

Select to have the statuses for all builds in the batch combined into a single status report.

Individual builds

Select to have the build statuses for all builds in the batch reported separately.

Artifacts

In the Artifacts section, choose Edit. When your changes are complete, choose Update **configuration** to save the new configuration.

You can modify the following properties:

Type

Do one of the following:

• If you do not want to create any build output artifacts, choose **No artifacts**. You might want to do this if you're only running build tests or you want to push a Docker image to an Amazon ECR repository.

- To store the build output in an S3 bucket, choose **Amazon S3**, and then do the following:
 - If you want to use your project name for the build output ZIP file or folder, leave **Name** blank. Otherwise, enter the name. (If you want to output a ZIP file, and you want the ZIP file to have a file extension, be sure to include it after the ZIP file name.)
 - Select Enable semantic versioning if you want a name specified in the buildspec file to
 override any name that is specified in the console. The name in a buildspec file is calculated
 at build time and uses the Shell command language. For example, you can append a date
 and time to your artifact name so that it is always unique. Unique artifact names prevent
 artifacts from being overwritten. For more information, see Buildspec syntax.
 - For Bucket name, choose the name of the output bucket.
 - If you chose **Insert build commands** earlier in this procedure, then for **Output files**, enter the locations of the files from the build that you want to put into the build output ZIP file or folder. For multiple locations, separate each location with a comma (for example, appspec.yml, target/my-app.jar). For more information, see the description of files in Buildspec syntax.
 - If you do not want your build artifacts encrypted, select Remove artifacts encryption.

For each secondary set of artifacts you want:

- 1. For **Artifact identifier**, enter a value that is fewer than 128 characters and contains only alphanumeric characters and underscores.
- 2. Choose Add artifact.
- 3. Follow the previous steps to configure your secondary artifacts.
- 4. Choose Save artifact.

Additional configuration

Encryption key

Do one of the following:

• To use the AWS managed key Amazon S3 in your account to encrypt the build output artifacts, leave **Encryption key** blank. This is the default.

• To use a customer managed key to encrypt the build output artifacts, in **Encryption key**, enter the ARN of the customer managed key. Use the format arn:aws:kms:region-ID:account-ID:key/key-ID.

Cache type

For **Cache type**, choose one of the following:

- If you do not want to use a cache, choose **No cache**.
- If you want to use an Amazon S3 cache, choose **Amazon S3**, and then do the following:
 - For **Bucket**, choose the name of the S3 bucket where the cache is stored.
 - (Optional) For Cache path prefix, enter an Amazon S3 path prefix. The Cache path prefix value is similar to a directory name. It makes it possible for you to store the cache under the same directory in a bucket.



Important

Do not append a trailing slash (/) to the end of the path prefix.

• If you want to use a local cache, choose **Local**, and then choose one or more local cache modes.



Note

Docker layer cache mode is available for Linux only. If you choose it, your project must run in privileged mode.

Using a cache saves considerable build time because reusable pieces of the build environment are stored in the cache and used across builds. For information about specifying a cache in the buildspec file, see Buildspec syntax. For more information about caching, see Cache builds to improve performance.

Logs

In the **Logs** section, choose **Edit**. When your changes are complete, choose **Update configuration** to save the new configuration.

You can modify the following properties:

Choose the logs you want to create. You can create Amazon CloudWatch Logs, Amazon S3 logs, or both.

CloudWatch

If you want Amazon CloudWatch Logs logs:

CloudWatch logs

Select CloudWatch logs.

Group name

Enter the name of your Amazon CloudWatch Logs log group.

Stream name

Enter your Amazon CloudWatch Logs log stream name.

S3

If you want Amazon S3 logs:

S3 logs

Select **S3 logs**.

Bucket

Choose the name of the S3 bucket for your logs.

Path prefix

Enter the prefix for your logs.

Disable S3 log encryption

Select if you do not want your S3 logs encrypted.

Change a build project's settings (AWS CLI)

For information about using the AWS CLI with AWS CodeBuild, see the Command line reference.

To update a CodeBuild project with the AWS CLI, you create a JSON file with the updated properties and pass that file to the <u>update-project</u> command. Any properties not contained in the update file remain unchanged.

In the update JSON file, only the name property and the modified properties are required. The name property identifies the project to modify. For any modified structures, the required parameters for those structures must also be included. For example, to modify the environment for the project, the environment/type and environment/computeType properties are required. Here is an example that updates the environment image:

```
"name": "project-name>",
    "environment": {
        "type": "LINUX_CONTAINER",
        "computeType": "BUILD_GENERAL1_SMALL",
        "image": "aws/codebuild/amazonlinux-x86_64-standard:4.0"
}
```

If you need to obtain the current property values for a project, use the <u>batch-get-projects</u> command to obtain the current properties of the project you are modifying, and write the output to a file.

```
aws codebuild batch-get-projects --names "roject-name" > project-info.json
```

The *project-info.json* file contains an array of projects, so it cannot be used directly to update a project. You can, however, copy the properties that you want to modify from the *project-info.json* file and paste them into your update file as a baseline for the properties you want to modify. For more information, see View a build project's details (AWS CLI).

Modify the update JSON file as described in <u>Create a build project (AWS CLI)</u>, and save your results. When you are finished modifying the update JSON file, run the <u>update-project</u> command, passing the update JSON file.

```
aws codebuild update-project --cli-input-json file://<update-project-file>
```

If successful, the updated project JSON appears in the output. If any required parameters are missing, an error message is displayed in the output that identifies the missing parameters. For example, this is the error message displayed if the environment/type parameter is missing:

```
aws codebuild update-project --cli-input-json file://update-project.json
```

Parameter validation failed:
Missing required parameter in environment: "type"

Change a build project's settings (AWS SDKs)

For information about using AWS CodeBuild with the AWS SDKs, see the <u>AWS SDKs and tools</u> reference.

Multiple access tokens in CodeBuild

CodeBuild supports sourcing access tokens to third party providers from your secrets in AWS Secrets Manager or through AWS CodeConnections connections. You can set your secret or connection as the default credential for interactions with a specified third party provider such as GitHub, GitHub Enterprise, or Bitbucket.

You can set your source credentials at three different levels:

- Account level credentials for all projects: These are default credentials for all projects in an AWS account. They will be used on a project when no project or source level credentials are specified.
- 2. Source level credentials for a specific repository: This is when a Secrets Manager secret or CodeConnections connection is defined on a project source. These credentials will only be used for operations on the specified source repository. This allows you to set up multiple access tokens with different permission scopes in the same project, and not use the default account level credentials.
- 3. **Project level fallback credentials:** You can set a project level fallback credential by using NO_SOURCE as primary source type and define a secret or connection on it. This is can be used when you have multiple sources on a project, but want to use the same credentials for them, or when you don't want to use the default account level credentials for your project.

Topics

- Step 1: Create a Secrets Manager secret or a CodeConnections connection
- Step 2: Grant CodeBuild project IAM role access to Secrets Manager secrets
- Step 3: Configure Secrets Manager or CodeConnections tokens
- Additional setup options

Step 1: Create a Secrets Manager secret or a CodeConnections connection

Use the following instructions to create a Secrets Manager secret or a CodeConnections connection:

- Create and store a token in a Secrets Manager secret.
- Create a connection to GitHub
- Create a connection to to GitHub Enterprise Server
- Create a connection to Bitbucket

Step 2: Grant CodeBuild project IAM role access to Secrets Manager secrets



Note

Before you continue, you must have access to the token created in Secrets Manager or CodeConnections.

To grant CodeBuild project IAM role access to Secrets Manager or CodeConnections, you must add the following IAM policy.

To grant CodeBuild project IAM role access

- Create an IAM role for your CodeBuild project by following the instructions to Allow CodeBuild to interact with other AWS services for your CodeBuild project.
- Do one of the following: 2.
 - Add the following IAM policy to your CodeBuild project role to grant access to your secret.

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Effect": "Allow",
            "Action": [
                "secretsmanager:GetSecretValue"
```

(Optional) If you're using AWS KMS customer managed keys to encrypt a Secrets Manager secret, you can add the following policy statement to grant access.

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Effect": "Allow",
            "Action": [
                 "kms:Decrypt"
            ],
            "Resource": "<kms-key-arn>",
            "Condition": {
                "StringEquals": {
                     "kms:EncryptionContext:SecretARN": "<secret-arn>"
                }
            }
        }
    ]
}
```

 Add the following IAM policy to your CodeBuild project role to grant access to your connection.

Step 3: Configure Secrets Manager or CodeConnections tokens

You can set your source credentials at three different levels with either Secrets Manager or CodeConnections tokens.

Configure Secrets Manager or CodeConnections tokens as account level credentials

You can configure a Secrets Manager secret or CodeConnections connection as an account level credential and use it in a project.

AWS Management Console

To configure a connection as an account level credential in the AWS Management Console

- 1. For **Source provider**, choose **Bitbucket**, **GitHub**, or **GitHub Enterprise**.
- 2. For **Credential**, do one of the following:
 - Choose Default source credential to use your account's default source credential to apply to all projects.
 - a. If you aren't connected to your source provider, choose Manage default source credential.
 - b. For Credential type, choose a credential type.
 - If you chose CodeConnections, choose to use an existing connection or create a new connection.

If you chose a different credential type, for **Service** choose which service you'd like to use to store your token and do the following:

• If you chose to use **Secrets Manager**, you can choose to use an existing secret connection or create a new secret and choose **Save**. For more information how to create a new secret, see <u>Create and store a token in a Secrets Manager secret</u>.

• If you chose to use **CodeBuild**, enter your token or your username and app password, and choose **Save**.

- Choose Custom source credential to use a custom source credential to override your account's default settings.
 - a. For **Credential type**, choose a credential type.
 - b. In **Connection**, choose to use an existing connection or create a new connection.

AWS CLI

To configure a connection as an account level credential in the AWS CLI

• Open a terminal (Linux, macOS, or Unix) or command prompt (Windows). Use the AWS CLI to run the **import-source-credentials** command.

Use the following command to configure a Secrets Manager secret:

```
aws codebuild import-source-credentials \
    --token "<secret-arn>" \
    --server-type <source-provider> \
    --auth-type SECRETS_MANAGER \
    --region <aws-region>
```

Use the following command to configure a CodeConnections connection:

```
aws codebuild import-source-credentials \
    --token "<connection-arn>" \
    --server-type <source-provider> \
    --auth-type CODECONNECTIONS \
    --region <aws-region>
```

This command allows you to import a token as the account level default source credentials. When you import a credential using the ImportSourceCredentials API, CodeBuild will use the token for all interactions with the source provider, such as webhooks, build status reporting and git clone operations unless a more specific set of credentials has been configured in the project.

You can now use the token in your build project and run it. For more information, see <u>Create a build</u> project in AWS CodeBuild and Run AWS CodeBuild builds manually.

Configure multiple tokens as source level credentials

To use Secrets Manager secrets or CodeConnections connections as source level credentials, directly reference the token in CodeBuild project, and start a build.

AWS Management Console

To configure multiple tokens as source level credentials in the AWS Management Console

- 1. For **Source provider**, choose **GitHub**.
- 2. For **Credential**, do one of the following:
 - Choose Default source credential to use your account's default source credential to apply to all projects.
 - a. If you aren't connected to GitHub, choose Manage default source credential.
 - b. For **Credential type**, choose **GitHub App**.
 - c. In **Connection**, choose to use an existing connection or create a new connection.
 - Choose Custom source credential to use a custom source credential to override your account's default settings.
 - a. For **Credential type**, choose **GitHub App**.
 - b. In **Connection**, choose to use an existing connection or create a new connection.
- 3. Choose **Add source** and repeat the process of choosing your source provider and credentials.

AWS CLI

To configure multiple tokens as source level credentials in the AWS CLI

 Open a terminal (Linux, macOS, or Unix) or command prompt (Windows). Use the AWS CLI to run the create-project command.

Use the following command:

```
aws codebuild create-project --region <aws-region> \
```

Set a project level source credential fallback

To set up project level source credential fallback, use NO_SOURCE for your project's primary source and reference the token.

When using NO_SOURCE, a buildspec typically is provided within the source model as it is not directly configured to use an external source to fetch the <u>buildspec</u>. Commonly, a NO_SOURCE

source will handle cloning all relevant repositories from within the buildspec. To ensure the configured credentials are available for those operations, you can enable the git-credential-helper option in the buildspec.

```
env:
git-credential-helper: yes
```

During the build, CodeBuild will then read the AuthServer field from the configured token and use the token credentials for all git requests to that particular third party source provider.

Additional setup options

You can configure Secrets Manager account level credentials by using AWS CloudFormation templates. You can use the following AWS CloudFormation template to set an account level credential:

```
Parameters:
  GitHubToken:
    Type: String
    NoEcho: true
    Default: placeholder
Resources:
  CodeBuildAuthTokenSecret:
    Type: AWS::SecretsManager::Secret
    Properties:
      Description: CodeBuild auth token
      Name: codebuild-auth-token
      SecretString:
        !Join
          - - '{"ServerType":"GITHUB", "AuthType": "PERSONAL_ACCESS_TOKEN", "Token":"'
            - !Ref GitHubToken
            - '"}'
      Tags:
        - Key: codebuild:source:provider
          Value: github
        - Key: codebuild:source:type
          Value: personal_access_token
  CodeBuildSecretsManagerAccountCredential:
    Type: AWS::CodeBuild::SourceCredential
    Properties:
      ServerType: GITHUB
```

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AuthType: SECRETS_MANAGER

Token: !Ref CodeBuildAuthTokenSecret



Note

If you're also creating a project in the same stack, use the AWS CloudFormation attribute DependsOn to ensure the AccountCredential is created before the project.

You can also configure Secrets Manager multiple source level credentials by using AWS CloudFormation templates. You can use the following AWS CloudFormation template to use multiple tokens to pull in multiple sources:

```
Parameters:
  GitHubTokenOne:
    Type: String
    NoEcho: true
    Default: placeholder
  GitHubTokenTwo:
    Type: String
    NoEcho: true
    Default: placeholder
Resources:
  CodeBuildSecretsManagerProject:
    Type: AWS::CodeBuild::Project
    Properties:
      Name: codebuild-multitoken-example
      ServiceRole: <service-role>
      Environment:
        Type: LINUX_CONTAINER
        ComputeType: BUILD_GENERAL1_SMALL
        Image: aws/codebuild/amazonlinux-x86_64-standard:5.0
      Source:
        Type: GITHUB
        Location: <github-repository-one>
        Auth:
          Type: SECRETS_MANAGER
          Resource: !Ref CodeBuildAuthTokenSecretOne
      SecondarySources:
        - Type: GITHUB
          Location: <github-repository-two>
```

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```
Auth:
          Type: SECRETS_MANAGER
          Resource: !Ref CodeBuildAuthTokenSecretTwo
        SourceIdentifier: secondary
    Artifacts:
      Type: NO_ARTIFACTS
    LogsConfig:
      CloudWatchLogs:
        Status: ENABLED
CodeBuildProjectIAMRoleSecretAccess:
  Type: AWS::IAM::RolePolicy
  Properties:
    RoleName: <role-name>
    PolicyName: CodeBuildProjectIAMRoleSecretAccessPolicy
    PolicyDocument:
      Version: '2012-10-17'
      Statement:
        - Effect: Allow
          Action:
            secretsmanager:GetSecretValue
          Resource:
            - !Ref CodeBuildAuthTokenSecretOne
            - !Ref CodeBuildAuthTokenSecretTwo
CodeBuildAuthTokenSecretOne:
  Type: AWS::SecretsManager::Secret
  Properties:
    Description: CodeBuild auth token one
    Name: codebuild-auth-token-one
    SecretString:
      !Join
        - - '{"ServerType":"GITHUB","AuthType":"PERSONAL_ACCESS_TOKEN","Token":"'
          - !Ref GitHubTokenOne
          - '"}'
    Tags:
      - Key: codebuild:source:provider
        Value: github
      - Key: codebuild:source:type
        Value: personal_access_token
CodeBuildAuthTokenSecretTwo:
  Type: AWS::SecretsManager::Secret
  Properties:
    Description: CodeBuild auth token two
    Name: codebuild-auth-token-two
```

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```
SecretString:
!Join
- ''
- - '{"ServerType":"GITHUB","AuthType":"PERSONAL_ACCESS_TOKEN","Token":"'
- !Ref GitHubTokenTwo
- '"}'
Tags:
- Key: codebuild:source:provider
   Value: github
- Key: codebuild:source:type
   Value: personal_access_token
```

Delete build projects in AWS CodeBuild

You can use the CodeBuild console, AWS CLI, or AWS SDKs to delete a build project in CodeBuild. If you delete a project, its builds are not deleted.

Marning

You cannot delete a project that has builds and a resource policy. To delete a project with a resource policy and builds, you must first remove the resource policy and delete its builds.

Topics

- Delete a build project (console)
- Delete a build project (AWS CLI)
- Delete a build project (AWS SDKs)

Delete a build project (console)

- 1. Open the AWS CodeBuild console at https://console.aws.amazon.com/codesuite/codebuild/ home.
- 2. In the navigation pane, choose **Build projects**.
- 3. Do one of the following:
 - Choose the radio button next to the build project you want to delete, and then choose
 Delete.

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Choose the link for the build project you want to delete, and then choose Delete.



Note

By default, only the most recent 10 build projects are displayed. To view more build projects, choose a different value for **Projects per page** or use the back and forward arrows for viewing projects.

Delete a build project (AWS CLI)

Run the delete-project command: 1.

```
aws codebuild delete-project --name name
```

Replace the following placeholder:

- name: Required string. The name of the build project to delete. To get a list of available build projects, run the list-projects command. For more information, see View a list of build project names (AWS CLI).
- If successful, no data and no errors appear in the output.

For more information about using the AWS CLI with AWS CodeBuild, see the Command line reference.

Delete a build project (AWS SDKs)

For more information about using AWS CodeBuild with the AWS SDKs, see the AWS SDKs and tools reference.

Get public build project URLs

AWS CodeBuild allows you to make the build results, logs, and artifacts for your build projects available to the general public. This allows contributors to your source repositories to view the results and download the artifacts of a build, without requiring them to have access to an AWS account.

When you make your project's builds available to the public, all of a project's build results, logs, and artifacts, including builds that were run when the project was private, are made available to the public. Likewise, when you make a public build project private, the build results for that project are no longer available to the public.

For information about how to change the public visibility of your project's build results, see **Enable public build access**.

CodeBuild provides a URL for the public builds for your project that is unique to your project.

To obtain the public URL for your build project, use the following procedure.

To obtain the URL of a public build project

- Open the AWS CodeBuild console at https://console.aws.amazon.com/codesuite/codebuild/ home.
- 2. In the navigation pane, choose **Build projects**.
- 3. Choose the link for the build project you want to obtain the public URL for.
- 4. The public URL is displayed in the **Public project URL** field in the **Configuration** section. You can choose the link to open the URL, or copy the URL with the copy button.

Marning

The following should be kept in mind when making your project's build results public:

- All of a project's build results, logs, and artifacts, including builds that were run when the project was private, are available to the public.
- All build logs and artifacts are available to the public. Environment variables, source
 code, and other sensitive information may have been output to the build logs and
 artifacts. You must be careful about what information is output to the build logs. Some
 best practices are:
 - Do not store sensitive values, especially AWS access key IDs and secret access keys, in environment variables. We recommend that you use an Amazon EC2 Systems Manager Parameter Store or AWS Secrets Manager to store sensitive values.
 - Follow <u>Best practices for using webhooks</u> to limit which entities can trigger a build, and do not store the buildspec in the project itself, to ensure that your webhooks are as secure as possible.

 A malicious user can use public builds to distribute malicious artifacts. We recommend that project administrators review all pull requests to verify that the pull request is a legitimate change. We also recommend that you validate any artifacts with their checksums to make sure that the correct artifacts are being downloaded.

Share build projects

Project sharing allows project owners to share their AWS CodeBuild projects with other AWS accounts or users. In this model, the account that owns the project (owner) shares a project with other accounts (consumers). A consumer cannot edit or run a project.

Topics

- Share a project
- Related services
- Access CodeBuild projects shared with you
- Unshare a shared project
- Identify a shared project
- Shared project permissions

Share a project

The consumer can use both the AWS CLI and AWS CodeBuild console to view the project and builds you've shared. The consumer cannot edit or run the project.

You can add a project to an existing resource share or you can create one in the AWS RAM console.



Note

You cannot delete a project with builds that has been added to a resource share.

To share a project with organizational units or an entire organization, you must enable sharing with AWS Organizations. For more information, see Enable sharing with AWS Organizations in the AWS RAM User Guide.

Share build projects API Version 2016-10-06 416

You can use the AWS CodeBuild console, AWS RAM console, or the AWS CLI to share a project that you own.

Prerequisites for sharing projects

Before you start sharing a project, make sure your AWS account owns it. You cannot share a project that has been shared with you.

To share a project that you own (CodeBuild console)

- Open the AWS CodeBuild console at https://console.aws.amazon.com/codesuite/codebuild/ home.
- In the navigation pane, choose **Build projects**.



Note

By default, only the 10 most recent build projects are displayed. To view more build projects, choose the gear icon, and then choose a different value for **Projects per page** or use the back and forward arrows.

Choose the project you want to share, and then choose **Share**. For more information, see Create a resource share in the AWS RAM User Guide.

To share a project that you own (AWS RAM console)

See Creating a resource share in the AWS RAM User Guide.

To share a project that you own (AWS RAM command)

Use the create-resource-share command.

To share a project that you own (CodeBuild command)

Use the put-resource-policy command:

Create a file named policy. json and copy the following into it.

```
{
  "Version": "2012-10-17",
  "Statement":[{
    "Effect": "Allow",
```

Share a project API Version 2016-10-06 417

```
"Principal":{
    "AWS":"<consumer-aws-account-id-or-user>"
},
    "Action":[
        "codebuild:BatchGetProjects",
        "codebuild:BatchGetBuilds",
        "codebuild:ListBuildsForProject"],
        "Resource":"<arn-of-project-to-share>"
}]
}
```

 Update policy.json with the project ARN and identifiers to share it with. The following example grants read-only access to the root user for the AWS account identified by 123456789012.

```
{
  "Version":"2012-10-17",
  "Statement":[{
     "Effect":"Allow",
     "Principal":{
        "AWS": [
           "123456789012"
      ]
     },
     "Action":[
        "codebuild:BatchGetProjects",
        "codebuild:BatchGetBuilds",
        "codebuild:ListBuildsForProject"],
     "Resource":"arn:aws:codebuild:us-west-2:123456789012:project/my-project"
}]
}
```

3. Run the put-resource-policy command.

4. Get the AWS RAM resource share ARN.

```
aws ram list-resources --resource-owner SELF --resource-arns project-arn>
```

This will return a response similar to this:

Share a project API Version 2016-10-06 418

```
{
    "resources": [
        {
             "arn": "<project-arn>",
             "type": "<type>",
             "resourceShareArn": "<resource-share-arn>",
             "creationTime": "<creation-time>",
             "lastUpdatedTime": "<last-update-time>"
        }
    ]
}
```

From the response, copy the < resource-share-arn > value to use in the next step.

5. Run the AWS RAM promote-resource-share-created-from-policy command.

```
aws ram promote-resource-share-created-from-policy --resource-share-arn <resource-
share-arn>
```

Related services

Project sharing integrates with AWS Resource Access Manager (AWS RAM), a service that makes it possible for you to share your AWS resources with any AWS account or through AWS Organizations. With AWS RAM, you share resources by creating a *resource share* that specifies the resources and the consumers to share them with. Consumers can be individual AWS accounts, organizational units in AWS Organizations, or an entire organization in AWS Organizations.

For more information, see the AWS RAM User Guide.

Access CodeBuild projects shared with you

To access a shared project, a consumer's IAM role requires the BatchGetProjects permission. You can attach the following policy to their IAM role:

Related services API Version 2016-10-06 419

```
"codebuild:BatchGetProjects"
]
}
```

For more information, see <u>Using identity-based policies for AWS CodeBuild</u>.

Unshare a shared project

An unshared project, including its builds, can be accessed only by its owner. If you unshare a project, any AWS account or user you previously shared it with cannot access the project or its builds.

To unshare a shared project that you own, you must remove it from the resource share. You can use the AWS CodeBuild console, AWS RAM console, or AWS CLI to do this.

To unshare a shared project that you own (AWS RAM console)

See Updating a resource share in the AWS RAM User Guide.

To unshare a shared project that you own (AWS CLI)

Use the disassociate-resource-share command.

To unshare project that you own (CodeBuild command)

Run the <u>delete-resource-policy</u> command and specify the ARN of the project you want to unshare:

```
aws codebuild delete-resource-policy --resource-arn project-arn
```

Identify a shared project

Owners and consumers can use the AWS CLI to identify shared projects.

To identify projects shared with your AWS account or user (AWS CLI)

Use the <u>list-shared-projects</u> command to return the projects that are shared with you.

Shared project permissions

Permissions for owners

A project owner can edit the project and use it to run builds.

Unshare a shared project API Version 2016-10-06 420

Permissions for consumers

A project consumer can view a project and its builds, but cannot edit a project or use it to run builds.

Tag build projects

A tag is a custom attribute label that you or AWS assigns to an AWS resource. Each AWS tag has two parts:

- A tag key (for example, CostCenter, Environment, Project, or Secret). Tag keys are case sensitive.
- An optional field known as a tag value (for example, 111122223333, Production, or a team name). Omitting the tag value is the same as using an empty string. Like tag keys, tag values are case sensitive.

Together these are known as key-value pairs. For information about the number of tags you can have on a project and restrictions on tag keys and values, see Tags.

Tags help you identify and organize your AWS resources. Many AWS services support tagging, so you can assign the same tag to resources from different services to indicate that the resources are related. For example, you can assign the same tag to a CodeBuild project that you assign to an S3 bucket. For more information about using tags, see Tagging Best Practices.

In CodeBuild, the primary resources are the project and the report group. You can use the CodeBuild console, the AWS CLI, CodeBuild APIs, or AWS SDKs to add, manage, and remove tags for a project. In addition to identifying, organizing, and tracking your project with tags, you can use tags in IAM policies to help control who can view and interact with your project. For examples of tag-based access policies, see Using tags to control access to AWS CodeBuild resources.



Important

When using the reserved capacity feature, data cached on fleet instances, including source files, Docker layers, and cached directories specified in the buildspec, can be accessible to other projects within the same account. This is by design and allows projects within the same account to share fleet instances.

Tag build projects API Version 2016-10-06 421

Topics

- Add a tag to a project
- View tags for a project
- Edit tags for a project
- Remove a tag from a project

Add a tag to a project

Adding tags to a project can help you identify and organize your AWS resources and manage access to them. First, you add one or more tags (key-value pairs) to a project. Keep in mind that there are limits on the number of tags you can have on a project. There are restrictions on the characters you can use in the key and value fields. For more information, see Tags. After you have tags, you can create IAM policies to manage access to the project based on these tags. You can use the CodeBuild console or the AWS CLI to add tags to a project.



Important

When using the reserved capacity feature, data cached on fleet instances, including source files, Docker layers, and cached directories specified in the buildspec, can be accessible to other projects within the same account. This is by design and allows projects within the same account to share fleet instances.

For more information about adding tags to a project when you create it, see Add a tag to a project (console).



Important

Before you add a tag to a project, make sure to review any IAM policies that might use tags to control access to resources such as build projects. For examples of tag-based access policies, see Using tags to control access to AWS CodeBuild resources.

Topics

- Add a tag to a project (console)
- Add a tag to a project (AWS CLI)

API Version 2016-10-06 422 Add a tag to a project

Add a tag to a project (console)

You can use the CodeBuild console to add one or more tags to a CodeBuild project.

- 1. Open the CodeBuild console at https://console.aws.amazon.com/codebuild/.
- 2. In **Build projects**, choose the name of the project where you want to add tags.
- 3. In the navigation pane, choose **Settings**. Choose **Build project tags**.
- 4. If no tags have been added to the project, choose **Add tag**. Otherwise, choose **Edit**, and then choose **Add tag**.
- 5. In **Key**, enter a name for the tag. You can add an optional value for the tag in **Value**.
- 6. (Optional) To add another tag, choose **Add tag** again.
- 7. When you have finished adding tags, choose **Submit**.

Add a tag to a project (AWS CLI)

To add a tag to a project when you create it, see <u>Create a build project (AWS CLI)</u>. In create-project.json, add your tags.

In these steps, we assume that you have already installed a recent version of the AWS CLI or updated to the current version. For more information, see <u>Installing the AWS Command Line</u> <u>Interface</u>.

If successful, this command returns nothing.

View tags for a project

Tags can help you identify and organize your AWS resources and manage access to them. For more information about using tags, see the <u>Tagging best practices</u> whitepaper. For examples of tagbased access policies, see Using tags to control access to AWS CodeBuild resources.

View tags for a project (console)

You can use the CodeBuild console to view the tags associated with a CodeBuild project.

- 1. Open the CodeBuild console at https://console.aws.amazon.com/codebuild/.
- 2. In **Build projects**, choose the name of the project where you want to view tags.
- 3. In the navigation pane, choose **Settings**. Choose **Build project tags**.

View tags for a project API Version 2016-10-06 423

View tags for a project (AWS CLI)

To view tags for a build project, run the following command. Use the name of your project for the -- names parameter.

```
aws codebuild batch-get-projects -- names your-project-name
```

If successful, this command returns JSON-formatted information about your build project that includes something like the following:

```
{
    "tags": {
        "Status": "Secret",
        "Team": "JanesProject"
    }
}
```

If the project does not have tags, the tags section is empty:

```
"tags": []
```

Edit tags for a project

You can change the value for a tag associated with a project. You can also change the name of the key, which is equivalent to removing the current tag and adding a different one with the new name and the same value as the other key. Keep in mind that there are limits on the characters you can use in the key and value fields. For more information, see Tags.

Important

Editing tags for a project can impact access to that project. Before you edit the name (key) or value of a tag for a project, make sure to review any IAM policies that might use the key or value for a tag to control access to resources such as build projects. For examples of tagbased access policies, see Using tags to control access to AWS CodeBuild resources.

Edit a tag for a project (console)

You can use the CodeBuild console to edit the tags associated with a CodeBuild project.

Edit tags for a project API Version 2016-10-06 424

- Open the CodeBuild console at https://console.aws.amazon.com/codebuild/. 1.
- 2. In **Build projects**, choose the name of the project where you want to edit tags.
- 3. In the navigation pane, choose **Settings**. Choose **Build project tags**.
- 4. Choose Edit.
- Do one of the following: 5.
 - To change the tag, enter a new name in Key. Changing the name of the tag is the equivalent of removing a tag and adding a new tag with the new key name.
 - To change the value of a tag, enter a new value. If you want to change the value to nothing, delete the current value and leave the field blank.
- When you have finished editing tags, choose **Submit**.

Edit tags for a project (AWS CLI)

To add, change, or delete tags from a build project, see Change a build project's settings (AWS CLI). Update the tags section in the JSON-formatted data you use to update the project.

Remove a tag from a project

You can remove one or more tags associated with a project. Removing a tag does not delete the tag from other AWS resources that are associated with that tag.

Important

Removing tags for a project can impact access to that project. Before you remove a tag from a project, make sure to review any IAM policies that might use the key or value for a tag to control access to resources such as build projects. For examples of tag-based access policies, see Using tags to control access to AWS CodeBuild resources.

Remove a tag from a project (console)

You can use the CodeBuild console to remove the association between a tag and a CodeBuild project.

- 1. Open the CodeBuild console at https://console.aws.amazon.com/codebuild/.
- In **Build projects**, choose the name of the project where you want to remove tags. 2.

- In the navigation pane, choose **Settings**. Choose **Build project tags**. 3.
- Choose Edit. 4.
- Find the tag you want to remove, and then choose **Remove tag**.
- When you have finished removing tags, choose **Submit**. 6.

Remove a tag from a project (AWS CLI)

To delete one or more tags from a build project, see Change a build project's settings (AWS CLI). Update the tags section in the JSON-formatted data with an updated list of tags that does not contain the ones you want to delete. If you want to delete all tags, update the tags section to:

"tags: []"



Note

If you delete a CodeBuild build project, all tag associations are removed from the deleted build project. You do not have to remove tags before you delete a build project.

Use runners with AWS CodeBuild

AWS CodeBuild supports integration with GitHub Actions runners, self-managed GitLab runners, and the Buildkite runner.

Topics

- Self-hosted GitHub Actions runners in AWS CodeBuild
- Self-managed GitLab runners in AWS CodeBuild
- Self-managed Buildkite runner in AWS CodeBuild

Self-hosted GitHub Actions runners in AWS CodeBuild

You can configure your project to set up self-hosted GitHub Actions runners in CodeBuild containers to process your GitHub Actions workflow jobs. This can be done by setting up a webhook using your CodeBuild project, and updating your GitHub Actions workflow YAML to use self-hosted runners hosted on CodeBuild machines.

Use runners API Version 2016-10-06 426

The high-level steps to configure a CodeBuild project to run GitHub Actions jobs are as follows:

1. If you haven't done so already, create a personal access token or connect with an OAuth app to connect your project to GitHub.

- 2. Navigate to the CodeBuild console and create a CodeBuild project with a webhook and set up your webhook filters.
- 3. Update your GitHub Actions workflow YAML in GitHub to configure your build environment.

For a more detailed procedure, see Tutorial: Configure a CodeBuild-hosted GitHub Actions runner.

This feature allows your GitHub Actions workflow jobs to get native integration with AWS, which provides security and convenience through features like IAM, AWS Secrets Manager integration, AWS CloudTrail, and Amazon VPC. You can access latest instance types, including ARM-based instances.

Topics

- About the CodeBuild-hosted GitHub Actions runner
- Tutorial: Configure a CodeBuild-hosted GitHub Actions runner
- Troubleshoot the webhook
- Label overrides supported with the CodeBuild-hosted GitHub Actions runner
- Compute images supported with the CodeBuild-hosted GitHub Actions runner

About the CodeBuild-hosted GitHub Actions runner

The following are some common questions about the CodeBuild-hosted GitHub Actions runner.

When should I include the image and instance overrides in the label?

You can include the image and instance overrides in the label in order to specify different build environment for each of your GitHub Actions workflow jobs. This can be done without the need to create multiple CodeBuild projects or webhooks. For example, this is useful when you need to use a matrix for your workflow jobs.

name: Hello World

on: [push]

jobs:

Hello-World-Job:

```
runs-on:
    - codebuild-myProject-${{ github.run_id }}-${{ github.run_attempt }}
    image:${{ matrix.os }}
    instance-size:${{ matrix.size }}

strategy:
    matrix:
    include:
        - os: arm-3.0
            size: small
            - os: linux-5.0
            size: large

steps:
        - run: echo "Hello World!"
```

Note

Quotation marks might be required if runs-on has multiple labels containing GitHub Actions context.

Can I use AWS CloudFormation for this feature?

Yes, you can include a filter group in your AWS CloudFormation template that specifies a GitHub Actions workflow job event filter in your project webhook.

For more information, see Filter GitHub webhook events (AWS CloudFormation).

If you need help setting up project credentials in your AWS CloudFormation template, see AWS::CodeBuild::SourceCredential in the AWS CloudFormation User Guide for more information.

How can I mask secrets when using this feature?

By default, secrets that are printed in the log is not masked. If you would like to mask your secrets, you can use the following syntax: ::add-mask::value. The following is an example of how you can use this syntax in your YAML:

```
name: Secret Job
on: [push]
jobs:
    Secret-Job:
    runs-on: codebuild-myProject-${{ github.run_id }}-${{ github.run_attempt }}
    env:
        SECRET_NAME: "secret-name"
    steps:
        - run: echo "::add-mask::$SECRET_NAME"
```

For more information, see Masking a value in a log on GitHub.

Can I receive GitHub Actions webhook events from multiple repositories within a single project?

CodeBuild supports organization and global level webhooks, which receive events from a specified organization or enterprise. For more information, see GitHub global and organization webhooks.

Which regions support using a CodeBuild-hosted GitHub Actions runner?

CodeBuild-hosted GitHub Actions runners are supported in all CodeBuild regions. For more information about AWS Regions where CodeBuild is available, see AWS Services by Region.

Which platforms support using a CodeBuild-hosted GitHub Actions runner?

CodeBuild-hosted GitHub Actions runners are supported on both Amazon EC2 and <u>AWS Lambda</u> compute. You can use the following platforms: Amazon Linux 2, Amazon Linux 2023, Ubuntu, and Windows Server Core 2019. For more information, see <u>EC2 compute images</u> and <u>Lambda compute images</u>.

Tutorial: Configure a CodeBuild-hosted GitHub Actions runner

This tutorial shows you how to configure your CodeBuild projects to run GitHub Actions jobs. For more information about using GitHub Actions with CodeBuild see <u>Tutorial</u>: <u>Configure a CodeBuildhosted GitHub Actions runner</u>.

To complete this tutorial, you must first:

• Connect with a personal access token, a Secrets Manager secret, OAuth app, or GitHub App. If you'd like to connect with an OAuth app, you must use the CodeBuild console to do so. If

you'd like to create a personal access token, you can either use the CodeBuild console or use the ImportSourceCredentials API. For more instructions, see GitHub and GitHub Enterprise Server access in CodeBuild.

- Connect CodeBuild to your GitHub account. To do so, you can do one of the following:
 - You can add GitHub as a source provider in the console. You can connect with either a personal access token, a Secrets Manager secret, OAuth app, or GitHub App. For instructions, see GitHub and GitHub Enterprise Server access in CodeBuild.
 - You can import your GitHub credentials via the ImportSourceCredentials API. This can only be done with a personal access token. If you connect using an OAuth app, you must connect using the console instead. For instructions, see Connect GitHub with an access token (CLI).



Note

This only needs to be done if you haven't connected to GitHub for your account.

Step 1: Create a CodeBuild project with a webhook

In this step, you will create a CodeBuild project with a webhook and review it in the GitHub console. You can also choose GitHub Enterprise as your source provider. To learn more about creating a webhook within GitHub Enterprise, see GitHub manual webhooks.

To create a CodeBuild project with a webhook

- Open the AWS CodeBuild console at https://console.aws.amazon.com/codesuite/codebuild/ 1. home.
- Create a build project. For information, see Create a build project (console) and Run a build 2. (console).
- In **Project type**, choose **Runner project**.

In Runner:

- For Runner provider, choose GitHub. a.
- b. For **Runner location**, choose **Repository**.
- For Repository URL under **Repository**, choose **https://github.com/user-name/** repository-name.



Note

By default, your project will only receive WORKFLOW_JOB_QUEUED events for a single repository. If you would like to receive events for all repositories within an organization or enterprise, see GitHub global and organization webhooks.

• In Environment: 4.

• Choose a supported **Environment image** and **Compute**. Note that you have the option to override the image and instance settings by using a label in your GitHub Actions workflow YAML. For more information, see Step 2: Update your GitHub Actions workflow YAML

In Buildspec:

- Note that your buildspec will be ignored unless buildspec-override: true is added as a label. Instead, CodeBuild will override it to use commands that will setup the self-hosted runner.
- 5. Continue with the default values and then choose **Create build project**.
- Open the GitHub console at https://github.com/user-name/repository-name/ settings/hooks to verify that a webhook has been created and is enabled to deliver Workflow jobs events.

Step 2: Update your GitHub Actions workflow YAML

In this step, you will update your GitHub Actions workflow YAML file in GitHub to configure your build environment and use GitHub Actions self-hosted runners in CodeBuild. For more information, see Using labels with self-hosted runners and Label overrides supported with the CodeBuild-hosted GitHub Actions runner.

Update your GitHub Actions workflow YAML

Navigate to GitHub and update the runs-on setting in your GitHub Actions workflow YAML to configure your build environment. To do so, you can do one of the following:

 You can specify the project name and run ID, in which case the build will use your existing project configuration for the compute, image, image version, and instance size. The project name is needed to link the AWS-related settings of your GitHub Actions job to a specific CodeBuild project. By including the project name in the YAML, CodeBuild is allowed to invoke jobs with

the correct project settings. By providing the run ID, CodeBuild will map your build to specific workflow runs and stop the build when the workflow run is cancelled. For more information, see github context.

```
runs-on: codebuild-roject-name-${{ github.run_id }}-${{ github.run_attempt }}
```



Note

Make sure that your project-name> matches the name of the project that you created in the previous step. If it doesn't match, CodeBuild will not process the webhook and the GitHub Actions workflow might hang.

The following is an example of a GitHub Actions workflow YAML:

```
name: Hello World
on: [push]
jobs:
  Hello-World-Job:
    runs-on:
      - codebuild-myProject-${{ github.run_id }}-${{ github.run_attempt }}
    steps:
      - run: echo "Hello World!"
```

 You can also override your image and compute type in the label. See Compute images supported with the CodeBuild-hosted GitHub Actions runner for a list of curated images. For using custom images, see Label overrides supported with the CodeBuild-hosted GitHub Actions runner. The compute type and image in the label will override the environment settings on your project. To override your environment settings for an CodeBuild EC2 or Lambda compute build, use the following syntax:

```
runs-on:
                    - codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-<pre
                                      image:<environment-type>-<image-identifier>
                                      instance-size:<instance-size>
```

The following is an example of a GitHub Actions workflow YAML:

```
name: Hello World
```

```
on: [push]
jobs:
    Hello-World-Job:
    runs-on:
        - codebuild-myProject-${{ github.run_id }}-${{ github.run_attempt }}
        image:arm-3.0
        instance-size:small
    steps:
        - run: echo "Hello World!"
```

You can override the fleet used for your build in the label. This will override the fleet settings
configured on your project to use the specified fleet. For more information, see <u>Run builds on</u>
<u>reserved capacity fleets</u>. To override your fleet settings for an Amazon EC2 compute build, use
the following syntax:

```
runs-on:
  - codebuild-<project-name>-${{ github.run_id }}-${{ github.run_attempt }}
  fleet:<fleet-name>
```

To override both the fleet and the image used for the build, use the following syntax:

```
runs-on:
  - codebuild-<project-name>-${{ github.run_id }}-${{ github.run_attempt }}
  fleet:<fleet-name>
  image:<environment-type>-<image-identifier>
```

The following is an example of a GitHub Actions workflow YAML:

```
name: Hello World
on: [push]
jobs:
    Hello-World-Job:
    runs-on:
        - codebuild-myProject-${{ github.run_id }}-${{ github.run_attempt }}
        fleet:myFleet
        image:arm-3.0
    steps:
        - run: echo "Hello World!"
```

• In order to run your GitHub Actions jobs on a custom image, you can configure a custom image in your CodeBuild project and avoid providing an image override label. CodeBuild will use the image configured in the project if no image override label is provided.

• Optionally, you can provide labels outside of those that CodeBuild supports. These labels will be ignored for the purpose of overriding attributes of the build, but will not fail the webhook request. For example, adding testLabel as a label will not prevent the build from running.



Note

If a dependency provided by GitHub-hosted runners is unavailable in the CodeBuild environment, you can install the dependency using GitHub Actions in your workflow run. For example, you can use the setup-python action to install Python for your build environment.

Run buildspec commands the INSTALL, PRE_BUILD, and POST_BUILD phases

By default, CodeBuild ignores any buildspec commands when running a self-hosted GitHub Actions build. To run buildspec commands during the build, buildspec-override: true can be added as a suffix to the label:

```
runs-on:
                          - codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-codebuild-<pre
                                                       buildspec-override:true
```

By using this command, CodeBuild will create a folder called actions-runner in the container's primary source folder. When the GitHub Actions runner starts during the BUILD phase, the runner will run in the actions-runner directory.

There are several limitations when using a buildspec override in a self-hosted GitHub Actions build:

- CodeBuild will not run buildspec commands during the BUILD phase, as the self-hosted runner runs in the BUILD phase.
- CodeBuild will not download any primary or secondary sources during the DOWNLOAD_SOURCE phase. If you have a buildspec file configured, only that file will be downloaded from the project's primary source.

If a build command fails in the PRE_BUILD or INSTALL phase, CodeBuild will not start the self-hosted runner and the GitHub Actions workflow job will need to be cancelled manually.

CodeBuild fetches the runner token during the DOWNLOAD_SOURCE phase, which has an
expiration time of one hour. If your PRE_BUILD or INSTALL phases exceed an hour, the runner
token may expire before the GitHub self-hosted runner starts.

Step 3: Review your results

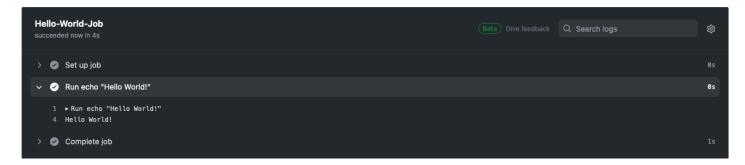
Whenever a GitHub Actions workflow run occurs, CodeBuild would receive the workflow job events through the webhook. For each job in the workflow, CodeBuild starts a build to run an ephemeral GitHub Actions runner. The runner is responsible for executing a single workflow job. Once the job is completed, the runner and the associated build process will be immediately terminated.

To view your workflow job logs, navigate to your repository in GitHub, choose **Actions**, choose your desired workflow, and then choose the specific **Job** that you'd like to review the logs for.

You can review the requested labels in the log while the job is waiting to be picked up by a self-hosted runner in CodeBuild.



Once the job is completed, you will be able to view the log of the job.



GitHub Actions runner configuration options

You can specify the following environment variables in your project configuration to modify the setup configuration of your self-hosted runners.

CODEBUILD CONFIG GITHUB ACTIONS ORG REGISTRATION NAME

CodeBuild will register self-hosted runners to the organization name specified as the value of this environment variable. For more information about registering runners at the organization level and the necessary permissions, see Create configuration for a just-in-time runner for an organization.

CODEBUILD_CONFIG_GITHUB_ACTIONS_ENTERPRISE_REGISTRATION_NAME

CodeBuild will register self-hosted runners to the enterprise name specified as the value of this environment variable. For more information about registering runners at the enterprise level and the necessary permissions, see Create configuration for a just-in-time runner for an Enterprise.



Note

Enterprise runners are not available to organization repositories by default. For selfhosted runners to pick up workflow jobs, you might need to configure your runner group access settings. For more information, see Making enterprise runners available to repositories.

CODEBUILD_CONFIG_GITHUB_ACTIONS_RUNNER_GROUP_ID

CodeBuild will register self-hosted runners to the integer runner group ID stored as the value of this environment variable. By default, this value is 1. For more information about self-hosted runner groups, see Managing access to self-hosted runners using groups.

```
CODEBUILD_CONFIG_GITHUB_ACTIONS_ORG_REGISTRATION_NAME
```

To configure organization level runner registration using your GitHub Actions workflow YAML file, you can use the following syntax:

```
name: Hello World
on: [push]
jobs:
  Hello-World-Job:
    runs-on:
      - codebuild-myProject-${{ github.run_id }}-${{ github.run_attempt }}
        organization-registration-name:myOrganization
```

```
- run: echo "Hello World!"
```

CODEBUILD_CONFIG_GITHUB_ACTIONS_ENTERPRISE_REGISTRATION_NAME

To configure enterprise level runner registration using your GitHub Actions workflow YAML file, you can use the following syntax:

```
name: Hello World
on: [push]
jobs:
    Hello-World-Job:
    runs-on:
        - codebuild-myProject-${{ github.run_id }}-${{ github.run_attempt }}
        enterprise-registration-name:myEnterprise
    steps:
        - run: echo "Hello World!"
```

CODEBUILD_CONFIG_GITHUB_ACTIONS_RUNNER_GROUP_ID

To configure registering runners to a specific runner group ID using your GitHub Actions workflow YAML file, you can use the following syntax:

```
name: Hello World
on: [push]
jobs:
    Hello-World-Job:
    runs-on:
    - codebuild-myProject-${{ github.run_id }}-${{ github.run_attempt }}
        registration-group-id:3
    steps:
    - run: echo "Hello World!"
```

Filter GitHub Actions webhook events (AWS CloudFormation)

The following YAML-formatted portion of an AWS CloudFormation template creates a filter group that triggers a build when it evaluates to true. The following filter group specifies a GitHub Actions workflow job request with a workflow name matching the regular expression \[CI-CodeBuild\].

```
CodeBuildProject:
Type: AWS::CodeBuild::Project
Properties:
```

```
Name: MyProject
ServiceRole: service-role
Artifacts:
  Type: NO_ARTIFACTS
Environment:
  Type: LINUX_CONTAINER
  ComputeType: BUILD_GENERAL1_SMALL
  Image: aws/codebuild/standard:5.0
Source:
  Type: GITHUB
  Location: CODEBUILD_DEFAULT_WEBHOOK_SOURCE_LOCATION
Triggers:
  Webhook: true
  ScopeConfiguration:
    Name: organization-name
    Scope: GITHUB_ORGANIZATION
  FilterGroups:
    - - Type: EVENT
        Pattern: WORKFLOW_JOB_QUEUED
      - Type: WORKFLOW_NAME
        Pattern: \[CI-CodeBuild\]
```

Filter GitHub Actions webhook events (AWS CDK)

The following AWS CDK template creates a filter group that triggers a build when it evaluates to true. The following filter group specifies a GitHub Actions workflow job request.

```
import { aws_codebuild as codebuild } from 'aws-cdk-lib';
import {EventAction, FilterGroup} from "aws-cdk-lib/aws-codebuild";

const source = codebuild.Source.gitHub({
    owner: 'owner',
    repo: 'repo',
    webhook: true,
    webhookFilters: [FilterGroup.inEventOf(EventAction.WORKFLOW_JOB_QUEUED)],
    })
```

Filter GitHub Actions webhook events (Terraform)

The following Terraform template creates a filter group that triggers a build when it evaluates to true. The following filter group specifies a GitHub Actions workflow job request.

```
resource "aws_codebuild_webhook" "example" {
```

```
project_name = aws_codebuild_project.example.name
build_type = "BUILD"
filter_group {
   filter {
     type = "EVENT"
     pattern = "WORKFLOW_JOB_QUEUED"
   }
}
```

Filter GitHub Actions webhook events (AWS CLI)

The following AWS CLI commands create a self-hosted GitHub Actions runner project with a GitHub Actions workflow job request filter group that triggers a build when it evaluates to true.

```
aws codebuild create-project \
--name <project name> \
--source "{\"type\":\"GITHUB\",\"location\":\"<repository location>\",\"buildspec\":
\"\"}" \
--artifacts {"\"type\":\"NO_ARTIFACTS\""} \
--environment "{\"type\": \"LINUX_CONTAINER\",\"image\": \"aws/codebuild/amazonlinux-
x86_64-standard:5.0\",\"computeType\": \"BUILD_GENERAL1_MEDIUM\"}" \
--service-role "<service role ARN>"
```

```
aws codebuild create-webhook \
--project-name <project name> \
--filter-groups "[[{\"type\":\"EVENT\",\"pattern\":\"WORKFLOW_JOB_QUEUED\"}]]"
```

Troubleshoot the webhook

Issue: The webhook you set up in <u>Tutorial: Configure a CodeBuild-hosted GitHub Actions runner</u> isn't working or your workflow job is hanging on GitHub.

Possible causes:

- Your webhook Workflow jobs event might be failing to trigger a build. Review the Response logs to view the response or error message.
- Your jobs are being assigned to the incorrect runner agent due to their label configuration. This issue can occur when one of your jobs within a single workflow run has fewer labels than another job. For example, if you have two jobs with the following labels in the same workflow run:
 - Job 1: codebuild-myProject-\${{ github.run_id }}-\${{ github.run_attempt }}

Job 2: codebuild-myProject-\${{ github.run_id }}-\${{ github.run_attempt }},
 instance-size:medium

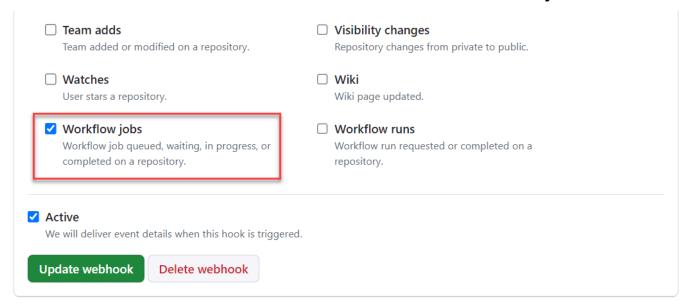
When routing a self-hosted GitHub Actions job, GitHub will route the job to any runner with all the job's specified labels. This behavior means that **Job 1** can be picked up by either the runner created for **Job 1** or **Job 2**, but **Job 2** can only be picked up by the runner created for **Job 2** since it has an additional label. If **Job 1** is picked up by the runner created for **Job 2**, then **Job 2** will become stuck since the **Job 1** runner doesn't have the instance-size:medium label.

Recommended solutions:

When creating multiple jobs within the same workflow run, use the same number of label overrides for each job or assign each job a custom label, such as job1 or job2.

If the error persists, use the following instructions to debug the issue.

- Open the GitHub console at https://github.com/user-name/repository-name/ settings/hooks to view your repository's webhook settings. On this page, you'll see a webhook that was created for your repository.
- 2. Choose **Edit** and confirm that the webhook is enabled to deliver **Workflow jobs** events.



- 3. Navigate to the **Recent Deliveries** tab, find the corresponding workflow_job.queued event, and expand the event.
- 4. Review the labels field in the Payload and make sure it's as expected.

5. Finally, review the **Response** tab, as this contains the response or error message returned from CodeBuild.



Alternatively, you can debug webhook failures using GitHub's APIs. You can view recent deliveries for a webhook using the List deliveries for a repository webhook API:

```
gh api \
  -H "Accept: application/vnd.github+json" \
  -H "X-GitHub-Api-Version: 2022-11-28" \
  /repos/owner/repo/hooks/hook-id/deliveries
```

After finding the webhook delivery you're looking to debug and noting the delivery ID, you can use the <u>Get a delivery for a repository webhook</u> API. CodeBuild's response to the webhook's delivery payload can be found in the response section:

```
gh api \
  -H "Accept: application/vnd.github+json" \
  -H "X-GitHub-Api-Version: 2022-11-28" \
  /repos/owner/repo/hooks/hook-id/deliveries/delivery-id
```

Issue: Your GitHub Actions with <u>deployment protection</u> rules enabled triggers builds within CodeBuild before the deployment has been approved.

Possible causes: CodeBuild fetches the deployment and environment associated with the GitHub Actions job if they exist to verify if the is approved. If CodeBuild fails to fetch either the deployment or environment, the CodeBuild build may be triggered prematurely.

Recommended solutions: Verify that the credentials associated with your CodeBuild projects have read permissions for deployments and actions within GitHub.

Label overrides supported with the CodeBuild-hosted GitHub Actions runner

In your GitHub Actions workflow YAML, you can provide a variety of label overrides that modify your self-hosted runner build. Any builds not recognized by CodeBuild will be ignored but will not fail your webhook request. For example, the following workflow YAML includes overrides for image, instance size, fleet, and the buildspec:

```
name: Hello World
on: [push]
jobs:
  Hello-World-Job:
    runs-on:
      - codebuild-myProject-${{ github.run_id }}-${{ github.run_attempt }}
        image:${{ matrix.os }}
        instance-size:${{ matrix.size }}
        fleet:myFleet
        buildspec-override:true
    strategy:
      matrix:
        include:
          - os: arm-3.0
            size: small
          - os: linux-5.0
            size: large
    steps:
      - run: echo "Hello World!"
```

Note

If your workflow job is hanging on GitHub, see <u>Troubleshoot the webhook</u> and <u>Using</u> custom labels to route jobs.

codebuild-c

- Example: codebuild-fake-project-\${{ github.run_id }}\${{ github.run_attempt }}
- Required for all GitHub Actions workflow YAMLs. project name
 should be equal to the name
 of the project for which the self-hosted runner webhook is configured.

image:<environment-type>-<image-identifier>

- Example: image:arm-3.0
- Overrides the image and environment type used when starting the self-hosted runner build with a curated image. To learn about supported values, see Compute images supported with the CodeBuild-hosted GitHub Actions runner.
 - To override the image and environment type used with a custom image, use image:custom-<environment-type>-<custom-image-identifier>
 - Example: image:custom-arm-public.ecr.aws/codebuild/amazonlinux-aarch64standard:3.0



Note

If the custom image resides in a private registry, see Configure a private registry credential for self-hosted runners.

instance-size:<instance-size>

- Example: instance-size:medium
- Overrides the instance type used when starting the self-hosted runner build. To learn about supported values, see Compute images supported with the CodeBuild-hosted GitHub Actions runner.

fleet:<fleet-name>

- Example: fleet:myFleet
- Overrides the fleet settings configured on your project to use the specified fleet. For more information, see Run builds on reserved capacity fleets.

buildspec-override: <boolean>

- Example: buildspec-override: true
- Allows the build to run buildspec commands in the INSTALL, PRE_BUILD, and POST_BUILD phases if set to true.

Single label override (legacy)

CodeBuild allows you to provide multiple overrides in a single label using the following:

 To override your environment settings for an Amazon EC2/Lambda compute build, use the following syntax:

```
runs-on: codebuild-<project-name>-${{ github.run_id }}-
${{ github.run_attempt }}-<environment-type>-<image-identifier>-<instance-size>
```

• To override your fleet settings for Amazon EC2 compute build, use the following syntax:

```
runs-on: codebuild-<project-name>-${{ github.run_id }}-${{ github.run_attempt }}-
fleet-<fleet-name>
```

• To override both the fleet and the image used for the build, use the following syntax:

```
runs-on: codebuild-<project-name>-${{ github.run_id }}-
${{ github.run_attempt }}-image-<image-version>-fleet-<fleet-name>
```

 To run buildspec commands during the build, -with-buildspec can be added as a suffix to the label:

```
runs-on: codebuild-<project-name>-${{ github.run_id }}-
${{ github.run_attempt }}-<image>-<image-version>-<instance-size>-with-buildspec
```

• Optionally, you can provide an instance size override without overriding the image. For Amazon EC2 builds, you can exclude both environment type and image identifier. For Lambda builds, you can exclude the image identifier.

Compute images supported with the CodeBuild-hosted GitHub Actions runner

In the label you configured in <u>Tutorial</u>: <u>Configure a CodeBuild-hosted GitHub Actions runner</u>, you can override your Amazon EC2 environment settings by using the values in the first three columns. CodeBuild provides the following Amazon EC2 compute images. For more information about

Environment type	lmage identifier	Instance size	Platform	Resolved image	Definition
linux	4.0	small medium large xlarge	Amazon Linux 2	aws/codeb uild/amaz onlinux-x 86_64-sta ndard:4.0	al/standa rd/4.0
linux	5.0	<pre>2xlarge gpu_small gpu_large</pre>	Amazon Linux 2	aws/codeb uild/amaz onlinux-x 86_64-sta ndard:5.0	al/standa rd/5.0
linux-ec2	latest	small medium large	Amazon Linux 2	aws/codeb uild/ami/ amazonlin ux-x86_64 -base:lat est	None
arm	2.0	small medium large xlarge	Amazon Linux 2	aws/codeb uild/amaz onlinux-a arch64-st andard:2. 0	al/aarch64/ standard/2.0
arm	3.0	2xlarge	Amazon Linux 2	aws/codeb uild/amaz onlinux-a arch64-st andard:3.	al/aarch64/ standard/3.0

Environment type	lmage identifier	Instance size	Platform	Resolved image	Definition
arm-ec2	latest	small medium large	Amazon Linux 2	aws/codeb uild/ami/ amazonlin ux-arm-ba se:latest	None
ubuntu	5.0	small medium	Ubuntu 20.04	aws/codeb uild/stan dard:5.0	ubuntu/st andard/5.0
ubuntu	6.0	large	Ubuntu 22.04	aws/codeb uild/stan dard:6.0	ubuntu/st andard/6.0
ubuntu	7.0	<pre>2xlarge gpu_small gpu_large</pre>	Ubuntu 22.04	aws/codeb uild/stan dard:7.0	ubuntu/st andard/7.0
windows	1.0	medium large	Windows Server Core 2019	aws/codeb uild/wind ows-base: 2019-1.0	N/A
			Windows Server Core 2022	aws/codeb uild/wind ows-base: 2022-1.0	N/A
windows	2.0		Windows Server Core 2019	aws/codeb uild/wind ows-base: 2019-2.0	N/A

Environment type	lmage identifier	Instance size	Platform	Resolved image	Definition
windows	3.0		Windows Server Core 2019	aws/codeb uild/wind ows-base: 2019-3.0	N/A
windows-e c2	2022	medium large	Windows Server Core 2022	<pre>aws/codeb uild/ami/ windows-b ase:2022</pre>	None

In addition, you can override your Lambda environment settings by using the following values. For more information about CodeBuild Lambda compute, see Run builds on AWS Lambda compute. CodeBuild supports the following Lambda compute images:

Environment type	lmage identifier	Instance size
linux-lam bda	dotnet6	1GB
	go1.21	2GB
arm-lambd a	corretto1	4GB
	1	8GB
	corretto1 7	10GB
	corretto2	
	nodejs18	
	nodejs20	

Environment type	lmage identifier	Instance size
	<pre>python3.1 1</pre>	
	python3.1	
	ruby3.2	

For more information, see <u>Build environment compute modes and types</u> and <u>Docker images</u> provided by CodeBuild.

Self-managed GitLab runners in AWS CodeBuild

GitLab provides two execution modes to run GitLab jobs in your CI/CD pipeline. One mode is GitLab-hosted runners, which are managed by GitLab and fully integrated with GitLab. The other mode is self-managed runners, which allows you to bring your own customized environment to run jobs in the GitLab CI/CD pipeline.

The high-level steps to configure a CodeBuild project to run GitLab CI/CD pipeline jobs are as follows:

- 1. If you haven't done so already, connect with an OAuth app to connect your project to GitLab.
- 2. Navigate to the CodeBuild console and create a CodeBuild project with a webhook and set up your webhook filters.
- 3. Update your GitLab CI/CD pipeline YAML in GitLab to configure your build environment.

For a more detailed procedure, see <u>Tutorial</u>: <u>Configure a CodeBuild-hosted GitLab runner</u>.

This feature allows your GitLab CI/CD pipeline jobs to get native integration with AWS, which provides security and convenience through features like IAM, AWS CloudTrail, and Amazon VPC. You can access latest instance types, including ARM-based instances.

Topics

- About the CodeBuild-hosted GitLab runner
- Tutorial: Configure a CodeBuild-hosted GitLab runner

- Label overrides supported with the CodeBuild-hosted GitLab runner
- Compute images supported with the CodeBuild-hosted GitLab runner

About the CodeBuild-hosted GitLab runner

The following are some common questions about the CodeBuild-hosted GitLab runner.

What source types are supported for CodeBuild-hosted GitLab runners?

CodeBuild-hosted GitLab runners are supported for the GITLAB and GITLAB_SELF_MANAGED source type.

When should I include the image and instance overrides in the label?

You can include the image and instance overrides in the label in order to specify different build environment for each of your GitLab CI/CD pipeline jobs. This can be done without the need to create multiple CodeBuild projects or webhooks.

Can I use AWS CloudFormation for this feature?

Yes, you can include a filter group in your AWS CloudFormation template that specifies a GitLab workflow job event filter in your project webhook.

```
Triggers:
Webhook: true
FilterGroups:
- - Type: EVENT
Pattern: WORKFLOW_JOB_QUEUED
```

For more information, see Filter GitLab webhook events (AWS CloudFormation).

If you need help setting up project credentials in your AWS CloudFormation template, see AWS::CodeBuild::SourceCredential in the AWS CloudFormation User Guide for more information.

How can I mask secrets when using this feature?

By default, secrets that are printed in the log is not masked. If you would like to mask your secrets, you can do so by updating your CI/CD environment variable settings:

To mask secrets in GitLab

1. In your GitLab Settings, choose CI/CD.

- 2. In Variables, choose Edit for the secret you'd like to mask.
- 3. In Visibility, select Mask variable, and then choose Update variable to save your changes.

Can I receive GitLab webhook events from multiple projects within a single group?

CodeBuild supports group webhooks, which receive events from a specified GitLab group. For more information, see GitLab group webhooks.

Can I execute a job in docker executor for the self-managed runner? For example, I want to run a pipeline job on a specific image to maintain the same build environment in a separate and isolated container.

You can run the GitLab self-managed runner in CodeBuild with a specific image by <u>creating the</u> project with a custom image or overriding the image in your .gitlab-ci.yml file.

What executor does the self-managed runner in CodeBuild run with?

The self-managed runner in CodeBuild runs with the shell executor, where the build runs locally along with the GitLab runner that is running inside the docker container.

Can I provide buildspec commands along with the self-managed runner?

Yes, it is possible to add buildspec commands along with self-managed runner. You can provide the buildspec.yml file in your GitLab repository and use the buildspec-override: true tag in the **Tags** section of the job. For more information, see <u>Buildspec file name and storage location</u>.

Which regions support using a CodeBuild-hosted GitLab runner?

CodeBuild-hosted GitLab runners are supported in all CodeBuild regions. For more information about AWS Regions where CodeBuild is available, see AWS Services by Region.

Which platforms support using a CodeBuild-hosted GitLab runner?

CodeBuild-hosted GitLab runners are supported on both Amazon EC2 and <u>AWS Lambda</u> compute. You can use the following platforms: Amazon Linux 2, Amazon Linux 2023, Ubuntu, and Windows Server Core 2019. For more information, see <u>EC2 compute images</u> and <u>Lambda compute images</u>.

Tutorial: Configure a CodeBuild-hosted GitLab runner

This tutorial shows you how to configure your CodeBuild projects to run GitLab CI/CD pipeline jobs. For more information about using GitLab or GitLab Self Managed with CodeBuild, see <u>Selfmanaged GitLab runners in AWS CodeBuild</u>.

To complete this tutorial, you must first:

 Connect with a OAuth app by using CodeConnections. Note that when connecting with an OAuth app, you must use the CodeBuild console to do so. For more instructions, see GitLab access in CodeBuild.

 Connect CodeBuild to your GitLab account. To do so, you can add GitLab as a source provider in the console. For instructions, see GitLab access in CodeBuild.



Note

This only needs to be done if you haven't connected to GitLab for your account. With this feature, CodeBuild needs additional permissions. such as create_runner and manage_runner from the GitLab OAuth app. If there are existing CodeConnections for a particular GitLab account, then it doesn't automatically request for permission updates. To do so, you can go to the CodeConnections console and create a dummy connection to the same GitLab account to trigger the reauthorization to get the additional prmissions. With this, all the existing connections can use the runner feature. Once complete, you can delete the dummy connection.

Step 1: Create a CodeBuild project with a webhook

In this step, you will create a CodeBuild project with a webhook and review it in the GitLab console.

To create a CodeBuild project with a webhook

- Open the AWS CodeBuild console at https://console.aws.amazon.com/codesuite/codebuild/ home.
- Create a build project. For information, see Create a build project (console) and Run a build (console).

In **Project type**, choose **Runner project**.

- In Runner:
 - For Runner provider, choose GitLab.
 - For Credential, choose one of the following:
 - Choose **Default source credential**. Default connection applies a default GitLab connection across all projects.

• Choose **Custom source credential**. Custom connection applies a custom GitLab connection that overrides your account's default settings.



Note

If you have not already created a connection to your provider, you'll have to create a new GitLab connection. For instructions, see Connect CodeBuild to GitLab.

- For Runner location, choose Repository.
- For **Repository**, choose the name of your project in GitLab by specifying the project path with the namespace.

• In Environment:

• Choose a supported **Environment image** and **Compute**. Note that you have the option to override the image and instance settings by using a label in your GitLab CI/CD pipeline YAML. For more information, see Step 2: Create a .gitlab-ci.yml file in your repository.

In Buildspec:

- Note that your buildspec will be ignored unless buildspec-override: true is added as a label. Instead, CodeBuild will override it to use commands that will setup the selfmanaged runner.
- Continue with the default values and then choose **Create build project**. 3.
- Open the GitLab console at https://gitlab.com/user-name/repository-name/-/ hooks to verify that a webhook has been created and is enabled to deliver Workflow jobs events.

Step 2: Create a .gitlab-ci.yml file in your repository

In this step, you will create a .gitlab-ci.yml file in GitLab to configure your build environment and use GitLab self-managed runners in CodeBuild. For more information, see Use self-managed runners.

Update your GitLab CI/CD pipeline YAML

Navigate to https://gitlab.com/user-name/project-name/-/tree/branch-name and create a .gitlab-ci.yml file in your repository. You can configure your build environment by doing one of the following:

You can specify the CodeBuild project name, in which case the build will use your existing project
configuration for the compute, image, image version, and instance size. The project name is
needed to link the AWS-related settings of your GitLab job to a specific CodeBuild project. By
including the project name in the YAML, CodeBuild is allowed to invoke jobs with the correct
project settings.

```
tags:
    - codebuild-<codebuild-project-name>-$CI_PROJECT_ID-$CI_PIPELINE_IID-$CI_JOB_NAME
```

\$CI_PROJECT_ID-\$CI_PIPELINE_IID-\$CI_JOB_NAME is required to map the build to specific pipeline job runs and stop the build when the pipeline run is cancelled.



Make sure that your project-name> matches the name of the project that you created in CodeBuild. If it doesn't match, CodeBuild will not process the webhook and the GitLab CI/CD pipeline might hang.

The following is an example of a GitLab CI/CD pipeline YAML:

You can also override your image and compute type in the tag. See <u>Compute images supported</u> with the <u>CodeBuild-hosted GitLab runner</u> for a list of curated images. For using custom images, see <u>Label overrides supported with the CodeBuild-hosted GitLab runner</u>. The compute type and image in the tag will override the environment settings on your project. To override your environment settings for an Amazon EC2 compute build, use the following syntax:

```
tags:
    - codebuild-<codebuild-project-name>-$CI_PROJECT_ID-$CI_PIPELINE_IID-$CI_JOB_NAME
    - image:<environment-type>-<image-identifier>
    - instance-size:<instance-size>
```

The following is an example of a GitLab CI/CD pipeline YAML:

```
stages:
    - build

build-job:
    stage: build
    script:
        - echo "Hello World!"
    tags:
        - codebuild-myProject-$CI_PROJECT_ID-$CI_PIPELINE_IID-$CI_JOB_NAME
        - image:arm-3.0
        - instance-size:small
```

You can override the fleet used for your build in the tag. This will override the fleet settings
configured on your project to use the specified fleet. For more information, see <u>Run builds on</u>
<u>reserved capacity fleets</u>. To override your fleet settings for an Amazon EC2 compute build, use
the following syntax:

```
tags:
    - codebuild-<a href="codebuild-project-name">codebuild-<a href="codebuild-sci_Job_NAME">codebuild-sci_Job_NAME">codebuild-sci_Job_NAME</a>
    - fleet:<a href="fleet-name">fleet:<fleet-name</a>>
```

To override both the fleet and the image used for the build, use the following syntax:

```
tags:
    - codebuild-<codebuild-project-name>-$CI_PROJECT_ID-$CI_PIPELINE_IID-$CI_JOB_NAME
    - fleet:<fleet-name>
    - image:<environment-type>-<image-identifier>
```

The following is an example of a GitLab CI/CD pipeline YAML:

```
stages:
    - build

build-job:
    stage: build
    script:
        - echo "Hello World!"
    tags:
        - codebuild-myProject-$CI_PROJECT_ID-$CI_PIPELINE_IID-$CI_JOB_NAME
        - fleet:myFleet
        - image:arm-3.0
```

• In order to run your GitLab CI/CD pipeline jobs on a custom image, you can configure a custom image in your CodeBuild project and avoid providing an image override label. CodeBuild will use the image configured in the project if no image override label is provided.

After you commit your changes to .gitlab-ci.yml, a GitLab pipeline will be triggered and the build-job will send a webhook notification that will start your build in CodeBuild.

Run buildspec commands the INSTALL, PRE_BUILD, and POST_BUILD phases

By default, CodeBuild ignores any buildspec commands when running a self-managed GitLab build. To run buildspec commands during the build, buildspec-override:true can be added as a suffix to tags:

```
tags:
    - codebuild-<codebuild-project-name>-$CI_PROJECT_ID-$CI_PIPELINE_IID-$CI_JOB_NAME
    - buildspec-override:true
```

By using this command, CodeBuild will create a folder called gitlab-runner in the container's primary source folder. When the GitLab runner starts during the BUILD phase, the runner will run in the gitlab-runner directory.

There are several limitations when using a buildspec override in a self-managed GitLab build:

• CodeBuild will not run buildspec commands during the BUILD phase, as the self-managed runner runs in the BUILD phase.

CodeBuild will not download any primary or secondary sources during the DOWNLOAD_SOURCE
phase. If you have a buildspec file configured, only that file will be downloaded from the
project's primary source.

- If a build command fails in the PRE_BUILD or INSTALL phase, CodeBuild will not start the self-managed runner and the GitLab CI/CD pipeline job will need to be cancelled manually.
- CodeBuild fetches the runner token during the DOWNLOAD_SOURCE phase, which has an expiration time of one hour. If your PRE_BUILD or INSTALL phases exceed an hour, the runner token may expire before the GitLab self-managed runner starts.

Step 3: Review your results

Whenever a GitLab CI/CD pipeline run occurs, CodeBuild would receive the CI/CD pipeline job events through the webhook. For each job in the CI/CD pipeline, CodeBuild starts a build to run an ephemeral GitLab runner. The runner is responsible for executing a single CI/CD pipeline job. Once the job is completed, the runner and the associated build process will be immediately terminated.

To view your CI/CD pipeline job logs, navigate to your repository in GitLab, choose **Build**, **Jobs**, and then choose the specific **Job** that you'd like to review the logs for.

You can review the requested labels in the log while the job is waiting to be picked up by a self-managed runner in CodeBuild.

Filter GitLab webhook events (AWS CloudFormation)

The following YAML-formatted portion of an AWS CloudFormation template creates a filter group that triggers a build when it evaluates to true. The following filter group specifies a GitLab CI/CD pipeline job request with a CI/CD pipeline name matching the regular expression \[CI-CodeBuild\].

CodeBuildProject:

Type: AWS::CodeBuild::Project

Properties:

Name: MyProject

ServiceRole: service-role

Artifacts:

Type: NO_ARTIFACTS

Environment:

Type: LINUX_CONTAINER

ComputeType: BUILD_GENERAL1_SMALL

```
Image: aws/codebuild/standard:5.0
Source:
    Type: GITLAB
    Location: CODEBUILD_DEFAULT_WEBHOOK_SOURCE_LOCATION
Triggers:
    Webhook: true
ScopeConfiguration:
    Name: group-name
    Scope: GITLAB_GROUP
FilterGroups:
    - Type: EVENT
         Pattern: WORKFLOW_JOB_QUEUED
    - Type: WORKFLOW_NAME
         Pattern: \[CI-CodeBuild\]
```

Label overrides supported with the CodeBuild-hosted GitLab runner

In your GitLab CI/CD pipeline YAML, you can provide a variety of label overrides that modify your self-managed runner build. Any builds not recognized by CodeBuild will be ignored but will not fail your webhook request. For example, the following YAML includes overrides for image, instance size, fleet, and the buildspec:

```
workflow:
   name: HelloWorld
stages:
   - build

build-job:
   stage: build
   script:
     - echo "Hello World!"
   tags:
     - codebuild-myProject-$CI_PROJECT_ID-$CI_PIPELINE_IID-$CI_JOB_NAME
     - image:arm-3.0
     - instance-size:small
     - fleet:myFleet
     - buildspec-override:true
```

codebuild-c

• Example: codebuild-myProject-\$CI_PROJECT_ID-\$CI_PIPELINE_IID-\$CI_JOB_NAME

 Required for all GitLab CI/CD pipeline YAMLs. project name> should be equal to the name of the project for which the self-managed runner webhook is configured.

image:<environment-type>-<image-identifier>

- Example: image:arm-3.0
- Overrides the image and environment type used when starting the self-managed runner build. To learn about supported values, see Compute images supported with the CodeBuild-hosted GitLab runner.
 - To override the image and environment type used with a custom image, use image:custom-<environment-type>-<custom-image-identifier>
 - Example: image:custom-arm-public.ecr.aws/codebuild/amazonlinux-aarch64standard:3.0



Note

If the custom image resides in a private registry, see Configure a private registry credential for self-hosted runners.

instance-size:<instance-size>

- Example: instance-size:small
- Overrides the instance type used when starting the self-managed runner build. To learn about supported values, see Compute images supported with the CodeBuild-hosted GitLab runner.

fleet:<fleet-name>

- Example: fleet:myFleet
- Overrides the fleet settings configured on your project to use the specified fleet. For more information, see Run builds on reserved capacity fleets.

buildspec-override: <boolean>

• Example: buildspec-override:true

Allows the build to run buildspec commands in the INSTALL, PRE_BUILD, and POST_BUILD phases if set to true.

Compute images supported with the CodeBuild-hosted GitLab runner

In the label you configured in <u>Tutorial</u>: <u>Configure a CodeBuild-hosted GitLab runner</u>, you can override your Amazon EC2 environment settings by using the values in the first three columns. CodeBuild provides the following Amazon EC2 compute images. For more information about

Environment type	lmage identifier	Instance size	Platform	lmage	Definition
linux	4.0	small medium large xlarge	Amazon Linux 2	aws/codeb uild/amaz onlinux-x 86_64-sta ndard:4.0	al/standa rd/4.0
linux	5.0	<pre>2xlarge gpu_small gpu_large</pre>	Amazon Linux 2	aws/codeb uild/amaz onlinux-x 86_64-sta ndard:5.0	al/standa rd/5.0
linux-ec2	latest	small medium large	Amazon Linux 2	aws/codeb uild/ami/ amazonlin ux-x86_64 -base:lat est	None
arm	2.0	small medium large	Amazon Linux 2	aws/codeb uild/amaz onlinux-a arch64-st	al/aarch64/ standard/2.0

Environment type	Image identifier	Instance size	Platform	lmage	Definition
		xlarge 2xlarge		andard:2. 0	
arm	3.0		Amazon Linux 2	aws/codeb uild/amaz onlinux-a arch64-st andard:3.	al/aarch64/ standard/3.0
arm-ec2	latest	small medium large	Amazon Linux 2	aws/codeb uild/ami/ amazonlin ux-arm-ba se:latest	None
ubuntu	5.0	small medium	Ubuntu 20.04	aws/codeb uild/stan dard:5.0	ubuntu/st andard/5.0
ubuntu	6.0	large xlarge	Ubuntu 22.04	aws/codeb uild/stan dard:6.0	ubuntu/st andard/6.0
ubuntu	7.0	<pre>2xlarge gpu_small gpu_large</pre>	Ubuntu 22.04	aws/codeb uild/stan dard:7.0	ubuntu/st andard/7.0
windows	1.0	medium large	Windows Server Core 2019	aws/codeb uild/wind ows-base: 2019-1.0	N/A

Environment type	lmage identifier	Instance size	Platform	lmage	Definition
			Windows Server Core 2022	aws/codeb uild/wind ows-base: 2022-1.0	N/A
windows	2.0		Windows Server Core 2019	aws/codeb uild/wind ows-base: 2019-2.0	N/A
windows	3.0		Windows Server Core 2019	aws/codeb uild/wind ows-base: 2019-3.0	N/A
windows-e c2	2022	medium large	Windows Server Core 2022	<pre>aws/codeb uild/ami/ windows-b ase:2022</pre>	None

In addition, you can override your Lambda environment settings by using the following values. For more information about CodeBuild Lambda compute, see Run builds on AWS Lambda compute. CodeBuild supports the following Lambda compute images:

Environment type	Runtime version	Instance size
linux-lam	dotnet6	1GB
bda	go1.21	2GB
arm-lambd a	corretto1	4GB
	1	8GB

Environment type	Runtime version	Instance size
	corretto1 7	10GB
	corretto2	
	nodejs18	
	nodejs20	
	python3.1 1	
	python3.1	
	ruby3.2	

For more information, see <u>Build environment compute modes and types</u> and <u>Docker images</u> provided by CodeBuild.

Self-managed Buildkite runner in AWS CodeBuild

You can configure your project to set up self-hosted Buildkite runners in CodeBuild containers to process your Buildkite jobs. This can be done by setting up a webhook using your CodeBuild project, and updating your Buildkite pipeline YAML steps to use self-hosted runners hosted on CodeBuild machines.

The high-level steps to configure a CodeBuild project to run Buildkite jobs are as follows:

- Navigate to the CodeBuild console and create a CodeBuild project with the Buildkite runner project runner type configuration
- Add a job.scheduled webhook to your Buildkite organization.
- Update your Buildkite pipeline YAML steps in Buildkite to configure your build environment.

For a more detailed procedure, see <u>Tutorial</u>: <u>Configure a CodeBuild-hosted Buildkite runner</u>. This feature allows your Buildkite jobs to get native integration with AWS, which provides security and convenience through features like IAM, AWS Secrets Manager, AWS CloudTrail, and Amazon VPC. You can access the latest instance types, including ARM-based instances.

About the CodeBuild-hosted Buildkite runner

The following are some common questions about the CodeBuild-hosted Buildkite runner.

When should I include the image and instance overrides in the label?

You can include the image and instance overrides in the label in order to specify different build environment for each of your Buildkite jobs. This can be done without the need to create multiple CodeBuild projects or webhooks. For example, this is useful when you need to use a <a href="mailto:m

```
agents:
  queue: "myQueue"
steps:
  - command: "echo \"Hello World\""
    agents:
      project: "codebuild-myProject"
      image: "{{matrix.os}}"
      instance-size: "{{matrix.size}}"
    matrix:
      setup:
        os:
          - "arm-3.0"
          - "al2-5.0"
        size:
          - "small"
          - "large"
```

Can CodeBuild create webhooks within Buildkite automatically?

Currently, Buildkite requires that all webhooks are created manually using their console. You can follow the tutorial at <u>Tutorial</u>: <u>Configure a CodeBuild-hosted Buildkite runner</u> to create a Buildkite webhook manually in the Buildkite console.

Can I use AWS CloudFormation to create Buildkite webhooks?

AWS CloudFormation is not currently supported for Buildkite runner webhooks, as Buildkite requires webhooks to be created manually using their console.

Which regions support using a CodeBuild-hosted Buildkite runner?

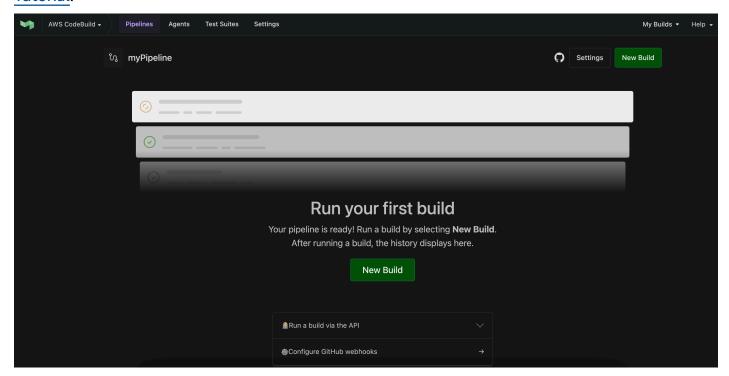
CodeBuild-hosted Buildkite runners are supported in all CodeBuild regions. For more information about AWS Regions where CodeBuild is available, see AWS Services by Region.

Tutorial: Configure a CodeBuild-hosted Buildkite runner

This tutorial shows you how to configure your CodeBuild projects to run Buildkite jobs. For more information about using Buildkite with CodeBuild see <u>Self-managed Buildkite runner in AWS</u> CodeBuild.

To complete this tutorial, you must first:

- Have access to a Buildkite organization. For more information about setting up a Buildkite
 account and organization, you can follow this Getting Started Tutorial.
- Create a Buildkite pipeline, cluster, and queue configured to use self-hosted runners. For more
 information about setting up these resources, you can reference the <u>Buildkite Pipeline Setup</u>
 Tutorial.

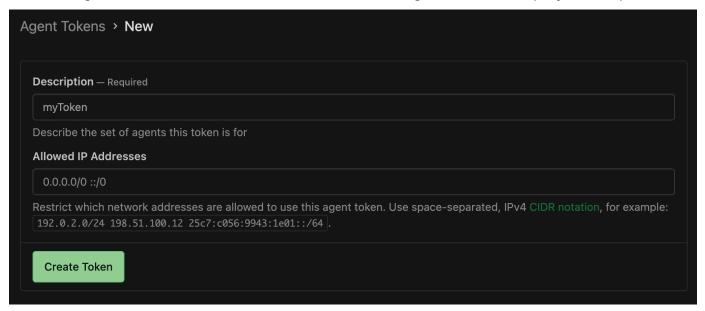


Step 1: Generate a Buildkite agent token

In this step, you will generate an agent token within Buildkite that will be used to authenticate the CodeBuild self-hosted runners. For more information about this resource, see <u>Buildkite Agent Tokens</u>.

To generate a Buildkite agent token

- 1. In your Buildkite cluster, choose **Agent Tokens**, and then choose **New Token**.
- 2. Add a description to the token and click **Create Token**.
- 3. Save the agent token value, as it will be used later during the CodeBuild project setup.



Step 2: Create a CodeBuild project with a webhook

To create a CodeBuild project with a webhook

- 1. Open the AWS CodeBuild console at https://console.aws.amazon.com/codesuite/codebuild/ home.
- 2. Create a self-hosted build project. For information, see <u>Create a build project (console)</u> and Run a build (console).
 - In Project configuration, select Runner project. In Runner:
 - For Runner provider, choose Buildkite.

• For Buildkite agent token, choose Create a new agent token by using the create secret page. You will be prompted to create a new secret in AWS Secrets Manager with a secret value equal to the Buildkite agent token you generated above.

• (Optional) If you would like to use CodeBuild managed credentials for your job, select your job's source repository provider under **Buildkite source credential options** and verify that credentials are configured for your account. Additionally, verify that your Buildkite pipeline uses **Checkout using HTTPS**.



Note

Buildkite requires source credentials within the build environment in order to pull your job's source. See Authenticating Buildkite to a Private Repository for available source credential options.

- (Optional) In Environment:
 - Choose a supported Environment image and Compute.

Note that you have the option to override the image and instance settings by using a label in your Buildkite YAML steps. For more information, see Step 4: Update your Buildkite pipeline steps.

- (Optional) In Buildspec:
 - Your buildspec will be ignored by default unless buildspec-override: "true" is added as a label. Instead, CodeBuild will override it to use commands that will set up the self-hosted runner.



Note

CodeBuild does not support buildspec files for Buildkite self-hosted runner builds. For inline buildspecs, you will need to enable git-credential-helper in your buildspec if you have configured CodeBuild managed source credentials

- 3. Continue with the default values and then choose Create build project.
- Save the Payload URL and Secret values from the Create Webhook popup. Either follow the 4. instructions in the popup to create a new Buildkite organization webhook or continue to the next section.

Step 3: Create a CodeBuild webhook within Buildkite

In this step, you will use the **Payload URL** and **Secret** values from the CodeBuild webhook to create a new webhook within Buildkite. This webhook will be used to trigger builds within CodeBuild when a valid Buildkite job starts.

To create a new webhook in Buildkite

- 1. Navigate to your Buildkite organization's **Settings** page.
- 2. Under Integrations, select Notification Services.
- 3. Choose **Add** next to the **Webhook** box. In the **Add Webhook Notification** page, use the following configuration:
 - Under Webhook URL, add the saved Payload URL value.
 - b. Under **Token**, verify that **Send the token as X-Buildkite-Token** is selected. Add your webhook **Secret** value to the **Token** field.
 - c. Under, verify that **Send the token as X-Buildkite-Token** is selected. Add your webhook **Secret** value to the **Token** field.
 - d. Under **Events**, select the job.scheduled webhook event.
 - e. (Optional) Under **Pipelines**, you can optionally choose to only trigger builds for a specific pipeline.
- Choose Add Webhook Notification.

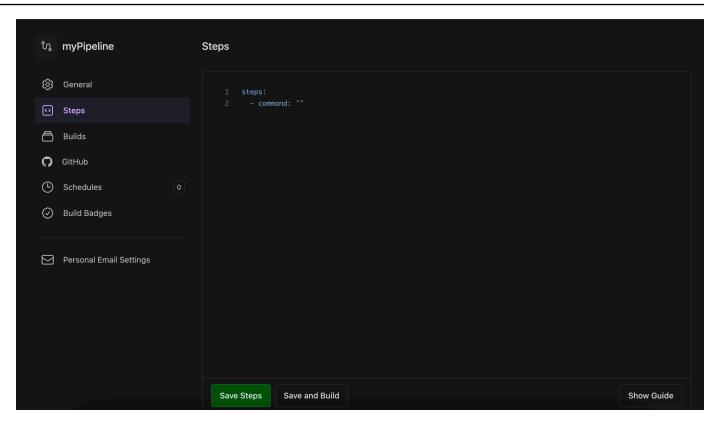
Step 4: Update your Buildkite pipeline steps

In this step, you will update your Buildkite pipeline's steps in order to add necessary labels and optional overrides. For the full list of supported label overrides, see <u>Label overrides supported with</u> the CodeBuild-hosted Buildkite runner.

Update your pipeline steps

 Navigate to your Buildkite pipeline steps page by selecting your Buildkite pipeline, choosing Settings, and then choosing Steps.

If you haven't already, choose **Convert to YAML steps**.



2. At a minimum, you will need to specify a <u>Buildkite agent tag</u> referencing the name of your CodeBuild pipeline. The project name is needed to link the AWS-related settings of your Buildkite job to a specific CodeBuild project. By including the project name in the YAML, CodeBuild is allowed to invoke jobs with the correct project settings.

```
agents:
  project: "codebuild-<project name>"
```

The following is an example of Buildkite pipeline steps with just the project label tag:

```
agents:
  project: "codebuild-myProject"
steps:
  - command: "echo \"Hello World\""
```

You can also override your image and compute type in the label. See <u>Compute images</u> <u>supported with the CodeBuild-hosted Buildkite runner</u> for a list of available images. The compute type and image in the label will override the environment settings on your project. To override your environment settings for a CodeBuild EC2 or Lambda compute build, use the following syntax:

```
agents:
  project: "codebuild-<project name>"
  image: "<environment-type>-<image-identifier>"
  instance-size: "<instance-size>"
```

The following is an example of Buildkite pipeline steps with image and instance size overrides:

```
agents:
  project: "codebuild-myProject"
  image: "arm-3.0"
  instance-size: "small"
steps:
  - command: "echo \"Hello World\""
```

You can override the fleet used for your build in the label. This will override the fleet settings configured on your project to use the specified fleet. For more information, see Run builds on reserved capacity fleets.

To override your fleet settings for an Amazon EC2 compute build, use the following syntax:

```
agents:
  project: "codebuild-<project name>"
  fleet: "<fleet-name>"
```

To override both the fleet and the image used for the build, use the following syntax:

```
agents:
  project: "codebuild-<project name>"
  fleet: "<fleet-name>"
  image: "<environment-type>-<image-identifier>"
```

The following is an example of Buildkite pipeline steps with fleet and image overrides:

```
agents:
  project: "codebuild-myProject"
  fleet: "myFleet"
  image: "arm-3.0"
steps:
  - command: "echo \"Hello World\""
```

3. You can choose to run inline buildspec commands during the self-hosted Buildkite runner build (see Run buildspec commands for the INSTALL, PRE_BUILD, and POST_BUILD phases for more details). To specify that the CodeBuild build should run buildspec commands during your Buildkite self-hosted runner build, use the following syntax:

```
agents:
  project: "codebuild-<project name>"
  buildspec-override: "true"
```

The following is an example of a Buildkite pipeline with a buildspec override:

```
agents:
  project: "codebuild-myProject"
  buildspec-override: "true"
steps:
  - command: "echo \"Hello World\""
```

4. Optionally, you can provide labels outside of those that CodeBuild supports. These labels will be ignored for the purpose of overriding attributes of the build, but will not fail the webhook request. For example, adding myLabel: "testLabel" as a label will not prevent the build from running.

Step 5: Review your results

Whenever a Buildkite job is started in your pipeline, CodeBuild will receive a job.scheduled webhook event through the Buildkite webhook. For each job in your Buildkite build, CodeBuild will start a build to run an ephemeral Buildkite runner. The runner is responsible for executing a single Buildkite job. Once the job is completed, the runner and the associated build process will be immediately terminated.

To view your workflow job logs, navigate to your Buildkite pipeline and select the most recent build (you can trigger a new build by choosing **New Build**). Once the associated CodeBuild build for each of your jobs starts and picks up the job, you should see logs for the job within the Buildkite console



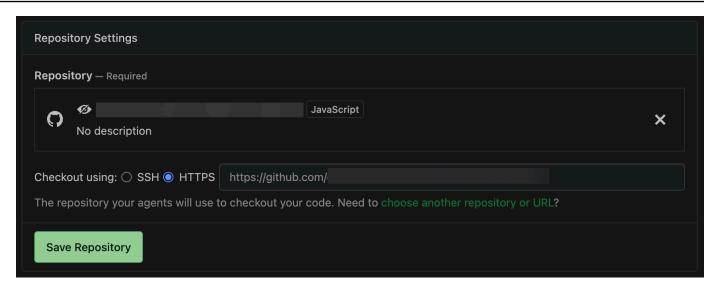
Authenticating Buildkite to a Private Repository

If you have a private repository configured within your Buildkite pipeline, Buildkite requires additional permissions within the build environment to pull the repository, as Buildkite does not vend credentials to self-hosted runners to pull from private repositories. In order to authenticate the Buildkite self-hosted runner agent to your external private source repository, you can use one of the following options.

To authenticate with CodeBuild

CodeBuild offers managed credentials handling for Supported source types. In order to use CodeBuild source credentials to pull your job's source repository, you can use the following steps:

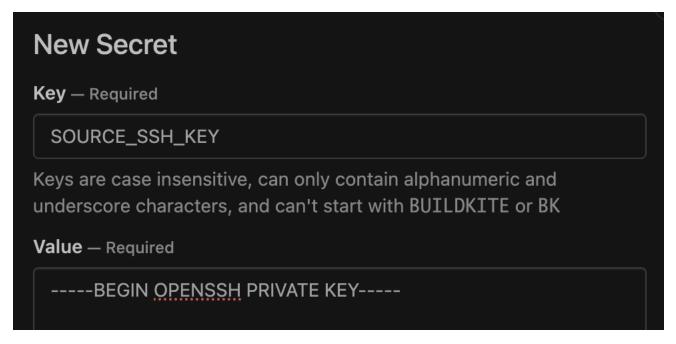
- 1. In the CodeBuild console, navigate to **Edit project** or create a new CodeBuild project using the steps in Step 2: Create a CodeBuild project with a webhook.
- 2. Under Buildkite source credential options, select your job's source repository provider.
 - 1. If you would like to use account-level CodeBuild credentials, verify that they are configured correctly. Additionally, if your project has an inline buildspec configured, verify that git-credential-helper is enabled.
 - 2. If you would like to use project level CodeBuild credentials, select **Use override credentials for this project only** and set up credentials for your project.
- 3. In your Buildkite pipeline settings, navigate to **Repository Settings**. Set your source repository checkout settings to **Checkout using HTTPS**



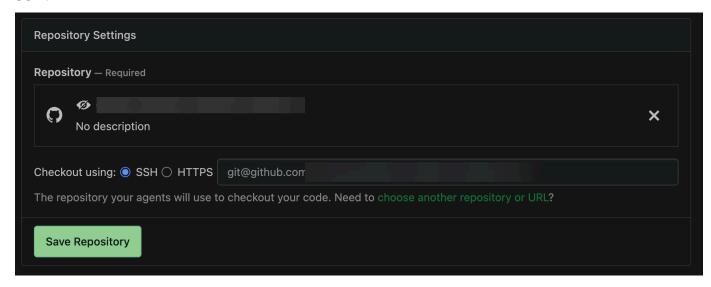
To authenticate with Buildkite secrets

Buildkite maintains an <u>ssh-checkout plugin</u> which can be used to authenticate the self-hosted runner to an external source repository using an ssh key. The key value is stored as a <u>Buildkite</u> <u>secret</u> and fetched automatically by the Buildkite self-hosted runner agent when attempting to pull a private repository. In order to configure the ssh-checkout plugin for your Buildkite pipeline, you can use the following steps:

- Generate a private and public ssh key using your email address e.g. ssh-keygen -t rsa -b
 4096 -C "myEmail@address.com"
- 2. Add the public key to your private source repository. For example, you can follow this guide to add a key to a GitHub account.
- 3. Add a <u>new SSH key secret</u> to your Buildkite cluster. Within your Buildkite cluster, select Secrets → New Secret. Add a name for you secret in the Key field and add your private SSH key into the Value field:



4. Within your Buildkite pipeline, navigate to your repository settings and set checkout to use **SSH**.



5. Update your pipeline YAML steps to use the git-ssh-checkout plugin. For example, the following pipeline YAML file uses the checkout action with the above Buildkite secret key:

```
agents:
  project: "codebuild-myProject"
steps:
  - command: "npm run build"
  plugins:
     - git-ssh-checkout#v0.4.1:
          ssh-secret-key-name: 'SOURCE_SSH_KEY'
```

6. When running a Buildkite self-hosted runner job within CodeBuild, Buildkite will now automatically use your configured secret value when pulling your private repository

Runner configuration options

You can specify the following environment variables in your project configuration to modify the setup configuration of your self-hosted runners:

- CODEBUILD_CONFIG_BUILDKITE_AGENT_TOKEN: CodeBuild will fetch the secret value
 configured as the value of this environment variable from AWS Secrets Manager in order to
 register the Buildkite self-hosted runner agent. This environment variable must be of type
 SECRETS_MANAGER, and the value should be the name of your secret in Secrets Manager. A
 Buildkite agent token environment variable is required for all Buildkite runner projects.
- CODEBUILD_CONFIG_BUILDKITE_CREDENTIAL_DISABLE: By default, CodeBuild will load
 account or project level source credentials into the build environment, as these credentials are
 used by the Buildkite agent to pull the job's source repository. To disable this behavior, you can
 add this environment variable to your project with the value set to true, which will prevent
 source credentials from being loaded into the build environment.

Run buildspec commands for the INSTALL, PRE_BUILD, and POST_BUILD phases

By default, CodeBuild ignores any buildspec commands when running a self-hosted Buildkite runner build. To run buildspec commands during the build,

```
buildspec-override: "true"
```

can be added as a suffix to the label:

```
agents:
  project: "codebuild-<project name>"
  buildspec-override: "true"
```

By using this command, CodeBuild will create a folder called buildkite-runner in the container's primary source folder. When the Buildkite runner starts during the BUILD phase, the runner will run in the buildkite-runner directory.

There are several limitations when using a buildspec override in a self-hosted Buildkite build:

• The Buildkite agent requires that source credentials exist within the build environment to pull the job's source repository. If you use CodeBuild source credentials for authentication, you will need to enable git-credential-helper in your buildspec. For example, you can use the following buildspec to enable git-credential-helper for your Buildkite builds:

```
version: 0.2
env:
    git-credential-helper: yes
phases:
    pre_build:
        commands:
        - echo "Hello World"
```

- CodeBuild will not run buildspec commands during the BUILD phase, as the self-hosted runner runs in the BUILD phase.
- CodeBuild does not support buildspec files for Buildkite runner builds. Only inline buildspecs are supported for Buildkite self-hosted runners
- If a build command fails in the PRE_BUILD or INSTALL phase, CodeBuild will not start the self-hosted runner and the Buildkite job will need to be cancelled manually.

Setting up a Buildkite runner programmatically

In order to configure a Buildkite runner project programatically, you will need to configure the following resources:

To create a Buildkite runner programmatically

- 1. Create a Buildkite agent token and save the token in plaintext within AWS Secrets Manager.
- 2. Set up a CodeBuild project with your preferred configuration. You will need to configure the following additional attributes:
 - 1. An environment value with name CODEBUILD_CONFIG_BUILDKITE_AGENT_TOKEN, type SECRETS_MANAGER, and a value equal to the Buildkite agent token associated with your Buildkite cluster.
 - 2. Source type equal to NO_SOURCE
 - 3. Permissions to access the secret created in step 1 in your project's service role

For example, you can use the following command to create a valid Buildkite runner project through the CLI:

```
aws codebuild create-project \
--name buildkite-runner-project \
--source "{\"type\": \"NO_SOURCE\",\"buildspec\":\"\"}" \
--environment "{\"image\":\"aws/codebuild/amazonlinux-x86_64-standard:5.0\",
\"type\":\"LINUX_CONTAINER\",\"computeType\":\"BUILD_GENERAL1_MEDIUM\",
\"environmentVariables\":[{\"name\":\"CODEBUILD_CONFIG_BUILDKITE_AGENT_TOKEN\",
\"type\":\"SECRETS_MANAGER\",\"value\":\"<buildkite-secret-name>\"}]}" \
--artifacts "{\"type\": \"NO_ARTIFACTS\"}" \
--service-role <service-role>
```

- Create a Buildkite runner webhook on the project created in step 2. You will need to use the following configuration options when creating the webhook:
 - 1. **build-type** should be equal to RUNNER_BUILDKITE_BUILD
 - 2. A filter with type EVENT and a pattern equal to WORKFLOW_JOB_QUEUED

For example, you can use the following command to create a valid Buildkite runner webhook through the CLI:

```
aws codebuild create-webhook \
--project-name buildkite-runner-project \
--filter-groups "[[{\"type\":\"EVENT\",\"pattern\":\"WORKFLOW_JOB_QUEUED\"}]]" \
--build-type RUNNER_BUILDKITE_BUILD
```

4. Save the **Payload URL** and **Secret** values returned by the create-webhook call and use the credentials to create a webhook within the Buildkite console. You can reference Step 3: Create a CodeBuild webhook within Buildkite in <u>Tutorial</u>: <u>Configure a CodeBuild-hosted Buildkite</u> runner for a guide on how to set up this resource.

Troubleshoot the webhook for failed builds or a hanging job

Issue:

The webhook you set up in <u>Tutorial</u>: <u>Configure a CodeBuild-hosted Buildkite runner</u> isn't working or your workflow job is hanging in Buildkite.

Possible causes:

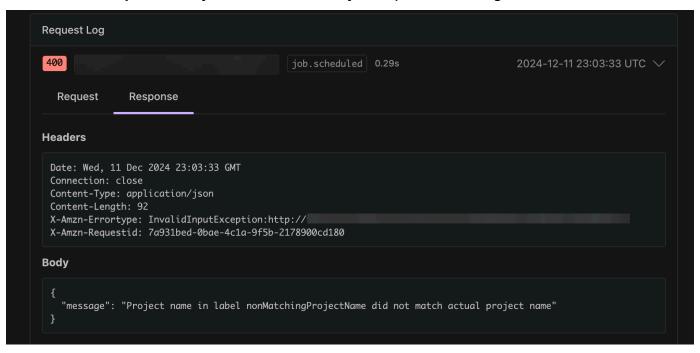
• Your webhook **job.scheduled** event might be failing to trigger a build. Review the **Response** logs to view the response or error message.

 Your CodeBuild build fails before starting the Buildkite self-hosted runner agent to handle your job.

Recommended solutions:

To debug failed Buildkite webhook events:

- In your Buildkite organization settings, navigate to Notification Services, select your CodeBuild webhook, and then find the Request Log.
- Find the job.scheduled webhook event associated with your stuck Buildkite job. You can use the job ID field within the webhook payload to correlate the webhook event to your Buildkite job.
- Select the Response tab and check the response body. Verify that the Response status code is 200 and the Response body doesn't contain any unexpected messages.



Troubleshoot the webhook permission issues

Issue:

The Buildkite job fails to checkout the job's source repository due to permission issues.

Possible causes:

- CodeBuild does not have sufficient permissions to checkout the job's source repository.
- The pipeline's repository settings are set to check out using SSH for CodeBuild managed credentials.

Recommended solutions:

- Verify that CodeBuild has sufficient permissions configured to check out the job's source repository. Additionally, verify that your CodeBuild project's service role has sufficient permissions to access the configured source permission option.
- Verify that your Buildkite pipeline is configured to use checkout using HTTPS if you are using CodeBuild managed source repository credentials.

Label overrides supported with the CodeBuild-hosted Buildkite runner

In your Buildkite pipeline steps agent tag labels, you can provide a variety of label overrides that modify your self-hosted runner build. Any builds not recognized by CodeBuild will be ignored but will not fail your webhook request. For example, the following workflow YAML includes overrides for image, instance size, fleet, and the buildspec:

```
agents:
  queue: "myQueue"
steps:
  - command: "echo \"Hello World\""
    agents:
      project: "codebuild-myProject"
      image: "{{matrix.os}}"
      instance-size: "{{matrix.size}}"
      buildspec-override: "true"
    matrix:
      setup:
        os:
          - "arm-3.0"
          - "al2-5.0"
        size:
          - "small"
```

- "large"

project:codebuild-ct-name (required)

- Example: project: "codebuild-myProject"
- Required for all Buildkite pipeline step configurations. project name name of the project for which the self-hosted runner webhook is configured.

queue: "<queue-name>"

- Example: queue: "<queue-name>"
- Used to route Buildkite jobs to a specific queue. See the Buildkite Agent Queue Tag for more information.

image: "<environment-type>-<image-identifier>"

- Example: image: "arm-3.0"
- Overrides the image and environment type used when starting the self-hosted runner build with a curated image. To learn about supported values, see Compute images supported with the CodeBuild-hosted Buildkite runner.
 - 1. To override the image and environment type used with a custom image, use image: "custom-<environment-type>-<custom-image-identifier>"
 - 2. Example:

image:

"custom-arm-public.ecr.aws/codebuild/amazonlinux-aarch64-standard:3.0"



Note

If the custom image resides in a private registry, you must configure the appropriate registry credentials in your CodeBuild project.

instance-size: "<instance-size>"

Example: instance-size: "medium"

 Overrides the instance type used when starting the self-hosted runner build. To learn about supported values, see Compute images supported with the CodeBuild-hosted Buildkite runner.

fleet: "<fleet-name>"

- Example: fleet: "myFleet"
- Overrides the fleet settings configured on your project to use the specified fleet. For more information, see Run builds on reserved capacity fleets.

buildspec-override: "<boolean>"

- Example: buildspec-override: "true"
- Allows the build to run buildspec commands in the INSTALL, PRE_BUILD, and POST_BUILD phases if set to true.

Compute images supported with the CodeBuild-hosted Buildkite runner

In the label you configured in <u>Self-managed Buildkite runner in AWS CodeBuild</u>, you can override your Amazon EC2 environment settings by using the values in the first three columns. CodeBuild provides the following Amazon EC2 compute images. For more information about

Environment type	lmage identifier	Instance size	Platform	Resolved image	Definition
linux	4.0	small medium large xlarge	Amazon Linux 2	aws/codeb uild/amaz onlinux-x 86_64-sta ndard:4.0	al/standa rd/4.0
linux	5.0	<pre>2xlarge gpu_small gpu_large</pre>	Amazon Linux 2	aws/codeb uild/amaz onlinux-x 86_64-sta	al/standa rd/5.0

Environment type	lmage identifier	Instance size	Platform	Resolved image	Definition
				ndard:5.0	
linux-ec2	latest	small medium large	Amazon Linux 2	aws/codeb uild/ami/ amazonlin ux-x86_64 -base:lat est	None
arm	2.0	small medium large xlarge	Amazon Linux 2	aws/codeb uild/amaz onlinux-a arch64-st andard:2. 0	al/aarch64/ standard/2.0
arm	3.0	2xlarge	Amazon Linux 2	aws/codeb uild/amaz onlinux-a arch64-st andard:3. 0	al/aarch64/ standard/3.0
arm-ec2	latest	small medium large	Amazon Linux 2	aws/codeb uild/ami/ amazonlin ux-arm-ba se:latest	None

Environment type	lmage identifier	Instance size	Platform	Resolved image	Definition	
ubuntu	5.0	small medium	Ubuntu 20.04	aws/codeb uild/stan dard:5.0	ubuntu/st andard/5.0	
ubuntu	6.0	large	Ubuntu 22.04	aws/codeb uild/stan dard:6.0	ubuntu/st andard/6.0	
ubuntu	7.0	<pre>2xlarge gpu_small gpu_large</pre>	Ubuntu 22.04	aws/codeb uild/stan dard:7.0	ubuntu/st andard/7.0	
windows	1.0	medium	Windows Server Core 2019	aws/codeb uild/wind ows-base: 2019-1.0	N/A	
				Windows Server Core 2022	aws/codeb uild/wind ows-base: 2022-1.0	N/A
windows	2.0		Windows Server Core 2019	aws/codeb uild/wind ows-base: 2019-2.0	N/A	
windows	3.0		Windows Server Core 2019	aws/codeb uild/wind ows-base: 2019-3.0	N/A	

Environment type	lmage identifier	Instance size	Platform	Resolved image	Definition
windows-e c2	2022	medium large	Windows Server Core 2022	<pre>aws/codeb uild/ami/ windows-b ase:2022</pre>	None

In addition, you can override your Lambda environment settings by using the following values. For more information about CodeBuild Lambda compute, see Run builds on AWS Lambda compute. CodeBuild supports the following Lambda compute images:

Environment type	lmage identifier	Instance size
linux-lam bda	dotnet6	1GB
	go1.21	2GB
arm-lambd a	corretto1	4GB
	1	8GB
	corretto1 7	10GB
	corretto2	
	1	
	nodejs18	
	nodejs20	
	python3.1	
	1	
	python3.1 2	

For more information, see <u>Build environment compute modes and types</u> and <u>Docker images</u> provided by CodeBuild.

Use webhooks with AWS CodeBuild

AWS CodeBuild supports webhook integration with GitHub, GitHub Enterprise Server, GitLab, GitLab Self Managed, and Bitbucket.

Topics

- Best practices for using webhooks with AWS CodeBuild
- Bitbucket webhook events
- GitHub global and organization webhooks
- GitHub manual webhooks
- GitHub webhook events
- GitLab group webhooks
- GitLab manual webhooks
- GitLab webhook events
- Buildkite manual webhooks

Best practices for using webhooks with AWS CodeBuild

For projects that use public repositories to setup webhooks, we recommend the following options:

Setup ACTOR_ACCOUNT_ID filters

Add ACTOR_ACCOUNT_ID filters to your project's webhook filter groups to specify which users can trigger a build. Every webhook event delivered to CodeBuild comes with sender information that specifies the actor's identifier. CodeBuild will filter the webhooks based on the regular expression pattern provided in the filters. You can specify the specific users that are allowed to

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trigger builds with this filter. For more information, see <u>GitHub webhook events</u> and <u>Bitbucket</u> webhook events.

Setup FILE_PATH filters

Add FILE_PATH filters to your project's webhook filter groups to include or exclude the files that can trigger a build when changed. For example, you can deny build requests for changes to the buildspec.yml file using a regular expression pattern such as ^buildspec.yml\$, along with the excludeMatchedPattern property. For more information, see GitHub webhook events and Bitbucket webhook events.

Scope down the permissions for your build IAM role

Builds triggered by a webhook use the IAM service role specified in the project. We recommend setting the permissions in the service role to the minimum set of permissions required to run the build. For example, in a test and deploy scenario, create one project for testing and another project for deployment. The testing project accepts webhook builds from the repository, but provides no write permissions to your resources. The deployment project provides write permissions to your resources, and the webhook filter is configured to only allow trusted users to trigger builds.

Use an inline or an Amazon S3 stored buildspec

If you define your buildspec inline within the project itself, or store the buildspec file in an Amazon S3 bucket, the buildspec file is only visible to the project owner. This prevents pull requests from making code changes to the buildspec file and triggering unwanted builds. For more information, see ProjectSource.buildspec in the CodeBuild API Reference.

Bitbucket webhook events

You can use webhook filter groups to specify which Bitbucket webhook events trigger a build. For example, you can specify that a build is only triggered for changes to specific branches.

You can create one or more webhook filter groups to specify which webhook events trigger a build. A build is triggered if any filter group evaluates to true, which occurs when all the filters in the group evaluate to true. When you create a filter group, you specify:

An event

For Bitbucket, you can choose one or more of the following events:

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- PUSH
- PULL_REQUEST_CREATED
- PULL_REQUEST_UPDATED
- PULL_REQUEST_MERGED
- PULL_REQUEST_CLOSED

The webhook's event type is in its header in the X-Event-Key field. The following table shows how X-Event-Key header values map to the event types.



Note

You must enable the merged event in your Bitbucket webhook setting if you create a webhook filter group that uses the PULL_REQUEST_MERGED event type. You must also enable the declined event in your Bitbucket webhook setting if you create a webhook filter group that uses the PULL_REQUEST_CLOSED event type.

X-Event-Key Header value	Event type
repo:push	PUSH
pullrequest:created	PULL_REQUEST_CREATED
pullrequest:updated	PULL_REQUEST_UPDATED
pullrequest:fulfilled	PULL_REQUEST_MERGED
pullrequest:rejected	PULL_REQUEST_CLOSED

For PULL_REQUEST_MERGED, if a pull request is merged with the squash strategy and the pull request branch is closed, the original pull request commit no longer exists. In this case, the CODEBUILD_WEBHOOK_MERGE_COMMIT environment variable contains the identifier of the squashed merge commit.

One or more optional filters

Use a regular expression to specify a filter. For an event to trigger a build, every filter within the group associated with it must evaluate to true.

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ACTOR ACCOUNT ID (ACTOR ID in the console)

A webhook event triggers a build when a Bitbucket account ID matches the regular expression pattern. This value appears in the account id property of the actor object in the webhook filter payload.

HEAD_REF

A webhook event triggers a build when the head reference matches the regular expression pattern (for example, refs/heads/branch-name and refs/tags/tag-name). A HEAD_REF filter evaluates the Git reference name for the branch or tag. The branch or tag name appears in the name field of the new object in the push object of the webhook payload. For pull request events, the branch name appears in the name field in the branch object of the source object in the webhook payload.

BASE_REF

A webhook event triggers a build when the base reference matches the regular expression pattern. A BASE_REF filter works with pull request events only (for example, refs/heads/ branch-name). A BASE REF filter evaluates the Git reference name for the branch. The branch name appears in the name field of the branch object in the destination object in the webhook payload.

FILE PATH

A webhook triggers a build when the path of a changed file matches the regular expression pattern.

COMMIT MESSAGE

A webhook triggers a build when the head commit message matches the regular expression pattern.

WORKFLOW_NAME

A webhook triggers a build when the workflow name matches the regular expression pattern.



Note

You can find the webhook payload in the webhook settings of your Bitbucket repository.

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Topics

- Filter Bitbucket webhook events (console)
- Filter Bitbucket webhook events (SDK)
- Filter Bitbucket webhook events (AWS CloudFormation)

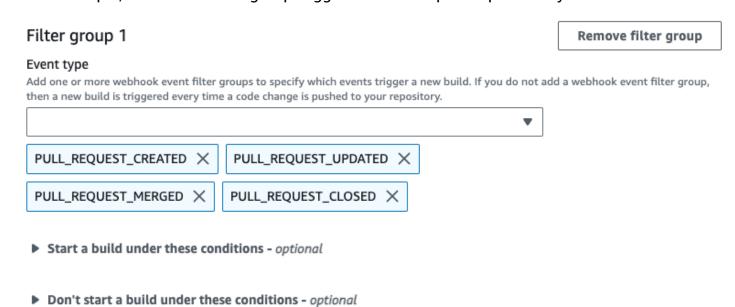
Filter Bitbucket webhook events (console)

To use the AWS Management Console to filter webhook events:

- Select Rebuild every time a code change is pushed to this repository when you create your project.
- 2. From **Event type**, choose one or more events.
- 3. To filter when an event triggers a build, under **Start a build under these conditions**, add one or more optional filters.
- 4. To filter when an event is not triggered, under **Don't start a build under these conditions**, add one or more optional filters.
- 5. Choose **Add filter group** to add another filter group.

For more information, see <u>Create a build project (console)</u> and <u>WebhookFilter</u> in the <u>AWS CodeBuild</u> API Reference.

In this example, a webhook filter group triggers a build for pull requests only:



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Using an example of two filter groups, a build is triggered when one or both evaluate to true:

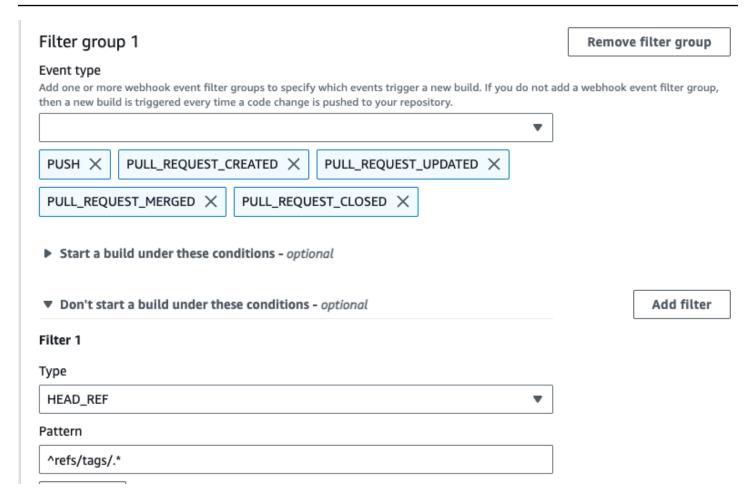
• The first filter group specifies pull requests that are created or updated on branches with Git reference names that match the regular expression <code>refs/heads/main</code> and head references that match <code>refs/heads/branch1!</code>.

• The second filter group specifies push requests on branches with Git reference names that match the regular expression <code>^refs/heads/branch1\$</code>.

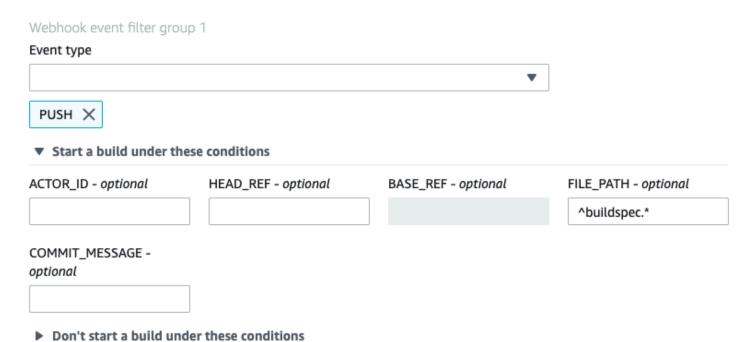
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then a new build is triggered e	every time a code change is pushed to	your repository.	
		▼	
PULL_REQUEST_CREATI	ED X PULL_REQUEST_UPD/	ATED X	
▼ Start a build under th	nese conditions		
ACTOR_ID - optional	HEAD_REF - optional	BASE_REF - optional	FILE_PATH - optional
	^refs/heads/branch1\$	^refs/heads/main\$	
COMMIT_MESSAGE - optional			
Don't start a build un	nder these conditions		
▶ Don't start a build un	nder these conditions		
			Remove filter group
Webhook event filter gro			Remove filter group
Webhook event filter gro Event type Add one or more a webhook e	up 2 vent filter groups to specify which eve		
Webhook event filter gro Event type Add one or more a webhook e	up 2		not add a webhook event filter group
Webhook event filter gro Event type Add one or more a webhook e then a new build is triggered o	up 2 vent filter groups to specify which eve	your repository.	not add a webhook event filter group
Webhook event filter gro Event type Add one or more a webhook e then a new build is triggered e	up 2 event filter groups to specify which eve every time a code change is pushed to	your repository.	not add a webhook event filter group
Webhook event filter gro Event type Add one or more a webhook e then a new build is triggered o	up 2 event filter groups to specify which eve every time a code change is pushed to	your repository.	not add a webhook event filter group
Webhook event filter gro Event type Add one or more a webhook e then a new build is triggered e	up 2 event filter groups to specify which every time a code change is pushed to specify which every time a code change is pushed to specify the specific p	your repository.	not add a webhook event filter group
Vebhook event filter gro Event type Add one or more a webhook e hen a new build is triggered e PUSH ▼ Start a build under the	up 2 event filter groups to specify which event every time a code change is pushed to the every time accode change is pushed to the every time according to the every tim	your repository.	not add a webhook event filter group

In this example, a webhook filter group triggers a build for all requests except tag events.



In this example, a webhook filter group triggers a build only when files with names that match the regular expression ^buildspec.* change.



In this example, a webhook filter group triggers a build only when files are changed in src or test folders.

Webhook event filter group 1

▶ Don't start a build under these conditions

	iggered every time a code change i	▼	
PUSH X			_
▼ Start a build under these conditions			
ACTOR_ID - optional	HEAD_REF - optional	BASE_REF - optional	FILE_PATH - optional
			^src/.+ ^test/.+
COMMIT_MESSAGE -			
optional			

In this example, a webhook filter group triggers a build only when a change is made by a Bitbucket user who does not have an account ID that matches the regular expression actor-account-id.



Note

For information about how to find your Bitbucket account ID, see https:// api.bitbucket.org/2.0/users/user-name, where user-name is your Bitbucket user name.

Filter group 1	Remove filter group
Event type Add one or more webhook event filter groups to specify which events trigger a new build. If you do not add then a new build is triggered every time a code change is pushed to your repository.	a webhook event filter group,
▼	
PUSH $ imes$ PULL_REQUEST_CREATED $ imes$ PULL_REQUEST_UPDATED $ imes$	
PULL_REQUEST_MERGED X	
▼ Start a build under these conditions - optional	Add filter
Filter 2	
Туре	
ACTOR_ACCOUNT_ID ▼	
Pattern	
actor-account-id	

In this example, a webhook filter group triggers a build for a push event when the head commit message matches the regular expression \[CodeBuild\].

Webhook event filter gro	oup 1		
Event type			
		▼	
PUSH X			
▼ Start a build under these conditions			
ACTOR_ID - optional	HEAD_REF - optional	BASE_REF - optional	FILE_PATH - optional
COMMIT_MESSAGE - optional			

Filter Bitbucket webhook events (SDK)

To use the AWS CodeBuild SDK to filter webhook events, use the filterGroups field in the request syntax of the CreateWebhook or UpdateWebhook API methods. For more information, see WebhookFilter in the CodeBuild API Reference.

To create a webhook filter that triggers a build for pull requests only, insert the following into the request syntax:

To create a webhook filter that triggers a build for specified branches only, use the pattern parameter to specify a regular expression to filter branch names. Using an example of two filter groups, a build is triggered when one or both evaluate to true:

• The first filter group specifies pull requests that are created or updated on branches with Git reference names that match the regular expression <code>refs/heads/main</code> and head references that match <code>refs/heads/myBranch</code>.

• The second filter group specifies push requests on branches with Git reference names that match the regular expression <code>^refs/heads/myBranch\$</code>.

```
"filterGroups": [
  Γ
    {
      "type": "EVENT",
      "pattern": "PULL_REQUEST_CREATED, PULL_REQUEST_UPDATED, PULL_REQUEST_CLOSED"
    },
    {
      "type": "HEAD_REF",
      "pattern": "^refs/heads/myBranch$"
    },
      "type": "BASE_REF",
      "pattern": "^refs/heads/main$"
    }
  ],
  {
      "type": "EVENT",
      "pattern": "PUSH"
    },
      "type": "HEAD_REF",
      "pattern": "^refs/heads/myBranch$"
    }
  ]
]
```

You can use the excludeMatchedPattern parameter to specify which events do not trigger a build. In this example, a build is triggered for all requests except tag events.

You can create a filter that triggers a build only when a change is made by a Bitbucket user with account ID actor-account-id.

Note

For information about how to find your Bitbucket account ID, see https://api.bitbucket.org/2.0/users/user-name, where user-name is your Bitbucket user name.

You can create a filter that triggers a build only when files with names that match the regular expression in the pattern argument change. In this example, the filter group specifies that a build is triggered only when files with a name that matches the regular expression ^buildspec.* change.

```
"filterGroups": [
```

In this example, the filter group specifies that a build is triggered only when files are changed in src or test folders.

You can create a filter that triggers a build only when the head commit message matches the regular expression in the pattern argument. In this example, the filter group specifies that a build is triggered only when the head commit message of the push event matches the regular expression \[CodeBuild\].

```
]
]
```

Filter Bitbucket webhook events (AWS CloudFormation)

To use an AWS CloudFormation template to filter webhook events, use the AWS CodeBuild project's FilterGroups property. The following YAML-formatted portion of an AWS CloudFormation template creates two filter groups. Together, they trigger a build when one or both evaluate to true:

- The first filter group specifies pull requests are created or updated on branches with Git
 reference names that match the regular expression \refs/heads/main\$ by a Bitbucket user
 who does not have account ID 12345.
- The second filter group specifies push requests are created on branches with Git reference names that match the regular expression <code>^refs/heads/.*</code>.
- The third filter group specifies a push request with a head commit message matching the regular expression \[CodeBuild\].

```
CodeBuildProject:
  Type: AWS::CodeBuild::Project
  Properties:
    Name: MyProject
    ServiceRole: service-role
    Artifacts:
      Type: NO_ARTIFACTS
    Environment:
      Type: LINUX_CONTAINER
      ComputeType: BUILD_GENERAL1_SMALL
      Image: aws/codebuild/standard:5.0
    Source:
      Type: BITBUCKET
      Location: source-location
    Triggers:
      Webhook: true
      FilterGroups:
        - - Type: EVENT
            Pattern: PULL_REQUEST_CREATED, PULL_REQUEST_UPDATED
          - Type: BASE_REF
            Pattern: ^refs/heads/main$
```

ExcludeMatchedPattern: false

- Type: ACTOR_ACCOUNT_ID

Pattern: 12345

ExcludeMatchedPattern: true

- Type: EVENT Pattern: PUSH- Type: HEAD_REF

Pattern: ^refs/heads/.*

Type: FILE_PATH Pattern: READ_ME

ExcludeMatchedPattern: true

- - Type: EVENT
 Pattern: PUSH

- Type: COMMIT_MESSAGE
 Pattern: \[CodeBuild\]

- Type: FILE_PATH

Pattern: ^src/.+|^test/.+

GitHub global and organization webhooks

You can use CodeBuild GitHub global or organization webhooks to start builds on webhook events from any repository within a GitHub organization or enterprise. Global and organization webhooks work with any of the existing GitHub webhook event types, and can be configured by adding a scope configuration when creating a CodeBuild webhook. You can also use global and organization webhooks to set up self-hosted GitHub Action runners within CodeBuild in order to receive WORKFLOW_JOB_QUEUED events from multiple repositories within a single project.

Topics

- Set up a global or organization GitHub webhook
- Filter GitHub global or organization webhook events (console)
- Filter GitHub organization webhook events (AWS CloudFormation)

Set up a global or organization GitHub webhook

The high-level steps to set up a global or organization GitHub webhook are as follows. For more information about global and organization GitHub webhooks, see <u>GitHub global and organization</u> webhooks.

1. Set your project's source location to CODEBUILD_DEFAULT_WEBHOOK_SOURCE_LOCATION.

2. In the webhook's scope configuration, set the scope to either GITHUB ORGANIZATION or GITHUB_GLOBAL depending on whether it should be an organization or global webhook. For more information, see Types of webhooks.

3. Specify a name as part of the webhook's scope configuration. For organization webhooks, this is the organization name, and for global webhooks this is the enterprise name.



Note

If the project's source type is GITHUB_ENTERPRISE, you will also need to specify a domain as part of the webhook scope configuration.

- 4. (Optional) If you would only like to receive webhook events for specific repositories within your organization or enterprise, you can specify REPOSITORY_NAME as a filter when creating the webhook.
- 5. If you are creating an organization webhook, ensure that CodeBuild has permissions to create organization level webhooks within GitHub. You can create a GitHub personal access token with organization webhook permissions, or use CodeBuild OAuth. For more information, see GitHub and GitHub Enterprise Server access token.

Note that organization webhooks work with any of the existing GitHub webhook event types.

6. If you are creating a global webhook, the webhook will need to be created manually. For more information about how to manually create a webhook within GitHub, see GitHub manual webhooks.

Note that global webhooks only support the WORKFLOW_JOB_QUEUED event type. For more information, see Tutorial: Configure a CodeBuild-hosted GitHub Actions runner.

Filter GitHub global or organization webhook events (console)

When creating a GitHub project through the console, select the following options to create a GitHub global or organization webhook within the project. For more information about global and organization GitHub webhooks, see GitHub global and organization webhooks.

- Open the AWS CodeBuild console at https://console.aws.amazon.com/codesuite/codebuild/ home.
- Create a build project. For information, see Create a build project (console) and Run a build 2. (console).

In Source:

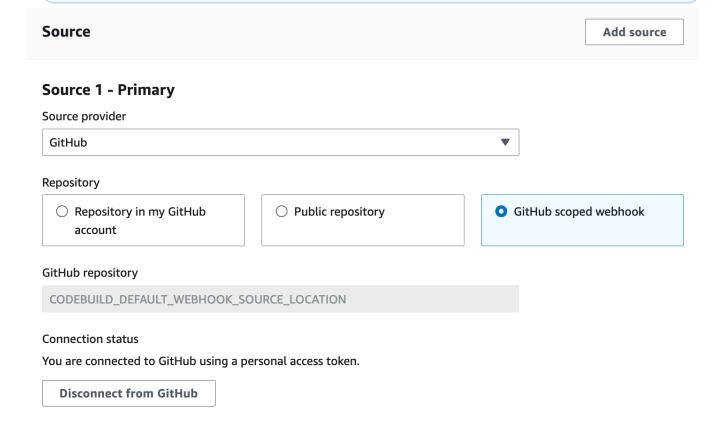
- For Source provider, choose GitHub or GitHub Enterprise.
- For Repository, choose GitHub scoped webhook.

The GitHub repository will automatically be set to CODEBUILD_DEFAULT_WEBHOOK_SOURCE_LOCATION, which is the required source location for global and organization webhooks.



Note

If you are using organization webhooks, make sure that CodeBuild has permissions to create organization level webhooks within GitHub. If you're using an existing OAuth connection, you may need to regenerate the connection in order to grant CodeBuild this permission. Alternatively, you can create the webhook manually using the CodeBuild manual webhooks feature. Note that if you have an existing GitHub OAuth token and would like to add additional organization permissions, you can revoke the OAuth token's permission and reconnect the token through the CodeBuild console.



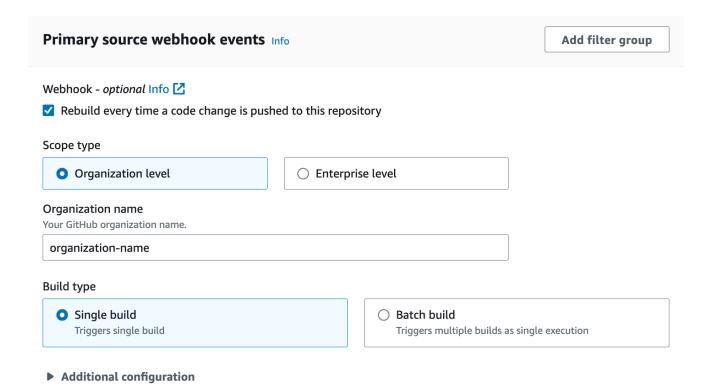
- In Primary source webhook events:
 - For Scope type, choose Organization level if you're creating an organization webhook or **Enterprise level** if you're creating a global webhook.
 - For Name, enter either the enterprise or organization name, depending on if the webhook is a global or organization webhook.

If the project's source type is GITHUB_ENTERPRISE, you also need to specify a domain as part of the webhook organization configuration. For example, if the URL of your organization is https://domain.com/orgs/org-name, then the domain is https:// domain.com.

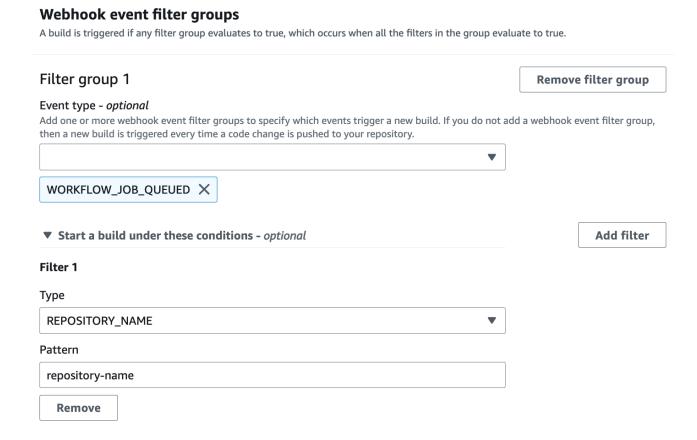


Note

This name cannot be changed after the webhook has been created. To change the name, you can delete and re-create the webhook. If you want to remove the webhook entirely, you can also update the project source location to a GitHub repository.



(Optional) In Webhook event filter groups, you can specify which events you would like
to trigger a new build. You can also specify REPOSITORY_NAME as a filter to only trigger
builds on webhook events from specific repositories.



You can also set the event type to WORKFLOW_JOB_QUEUED to set up self-hosted GitHub Actions runners. For more information, see <u>Tutorial</u>: <u>Configure a CodeBuild-hosted GitHub</u> Actions runner.

3. Continue with the default values and then choose **Create build project**.

Filter GitHub organization webhook events (AWS CloudFormation)

To use an AWS CloudFormation template to filter organization webhook events, use the AWS CodeBuild project's ScopeConfiguration property. For more information about global and organization GitHub webhooks, see <u>GitHub global and organization webhooks</u>.



Note

Global webhooks and GitHub Enterprise webhooks are not supported by AWS CloudFormation.

The following YAML-formatted portion of an AWS CloudFormation template creates four filter groups. Together, they trigger a build when one or all evaluate to true:

- The first filter group specifies pull requests are created or updated on branches with Git reference names that match the regular expression <code>refs/heads/main\$</code> by a GitHub user who does not have account ID 12345.
- The second filter group specifies push requests are created on files with names that match the regular expression READ_ME in branches with Git reference names that match the regular expression ^refs/heads/.*.
- The third filter group specifies a push request with a head commit message matching the regular expression \[CodeBuild\].
- The fourth filter group specifies a GitHub Actions workflow job request with a workflow name matching the regular expression \[CI-CodeBuild\].

```
CodeBuildProject:
 Type: AWS::CodeBuild::Project
 Properties:
    Name: MyProject
    ServiceRole: service-role
    Artifacts:
      Type: NO_ARTIFACTS
    Environment:
      Type: LINUX_CONTAINER
      ComputeType: BUILD_GENERAL1_SMALL
      Image: aws/codebuild/standard:5.0
    Source:
      Type: GITHUB
      Location: source-location
    Triggers:
     Webhook: true
      ScopeConfiguration:
        Name: organization-name
        Scope: GITHUB_ORGANIZATION
```

FilterGroups:

- - Type: EVENT

Pattern: PULL_REQUEST_CREATED, PULL_REQUEST_UPDATED

- Type: BASE_REF

Pattern: ^refs/heads/main\$
ExcludeMatchedPattern: false

- Type: ACTOR_ACCOUNT_ID

Pattern: 12345

ExcludeMatchedPattern: true

- Type: EVENT Pattern: PUSH- Type: HEAD_REF

Pattern: ^refs/heads/.*

- Type: FILE_PATH
 Pattern: READ_ME

ExcludeMatchedPattern: true

- - Type: EVENT
 Pattern: PUSH

- Type: COMMIT_MESSAGE
 Pattern: \[CodeBuild\]

- Type: FILE_PATH

Pattern: ^src/.+|^test/.+

- - Type: EVENT

Pattern: WORKFLOW_JOB_QUEUED

- Type: WORKFLOW_NAME

Pattern: \[CI-CodeBuild\]

GitHub manual webhooks

You can configure manual GitHub webhooks to prevent CodeBuild from automatically attempting to create a webhook within GitHub. CodeBuild returns a payload URL in as part of the call to create the webhook and can be used to manually create the webhook within GitHub. Even if CodeBuild is not allowlisted to create a webhook in your GitHub account, you can still manually create a webhook for your build project.

Use the following procedure to create a GitHub manual webhook.

To create a GitHub manual webhook

 Open the AWS CodeBuild console at https://console.aws.amazon.com/codesuite/codebuild/ home.

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2. Create a build project. For information, see <u>Create a build project (console)</u> and <u>Run a build</u> (console).

- In Source:
 - For Source provider, choose GitHub.
 - For Repository, choose Repository in my GitHub account.
 - For Repository URL, enter https://github.com/user-name/repository-name.
- In Primary source webhook events:
 - For Webhook optional, choose Rebuild every time a code change is pushed to this repository.
 - Choose Additional configuration and for Manual creation optional, choose Manually create a webhook for this repository in GitHub console..
- 3. Continue with the default values and then choose **Create build project**. Take note of the **Payload URL** and **Secret** values as you will use these later.



Close

- Open the GitHub console at https://github.com/user-name/repository-name/ settings/hooks and choose Add webhook.
 - For Payload URL, enter the Payload URL value you took note of earlier.
 - For **Content type**, choose **application/json**.
 - For **Secret**, enter the Secret value you took note of earlier.
 - Configure the individual events that will send a webhook payload to CodeBuild. For Which
 events would you like to trigger this webhook?, choose Let me select individual events,
 and then choose from the following events: Pushes, Pull requests, and Releases. If you want
 to start builds for WORKFLOW_JOB_QUEUED events, choose Workflow jobs. To learn more
 about GitHub Actions runners, see <u>Tutorial</u>: Configure a CodeBuild-hosted GitHub Actions
 runner. To learn more about event types supported by CodeBuild, see <u>GitHub webhook</u>
 events.

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Choose Add webhook.

GitHub webhook events

You can use webhook filter groups to specify which GitHub webhook events trigger a build. For example, you can specify that a build is only triggered for changes to specific branches.

You can create one or more webhook filter groups to specify which webhook events trigger a build. A build is triggered if any filter group evaluates to true, which occurs when all the filters in the group evaluate to true. When you create a filter group, you specify:

An event

For GitHub, you can choose one or more of the following events: PUSH, PULL_REQUEST_CREATED, PULL_REQUEST_UPDATED, PULL_REQUEST_REOPENED, PULL_REQUEST_MERGED, PULL_REQUEST_CLOSED, RELEASED, PRERELEASED, and WORKFLOW_JOB_QUEUED. The webhook event type is in the X-GitHub-Event header in the webhook payload. In the X-GitHub-Event header, you might see pull_request or push. For a pull request event, the type is in the action field of the webhook event payload. The following table shows how X-GitHub-Event header values and webhook pull request payload action field values map to the available event types.

X-GitHub-Event Header value	Webhook event payload action value	Event type
pull_request	opened	PULL_REQUEST_CREATED
pull_request	reopened	PULL_REQUEST_REOPE NED
pull_request	synchronize	PULL_REQUEST_UPDATED
pull_request	closed, and the merged field is true	PULL_REQUEST_MERGED
pull_request	closed, and the merged field is false	PULL_REQUEST_CLOSED
push	n/a	PUSH

X-GitHub-Event Header value	Webhook event payload action value	Event type
release	released	RELEASED
release	prereleased	PRERELEASED
workflow_job	queued	WORKFLOW_JOB_QUEUED

Note

The PULL_REQUEST_REOPENED event type can be used with GitHub and GitHub Enterprise Server only. The RELEASED and PRERELEASED event type can be used with GitHub only. For more information on WORKFLOW_JOB_QUEUED, see Tutorial: Configure a CodeBuild-hosted GitHub Actions runner.

One or more optional filters

Use a regular expression to specify a filter. For an event to trigger a build, every filter within the group associated with it must evaluate to true.

ACTOR_ACCOUNT_ID (ACTOR_ID in the console)

A webhook event triggers a build when a GitHub or GitHub Enterprise Server account ID matches the regular expression pattern. This value is found in the id property of the sender object in the webhook payload.

HEAD_REF

A webhook event triggers a build when the head reference matches the regular expression pattern (for example, refs/heads/branch-name or refs/tags/tag-name). For a push event, the reference name is found in the ref property in the webhook payload. For pull requests events, the branch name is found in the ref property of the head object in the webhook payload.

BASE_REF

A webhook event triggers a build when the base reference matches the regular expression pattern (for example, refs/heads/branch-name). A BASE_REF filter can be used with pull

request events only. The branch name is found in the ref property of the base object in the webhook payload.

FILE_PATH

A webhook triggers a build when the path of a changed file matches the regular expressions pattern. A FILE_PATH filter can be used with GitHub push and pull request events and GitHub Enterprise Server push events. It cannot be used with GitHub Enterprise Server pull request events.

COMMIT_MESSAGE

A webhook triggers a build when the head commit message matches the regular expression pattern. A COMMIT_MESSAGE filter can be used with GitHub push and pull request events and GitHub Enterprise Server push events. It cannot be used with GitHub Enterprise Server pull request events.

TAG_NAME

A webhook triggers a build when the tag name of the release matches the regular expression pattern. A TAG_NAME filter can be used with GitHub released and prereleased request events.

RELEASE_NAME

A webhook triggers a build when the release name matches the regular expression pattern. A RELEASE_NAME filter can be used with GitHub released and prereleased request events.

REPOSITORY NAME

A webhook triggers a build when the repository name matches the regular expression pattern. A REPOSITORY_NAME filter can only be used with GitHub global or organization webhooks.

ORGANIZATION_NAME

A webhook triggers a build when the organization name matches the regular expression pattern. A ORGANIZATION_NAME filter can only be used with GitHub global webhooks.

WORKFLOW_NAME

A webhook triggers a build when the workflow name matches the regular expression pattern. A WORKFLOW_NAME filter can be used with GitHub Actions workflow job queued request events.



Note

You can find the webhook payload in the webhook settings of your GitHub repository.

Topics

- Filter GitHub webhook events (console)
- Filter GitHub webhook events (SDK)
- Filter GitHub webhook events (AWS CloudFormation)

Filter GitHub webhook events (console)

Use the following instructions to filter GitHub webhook events using the AWS Management Console. For more information about GitHub webhook events, see GitHub webhook events.

In **Primary source webhook events**, select the following. This section is only available when you chose **Repository in my GitHub account** for the source repository.

- 1. Select Rebuild every time a code change is pushed to this repository when you create your project.
- 2. From **Event type**, choose one or more events.
- 3. To filter when an event triggers a build, under Start a build under these conditions, add one or more optional filters.
- 4. To filter when an event is not triggered, under **Don't start a build under these conditions**, add one or more optional filters.
- 5. Choose **Add filter group** to add another filter group, if needed.

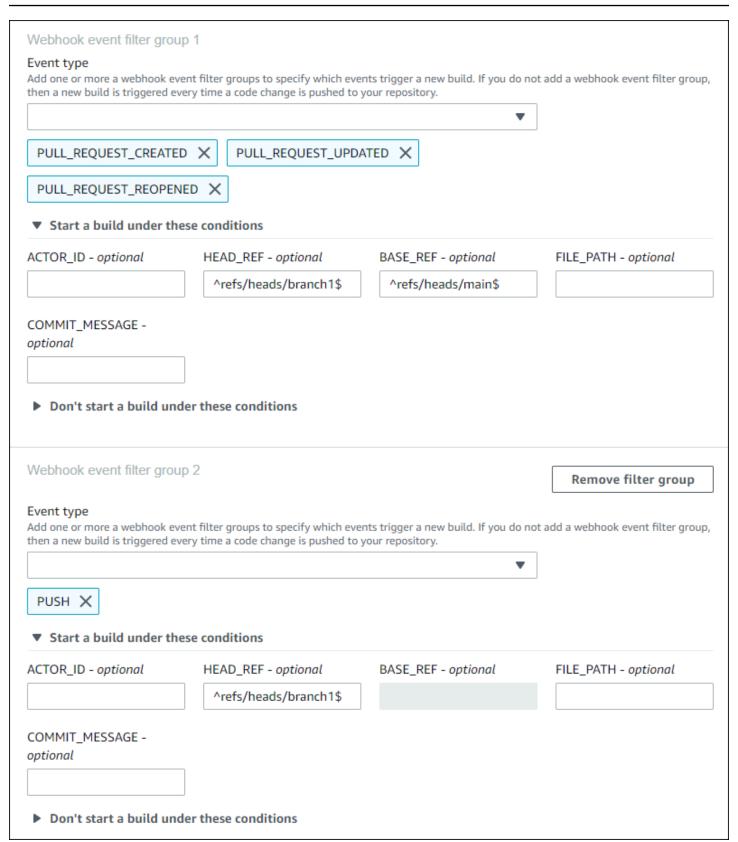
For more information, see Create a build project (console) and WebhookFilter in the AWS CodeBuild API Reference.

In this example, a webhook filter group triggers a build for pull requests only:



Using an example of two webhook filter groups, a build is triggered when one or both evaluate to true:

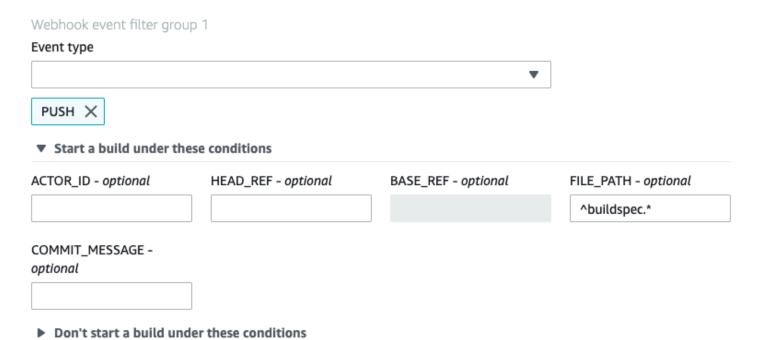
- The first filter group specifies pull requests that are created, updated, or reopened on branches with Git reference names that match the regular expression <code>^refs/heads/main\$</code> and head references that match <code>^refs/heads/branch1\$</code>.
- The second filter group specifies push requests on branches with Git reference names that match the regular expression <code>^refs/heads/branch1\$</code>.



In this example, a webhook filter group triggers a build for all requests except tag events.

Filter group 1	Remove filter group
Event type Add one or more webhook event filter groups to specify which events trigger a new build. If you do not add then a new build is triggered every time a code change is pushed to your repository.	d a webhook event filter group,
▼	
PUSH X PULL_REQUEST_CREATED X PULL_REQUEST_UPDATED X	
PULL_REQUEST_REOPENED X PULL_REQUEST_MERGED X	
PULL_REQUEST_CLOSED X	
► Start a build under these conditions - optional	
▼ Don't start a build under these conditions - optional	Add filter
Filter 1	
Туре	
HEAD_REF ▼	
Pattern	
^refs/tags/.*	

In this example, a webhook filter group triggers a build only when files with names that match the regular expression ^buildspec.* change.



In this example, a webhook filter group triggers a build only when files are changed in src or test folders.

Webhook event filter group 1

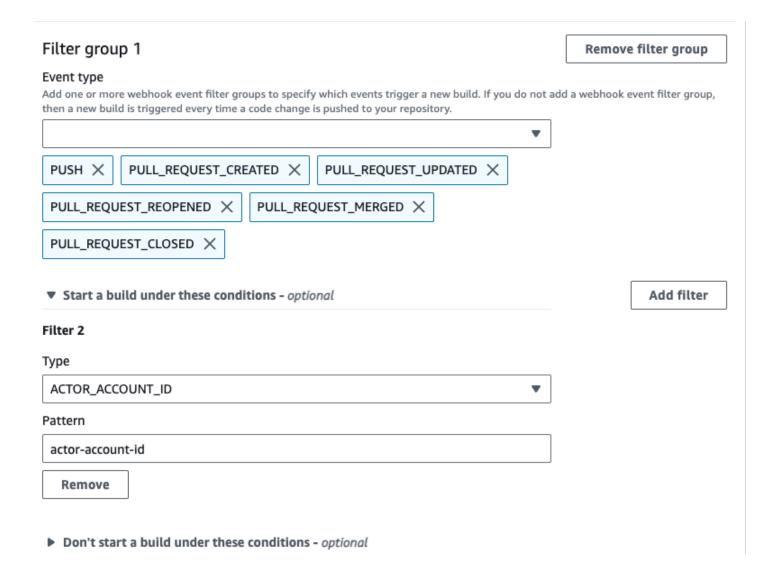
		▼		
PUSH X				
▼ Start a build under these conditions				
ACTOR_ID - optional	HEAD_REF - optional	BASE_REF - optional	FILE_PATH - optional	
			^src/.+ ^test/.+	

In this example, a webhook filter group triggers a build only when a change is made by a specified GitHub or GitHub Enterprise Server user with an account ID that matches the regular expression actor-account-id.

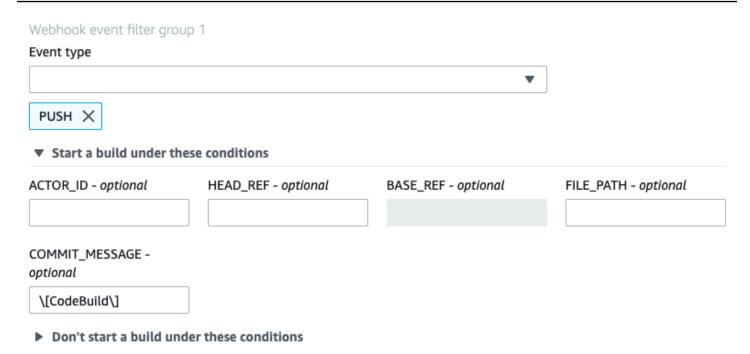


Note

For information about how to find your GitHub account ID, see https://api.github.com/ users/user-name, where user-name is your GitHub user name.



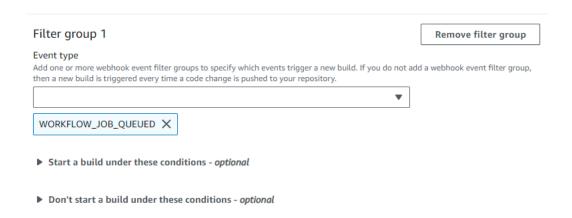
In this example, a webhook filter group triggers a build for a push event when the head commit message matches the regular expression \[CodeBuild\].



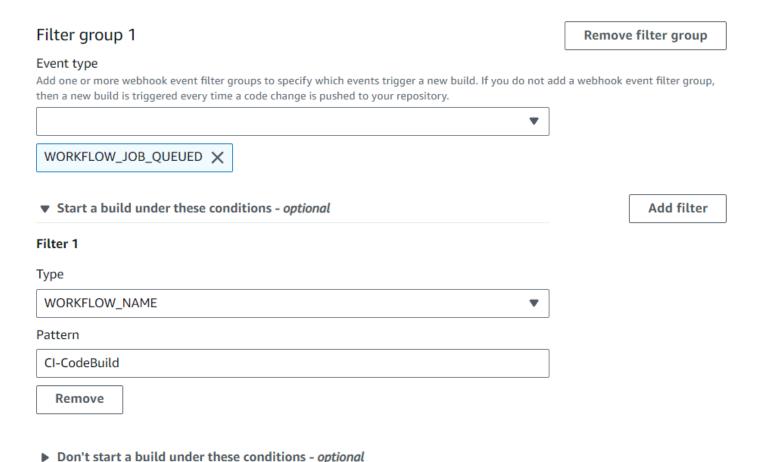
In this example, a webhook filter group triggers a build for GitHub Actions workflow job events only.



CodeBuild will only process GitHub Actions workflow jobs if a webhook has filter groups containing the **WORKFLOW_JOB_QUEUED** event filter.



In this example, a webhook filter group triggers a build for a workflow name that matches the regular expression CI-CodeBuild.



Filter GitHub webhook events (SDK)

To use the AWS CodeBuild SDK to filter webhook events, use the filterGroups field in the request syntax of the CreateWebhook or UpdateWebhook API methods. For more information, see WebhookFilter in the CodeBuild API Reference.

For more information about GitHub webhook events, see GitHub webhook events.

To create a webhook filter that triggers a build for pull requests only, insert the following into the request syntax:

```
]
```

To create a webhook filter that triggers a build for specified branches only, use the pattern parameter to specify a regular expression to filter branch names. Using an example of two filter groups, a build is triggered when one or both evaluate to true:

- The first filter group specifies pull requests that are created, updated, or reopened on branches with Git reference names that match the regular expression <code>^refs/heads/main\$</code> and head references that match <code>^refs/heads/myBranch\$</code>.
- The second filter group specifies push requests on branches with Git reference names that match the regular expression <code>^refs/heads/myBranch\$</code>.

```
"filterGroups": [
    Γ
        {
             "type": "EVENT",
            "pattern": "PULL_REQUEST_CREATED, PULL_REQUEST_UPDATED,
 PULL_REQUEST_REOPENED"
        },
        {
            "type": "HEAD_REF",
             "pattern": "^refs/heads/myBranch$"
        },
        {
            "type": "BASE_REF",
             "pattern": "^refs/heads/main$"
        }
    ],
    Ε
        {
            "type": "EVENT",
             "pattern": "PUSH"
        },
        {
            "type": "HEAD_REF",
             "pattern": "^refs/heads/myBranch$"
        }
    ]
]
```

You can use the excludeMatchedPattern parameter to specify which events do not trigger a build. For example, in this example a build is triggered for all requests except tag events.

You can create a filter that triggers a build only when files with names that match the regular expression in the pattern argument change. In this example, the filter group specifies that a build is triggered only when files with a name that matches the regular expression ^buildspec.* change.

In this example, the filter group specifies that a build is triggered only when files are changed in src or test folders.

```
"filterGroups": [
[
```

```
{
             "type": "EVENT",
             "pattern": "PUSH"
        },
        {
             "type": "FILE_PATH",
             "pattern": "^src/.+|^test/.+"
        }
    ]
]
```

You can create a filter that triggers a build only when a change is made by a specified GitHub or GitHub Enterprise Server user with account ID actor-account-id.

Note

For information about how to find your GitHub account ID, see https://api.github.com/ users/user-name, where user-name is your GitHub user name.

```
"filterGroups": [
    Γ
        {
            "type": "EVENT",
            "pattern": "PUSH, PULL_REQUEST_CREATED, PULL_REQUEST_UPDATED,
 PULL_REQUEST_REOPENED, PULL_REQUEST_MERGED, PULL_REQUEST_CLOSED"
        },
        {
            "type": "ACTOR_ACCOUNT_ID",
            "pattern": "actor-account-id"
        }
    ]
]
```

You can create a filter that triggers a build only when the head commit message matches the regular expression in the pattern argument. In this example, the filter group specifies that a build is triggered only when the head commit message of the push event matches the regular expression \[CodeBuild\].

```
"filterGroups": [
```

To create a webhook filter that triggers a build for GitHub Actions workflow jobs only, insert the following into the request syntax:

Filter GitHub webhook events (AWS CloudFormation)

To use an AWS CloudFormation template to filter webhook events, use the AWS CodeBuild project's FilterGroups property.

For more information about GitHub webhook events, see GitHub webhook events.

The following YAML-formatted portion of an AWS CloudFormation template creates two filter groups. Together, they trigger a build when one or both evaluate to true:

- The first filter group specifies pull requests are created or updated on branches with Git reference names that match the regular expression ^refs/heads/main\$ by a GitHub user who does not have account ID 12345.
- The second filter group specifies push requests are created on files with names that match the regular expression READ_ME in branches with Git reference names that match the regular expression ^refs/heads/.*.

• The third filter group specifies a push request with a head commit message matching the regular expression \[CodeBuild\].

• The fourth filter group specifies a GitHub Actions workflow job request with a workflow name matching the regular expression \[CI-CodeBuild\].

```
CodeBuildProject:
  Type: AWS::CodeBuild::Project
  Properties:
    Name: MyProject
    ServiceRole: service-role
    Artifacts:
      Type: NO_ARTIFACTS
    Environment:
      Type: LINUX_CONTAINER
      ComputeType: BUILD_GENERAL1_SMALL
      Image: aws/codebuild/standard:5.0
    Source:
      Type: GITHUB
      Location: source-location
    Triggers:
      Webhook: true
      FilterGroups:
        - - Type: EVENT
            Pattern: PULL_REQUEST_CREATED, PULL_REQUEST_UPDATED
          - Type: BASE_REF
            Pattern: ^refs/heads/main$
            ExcludeMatchedPattern: false
          - Type: ACTOR_ACCOUNT_ID
            Pattern: 12345
            ExcludeMatchedPattern: true
        - - Type: EVENT
            Pattern: PUSH
          - Type: HEAD_REF
            Pattern: ^refs/heads/.*
          - Type: FILE_PATH
            Pattern: READ_ME
            ExcludeMatchedPattern: true
        - - Type: EVENT
            Pattern: PUSH
          - Type: COMMIT_MESSAGE
            Pattern: \[CodeBuild\]
          - Type: FILE_PATH
```

Pattern: ^src/.+|^test/.+

- - Type: EVENT

Pattern: WORKFLOW_JOB_QUEUED

- Type: WORKFLOW_NAME

Pattern: \[CI-CodeBuild\]

GitLab group webhooks

You can use CodeBuild GitLab group webhooks to start builds on webhook events from any repository within a GitLab group. Group webhooks work with any of the existing GitLab webhook event types, and can be configured by adding a scope configuration when creating a CodeBuild webhook. You can also use group webhooks to set up self-hosted GitLab runners within CodeBuild in order to receive WORKFLOW_JOB_QUEUED events from multiple repositories within a single project.

Topics

- Set up a group GitLab webhook
- Filter GitLab group webhook events (console)
- Filter GitLab group webhook events (AWS CloudFormation)

Set up a group GitLab webhook

The high-level steps to set up a group GitLab webhook are as follows. For more information about group GitLab webhooks, see GitLab group webhooks.

- 1. Set your project's source location to CODEBUILD_DEFAULT_WEBHOOK_SOURCE_LOCATION.
- 2. In the webhook's scope configuration, set the scope to GITLAB_GROUP.
- 3. Specify a name as part of the webhook's scope configuration. For group webhooks, this is the group name.



Note

If the project's source type is GITLAB_SELF_MANAGED, you will also need to specify a domain as part of the webhook scope configuration.

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4. (Optional) If you would only like to receive webhook events for specific repositories within your organization or enterprise, you can specify REPOSITORY NAME as a filter when creating the webhook.

5. When creating a group webhook, ensure that CodeBuild has permissions to create group level webhooks within GitLab. To do so, you can use CodeBuild OAuth though CodeConnections. For more information, see GitLab access in CodeBuild.

Note that group webhooks work with any of the existing GitLab webhook event types.

Filter GitLab group webhook events (console)

When creating a GitLab project through the console, select the following options to create a GitLab group webhook within the project. For more information about group GitLab webhooks, see GitLab group webhooks.

- Open the AWS CodeBuild console at https://console.aws.amazon.com/codesuite/codebuild/ 1. home.
- Create a build project. For information, see Create a build project (console) and Run a build (console).
 - In Source:
 - For Source provider, choose GitLab or GitLab Self Managed.
 - For Repository, choose GitLab scoped webhook.

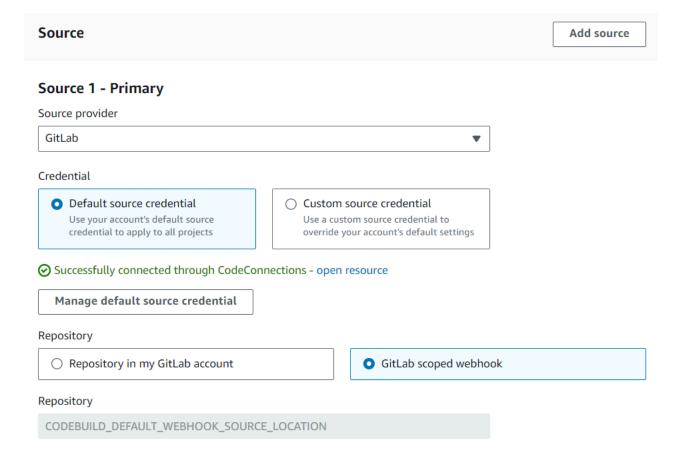
The GitLab repository will automatically be set to CODEBUILD_DEFAULT_WEBHOOK_SOURCE_LOCATION, which is the required source location for group webhooks.



Note

When using group webhooks, make sure that CodeBuild has permissions to create group level webhooks within GitLab. If you're using an existing OAuth connection, you may need to regenerate the connection in order to grant CodeBuild this permission.

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• In Primary source webhook events:

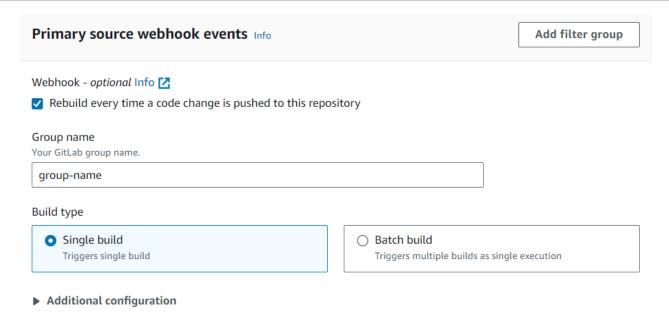
• For **Group name**, enter the group name.

If the project's source type is GITLAB_SELF_MANAGED, you also need to specify a domain as part of the webhook group configuration. For example, if the URL of your group is https://domain.com/group/group-name, then the domain is https://domain.com.



This name cannot be changed after the webhook has been created. To change the name, you can delete and re-create the webhook. If you want to remove the webhook entirely, you can also update the project source location to a GitLab repository.

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(Optional) In Webhook event filter groups, you can specify which events you would like
to trigger a new build. You can also specify REPOSITORY_NAME as a filter to only trigger
builds on webhook events from specific repositories.

A build is triggered if any filter group evaluates to true, which occurs when all the filters in the group evaluate to true.

Webhook event filter groups

Filter group 1 Event type - optional Add one or more webhook event filter groups to specify which events trigger a new build. If you do not add a webhook event filter group, then a new build is triggered every time a code change is pushed to your repository. WORKFLOW_JOB_QUEUED X Start a build under these conditions - optional Filter 1 Type REPOSITORY_NAME Pattern repository-name Remove

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You can also set the event type to WORKFLOW_JOB_QUEUED to set up self-hosted GitLab runners. For more information, see Self-managed GitLab runners in AWS CodeBuild.

3. Continue with the default values and then choose Create build project.

Filter GitLab group webhook events (AWS CloudFormation)

To use an AWS CloudFormation template to filter group webhook events, use the AWS CodeBuild project's ScopeConfiguration property. For more information about group GitLab webhooks, see <u>GitLab group webhooks</u>.

The following YAML-formatted portion of an AWS CloudFormation template creates four filter groups. Together, they trigger a build when one or all evaluate to true:

- The first filter group specifies pull requests are created or updated on branches with Git reference names that match the regular expression ^refs/heads/main\$ by a GitLab user who does not have account ID 12345.
- The second filter group specifies push requests are created on files with names that match the regular expression READ_ME in branches with Git reference names that match the regular expression ^refs/heads/.*.
- The third filter group specifies a push request with a head commit message matching the regular expression \[CodeBuild\].
- The fourth filter group specifies a GitLab CI/CD pipeline job request with a CI/CD pipeline name matching the regular expression \[CI-CodeBuild\].

```
CodeBuildProject:
  Type: AWS::CodeBuild::Project
Properties:
  Name: MyProject
  ServiceRole: service-role
  Artifacts:
    Type: NO_ARTIFACTS
  Environment:
    Type: LINUX_CONTAINER
    ComputeType: BUILD_GENERAL1_SMALL
    Image: aws/codebuild/standard:5.0
  Source:
    Type: GITLAB
```

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Location: source-location Triggers: Webhook: true ScopeConfiguration: Name: group-name Scope: GITLAB_GROUP FilterGroups: - - Type: EVENT Pattern: PULL_REQUEST_CREATED, PULL_REQUEST_UPDATED - Type: BASE_REF Pattern: ^refs/heads/main\$ ExcludeMatchedPattern: false - Type: ACTOR_ACCOUNT_ID Pattern: 12345 ExcludeMatchedPattern: true - - Type: EVENT Pattern: PUSH - Type: HEAD_REF Pattern: ^refs/heads/.* - Type: FILE_PATH Pattern: READ_ME ExcludeMatchedPattern: true - - Type: EVENT Pattern: PUSH - Type: COMMIT MESSAGE Pattern: \[CodeBuild\] - Type: FILE_PATH Pattern: ^src/.+|^test/.+ - - Type: EVENT Pattern: WORKFLOW_JOB_QUEUED - Type: WORKFLOW_NAME Pattern: \[CI-CodeBuild\]

GitLab manual webhooks

You can configure manual GitLab webhooks to prevent CodeBuild from automatically attempting to create a webhook within GitLab. CodeBuild returns a payload URL in as part of the call to create the webhook and can be used to manually create the webhook within GitLab. Even if CodeBuild is not allowlisted to create a webhook in your GitLab account, you can still manually create a webhook for your build project.

Use the following procedure to create a GitLab manual webhook.

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To create a GitLab manual webhook

 Open the AWS CodeBuild console at https://console.aws.amazon.com/codesuite/codebuild/ home.

- 2. Create a build project. For information, see <u>Create a build project (console)</u> and <u>Run a build</u> (console).
 - In Source:
 - For Source provider, choose GitLab.
 - For Repository, choose Repository in my GitLab account.
 - For Repository URL, enter https://gitlab.com/user-name/repository-name.
 - In Primary source webhook events:
 - For Webhook optional, choose Rebuild every time a code change is pushed to this repository.
 - Choose Additional configuration and for Manual creation optional, choose Manually create a webhook for this repository in GitLab console..
- 3. Continue with the default values and then choose **Create build project**. Take note of the **Payload URL** and **Secret** values as you will use these later.
- Open the GitLab console at https://gitlab.com/user-name/repository-name/-/ hooks and choose Add new webhook.
 - For **URL**, enter the Payload URL value you took note of earlier.
 - For **Secret token**, enter the Secret value you took note of earlier.
 - Configure the individual events that will send a webhook payload to CodeBuild. For Trigger, choose from the following events: Push events, Merge request events, Releases events, and Job events. To learn more about event types supported by CodeBuild, see GitLab webhook events.
- Choose Add webhook.

GitLab webhook events

You can use webhook filter groups to specify which GitLab webhook events trigger a build. For example, you can specify that a build is only triggered for changes to specific branches.

You can create one or more webhook filter groups to specify which webhook events trigger a build. A build is triggered if any filter group evaluates to true, which occurs when all the filters in the group evaluate to true. When you create a filter group, you specify:

An event

For GitLab, you can choose one or more of the following events: PUSH, PULL_REQUEST_CREATED, PULL_REQUEST_UPDATED, PULL_REQUEST_MERGED, PULL_REQUEST_REOPENED, PULL_REQUEST_CLOSED, RELEASED, and WORKFLOW_JOB_QUEUED.

The webhook's event type is in its header in the X-GitLab-Event field. The following table shows how X-GitLab-Event header values map to the event types. For the Merge Request Hook webhook event, the payload's object_attributes.action will contain additional information on merge request type.

X-GitLab-Event Header value	object_atttributes .action	Event type
Push Hook	N/A	PUSH
Merge Request Hook	open	PULL_REQUEST_CREATED
Merge Request Hook	update	PULL_REQUEST_UPDATED
Merge Request Hook	merge	PULL_REQUEST_MERGED
Merge Request Hook	reopen	PULL_REQUEST_REOPE NED
Merge Request Hook	close	PULL_REQUEST_CLOSED
Release Hook	create, update	RELEASED
Job Hook	N/A	WORKFLOW_JOB_QUEUED

For PULL_REQUEST_MERGED, if a pull request is merged with the squash strategy and the pull request branch is closed, the original pull request commit no longer exists. In this case, the

CODEBUILD_WEBHOOK_MERGE_COMMIT environment variable contains the identifier of the squashed merge commit.

One or more optional filters

Use a regular expression to specify a filter. For an event to trigger a build, every filter within the group associated with it must evaluate to true.

ACTOR_ACCOUNT_ID (ACTOR_ID in the console)

A webhook event triggers a build when a GitLab account ID matches the regular expression pattern. This value appears in the account_id property of the actor object in the webhook filter payload.

HEAD_REF

A webhook event triggers a build when the head reference matches the regular expression pattern (for example, refs/heads/branch-name and refs/tags/tag-name). A HEAD_REF filter evaluates the Git reference name for the branch or tag. The branch or tag name appears in the name field of the new object in the push object of the webhook payload. For pull request events, the branch name appears in the name field in the branch object of the source object in the webhook payload.

BASE_REF

A webhook event triggers a build when the base reference matches the regular expression pattern. A BASE_REF filter works with pull request events only (for example, refs/heads/branch-name). A BASE_REF filter evaluates the Git reference name for the branch. The branch name appears in the name field of the branch object in the destination object in the webhook payload.

FILE PATH

A webhook triggers a build when the path of a changed file matches the regular expression pattern.

COMMIT_MESSAGE

A webhook triggers a build when the head commit message matches the regular expression pattern.

WORKFLOW NAME

A webhook triggers a build when the workflow name matches the regular expression pattern.



Note

You can find the webhook payload in the webhook settings of your GitLab repository.

Topics

- Filter GitLab webhook events (console)
- Filter GitLab webhook events (SDK)
- Filter GitLab webhook events (AWS CloudFormation)

Filter GitLab webhook events (console)

Use the following instructions to use the AWS Management Console to filter webhook events. For more information about GitLab webhook events, see GitLab webhook events.

- 1. Select Rebuild every time a code change is pushed to this repository when you create your project.
- 2. From **Event type**, choose one or more events.
- 3. To filter when an event triggers a build, under **Start a build under these conditions**, add one or more optional filters.
- 4. To filter when an event is not triggered, under Don't start a build under these conditions, add one or more optional filters.
- 5. Choose **Add filter group** to add another filter group.

For more information, see Create a build project (console) and WebhookFilter in the AWS CodeBuild API Reference.

In this example, a webhook filter group triggers a build for pull requests only:

Event type Add one or more webhook event filter groups to specify which events trigger a new build. If you do not add a webhook event filter group, then a new build is triggered every time a code change is pushed to your repository. PULL_REQUEST_CREATED X PULL_REQUEST_UPDATED X PULL_REQUEST_MERGED X Start a build under these conditions - optional Don't start a build under these conditions - optional

Using an example of two filter groups, a build is triggered when one or both evaluate to true:

- The first filter group specifies pull requests that are created or updated on branches with Git reference names that match the regular expression <code>refs/heads/main\$</code> and head references that match <code>refs/heads/branch1!</code>.
- The second filter group specifies push requests on branches with Git reference names that match the regular expression <code>^refs/heads/branch1\$</code>.

Webhook event filter groups

A build is triggered if any filter group evaluates to true, which occurs when all the filters in the group evaluate to true.

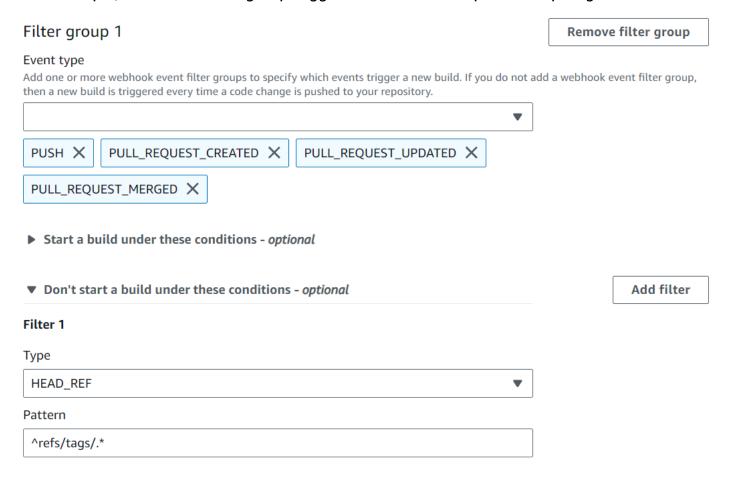
Filter group 1	Remove filter group
Event type Add one or more webhook event filter groups to specify which events trigger a new build. If you do not add then a new build is triggered every time a code change is pushed to your repository.	d a webhook event filter group,
▼	
PULL_REQUEST_CREATED X PULL_REQUEST_UPDATED X	
▼ Start a build under these conditions - optional	Add filter
Filter 1	
Туре	
HEAD_REF ▼	
Pattern	
^refs/heads/branch1\$	
Remove	
Filter 2	
Туре	
BASE_REF ▼	
Pattern	
^refs/heads/main	
Remove	
▶ Don't start a build under these conditions - optional	
Filter group 2	Remove filter group
Event type Add one or more webhook event filter groups to specify which events trigger a new build. If you do not add then a new build is triggered every time a code change is pushed to your repository.	d a webhook event filter group,
PUSH X	

Filter 1

GitLab webhook events
Start a build under these conditions - optional

API Version 2016-10-06 534 Add filter

In this example, a webhook filter group triggers a build for all requests except tag events.



In this example, a webhook filter group triggers a build only when files with names that match the regular expression ^buildspec.* change.

Webhook event filter groups

A build is triggered if any filter group evaluates to true, which occurs when all the filters in the group evaluate to true.

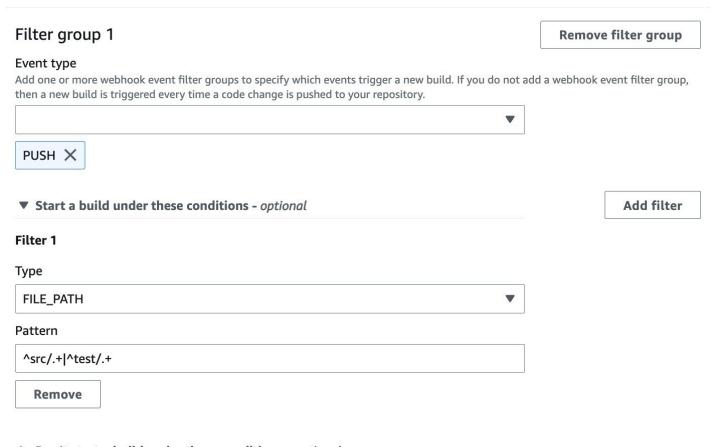
Filter group 1	Remove filter group
Event type Add one or more webhook event filter groups to specify which events trigger a new build. If you do not add then a new build is triggered every time a code change is pushed to your repository.	
PUSH X	
▼ Start a build under these conditions - optional	Add filter
Filter 1	
Туре	
FILE_PATH	
Pattern	
^buildspec.*	
Remove	

▶ Don't start a build under these conditions - optional

In this example, a webhook filter group triggers a build only when files are changed in src or test folders.

Webhook event filter groups

A build is triggered if any filter group evaluates to true, which occurs when all the filters in the group evaluate to true.



▶ Don't start a build under these conditions - optional

In this example, a webhook filter group triggers a build only when a change is made by a GitLab user who does not have an account ID that matches the regular expression actor-account-id.

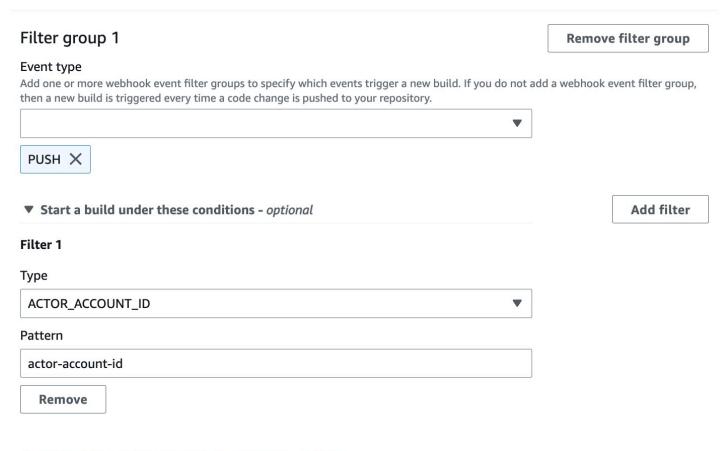


Note

For information about how to find your GitLab account ID, see https://api.github.com/ users/user-name, where user-name is your GitLab user name.

Webhook event filter groups

A build is triggered if any filter group evaluates to true, which occurs when all the filters in the group evaluate to true.



▶ Don't start a build under these conditions - optional

In this example, a webhook filter group triggers a build for a push event when the head commit message matches the regular expression \[CodeBuild\].

Webhook event filter groups

A build is triggered if any filter group evaluates to true, which occurs when all the filters in the group evaluate to true.

Filter group 1	Remove filter group
Event type Add one or more webhook event filter groups to specify which events trigger a new build. If you hen a new build is triggered every time a code change is pushed to your repository.	ou do not add a webhook event filter group
PUSH X	
▼ Start a build under these conditions - optional	Add filter
Filter 1	
Гуре	
COMMIT_MESSAGE	▼.
Pattern	
\[CodeBuild]\	
Remove	

▶ Don't start a build under these conditions - optional

Filter GitLab webhook events (SDK)

To use the AWS CodeBuild SDK to filter webhook events, use the filterGroups field in the request syntax of the CreateWebhook or UpdateWebhook API methods. For more information, see WebhookFilter in the CodeBuild API Reference.

For more information about GitLab webhook events, see GitLab webhook events.

To create a webhook filter that triggers a build for pull requests only, insert the following into the request syntax:

```
"filterGroups": [
   [
     {
       "type": "EVENT",
```

```
"pattern": "PULL_REQUEST_CREATED, PULL_REQUEST_UPDATED, PULL_REQUEST_MERGED"
}
]
```

To create a webhook filter that triggers a build for specified branches only, use the pattern parameter to specify a regular expression to filter branch names. Using an example of two filter groups, a build is triggered when one or both evaluate to true:

- The first filter group specifies pull requests that are created or updated on branches with Git reference names that match the regular expression <code>refs/heads/main\$</code> and head references that match <code>refs/heads/myBranch\$</code>.
- The second filter group specifies push requests on branches with Git reference names that match the regular expression <code>^refs/heads/myBranch\$</code>.

```
"filterGroups": [
 Г
    {
      "type": "EVENT",
      "pattern": "PULL_REQUEST_CREATED, PULL_REQUEST_UPDATED"
    },
      "type": "HEAD_REF",
      "pattern": "^refs/heads/myBranch$"
   },
    {
      "type": "BASE_REF",
      "pattern": "^refs/heads/main$"
   }
 ],
 Γ
   {
      "type": "EVENT",
      "pattern": "PUSH"
   },
      "type": "HEAD_REF",
      "pattern": "^refs/heads/myBranch$"
    }
```

]

You can use the excludeMatchedPattern parameter to specify which events do not trigger a build. In this example, a build is triggered for all requests except tag events.

You can create a filter that triggers a build only when a change is made by a GitLab user with account ID actor-account-id.

Note

For information about how to find your GitLab account ID, see https://api.github.com/users/user-name, where user-name is your GitLab user name.

]

You can create a filter that triggers a build only when files with names that match the regular expression in the pattern argument change. In this example, the filter group specifies that a build is triggered only when files with a name that matches the regular expression ^buildspec.* change.

In this example, the filter group specifies that a build is triggered only when files are changed in src or test folders.

You can create a filter that triggers a build only when the head commit message matches the regular expression in the pattern argument. In this example, the filter group specifies that a build is triggered only when the head commit message of the push event matches the regular expression \[CodeBuild\].

Filter GitLab webhook events (AWS CloudFormation)

To use an AWS CloudFormation template to filter webhook events, use the AWS CodeBuild project's FilterGroups property. For more information about GitLab webhook events, see <u>GitLab</u> webhook events.

The following YAML-formatted portion of an AWS CloudFormation template creates two filter groups. Together, they trigger a build when one or both evaluate to true:

- The first filter group specifies pull requests are created or updated on branches with Git
 reference names that match the regular expression \refs/heads/main\$ by a GitLab user who
 does not have account ID 12345.
- The second filter group specifies push requests are created on branches with Git reference names that match the regular expression <code>^refs/heads/.*</code>.
- The third filter group specifies a push request with a head commit message matching the regular expression \[CodeBuild\].
- The fourth filter group specifies a GitHub Actions workflow job request with a workflow name matching the regular expression \[CI-CodeBuild\].

```
CodeBuildProject:
Type: AWS::CodeBuild::Project
Properties:
Name: MyProject
ServiceRole: service-role
Artifacts:
Type: NO_ARTIFACTS
```

```
Environment:
  Type: LINUX_CONTAINER
  ComputeType: BUILD_GENERAL1_SMALL
  Image: aws/codebuild/standard:5.0
Source:
  Type: GITLAB
  Location: source-location
Triggers:
 Webhook: true
  FilterGroups:
    - - Type: EVENT
        Pattern: PULL_REQUEST_CREATED, PULL_REQUEST_UPDATED
      - Type: BASE_REF
        Pattern: ^refs/heads/main$
        ExcludeMatchedPattern: false
      - Type: ACTOR_ACCOUNT_ID
        Pattern: 12345
        ExcludeMatchedPattern: true
    - - Type: EVENT
        Pattern: PUSH
      - Type: HEAD_REF
        Pattern: ^refs/heads/.*
    - - Type: EVENT
        Pattern: PUSH
      - Type: COMMIT MESSAGE
        Pattern: \[CodeBuild\]
    - - Type: EVENT
        Pattern: WORKFLOW_JOB_QUEUED
      - Type: WORKFLOW_NAME
        Pattern: \[CI-CodeBuild\]
```

Buildkite manual webhooks

Currently, CodeBuild requires all Buildkite webhooks to be created manually. CodeBuild returns a payload URL as part of the call to create the webhook, which can be used to manually create the webhook within Buildkite.

Use the following procedure to create a Buildkite manual webhook.

To create a CodeBuild project with a webhook

 Open the AWS CodeBuild console at https://console.aws.amazon.com/codesuite/codebuild/ home.

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Create a build project. For information, see <u>Create a build project (console)</u> and <u>Run a build</u> (console).

3. In **Project configuration**, choose **Runner project**.

In Runner:

- For Runner provider, choose Buildkite.
- For Buildkite agent token, choose Create a new agent token by using the create secret page. You will be prompted to create a new secret in AWS Secrets Manager with a secret value equal to the Buildkite agent token you generated above.
- (Optional) If you would like to use CodeBuild managed credentials for your job, select your
 job's source repository provider under Buildkite source credential options and verify that
 credentials are configured for your account. Additionally, verify that your Buildkite pipeline
 uses Checkout using HTTPS.

4. • In Environment:

Choose a supported Environment image and Compute. Note that you have the option to
override the image and instance settings by using a label in your GitHub Actions workflow
YAML. For more information, see Step 2: Update your GitHub Actions workflow YAML

• In Buildspec:

- Note that your buildspec will be ignored unless buildspec-override: true is added as a label. Instead, CodeBuild will override it to use commands that will setup the self-hosted runner.
- 5. Continue with the default values and then choose **Create build project**.
- 6. Save the **Payload URL** and **Secret** values from the **Create Webhook** popup. Follow the instructions in the popup to create a new Buildkite organization webhook.

View a build project's details in AWS CodeBuild

You can use the AWS CodeBuild console, AWS CLI, or AWS SDKs to view the details of a build project in CodeBuild.

Topics

- View a build project's details (console)
- View a build project's details (AWS CLI)
- View a build project's details (AWS SDKs)

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View a build project's details (console)

Open the AWS CodeBuild console at https://console.aws.amazon.com/codesuite/codebuild/ 1. home.

In the navigation pane, choose **Build projects**. 2.



Note

By default, only the 10 most recent build projects are displayed. To view more build projects, choose the gear icon, and then choose a different value for **Projects per page** or use the back and forward arrows.

- 3. In the list of build projects, in the **Name** column, choose the link for the build project.
- 4. On the **Build project: project-name** page, choose **Build details**.

View a build project's details (AWS CLI)

Run the **batch-get-projects** command:

```
aws codebuild batch-get-projects --names names
```

In the preceding command, replace the following placeholder:

 names: Required string used to indicate one or more build project names to view details about. To specify more than one build project, separate each build project's name with a space. You can specify up to 100 build project names. To get a list of build projects, see View a list of build project names (AWS CLI).

For example, if you run this command:

```
aws codebuild batch-get-projects --names codebuild-demo-project codebuild-demo-project2
my-other-demo-project
```

A result similar to the following might appear in the output. Ellipses (...) are used to represent data omitted for brevity.

```
"projectsNotFound": [
    "my-other-demo-project"
],
    "projects": [
    {
        ...
        "name": codebuild-demo-project,
        ...
    },
    {
        ...
        "name": codebuild-demo-project2",
        ...
        "name": codebuild-demo-project2",
        ...
}
```

In the preceding output, the projectsNotFound array lists any build project names that were specified, but not found. The projects array lists details for each build project where information was found. Build project details have been omitted from the preceding output for brevity. For more information, see the output of Create a build project (AWS CLI).

The **batch-get-projects** command does not support filtering for certain property values, but you can write a script that enumerates the properties for a project. For example, the following Linux shell script enumerates the projects in the current region for the current account, and prints the image used by each project.

```
#!/usr/bin/sh

# This script enumerates all of the projects for the current account
# in the current region and prints out the image that each project is using.

imageName=""

function getImageName(){
  local environmentValues=(${1//$'\t'/})
  imageName=${environmentValues[1]}
}

function processProjectInfo() {
  local projectInfo=$1
```

```
while IFS=$'\t' read -r section value; do
    if [[ "$section" == *"ENVIRONMENT"* ]]; then
     getImageName "$value"
   fi
 done <<< "$projectInfo"</pre>
}
# Get the list of projects.
projectList=$(aws codebuild list-projects --output=text)
for projectName in $projectList
do
 if [[ "$projectName" != *"PROJECTS"* ]]; then
    echo "=============""
   # Get the detailed information for the project.
    projectInfo=$(aws codebuild batch-get-projects --output=text --names
 "$projectName")
    processProjectInfo "$projectInfo"
    printf 'Project "%s" has image "%s"\n' "$projectName" "$imageName"
 fi
done
```

For more information about using the AWS CLI with AWS CodeBuild, see the <u>Command line</u> reference.

View a build project's details (AWS SDKs)

For more information about using AWS CodeBuild with the AWS SDKs, see the <u>AWS SDKs and tools</u> reference.

View build project names in AWS CodeBuild

You can use the AWS CodeBuild console, AWS CLI, or AWS SDKs to view a list of build projects in CodeBuild.

Topics

- View a list of build project names (console)
- View a list of build project names (AWS CLI)

View a list of build project names (AWS SDKs)

View a list of build project names (console)

You can view a list of build projects in an AWS Region in the console. Information includes the name, source provider, repository, latest build status, and description, if any.

- Open the AWS CodeBuild console at https://console.aws.amazon.com/codesuite/codebuild/ 1. home.
- In the navigation pane, choose **Build projects**.



Note

By default, only the 10 most recent build projects are displayed. To view more build projects, choose the gear icon, and then choose a different value for **Projects per page** or use the back and forward arrows.

View a list of build project names (AWS CLI)

Run the **list-projects** command:

```
aws codebuild list-projects --sort-by sort-by --sort-order sort-order --next-
token next-token
```

In the preceding command, replace the following placeholders:

- sort-by: Optional string used to indicate the criterion to be used to list build project names. Valid values include:
 - CREATED_TIME: List the build project names based on when each build project was created.
 - LAST MODIFIED_TIME: List the build project names based on when information about each build project was last changed.
 - NAME: List the build project names based on each build project's name.
- sort-order: Optional string used to indicate the order in which to list build projects, based on *sort-by*. Valid values include ASCENDING and DESCENDING.
- next-token: Optional string. During a previous run, if there were more than 100 items in the list, only the first 100 items are returned, along with a unique string called *next token*. To get the

next batch of items in the list, run this command again, adding the next token to the call. To get all of the items in the list, keep running this command with each subsequent next token, until no more next tokens are returned.

For example, if you run this command:

```
aws codebuild list-projects --sort-by NAME --sort-order ASCENDING
```

A result similar to the following might appear in the output:

```
{
  "nextToken": "Ci33ACF6...The full token has been omitted for brevity...U+AkMx8=",
  "projects": [
      "codebuild-demo-project",
      "codebuild-demo-project2",
      ... The full list of build project names has been omitted for brevity ...
  "codebuild-demo-project99"
]
}
```

If you run this command again:

```
aws codebuild list-projects --sort-by NAME --sort-order ASCENDING --next-token Ci33ACF6...The full token has been omitted for brevity...U+AkMx8=
```

A result similar to the following might appear in the output:

```
{
  "projects": [
    "codebuild-demo-project100",
    "codebuild-demo-project101",
    ... The full list of build project names has been omitted for brevity ...
    "codebuild-demo-project122"
]
}
```

View a list of build project names (AWS SDKs)

For more information about using AWS CodeBuild with the AWS SDKs, see the <u>AWS SDKs and tools</u> reference.

Builds in AWS CodeBuild

A build represents a set of actions performed by AWS CodeBuild to create output artifacts (for example, a JAR file) based on a set of input artifacts (for example, a collection of Java class files).

The following rules apply when you run multiple builds:

- When possible, builds run concurrently. The maximum number of concurrently running builds can vary. For more information, see Quotas for AWS CodeBuild.
- If the build project has a concurrent build limit set, builds return an error if the number of running builds reaches the concurrent build limit for the project. For more information, see Enable concurrent build limit.
- If the build project does not have a concurrent build limit set, builds are queued if the number of running builds reaches the concurrent build limit for the platform and compute type. The maximum number of builds in a queue is five times the concurrent build limit. For more information, see Quotas for AWS CodeBuild.

A build in a gueue that does not start after the number of minutes specified in its time out value is removed from the queue. The default timeout value is eight hours. You can override the build queue timeout with a value between five minutes and eight hours when you run your build. For more information, see Run AWS CodeBuild builds manually.

It is not possible to predict the order in which queued builds start.



Note

You can access the history of a build for one year.

You can perform these tasks when working with builds:

Topics

- Run AWS CodeBuild builds manually
- Run builds on AWS Lambda compute
- Run builds on reserved capacity fleets
- Run builds in batches

- Execute parallel tests in batch builds
- Cache builds to improve performance
- Debug builds in AWS CodeBuild
- Delete builds in AWS CodeBuild
- Retry builds manually in AWS CodeBuild
- · Retry builds automatically in AWS CodeBuild
- Stop builds in AWS CodeBuild
- Stop batch builds in AWS CodeBuild
- Trigger AWS CodeBuild builds automatically
- View build details in AWS CodeBuild
- View a list of build IDs in AWS CodeBuild
- View a list of build IDs for a build project in AWS CodeBuild

Run AWS CodeBuild builds manually

You can use the AWS CodeBuild console, AWS CLI, or AWS SDKs to run a build in CodeBuild.

Topics

- Run builds locally with the AWS CodeBuild agent
- Run a build (console)
- Run a build (AWS CLI)
- Run a batch build (AWS CLI)
- Start running builds automatically (AWS CLI)
- Stop running builds automatically (AWS CLI)
- Run a build (AWS SDKs)

Run builds locally with the AWS CodeBuild agent

You can use the AWS CodeBuild agent to run CodeBuild builds on a local machine. There are agents available for x86_64 and ARM platforms.

You can also subscribe to receive notifications when new versions of the agent are published.

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Prerequisites

Before you begin, you need to do the following:

- Install Git on your local machine.
- Install and set up Docker on your local machine.

Set up the build image

You only need to set up the build image the first time you run the agent, or when the image has changed.

To set up the build image

1. If you want to use a curated Amazon Linux 2 image, you can pull it from the CodeBuild public Amazon ECR repository at https://gallery.ecr.aws/codebuild/amazonlinux-x86_64-standard with the following command:

```
$ docker pull public.ecr.aws/codebuild/amazonlinux-x86_64-standard:4.0
```

Alternatively, if you want to use another Linux image, perform the following steps:

a. Clone the CodeBuild image repo:

```
$ git clone https://github.com/aws/aws-codebuild-docker-images.git
```

b. Change to the image directory. For this example, use the aws/codebuild/ standard:5.0 image:

```
$ cd aws-codebuild-docker-images/ubuntu/standard/5.0
```

c. Build the image. This will take several minutes.

```
$ docker build -t aws/codebuild/standard:5.0 .
```

2. Download the CodeBuild agent.

To download the x86_64 version of the agent, run the following command:

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```
$ docker pull public.ecr.aws/codebuild/local-builds:latest
```

To download the ARM version of the agent, run the following command:

```
$ docker pull public.ecr.aws/codebuild/local-builds:aarch64
```

3. The CodeBuild agent is available from https://gallery.ecr.aws/codebuild/local-builds.

The Secure Hash Algorithm (SHA) signature for the x86_64 version of the agent is:

```
sha256:ccb19bdd7af94e4dc761e4c58c267e9455c28ec68d938086b4dc1cf8fe6b0940
```

The SHA signature for the ARM version of the agent is:

```
sha256:7d7b5d35d2ac4e062ae7ba8c662ffed15229a52d09bd0d664a7816c439679192
```

You can use the SHA to identify the version of the agent. To see the agent's SHA signature, run the following command and look for the SHA under RepoDigests:

```
$ docker inspect public.ecr.aws/codebuild/local-builds:latest
```

Run the CodeBuild agent

To run the CodeBuild agent

- 1. Change to the directory that contains your build project source.
- 2. Download the <u>codebuild_build.sh</u> script:

```
$ curl -0 https://raw.githubusercontent.com/aws/aws-codebuild-docker-images/
master/local_builds/codebuild_build.sh
$ chmod +x codebuild_build.sh
```

3. Run the codebuild_build.sh script and specify your container image and the output directory.

To run an x86_64 build, run the following command:

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```
$ ./codebuild_build.sh -i <container-image> -a <output directory>
```

To run an ARM build, run the following command:

```
$ ./codebuild_build.sh -i <container-image> -a <output directory> -l
public.ecr.aws/codebuild/local-builds:aarch64
```

Replace <container-image> with the name of the container image, such as aws/codebuild/standard:5.0 or public.ecr.aws/codebuild/amazonlinux-x86_64-standard:4.0.

The script launches the build image and runs the build on the project in the current directory. To specify the location of the build project, add the -s *<build project directory>* option to the script command.

Receive notifications for new CodeBuild agent versions

You can subscribe to Amazon SNS notifications so you will be notified when new versions of the AWS CodeBuild agent are released.

To subscribe to CodeBuild agent notifications

- 1. Open the Amazon SNS console at https://console.aws.amazon.com/sns/v3/home.
- 2. In the navigation bar, if it's not already selected, change the AWS Region to **US East (N. Virginia)**. You must select this AWS Region because the Amazon SNS notifications that you are subscribing to are created in this Region.
- 3. In the navigation pane, choose **Subscriptions**.
- 4. Choose **Create subscription**.
- 5. In **Create subscription**, do the following:
 - a. For **Topic ARN**, use the following Amazon Resource Name (ARN):

```
arn:aws:sns:us-east-1:850632864840:AWS-CodeBuild-Local-Agent-Updates
```

b. For **Protocol**, choose **Email** or **SMS**.

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c. For **Endpoint**, choose where (email or SMS) to receive the notifications. Enter an email or address or phone number, including area code.

- d. Choose Create subscription.
- e. Choose **Email** to receive an email asking you to confirm your subscription. Follow the directions in the email to complete your subscription.

If you no longer want to receive these notifications, use the following procedure to unsubscribe.

To unsubscribe from CodeBuild agent notifications

- 1. Open the Amazon SNS console at https://console.aws.amazon.com/sns/v3/home.
- 2. In the navigation pane, choose **Subscriptions**.
- 3. Select the subscription and from **Actions**, choose **Delete subscriptions**. When you are prompted to confirm, choose **Delete**.

Run a build (console)

To use AWS CodePipeline to run a build with CodeBuild, skip these steps and follow the instructions in Use CodeBuild with CodePipeline.

- Open the AWS CodeBuild console at https://console.aws.amazon.com/codesuite/codebuild/
 home.
- 2. In the navigation pane, choose **Build projects**.
- 3. In the list of build projects, choose the build project.
- 4. You can run the build with the default build project settings, or override build settings for this build only.
 - a. If you want to run the build with the default build project settings, choose **Start build**. The build starts immediately.
 - b. If you want to override the default build project settings, choose **Start build with overrides**. In the **Start build** page, you can override the following:
 - Build configuration
 - Source

Run a build (console)

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Environment variable overrides

If you need to select more advanced overrides, choose **Advanced build overrides**. In this page, you can override the following:

- Build configuration
- Source
- Environment
- Buildspec
- Artifacts
- Logs

When you have made your override selections, choose **Start build**.

For detailed information about this build, see View build details (console).

Run a build (AWS CLI)



To use CodePipeline to run a build with AWS CodeBuild, skip these steps and follow the instructions in Create a pipeline that uses CodeBuild (AWS CLI).

For more information about using the AWS CLI with CodeBuild, see the <u>Command line</u> reference.

1. Run the start-build command in one of the following ways:

```
aws codebuild start-build --project-name
```

Use this if you want to run a build that uses the latest version of the build input artifact and the build project's existing settings.

```
aws codebuild start-build --generate-cli-skeleton
```

Use this if you want to run a build with an earlier version of the build input artifact or if you want to override the settings for the build output artifacts, environment variables, buildspec, or default build timeout period.

- 2. If you run the **start-build** command with the --project-name option, replace projectname> with the name of the build project, and then skip to step 6 of this procedure. To get a
 list of build projects, see View build project names.
- 3. If you run the **start-build** command with the --idempotency-token option, a unique case-sensitive identifier or token, is included with the start-build request. The token is valid for 5 minutes after the request. If you repeat the start-build request with the same token, but change a parameter, CodeBuild returns a parameter mismatch error.
- 4. If you run the start-build command with the --generate-cli-skeleton option, JSON-formatted data appears in the output. Copy the data to a file (for example, start-build.json) in a location on the local computer or instance where the AWS CLI is installed. Modify the copied data to match the following format, and save your results:

```
{
  "projectName": "projectName",
  "sourceVersion": "sourceVersion",
  "artifactsOverride": {
    "type": "type",
    "location": "location",
    "path": "path",
    "namespaceType": "namespaceType",
    "name": "artifactsOverride-name",
    "packaging": "packaging"
 },
  "buildspecOverride": "buildspecOverride",
  "cacheOverride": {
    "location": "cacheOverride-location",
    "type": "cacheOverride-type"
  },
  "certificateOverride": "certificateOverride",
  "computeTypeOverride": "computeTypeOverride",
  "environmentTypeOverride": "environmentTypeOverride",
  "environmentVariablesOverride": {
    "name": "environmentVariablesOverride-name",
    "value": "environmentVariablesValue",
    "type": "environmentVariablesOverride-type"
  },
```

```
"gitCloneDepthOverride": "gitCloneDepthOverride",
"imageOverride": "imageOverride",
"idempotencyToken": "idempotencyToken",
"insecureSslOverride": "insecureSslOverride",
"privilegedModeOverride": "privilegedModeOverride",
"queuedTimeoutInMinutesOverride": "queuedTimeoutInMinutesOverride",
"reportBuildStatusOverride": "reportBuildStatusOverride",
"timeoutInMinutesOverride": "timeoutInMinutesOverride",
"sourceAuthOverride": "sourceAuthOverride",
"sourceLocationOverride": "sourceLocationOverride",
"serviceRoleOverride": "serviceRoleOverride",
"sourceTypeOverride": "sourceTypeOverride"
```

Replace the following placeholders:

- projectName: Required string. The name of the build project to use for this build.
- sourceVersion: Optional string. A version of the source code to be built, as follows:
 - For Amazon S3, the version ID that corresponds to the version of the input ZIP file you want to build. If *sourceVersion* is not specified, then the latest version is used.
 - For CodeCommit, the commit ID that corresponds to the version of the source code you
 want to build. If sourceVersion is not specified, the default branch's HEAD commit ID is
 used. (You cannot specify a tag name for sourceVersion, but you can specify the tag's
 commit ID.)
 - For GitHub, the commit ID, pull request ID, branch name, or tag name that corresponds
 to the version of the source code you want to build. If a pull request ID is specified, it
 must use the format pr/pull-request-ID (for example, pr/25). If a branch name is
 specified, the branch's HEAD commit ID is used. If sourceVersion is not specified, the
 default branch's HEAD commit ID is used.
 - For Bitbucket, the commit ID, branch name, or tag name that corresponds to the version
 of the source code you want to build. If a branch name is specified, the branch's HEAD
 commit ID is used. If sourceVersion is not specified, the default branch's HEAD commit
 ID is used.
- The following placeholders are for artifactsOverride.
 - *type*: Optional. The build output artifact type that overrides for this build the one defined in the build project.

• *location*: Optional. The build output artifact location that overrides for this build the one defined in the build project.

- *path*: Optional. The build output artifact path that overrides for this build the one defined in the build project.
- namespaceType: Optional. The build output artifact path type that overrides for this build the one defined in the build project.
- name: Optional. The build output artifact name that overrides for this build the one defined in the build project.
- *packaging*: Optional. The build output artifact packaging type that overrides for this build the one defined in the build project.
- buildspecOverride: Optional. A buildspec declaration that overrides for this build the one defined in the build project. If this value is set, it can be either an inline buildspec definition, the path to an alternate buildspec file relative to the value of the built-in CODEBUILD_SRC_DIR environment variable, or the path to an S3 bucket. The S3 bucket must be in the same AWS Region as the build project. Specify the buildspec file using its ARN (for example, arn:aws:s3:::<my-codebuild-sample2>/buildspec.yml). If this value is not provided or is set to an empty string, the source code must contain a buildspec.yml file in its root directory. For more information, see Buildspec file name and storage location.
- The following placeholders are for cacheOverride.
 - cacheOverride-location: Optional. The location of a ProjectCache object for
 this build that overrides the ProjectCache object specified in the build project.
 cacheOverride is optional and takes a ProjectCache object. location is required in a
 ProjectCache object.
 - cacheOverride-type: Optional. The type of a ProjectCache object for this build that
 overrides the ProjectCache object specified in the build project. cacheOverride is
 optional and takes a ProjectCache object. type is required in a ProjectCache object.
- *certificateOverride*: Optional. The name of a certificate for this build that overrides the one specified in the build project.
- *environmentTypeOverride*: Optional. A container type for this build that overrides the one specified in the build project. The current valid string is LINUX_CONTAINER.
- The following placeholders are for environmentVariablesOverride.
 - *environmentVariables0verride-name*: Optional. The name of an environment variable in the build project whose value you want to override for this build.

• *environmentVariables0verride-type*: Optional. The type of environment variable in the build project whose value you want to override for this build.

- *environmentVariablesValue*: Optional. The value of the environment variable defined in the build project that you want to override for this build.
- *gitCloneDepthOverride*: Optional. The value of the **Git clone depth** in the build project whose value you want to override for this build. If your source type is Amazon S3, this value is not supported.
- *imageOverride*: Optional. The name of an image for this build that overrides the one specified in the build project.
- *idempotencyToken*: Optional. A string that serves as a token to specify that the build request is idempotent. You can choose any string that is 64 characters or less. The token is valid for 5 minutes after the start-build request. If you repeat the start-build request with the same token, but change a parameter, CodeBuild returns a parameter mismatch error.
- *insecureSs10verride*: Optional boolean that specifies whether to override the insecure TLS setting specified in the build project. The insecure TLS setting determines whether to ignore TLS warnings while connecting to the project source code. This override applies only if the build's source is GitHub Enterprise Server.
- *privilegedModeOverride*: Optional boolean. If set to true, the build overrides privileged mode in the build project.
- queuedTimeoutInMinutesOverride: Optional integer that specifies the number of minutes a build is allowed to be queued before it times out. Its minimum value is five minutes and its maximum value is 480 minutes (eight hours).
- reportBuildStatusOverride: Optional boolean that specifies whether to send your source provider the status of a build's start and completion. If you set this with a source provider other than GitHub, GitHub Enterprise Server, or Bitbucket, an invalidInputException is thrown.
- sourceAuthOverride: Optional string. An authorization type for this build that overrides the one defined in the build project. This override applies only if the build project's source is Bitbucket or GitHub.
- sourceLocationOverride: Optional string. A location that overrides for this build the source location for the one defined in the build project.
- serviceRoleOverride: Optional string. The name of a service role for this build that overrides the one specified in the build project.

• sourceTypeOverride: Optional string. A source input type for this build that overrides the source input defined in the build project. Valid strings are NO_SOURCE, CODECOMMIT, CODEPIPELINE, GITHUB, S3, BITBUCKET, and GITHUB_ENTERPRISE.

• *timeoutInMinutesOverride*: Optional number. The number of build timeout minutes that overrides for this build the one defined in the build project.

We recommend that you store an environment variable with a sensitive value, such as an AWS access key ID, an AWS secret access key, or a password as a parameter in Amazon EC2 Systems Manager Parameter Store. CodeBuild can use a parameter stored in Amazon EC2 Systems Manager Parameter Store only if that parameter's name starts with /CodeBuild/ (for example, /CodeBuild/dockerLoginPassword). You can use the CodeBuild console to create a parameter in Amazon EC2 Systems Manager. Choose Create a parameter, and then follow the instructions. (In that dialog box, for KMS key, you can optionally specify the ARN of an AWS KMS key in your account. Amazon EC2 Systems Manager uses this key to encrypt the parameter's value during storage and decrypt during retrieval.) If you use the CodeBuild console to create a parameter, the console starts the parameter with /CodeBuild/ as it is being stored. However, if you use the Amazon EC2 Systems Manager Parameter Store console to create a parameter, you must start the parameter's name with /CodeBuild/, and you must set Type to Secure String. For more information, see AWS Systems Manager parameter store and Walkthrough: Create and test a String parameter (console) in the Amazon EC2 Systems Manager User Guide.

If your build project refers to parameters stored in Amazon EC2 Systems Manager Parameter Store, the build project's service role must allow the ssm: GetParameters action. If you chose Create a new service role in your account earlier, then CodeBuild includes this action in the default service role for your build project automatically. However, if you chose Choose an existing service role from your account, then you must include this action in your service role separately.

Environment variables you set replace existing environment variables. For example, if the Docker image already contains an environment variable named MY_VAR with a value of my_value, and you set an environment variable named MY_VAR with a value of other_value, then my_value is replaced by other_value. Similarly, if the Docker image already contains an environment variable named PATH with a value of /usr/local/sbin:/usr/local/bin, and you set an environment variable named PATH with a value of \$PATH:/

Run a build (AWS CLI)

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usr/share/ant/bin, then /usr/local/sbin:/usr/local/bin is replaced by the literal value \$PATH:/usr/share/ant/bin.

Do not set any environment variable with a name that begins with CODEBUILD_. This prefix is reserved for internal use.

If an environment variable with the same name is defined in multiple places, the environment variable's value is determined as follows:

- The value in the start build operation call takes highest precedence.
- The value in the build project definition takes next precedence.
- The value in the buildspec file declaration takes lowest precedence.

For information about valid values for these placeholders, see <u>Create a build project (AWS CLI)</u>. For a list of the latest settings for a build project, see <u>View build project details</u>.

Switch to the directory that contains the file you just saved, and run the start-build command again.

```
aws codebuild start-build --cli-input-json file://start-build.json
```

6. If successful, data similar to that described in the <u>To run the build</u> procedure appears in the output.

To work with detailed information about this build, make a note of the id value in the output, and then see View build details (AWS CLI).

Run a batch build (AWS CLI)

1. Run the start-build-batch command in one of the following ways:

```
aws codebuild start-build-batch --project-name project-name>
```

Use this if you want to run a build that uses the latest version of the build input artifact and the build project's existing settings.

```
aws codebuild start-build-batch --generate-cli-skeleton > < json-file>
```

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Use this if you want to run a build with an earlier version of the build input artifact or if you want to override the settings for the build output artifacts, environment variables, buildspec, or default build timeout period.

- 2. If you run the **start-build-batch** command with the --project-name option, replace project-name< with the name of the build project, and then skip to step 6 of this procedure. To get a list of build projects, see View build project names.
- 3. If you run the **start-build-batch** command with the --idempotency-token option, a unique case-sensitive identifier, or token, is included with the start-build-batch request. The token is valid for 5 minutes after the request. If you repeat the start-build-batch request with the same token, but change a parameter, CodeBuild returns a parameter mismatch error.
- 4. If you run the **start-build-batch** command with the --generate-cli-skeleton option, JSON-formatted data is output to the *<json-file>* file. This file is similar to the skelton produced by the **start-build** command, with the addition of the following object. For more information about the common objects, see Run a build (AWS CLI).

Modify this file to add any build overrides, and save your results.

```
"buildBatchConfigOverride": {
    "combineArtifacts": combineArtifacts,
    "restrictions": {
        "computeTypesAllowed": [
            allowedComputeTypes
        ],
        "maximumBuildsAllowed": maximumBuildsAllowed
    },
    "serviceRole": "batchServiceRole",
    "timeoutInMins": batchTimeout
}
```

The buildBatchConfigOverride object is a <u>ProjectBuildBatchConfig</u> structure that contains the batch build configuration overides for this build.

combineArtifacts

A boolean that specifies if the build artifacts for the batch build should be combined into a single artifact location.

allowedComputeTypes

An array of strings that specify the compute types that are allowed for the batch build. See Build environment compute types for these values.

maximumBuildsAllowed

Specifies the maximum number of builds allowed.

batchServiceRole

Specifies the service role ARN for the batch build project.

batchTimeout

Specifies the maximum amount of time, in minutes, that the batch build must be completed in.

5. Switch to the directory that contains the file you just saved, and run the start-build-batch command again.

```
aws codebuild start-build-batch --cli-input-json file://start-build.json
```

6. If successful, the JSON representation of a <u>BuildBatch</u> object appears in the console output. See the <u>StartBuildBatch</u> Response Syntax for an example of this data.

Start running builds automatically (AWS CLI)

If your source code is stored in a GitHub or a GitHub Enterprise Server repository, you can use GitHub webhooks to have AWS CodeBuild rebuild your source code whenever a code change is pushed to the repository.

Run the **create-webhook** command as follows:

```
aws codebuild create-webhook --project-name project-name>
```

ct-name> is the name of the build project that contains the source code to be rebuilt.

For GitHub, information similar to the following appears in the output:

```
{
    "webhook": {
        "url": "<url>"
```

```
}
}
```

For GitHub Enterprise Server, information similar to the following appears in the output:

- 1. Copy the secret key and payload URL from the output. You need them to add a webhook in GitHub Enterprise Server.
- 2. In GitHub Enterprise Server, choose the repository where your CodeBuild project is stored. Choose **Settings**, choose **Hooks & services**, and then choose **Add webhook**.
- 3. Enter the payload URL and secret key, accept the defaults for the other fields, and then choose **Add webhook**.

Stop running builds automatically (AWS CLI)

If your source code is stored in a GitHub or a GitHub Enterprise Server repository, you can set up GitHub webhooks to have AWS CodeBuild rebuild your source code whenever a code change is pushed to the repository. For more information, see <u>Start running builds automatically</u> (AWS CLI).

If you have enabled this behavior, you can turn it off by running the delete-webhook command as follows:

```
aws codebuild delete-webhook --project-name project-name>
```

where project-name
 is the name of the build project that contains the source code to be rebuilt.

If this command is successful, no information and no errors appear in the output.



Note

This deletes the webhook from your CodeBuild project only. You should also delete the webhook from your GitHub or GitHub Enterprise Server repository.

Run a build (AWS SDKs)

To use CodePipeline to run a build with AWS CodeBuild, skip these steps and follow the instructions in Use AWS CodeBuild with AWS CodePipeline to test code and run builds instead.

For information about using CodeBuild with the AWS SDKs, see the AWS SDKs and tools reference.

Run builds on AWS Lambda compute

AWS Lambda compute offers optimized start-up speeds for your builds. AWS Lambda supports faster builds due to a lower start-up latency. AWS Lambda also automatically scales, so builds aren't waiting in queue to run. However, there are some use-cases which AWS Lambda does not support, and if they impact you, use the EC2 compute. For more information, see Limitations of AWS Lambda compute.

Topics

- Which tools and runtimes will be included in the curated runtime environment docker images which run on AWS Lambda?
- What if the curated image doesn't include the tools I need?
- Which regions support AWS Lambda compute in CodeBuild?
- Limitations of AWS Lambda compute
- Deploy a Lambda function using AWS SAM with CodeBuild Lambda Java
- Create a single page React app with CodeBuild Lambda Node.js
- Update a Lambda function configuration with CodeBuild Lambda Python

Which tools and runtimes will be included in the curated runtime environment docker images which run on AWS Lambda?

AWS Lambda supports the following tools: AWS CLI v2, AWS SAM CLI, git, go, Java, Node.js, Python, pip, Ruby, and .NET.

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What if the curated image doesn't include the tools I need?

If the curated image doesn't include the tools you need, you can provide a custom environment Docker image that includes the necessary tools.



Note

Lambda does not support functions that use multi-architecture container images. For more information, see Create a Lambda function using a container image in the AWS Lambda Developer Guide.

Note that you require the following Amazon ECR permissions to use custom images for Lambda compute:

```
"Version": "2012-10-17",
  "Statement": [
    {
      "Effect": "Allow",
      "Action": [
        "ecr:GetAuthorizationToken"
      "Resource": "*"
    },
    {
      "Effect": "Allow",
      "Action": [
        "ecr:BatchCheckLayerAvailability",
        "ecr:GetDownloadUrlForLayer",
        "ecr:BatchGetImage"
      "Resource": "arn:aws:ecr:image-region:image-account-id:repository/image-repo"
    }
  ]
}
```

Also note that curl or wget must be installed in order to use custom images.

Which regions support AWS Lambda compute in CodeBuild?

In CodeBuild, AWS Lambda compute is supported in the following AWS Regions: US East (N. Virginia), US East (Ohio), US West (Oregon), Asia Pacific (Mumbai), Asia Pacific (Singapore), Asia Pacific (Sydney), Asia Pacific (Tokyo), Europe (Frankfurt), Europe (Ireland), and South America (São Paulo). For more information about AWS Regions where CodeBuild is available, see AWS Services by Region.

Limitations of AWS Lambda compute

There are some use-cases which AWS Lambda does not support, and if they impact you, use the EC2 compute:

- AWS Lambda doesn't support tools that require root permissions. For tools such as yum or rpm, use the EC2 compute type or other tools that don't require root permissions.
- AWS Lambda doesn't support Docker builds or runs.
- AWS Lambda doesn't support writing to files outside /tmp. The included package managers are configured to use the /tmp directory by default for downloading and referencing packages.
- AWS Lambda doesn't support the environment type LINUX_GPU_CONTAINER and isn't supported on Windows Server Core 2019.
- AWS Lambda doesn't support caching, custom build timeouts, queue timeout, build badges, privileged mode, custom runtime environments, or runtimes longer than 15 minutes.
- AWS Lambda doesn't support VPC connectivity, a fixed range of CodeBuild source IP addresses,
 EFS, installing certificates, or SSH access with Session Manager.

Deploy a Lambda function using AWS SAM with CodeBuild Lambda Java

The AWS Serverless Application Model (AWS SAM) is an open-source framework for building serverless applications. For more information, see the AWS Serverless Application Model repository on GitHub. The following Java sample uses Gradle to build and test a AWS Lambda function. After which, the AWS SAM CLI is used to deploy the AWS CloudFormation template and deployment bundle. By using CodeBuild Lambda, the build, test, and deployment steps are all handled automatically, allowing for infrastructure to be quickly updated without manual intervention in a single build.

Set up your AWS SAM repository

Create an AWS SAM Hello World project using the AWS SAM CLI.

To create your AWS SAM Project

1. Follow the instructions in the AWS Serverless Application Model Developer Guide for <u>Installing</u> the AWS SAM CLI on your local machine.

2. Run sam init and select the following project configuration.

```
Which template source would you like to use?: 1 - AWS Quick Start Templates
Choose an AWS Quick Start application template: 1 - Hello World Example
Use the most popular runtime and package type? (Python and zip) [y/N]: N
Which runtime would you like to use?: 8 - java21
What package type would you like to use?: 1 - Zip
Which dependency manager would you like to use?: 1 - gradle
Would you like to enable X-Ray tracing on the function(s) in your application? [y/N]: N
Would you like to enable monitoring using CloudWatch Application Insights? [y/N]: N
Would you like to set Structured Logging in JSON format on your Lambda functions?
[y/N]: N
Project name [sam-app]: <insert project name>
```

3. Upload the AWS SAM project folder to a supported source repository. For a list of supported source types, see ProjectSource.

Create a CodeBuild Lambda Java project

Create an AWS CodeBuild Lambda Java project and set up the IAM permissions needed for the build.

To create your CodeBuild Lambda Java project

- 1. Open the AWS CodeBuild console at https://console.aws.amazon.com/codesuite/codebuild/ home.
- 2. If a CodeBuild information page is displayed, choose **Create build project**. Otherwise, on the navigation pane, expand **Build**, choose **Build projects**, and then choose **Create build project**.
- 3. In **Project name**, enter a name for this build project. Build project names must be unique across each AWS account. You can also include an optional description of the build project to help other users understand what this project is used for.

4. In **Source**, select the source repository where your AWS SAM project is located.

- 5. In **Environment**:
 - For Compute, select Lambda.
 - For Runtime(s), select Java.
 - For Image, select aws/codebuild/amazonlinux-x86_64-lambda-standard:corretto21.
 - For **Service role**, leave **New service role** selected. Make a note of the **Role name**. This will be required when you update the project's IAM permissions later in this sample.
- 6. Choose Create build project.
- 7. Open the IAM console at https://console.aws.amazon.com/iam/.
- 8. In the navigation pane, choose **Roles** and select the service role associated with your project. You can find your project role in CodeBuild by selecting your build project, choosing **Edit**, **Environment**, and then **Service role**.
- 9. Choose the **Trust relationships** tab, and then choose **Edit trust policy**.
- 10. Add the following inline policy to your IAM role. This will be used to deploy your AWS SAM infrastructure later on. For more information, see Adding and removing IAM identity permissions in the IAM User Guide.

```
{
    "Version": "2012-10-17",
    "Statement": 「
        {
             "Sid": "",
            "Effect": "Allow",
             "Action": [
                 "cloudformation:*",
                 "lambda:*",
                 "iam:*",
                 "apigateway: *",
                 "s3:*"
            ],
             "Resource": "*"
        }
    ]
}
```

Set up the project buildspec

In order to build, test, and deploy your Lambda function, CodeBuild reads and executes build commands from a buildspec.

To set up your project buildspec

- 1. In the CodeBuild console, select your build project, then choose **Edit** and **Buildspec**.
- 2. In Buildspec, choose Insert build commands and then Switch to editor.
- 3. Delete the pre-filled build commands and paste in the following buildspec.

```
version: 0.2
env:
    variables:
        GRADLE_DIR: "HelloWorldFunction"
phases:
    build:
        commands:
        - echo "Running unit tests..."
        - cd $GRADLE_DIR; gradle test; cd ..
        - echo "Running build..."
        - sam build --template-file template.yaml
        - echo "Running deploy..."
        - sam package --output-template-file packaged.yaml --resolve-s3 --template-file template.yaml
        - yes | sam deploy
```

4. Choose **Update buildspec**.

Deploy your AWS SAM Lambda infrastructure

Use CodeBuild Lambda to automatically deploy your Lambda infrastructure

To deploy your Lambda infrastructure

- Choose Start build. This will automatically build, test, and deploy your AWS SAM application to AWS Lambda using AWS CloudFormation.
- 2. Once the build has finished, navigate to the AWS Lambda console and search for your new Lambda function under the AWS SAM project name.

3. Test your Lambda function by selecting API Gateway under the Function overview, then clicking the API endpoint URL. You should see a page open with the message "message": "hello world".

Clean up your infrastructure

To avoid further charges for resources you used during this tutorial, delete the resources created by your AWS SAM template and CodeBuild.

To clean up your infrastructure

- Navigate to the AWS CloudFormation console and select the aws-sam-cli-manageddefault.
- 2. In Resources, empty the deployment bucket SamCliSourceBucket.
- 3. Delete the aws-sam-cli-managed-default stack.
- 4. Delete the AWS CloudFormation stack associated with your AWS SAM project. This stack should have the same name as your AWS SAM project.
- 5. Navigate to the CloudWatch console and delete the CloudWatch log groups associated with your CodeBuild project.
- 6. Navigate to the CodeBuild console and delete your CodeBuild project by choosing **Delete build project**.

Create a single page React app with CodeBuild Lambda Node.js

<u>Create React App</u> is a way to create single-page React applications. The following Node.js sample uses Node.js to build the source artifacts from Create React App and returns the build artifacts.

Set up your source repository and artifacts bucket

Create a source repository for your project using yarn and Create React App.

To set up the source repository and artifacts bucket

- 1. On your local machine, run yarn create react-app <app-name> to create a simple React app.
- 2. Upload the React app project folder to a supported source repository. For a list of supported source types, see ProjectSource.

Create a CodeBuild Lambda Node.js project

Create an AWS CodeBuild Lambda Node.js project.

To create your CodeBuild Lambda Node.js project

1. Open the AWS CodeBuild console at https://console.aws.amazon.com/codesuite/codebuild/ home.

- 2. If a CodeBuild information page is displayed, choose **Create build project**. Otherwise, on the navigation pane, expand **Build**, choose **Build projects**, and then choose **Create build project**.
- 3. In **Project name**, enter a name for this build project. Build project names must be unique across each AWS account. You can also include an optional description of the build project to help other users understand what this project is used for.
- 4. In **Source**, select the source repository where your AWS SAM project is located.
- 5. In **Environment**:
 - For Compute, select Lambda.
 - For Runtime(s), select Node.js.
 - For Image, select aws/codebuild/amazonlinux-x86_64-lambda-standard:nodejs20.
- 6. In Artifacts:
 - For Type, select Amazon S3.
 - For **Bucket name**, select the project artifacts bucket you created earlier.
 - For Artifacts packaging, select Zip.
- 7. Choose Create build project.

Set up the project buildspec

In order to build your React app, CodeBuild reads and executes build commands from a buildspec file.

To set up your project buildspec

- 1. In the CodeBuild console, select your build project, then choose **Edit** and **Buildspec**.
- 2. In **Buildspec**, choose **Insert build commands** and then **Switch to editor**.
- 3. Delete the pre-filled build commands and paste in the following buildspec.

```
version: 0.2
phases:
  build:
    commands:
      - yarn
      - yarn add --dev jest-junit @babel/plugin-proposal-private-property-in-object
      - yarn run build
      - yarn run test -- --coverage --watchAll=false --testResultsProcessor="jest-
junit" --detectOpenHandles
artifacts:
  name: "build-output"
  files:
    - "**/*"
reports:
  test-report:
    files:
      - 'junit.xml'
    file-format: 'JUNITXML'
  coverage-report:
    files:
      - 'coverage/clover.xml'
    file-format: 'CLOVERXML'
```

4. Choose **Update buildspec**.

Build and run your React app

Build the React app on CodeBuild Lambda, download the build artifacts, and run the React app locally.

To build and run your React app

- 1. Choose **Start build**.
- Once the build has finished, navigate to your Amazon S3 project artifacts bucket and download the React app artifact.
- 3. Unzip the React build artifact and run npm install -g serve && serve -s build in the project folder.

4. The serve command will serve the static site on a local port and print output to your terminal. You can visit the localhost URL under Local: in the terminal output to view your React app.

To learn more about how to handle deployment for a React based server, see <u>Create React App</u> <u>Deployment</u>.

Clean up your infrastructure

To avoid further charges for resources you used during this tutorial, delete the resources created for your CodeBuild project.

To clean up your infrastructure

- 1. Delete your project artifacts Amazon S3 bucket
- 2. Navigate to the CloudWatch console and delete the CloudWatch log groups associated with your CodeBuild project.
- Navigate to the CodeBuild console and delete your CodeBuild project by choosing Delete build project.

Update a Lambda function configuration with CodeBuild Lambda Python

The following Python sample uses <u>Boto3</u> and CodeBuild Lambda Python to update a Lambda function's configuration. This sample can be extended to manage other AWS resources programmatically. For more information, see <u>Boto3 documentation</u>.

Prerequisites

Create or find a Lambda function in your account.

This sample assumes that you have already created a Lambda function in your account and will use CodeBuild to update the Lambda function's environment variables. For more information on setting up a Lambda function through CodeBuild, see the <u>Deploy a Lambda function using AWS SAM with CodeBuild Lambda Java</u> sample or visit <u>AWS Lambda</u>.

Set up your source repository

Create a source repository to store your Boto3 python script.

To set up the source repository

 Copy the following python script to a new file called update_lambda_environment_variables.py.

```
import boto3
from os import environ
def update_lambda_env_variable(lambda_client):
    lambda_function_name = environ['LAMBDA_FUNC_NAME']
   lambda_env_variable = environ['LAMBDA_ENV_VARIABLE']
   lambda_env_variable_value = environ['LAMBDA_ENV_VARIABLE_VALUE']
    print("Updating lambda function " + lambda_function_name + " environment
 variable "
          + lambda_env_variable + " to " + lambda_env_variable_value)
    lambda_client.update_function_configuration(
        FunctionName=lambda_function_name,
        Environment={
            'Variables': {
                lambda_env_variable: lambda_env_variable_value
            }
       },
    )
if __name__ == "__main__":
    region = environ['AWS_REGION']
    client = boto3.client('lambda', region)
    update_lambda_env_variable(client)
```

2. Upload the python file to a supported source repository. For a list of supported source types, see ProjectSource.

Create a CodeBuild Lambda Python project

Create a CodeBuild Lambda Python project.

To create your CodeBuild Lambda Java project

Open the AWS CodeBuild console at https://console.aws.amazon.com/codesuite/codebuild/
 home.

2. If a CodeBuild information page is displayed, choose **Create build project**. Otherwise, on the navigation pane, expand **Build**, choose **Build projects**, and then choose **Create build project**.

- 3. In **Project name**, enter a name for this build project. Build project names must be unique across each AWS account. You can also include an optional description of the build project to help other users understand what this project is used for.
- 4. In **Source**, select the source repository where your AWS SAM project is located.
- 5. In **Environment**:
 - For **Compute**, select **Lambda**.
 - For Runtime(s), select Python.
 - For Image, select aws/codebuild/amazonlinux-x86_64-lambda-standard:python3.12.
 - For **Service role**, leave **New service role** selected. Make a note of the **Role name**. This will be required when you update the project's IAM permissions later in this sample.
- 6. Choose **Create build project**.
- 7. Open the IAM console at https://console.aws.amazon.com/iam/.
- 8. In the navigation pane, choose **Roles** and select the service role associated with your project. You can find your project role in CodeBuild by selecting your build project, choosing **Edit**, **Environment**, and then **Service role**.
- 9. Choose the **Trust relationships** tab, and then choose **Edit trust policy**.
- 10. Add the following inline policy to your IAM role. This will be used to deploy your AWS SAM infrastructure later on. For more information, see Adding and removing IAM identity permissions in the IAM User Guide.

}

Set up the project buildspec

In order to update the Lambda function, the script reads environment variables from the buildspec to find the Lambda function's name, environment variable name, and environment variable value.

To set up your project buildspec

- 1. In the CodeBuild console, select your build project, then choose **Edit** and **Buildspec**.
- 2. In Buildspec, choose Insert build commands and then Switch to editor.
- 3. Delete the pre-filled build commands and paste in the following buildspec.

```
version: 0.2
env:
    variables:
        LAMBDA_FUNC_NAME: "<lambda-function-name>"
        LAMBDA_ENV_VARIABLE: "FEATURE_ENABLED"
        LAMBDA_ENV_VARIABLE_VALUE: "true"
phases:
    install:
        commands:
        - pip3 install boto3
build:
        commands:
        - python3 update_lambda_environment_variables.py
```

4. Choose **Update buildspec**.

Update your Lambda configuration

Use CodeBuild Lambda Python to automatically update your Lambda function's configuration.

To update your Lambda function's configuration

- 1. Choose Start build.
- 2. Once the build has finished, navigate to your Lambda function.
- 3. Select **Configuration** and then **Environment** variables. You should see a new environment variable with key FEATURE_ENABLED and value true.

Clean up your infrastructure

To avoid further charges for resources you used during this tutorial, delete the resources created for your CodeBuild project.

To clean up your infrastructure

- Navigate to the CloudWatch console and delete the CloudWatch log groups associated with your CodeBuild project.
- Navigate to the CodeBuild console and delete your CodeBuild project by choosing Delete build project.
- 3. If you created a Lambda function for the purpose of this sample, choose **Actions** and **Delete function** to clean up your Lambda function.

Extensions

If you want to extend this sample to manage other AWS resources using AWS CodeBuild Lambda Python:

- Update the Python script to modify the new resources using Boto3.
- Update the IAM role associated with your CodeBuild project to have permissions for the new resources.
- Add any new environment variables associated with the new resources to your buildspec.

Run builds on reserved capacity fleets

CodeBuild offers the following compute fleets:

- · On-demand fleets
- Reserved capacity fleets

With on-demand fleets, CodeBuild provides compute for your builds. The machines are destroyed when the build finishes. On-demand fleets are fully managed, and includes automatic scaling capabilities to handle spikes in demand.



Note

On-demand fleets do not support macOS.

CodeBuild also offers reserved capacity fleets which contain instances powered by Amazon EC2 that are maintained by CodeBuild. With reserved capacity fleets, you configure a set of dedicated instances for your build environment. These machines remain idle, ready to process builds or tests immediately and reduces build durations. With reserved capacity fleets, your machines are always running and will continue to incur costs as long they're provisioned.

Important

Regardless of how long you run an instance for, reserved capacity fleets incur an initial charge per instance, after which there may be additional associated costs. For more information, see https://aws.amazon.com/codebuild/pricing/.

Topics

- Create a reserved capacity fleet
- Best practices
- Can I share a reserved capacity fleet across multiple CodeBuild projects?
- How does attribute-based compute work?
- Can I manually specify an Amazon EC2 instance for my fleet?
- Which regions support reserved capacity fleets?
- How do I configure a reserved capacity macOS fleet?
- How do I configure a custom Amazon Machine Image (AMI) for a reserved capacity fleet?
- Limitations of reserved capacity fleets
- Reserved capacity fleet properties
- Reserved capacity samples with AWS CodeBuild

Create a reserved capacity fleet

Use the following instructions to create a reserved capacity fleet.

To create a reserved capacity fleet

Sign in to the AWS Management Console and open the AWS CodeBuild console at https:// 1. console.aws.amazon.com/codesuite/codebuild/home.

- In the navigation pane, choose **Compute fleets**, and then choose **Create Fleet**. 2.
- In the **Compute fleet name** text field, enter a name for your fleet. 3.
- From the **Operating system** drop-down menu, choose the operating system. 4.
- From the **Architecture** drop-down menu, choose the architecture. 5.
- (Optional) Select Use instance running mode optional to run on an Amazon EC2 instance 6. directly instead of a Docker container. Then choose a Major version and Minor version.
- (Optional) In Additional configuration do the following: 7.
 - Select Configure VPC optional to connect your fleet to a VPC to access private resources during usage.
 - From the **VPC** drop-down menu, select a VPC that your CodeBuild fleet will access.
 - From the **Subnets** drop-down menu, select the subnets that CodeBuild should use to set up your VPC configuration.
 - From the **Security groups** drop-down menu, select the security groups that CodeBuild should use to work with your VPC.
 - In the Fleet Service Role field, choose an existing service role.



Note

Make sure that your fleet role has the necessary permissions. For more information, see Allow a user to add a permission policy for a fleet service role.

- If you chose the Amazon Linux operating system, select Define proxy configurations optional to apply network access control for your reserved capacity instances.
- For **Default behavior**, choose to allow or deny outgoing traffic to all destinations by default.
- For Proxy rules, choose Add proxy rule to specify destination domains or IPs to allow or deny network access control to.
- Select Configure custom AMI optional to use a custom Amazon Machine Image (AMI).
 - From the AMI drop-down menu, select a an Amazon Machine Image (AMI) for your fleet.
 - In the Fleet Service Role field, choose an existing service role.



Note

Make sure that your fleet role has the necessary permissions. For more information, see Allow a user to add a permission policy for a fleet service role.

- In **Capacity configuration**, from **Compute selection mode**, choose one of the following: 8.
 - If you choose **Guided selection**, do the following:
 - For **Compute**, choose the type of instances included in this fleet.
 - In the **Capacity** text field, enter the minimum number of instances in the fleet.
 - (Optional) In Additional configuration do the following:
 - Select Configure scaling optional to automatically scale your fleet based on this configuration. From the **Scaling mode - optional** drop-down menu, choose the behavior when demand exceeds the fleet capacity.
 - If you choose **Custom instance**, do the following:
 - From the **Compute instance type** drop-down menu, select the type of instances included in this fleet.
 - In the Additional EBS volume size optional text field, enter the volume additional to the 64GB of disk space provided.
 - In the **Capacity** text field, enter the minimum number of instances in the fleet.
 - (Optional) In Additional configuration do the following:
 - Select **Configure scaling optional** to automatically scale your fleet based on this configuration. From the **Scaling mode - optional** drop-down menu, choose the behavior when demand exceeds the fleet capacity.
- 9. Choose **Create compute fleet**.
- 10. After the compute fleet is created, create a new CodeBuild project or edit an existing one. From **Environment**, choose **Reserved capacity** under **Provisioning model**, and then choose the specified fleet under **Fleet name**.

Best practices

When using reserved capacity fleets, we recommend that you follow these best practices.

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• We recommend using source cache mode to help improve the build performance by caching the source.

 We recommend using Docker layer caching to help improve the build performance by caching existing Docker layers.

Can I share a reserved capacity fleet across multiple CodeBuild projects?

Yes, you can maximize the utilization of a fleet's capacity by using it across multiple projects.



Important

When using the reserved capacity feature, data cached on fleet instances, including source files, Docker layers, and cached directories specified in the buildspec, can be accessible to other projects within the same account. This is by design and allows projects within the same account to share fleet instances.

How does attribute-based compute work?

If you choose ATTRIBUTE_BASED_COMPUTE as your fleet's computeType, you can specify the attributes in a new field called computeConfiguration. These attributes include vCPUs, memory, disk space, and the machineType. This machineType is either GENERAL or NVME. After specifying one or some of the available attributes, CodeBuild will choose a compute type from the available supported instance types as the finalized computeConfiguration.



Note

CodeBuild will choose the cheapest instance that match all input requirements. The chosen instances' memory, vCPUs, and disk space will all be greater than or equal to the input requirements. You can check the resolved computeConfiguration in the created or updated fleet.

If you input a computeConfiguration that is not possible to satisfy in CodeBuild, you'll receive a validation exception. Also note that on-demand fleet overflow behavior will be overridden to queue behavior if the computeConfiguration is not available for on-demand.

Can I manually specify an Amazon EC2 instance for my fleet?

Yes, you can directly input your desired Amazon EC2 instance in the console by selecting **Custom instance** or by configuring the API parameter, InstanceType. This field is used in the following APIs: CreateFleet, UpdateFleet, CreateProject, UpdateProject and StartBuild. For more information, see <u>Compute instance type</u>.

Which regions support reserved capacity fleets?

Reserved capacity Amazon Linux and Windows fleets are supported in the following AWS Regions: US East (N. Virginia), US East (Ohio), US West (Oregon), Asia Pacific (Mumbai), Asia Pacific (Singapore), Asia Pacific (Sydney), Asia Pacific (Tokyo), Europe (Frankfurt), Europe (Ireland), and South America (São Paulo). For more information about AWS Regions where CodeBuild is available, see AWS Services by Region.

Reserved capacity macOS Medium fleets are supported in the following AWS Regions: US East (N. Virginia), US East (Ohio), US West (Oregon), Asia Pacific (Sydney), and Europe (Frankfurt). Reserved capacity macOS Large fleets are supported in the following AWS Regions: US East (N. Virginia), US East (Ohio), US West (Oregon), and Asia Pacific (Sydney).

How do I configure a reserved capacity macOS fleet?

To configure a reserved capacity macOS fleet

- 1. Sign in to the AWS Management Console and open the AWS CodeBuild console at https://console.aws.amazon.com/codesuite/codebuild/home.
- 2. In the navigation pane, choose **Compute fleets**, and then choose **Create Fleet**.
- 3. In the Compute fleet name text field, enter a name for your fleet.
- 4. From the **Operating system** drop-down menu, choose **macOS**.
- 5. In the Compute field, choose one of the following compute machine types: Apple M2, 24 GB memory, 8 vCPUs or Apple M2, 32 GB memory, 12 vCPUs.
- 6. In the **Capacity** text field, enter the minimum number of instances in the fleet.
- 7. (Optional) To use a custom image for your fleet, see How do I configure a custom Amazon
 Machine Image (AMI) for a reserved capacity fleet? to ensure that your Amazon Machine Image (AMI) has the required prerequisites.
- 8. (Optional) To configure a VPC with your fleet, in **Additional configuration** do the following:

• From the VPC - optional drop-down menu, select a VPC that your CodeBuild fleet will access.

- From the **Subnets** drop-down menu, select the subnets that CodeBuild should use to set up your VPC configuration.
- From the **Security groups** drop-down menu, select the security groups that CodeBuild should use to work with your VPC.
- In the **Fleet service role** field, choose an existing service role.



Note

Make sure that your fleet role has the necessary permissions. For more information, see Allow a user to add a permission policy for a fleet service role.

- Choose Create compute fleet and wait for the fleet instance to launch. Once launched the capacity will be n/n, where n is the capacity provided.
- 10. After the compute fleet has launched, create a new CodeBuild project or edit an existing one. From **Environment**, choose **Reserved capacity** under **Provisioning model**, and then choose the specified fleet under **Fleet name**.

How do I configure a custom Amazon Machine Image (AMI) for a reserved capacity fleet?

To configure a custom Amazon Machine Image (AMI) for a reserved capacity fleet

- Sign in to the AWS Management Console and open the AWS CodeBuild console at https:// 1. console.aws.amazon.com/codesuite/codebuild/home.
- In the navigation pane, choose **Compute fleets**, and then choose **Create Fleet**. 2.
- 3. In the **Compute fleet name** text field, enter a name for your fleet.
- 4. Choose **Custom image** for your fleet and ensure that your Amazon Machine Image (AMI) has the following prerequisites:
 - If your environment type is MAC_ARM, make sure that your AMI Architecture is 64-bit Mac-Arm.
 - If your environment type is LINUX EC2, make sure that your AMI **Architecture** is 64-bit x86.

• If your environment type is ARM_EC2, make sure that your AMI **Architecture** is 64-bit Arm.

- If your environment type is WINDOWS_EC2, make sure that your AMI **Architecture** is 64-bit x86.
- The AMI allows the CodeBuild service **Organization ARN**. For a list of Organization ARNs, see Amazon Machine Images (AMI).
- If the AMI is encrypted with a AWS KMS key, the AWS KMS key must also allow the
 CodeBuild service Organization ID. For a list of Organization IDs, see <u>Amazon Machine Images (AMI)</u>. For more information on AWS KMS keys, see <u>Allow organizations and OUs to use a KMS key</u> in the *Amazon EC2 User Guide*. To give CodeBuild organization permission to use a KMS key, add the following statement to the key policy:

```
{
    "Sid": "Allow access for organization root",
    "Effect": "Allow",
    "Principal": "*",
    "Action": [
        "kms:Describe*",
        "kms:List*",
        "kms:Get*",
        "kms:Encrypt",
        "kms:Decrypt",
        "kms:ReEncrypt*",
        "kms:GenerateDataKey*",
        "kms:CreateGrant"
    ],
    "Resource": "*",
    "Condition": {
        "StringEquals": {
            "aws:PrincipalOrgID": "o-123example"
        }
    }
}
```

• In the **Fleet service role** field, grant the following Amazon EC2 permissions:

```
"Action": [
          "ec2:DescribeImages",
          "ec2:DescribeSnapshots"
],
          "Resource": "*"
}
]
```

Limitations of reserved capacity fleets

There are some use-cases which reserved capacity fleets do not support, and if they impact you, use on-demand fleets instead:

- Reserved capacity fleets don't support build utilization metrics.
- Reserved capacity macOS fleets don't support debug session.

For more information on limits and quotas, see Compute fleets.

Reserved capacity fleet properties

A reserved capacity fleet contains the following properties. For more information about reserved capacity fleets, see Run builds on reserved capacity fleets.

Operating system

The operating system. The following operating systems are available:

- Amazon Linux
- macOS
- Windows Server 2019
- Windows Server 2022

Architecture

The processor architecture. The following architectures are available:

- x86_64
- Arm64

Environment type

The environment types available when **Amazon Linux** is selected. The following environment types are available:

- Linux EC2
- Linux GPU

Compute instance type

The compute configurations for fleet instances.

Guided selection

Specify different compute types by selecting vCPU, memory and disk space settings. For information about compute type availability by region, see About reserved capacity environment types.

Custom instance

Manually specify the desired instance type.

Capacity

The initial number of machines allocated to the fleet, which defines the number of builds that can run in parallel.

Overflow behavior

Defines the behavior when the number of builds exceeds the fleet capacity.

On-demand

Overflow builds run on CodeBuild on-demand.



Note

If you choose to set your overflow behavior to on-demand while creating a VPCconnected fleet, make sure that you add the required VPC permissions to your project service role. For more information, see Example policy statement to allow CodeBuild access to AWS services required to create a VPC network interface.

If you choose to set your overflow behavior to on-demand, note that overflow builds will be billed separately, similar to on-demand Amazon EC2. For more information, see https://aws.amazon.com/codebuild/pricing/.

Queue

Build runs are placed in a queue until a machine is available. This limits additional costs because no additional machines are allocated.

Amazon Machine Images (AMI)

The Amazon Machine Image (AMI) properties for your fleet. The following properties are supported by CodeBuild:

AWS Regions	Organization ARN	Organization ID
us-east-1	arn:aws:organizati ons::851725618577: organization/o-c6w cu152r1	o-c6wcu152r1
us-east-2	arn:aws:organizati ons::992382780434: organization/o-seu fr2suvq	o-seufr2suvq
us-west-2	arn:aws:organizati ons::381491982620: organization/o-041 2099a4r	o-0412o99a4r
ap-northeast-1	arn:aws:organizati ons::891376993293: organization/o-b6k 3sjqavm	o-b6k3sjqavm

AWS Regions	Organization ARN	Organization ID
ap-south-1	arn:aws:organizati ons::891376924779: organization/o-krt ah1lkeg	o-krtah1lkeg
ap-southeast-1	arn:aws:organizati ons::654654522137: organization/o-mcn 8uvc3tp	o-mcn8uvc3tp
ap-southeast-2	arn:aws:organizati ons::767398067170: organization/o-6cr t0f6bu4	o-6crt0f6bu4
eu-central-1	arn:aws:organizati ons::590183817084: organization/o-lb2 lne3te6	o-lb2lne3te6
eu-west-1	arn:aws:organizati ons::891376938588: organization/o-ull rrg5qf0	o-ullrrg5qf0
sa-east-1	arn:aws:organizati ons::533267309133: organization/o-db6 3c45ozw	o-db63c45ozw

Additional configuration

VPC - optional

The VPC that your CodeBuild fleet will access. For more information, see <u>Use AWS CodeBuild</u> with Amazon Virtual Private Cloud.



Note

If a fleet override is specified when calling the StartBuild API, CodeBuild will ignore the project VPC configuration.

Subnets

The VPC subnets that CodeBuild uses to set up your VPC configuration. Note that reserved capacity fleets support only one subnet in a single Availablity Zone. Also, ensure that your subnets include a NAT gateway.

Security groups

The VPC security groups that CodeBuild uses with your VPC. Ensure that your security groups allow outbound connections.

Fleet Service Role

Defines the service role for your fleet from an existing service role in your account.

Define proxy configurations - optional

Proxy configurations that apply network access control to your reserved capacity instances. For more information, see Use AWS CodeBuild with a managed proxy server.



Note

Proxy configurations don't support VPC, Windows, or MacOS.

Default behavior

Defines the behavior of outgoing traffic.

Allow

Allows outgoing traffic to all destinations by default.

Deny

Denies outgoing traffic to all destinations by default.

Proxy rules

Specifies destination domains or IPs to allow or deny network access control to.

Reserved capacity samples with AWS CodeBuild

These samples can be used to experiment with reserved capacity fleets in CodeBuild.

Topics

Caching with reserved capacity sample

Caching with reserved capacity sample

A cache can store reusable pieces of your build environment and use them across multiple builds. This sample demonstrated how to enable caching within your build project using reserved capacity. For more information, see Cache builds to improve performance.

You can start by specifying one or more cache modes in your project settings:

```
Cache:
Type: LOCAL
Modes:
- LOCAL_CUSTOM_CACHE
- LOCAL_DOCKER_LAYER_CACHE
- LOCAL_SOURCE_CACHE
```



Make sure to enable privileged mode in order to use Docker layer cache.

Your project buildspec settings should look like the following:

```
version: 0.2
  phases:
  build:
    commands:
        - echo testing local source cache
        - touch /codebuild/cache/workspace/foobar.txt
        - git checkout -b cached_branch
        - echo testing local docker layer cache
        - docker run alpine:3.14 2>&1 | grep 'Pulling from' || exit 1
        - echo testing local custom cache
```

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```
- touch foo
- mkdir bar && ln -s foo bar/foo2
- mkdir bar/bar && touch bar/bar/foo3 && touch bar/bar/foo4
- "[ -f foo ] || exit 1"
- "[ -L bar/foo2 ] || exit 1"
- "[ -f bar/bar/foo3 ] || exit 1"
- "[ -f bar/bar/foo4 ] || exit 1"

cache:
 paths:
- './foo'
- './bar/**/*'
- './bar/foo3'
```

You can start by running a build with the new project to seed the cache. Once that's complete, you should start another build with an overriding buildspec, similar to the following:

```
version: 0.2
      phases:
        build:
          commands:
            - echo testing local source cache
            - git branch | if grep 'cached_branch'; then (exit 0); else (exit 1); fi
            - ls /codebuild/cache/workspace | if grep 'foobar.txt'; then (exit 0); else
 (exit 1); fi
            - echo testing local docker layer cache
            - docker run alpine:3.14 2>&1 | if grep 'Pulling from'; then (exit 1); else
 (exit 0); fi
            - echo testing local custom cache
            - "[ -f foo ] || exit 1"
            - "[ -L bar/foo2 ] || exit 1"
            - "[ -f bar/bar/foo3 ] || exit 1"
            - "[ -f bar/bar/foo4 ] || exit 1"
      cache:
        paths:
           - './foo'
           - './bar/**/*'
           - './bar/bar/foo3'
```

Run builds in batches

You can use AWS CodeBuild to run concurrent and coordinated builds of a project with batch builds.

Run batch builds API Version 2016-10-06 594

Topics

- · Security role
- Batch build types
- Batch report mode
- More information

Security role

Batch builds introduce a new security role in the batch configuration. This new role is required as CodeBuild must be able to call the StartBuild, StopBuild, and RetryBuild actions on your behalf to run builds as part of a batch. Customers should use a new role, and not the same role they use in their build, for two reasons:

- Giving the build role StartBuild, StopBuild, and RetryBuild permissions would allow a single build to start more builds via the buildspec.
- CodeBuild batch builds provide restrictions that restrict the number of builds and compute types that can be used for the builds in the batch. If the build role has these permissions, it is possible the builds themselves could bypass these restrictions.

Batch build types

CodeBuild supports the following batch build types:

Batch build types

- Build graph
- Build list
- Build matrix
- Build fanout

Build graph

A build graph defines a set of tasks that have dependencies on other tasks in the batch.

The following example defines a build graph that creates a dependency chain.

batch:

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```
fast-fail: false
build-graph:
  - identifier: build1
    env:
      variables:
        BUILD_ID: build1
    ignore-failure: false
  - identifier: build2
    buildspec: build2.yml
    env:
      variables:
        BUILD_ID: build2
    depend-on:
      - build1
  - identifier: build3
    env:
      variables:
        BUILD_ID: build3
    depend-on:
      - build2
  - identifier: build4
    env:
      compute-type: ARM_LAMBDA_1GB
  - identifier: build5
    env:
      fleet: fleet_name
```

In this example:

- build1 runs first because it has no dependencies.
- build2 has a dependency on build1, so build2 runs after build1 completes.
- build3 has a dependency on build2, so build3 runs after build2 completes.

For more information about the build graph buildspec syntax, see batch/build-graph.

Build list

A build list defines a number of tasks that run in parallel.

The following example defines a build list. The build1 and build2 builds will run in parallel.

```
batch:
```

Batch build types API Version 2016-10-06 596

```
fast-fail: false
build-list:
  - identifier: build1
    env:
      variables:
        BUILD_ID: build1
    ignore-failure: false
  - identifier: build2
    buildspec: build2.yml
    env:
      variables:
        BUILD_ID: build2
    ignore-failure: true
  - identifier: build3
    env:
      compute-type: ARM_LAMBDA_1GB
  - identifier: build4
      fleet: fleet_name
  - identifier: build5
      compute-type: GENERAL_LINUX_XLAGRE
```

For more information about the build list buildspec syntax, see batch/build-list.

Build matrix

A build matrix defines tasks with different configurations that run in parallel. CodeBuild creates a separate build for each possible configuration combination.

The following example shows a build matrix with two buildspec files and three values for an environment variable.

```
batch:
  build-matrix:
    static:
    ignore-failure: false
    dynamic:
    buildspec:
    - matrix1.yml
    - matrix2.yml
    env:
```

Batch build types API Version 2016-10-06 597

variables:

- MY_VAR:
 - VALUE1
 - VALUE2
 - VALUE3

In this example, CodeBuild creates six builds:

```
matrix1.yml with $MY_VAR=VALUE1
```

- matrix1.yml with \$MY_VAR=VALUE2
- matrix1.yml with \$MY_VAR=VALUE3
- matrix2.yml with \$MY_VAR=VALUE1
- matrix2.yml with \$MY_VAR=VALUE2
- matrix2.yml with \$MY_VAR=VALUE3

Each build will have the following settings:

- ignore-failure set to false
- env/type set to LINUX_CONTAINER
- env/image set to aws/codebuild/amazonlinux-x86_64-standard:4.0
- env/privileged-mode set to true

These builds run in parallel.

For more information about the build matrix buildspec syntax, see batch/build-matrix.

Build fanout

A build fanout defines a task that will be split into multiple builds in the batch. This can be used for running tests in parallel. CodeBuild creates a separate build for each shard of test cases based on the value set in parallelism field.

The following example defines a build fanout that creates five builds that run in parallel.

```
version: 0.2
batch:
   fast-fail: false
```

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In this example, assuming that there are 100 tests that needs to be run, CodeBuild creates five builds that each runs 20 tests in parallel.

For more information about the build graph buildspec syntax, see batch/build-fanout.

Batch report mode

If the source provider for your project is Bitbucket, GitHub, or GitHub Enterprise, and your project is configured to report build statuses to the source provider, you can select how you want your batch build statuses sent to the source provider. You can select to have the statuses sent as a single aggregate status report for the batch, or have the status of each build in the batch reported individually.

For more information, see the following topics:

- Batch configuration (create)
- Batch configuration (update)

More information

For more information, see the following topics:

• Batch build buildspec reference

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- · Batch configuration
- Run a batch build (AWS CLI)
- Stop batch builds in AWS CodeBuild

Execute parallel tests in batch builds

You can use AWS CodeBuild to execute parallel tests in batch builds. Parallel test execution is a testing approach where multiple test cases run simultaneously across different environments, machines, or browsers, rather than executing sequentially. This approach can significantly reduce overall test execution time and improve testing efficiency. In CodeBuild, you can split your tests across multiple environments and run them concurrently.

The key advantages of parallel test execution include:

- 1. **Reduced execution time** Tests that would take hours sequentially can complete in minutes.
- 2. Better resource utilization Makes efficient use of available computing resources.
- 3. **Earlier feedback** Faster test completion means quicker feedback to developers.
- 4. **Cost-effective** Saves both time and computing costs in the long run.

When implementing parallel test execution, two main approaches are commonly considered: separate environments and multithreading. While both methods aim to achieve concurrent test execution, they differ significantly in their implementation and effectiveness. Separate environments create isolated instances where each test suite runs independently, while multithreading executes multiple tests simultaneously within the same process space using different threads.

The key advantages of separate environments over multithreading include:

- Isolation Each test runs in a completely isolated environment, preventing interference between tests.
- 2. Resource conflicts No competition for shared resources that often occurs in multithreading.
- 3. **Stability** Less prone to race conditions and synchronization issues.
- 4. **Easier debugging** When tests fail, it's simpler to identify the cause as each environment is independent.
- 5. State management Easily manage shared state issues that plague multithreaded tests.

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6. Better scalability - Can easily add more environments without complexity.

Topics

- Support in AWS CodeBuild
- · Enable parallel test execution in batch builds
- · Use the codebuild-tests-run CLI command
- Use the codebuild-glob-search CLI command
- About test splitting
- · Automatically merge individual build reports
- Parallel test execution for various test frameworks sample

Support in AWS CodeBuild

AWS CodeBuild provides robust support for parallel test execution through its batch build feature, specifically designed to leverage separate environment execution. This implementation aligns perfectly with the benefits of isolated testing environments.

Batch build with test distribution

CodeBuild's batch build functionality enables the creation of multiple build environments that run simultaneously. Each environment operates as a completely isolated unit, with its own compute resources, runtime environment, and dependencies. Through the batch build configuration, you can specify how many parallel environments they need and how tests should be distributed across them.

Test sharding CLI

CodeBuild includes a built-in test distribution mechanism through its CLI tool, codebuild-tests-run, which automatically divides tests into different environments.

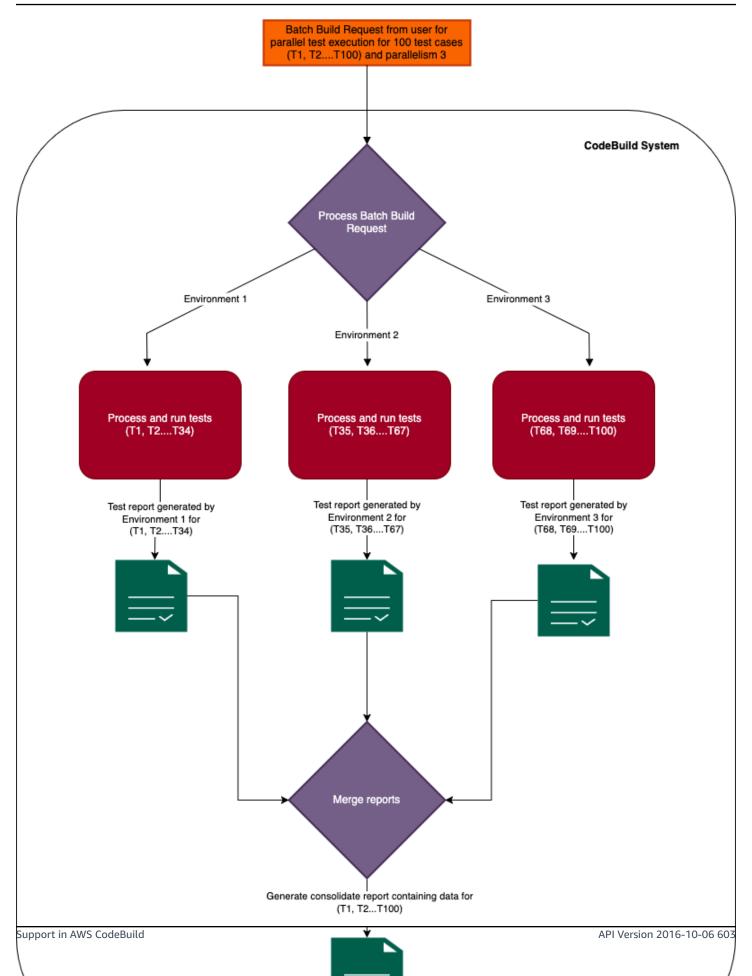
Report aggregation

One of the key strengths of CodeBuild's implementation is its ability to handle test result aggregation seamlessly. While tests execute in separate environments, CodeBuild automatically collects and combines the test reports from each environment into a unified test report at the batch build level. This consolidation provides a comprehensive view of test results while maintaining the efficiency benefits of parallel execution.

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The following is the diagram explains the complete concept of parallel test execution in AWS CodeBuild.

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Enable parallel test execution in batch builds

To run tests in parallel, update the batch build buildspec file to include the build-fanout field and the number of parallel builds to split the test suite in the parallelism field as shown below. The parallelism field specifies how many independent executors are setup to execute the test suite.

To run the tests in multiple parallel execution environments, set the parallelism field to a value greater than zero. In example below, parallelism is set to five, meaning CodeBuild starts five identical builds that executes a portion of the test suite in parallel.

You can use the <u>codebuild-tests-run</u> CLI command to split and run your tests. Your test files will be split up, and a portion of your tests run in each build. This reduces the overall time taken to run the full test suite. In the following example, tests will be split up into five and the split points are calculated based on name of the tests.

```
version: 0.2
batch:
  fast-fail: false
  build-fanout:
    parallelism: 5
    ignore-failure: false
phases:
  install:
    commands:
      - npm install jest-junit --save-dev
  pre_build:
    commands:
      - echo 'prebuild'
  build:
    commands:
      - 1
        codebuild-tests-run \
         --test-command 'npx jest --runInBand --coverage' \
         --files-search "codebuild-glob-search '**/_tests_/**/*.test.js'" \
         --sharding-strategy 'equal-distribution'
  post_build:
    commands:
      - codebuild-glob-search '**/*.xml'
      - echo "Running post-build steps..."
```

```
- echo "Build completed on `date`"

reports:
    test-reports:
    files:
        - '**/junit.xml'
    base-directory: .
    discard-paths: yes
    file-format: JUNITXML
```

If reports are configured for build-fanout build, then the test reports are generated for each build separately, which can be viewed under the **Reports** tab of the corresponding builds in the AWS CodeBuild console.

For more information on how to execute parallel tests in batch, see <u>Parallel test execution for various test frameworks sample.</u>

Use the codebuild-tests-run CLI command

AWS CodeBuild provides CLI that will take test command and test file location as input. The CLI with these input will split the tests into number of shards as specified in the parallelism field based on test file names. The assignment of test files to shard is decided by the sharding strategy.

```
codebuild-tests-run \
    --files-search "codebuild-glob-search '**/__tests__/*.js'" \
    --test-command 'npx jest --runInBand --coverage' \
    --sharding-strategy 'equal-distribution'
```

The following table describes the fields for the codebuild-tests-run CLI command.

Field name	Туре	Required or optional	Definition
test-command	String	Required	This command is used for running the tests.
files-search	String	Required	This command gives a list of test files. You can use the AWS CodeBuild provided

Field name	Туре	Required or optional	Definition
			codebuild-glob-sea rch CLI command or any other file search tool of your choice. Note Ensure that the files-
			search command outputs file names, each separated by a new line.

Field name	Туре	Required or optional	Definition
sharding- strategy	Enum	Optional	Valid values: equal-distribution (default), stability • equal-distribution: Shard test filesevenly based ontest file names. • stability: Shard test filesusing consistent hashing of the file names.
			For more informati on, see About test splitting.

The codebuild-tests-run CLI works first to identify the list of test files using the command provided in the files-search parameter. It then determines a subset of test files designated for the current shard (environment) using the specified sharding strategy. Finally, this subset of test files is formatted into a space-separated list and appended to the end of the command provided in the test-command parameter before being executed.

For test frameworks that don't accept space-separated lists, the codebuild-tests-run CLI provides a flexible alternative through the CODEBUILD_CURRENT_SHARD_FILES environment variable. This variable contains a newline-separated list of test file paths designated for the current build shard. By leveraging this environment variable, you can easily adapt to various test framework requirements, accommodating those that expect input formats different from space-separated lists. Moreover, you can also format the test file names as per need of test framework. The following is an example of the use of CODEBUILD_CURRENT_SHARD_FILES on Linux with

the Django framework. Here CODEBUILD_CURRENT_SHARD_FILES is used to get *dot notation* file paths supported by Django:

```
codebuild-tests-run \
    -files-search "codebuild-glob-search '/tests/test_.py'" \
    -test-command 'python3 manage.py test $(echo "$CODEBUILD_CURRENT_SHARD_FILES" | sed
-E "s/\//__/g; s/\.py$//; s/__/./g")' \
    -sharding-strategy 'equal-distribution'
```

Note

Note that the CODEBUILD_CURRENT_SHARD_FILES environment variable can be used only inside the scope of the codebuild-tests-run CLI.

Also, if you are using CODEBUILD_CURRENT_SHARD_FILES inside test-command, put CODEBUILD_CURRENT_SHARD_FILES inside double quotes as shown in above example.

Use the codebuild-glob-search CLI command

AWS CodeBuild provides a built-in CLI tool called codebuild-glob-search that allows you to search for files in your working directory based on one or more glob patterns. This tool can be particularly useful when you want to run tests on specific files or directories within your project.

Usage

The codebuild-glob-search CLI has the following usage syntax:

```
codebuild-glob-search <glob_pattern1> [<glob_pattern2> ...]
```

- <glob_pattern1>, <glob_pattern2>, etc.: One or more glob patterns to match against the
 files in your working directory.
- *: Matches any sequence of characters (excluding path separators).
- **: Matches any sequence of characters (including path separators).

Note

Ensure that the glob string has quotes. To check the results of pattern-matching, use the echo command.

```
version: 0.2

phases:
   build:
    commands:
        - echo $(codebuild-glob-search '**/__tests__/*.js')
        - codebuild-glob-search '**/__tests__/*.js' | xargs -n 1 echo
```

Output

The CLI will output a newline-separated list of file paths that match the provided glob patterns. The file paths returned will be relative to the working directory.

If no files are found matching the provided patterns, the CLI will output a message indicating that no files were found.

Note that directories found due to any given pattern will be excluded from the search results.

Example

If you want to search only for files inside the tests directory and its subdirectories with a .js extension, you can use the following command with the codebuild-glob-search CLI:

```
codebuild-glob-search '**/__tests__/*.js'
```

This command will search for all files with a .js extension inside the __tests__directory and its subdirectories, as denoted by the pattern.

About test splitting

AWS CodeBuild's test splitting feature allows you to parallelize your test suite execution across multiple compute instances, reducing the overall test run time. This feature is enabled through the batch configuration in your CodeBuild project settings and the codebuild-tests-runutility in your buildspec file.

The tests are split based on the sharding strategy specified. CodeBuild provides two sharding strategies as specified below:

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Equal-distribution

The equal-distribution sharding strategy divides the tests across parallel builds based on the alphabetical order of the test file names. This approach first sorts the test files and then employs a chunk-based method to distribute them, ensuring that similar files are grouped together for testing. It is recommended when dealing with a relatively small set of test files. While this method aims to allocate an approximately equal number of files to each shard, with a maximum difference of one, it does not guarantee stability. When test files are added or removed in subsequent builds, the distribution of existing files may change, potentially causing reassignment across shards.

Stability

The stability sharding strategy employs a consistent hashing algorithm to split tests among shards, ensuring that file distribution remains stable. When new files are added or removed, this approach ensures that the existing file-to-shard assignments remain largely unchanged. For large test suites, it is recommended to use the stability option to evenly distribute the tests across shards. This mechanism aims to provide a near-equal distribution, ensuring that each shard receives a similar number of files, with only minimal variance. While the stability strategy does not guarantee an ideal equal distribution, it offers a near-equal distribution that maintains consistency in file assignments across builds, even as files are added or removed.

To enable test splitting, you need to configure the batch section in your CodeBuild project settings, specifying the desired parallelism level and other relevant parameters. Additionally, you'll need to include the codebuild-tests-run utility in your buildspec file, along with the appropriate test commands and splitting method.

Automatically merge individual build reports

In fanout batch builds, AWS CodeBuild supports automatic merging of individual build reports into a consolidated batch-level report. This feature provides a comprehensive view of test results and code coverage across all builds within a batch.

How it works

When executing fanout batch builds, each individual build generates <u>test reports</u>. CodeBuild then automatically consolidates identical reports from different builds into a unified report, which is attached to the batch build. These consolidated reports are readily accessible through the

<u>BatchGetBuildBatches</u> API's reportArns field, and can also be viewed in the **Reports** tab of the console. This merging capability extends to auto-discovered reports as well.

Consolidated reports are created under <u>report groups</u> that are either specified in the buildspec or auto-discovered by CodeBuild. You can analyze trends of the merged reports directly under these report groups, providing valuable insights into the overall build performance and quality metrics across historical builds of the same build-batch project.

For each individual build within the batch, CodeBuild automatically creates separate report groups. These follow a specific naming convention, combining the batch build report group name with a suffix of BuildFanoutShard<shard_number>, where the shard_number represents the number of the shard in which the report group is created. This organization allows you to track and analyze trends at both the consolidated and individual build levels, providing flexibility in how you monitor and evaluate their build processes.

The batch-build report follows the same structure as <u>individual build reports</u>. The following key fields in the **Report** tab are specific to batch-build reports:

Batch build report status

The status of batch build reports follows specific rules depending on the report type:

- Test reports:
 - Succeeded: Status is set to succeeded when all individual build reports have succeeded.
 - Failed: Status is set to failed if any individual build report has failed.
 - Incomplete: Status is marked as incomplete if any individual build report is missing or has an incomplete status.
- Code coverage reports:
 - Complete: Status is set to complete when all individual build reports are complete.
 - Failed: Status is set to failed if any individual build report has failed.
 - Incomplete: Status is marked as incomplete if any individual build report is missing or has an incomplete status.

Test summary

The merged test report consolidates the following fields from all individual build reports:

 duration-in-nano-seconds: Maximum test duration time in nanoseconds among all individual build reports.

• total: The combined count of all test cases, summing the total number of tests from each build.

• status-counts: Provides a consolidated view of test statuses such as passed, failed, or skipped, calculated by aggregating the count of each status type across all individual builds.

Code coverage summary

The merged code coverage report combines fields from all individual builds using the following calculations:

- branches-covered: Sum of all covered branches from individual reports.
- branches-missed: Sum of all missed branches from individual reports.
- branch-coverage-percentage: (Total covered branches / Total branches) * 100
- lines-covered: Sum of all covered lines from individual reports.
- lines-missed: Sum of all missed lines from individual reports.
- lines-coverage-percentage: (Total covered lines / Total lines) * 100

Execution ID

The batch build ARN.

Test cases

The merged report contains a consolidated list of all test cases from individual builds, accessible through both the DescribeTestCases API and the batch build report in the console.

Code coverages

The merged code coverage report provides consolidated line and branch coverage information for each file across all individual builds, accessible through both the DescribeCodeCoverages
API and the batch build report in the console. Note: For files covered by multiple test files distributed across different shards, the merged report uses the following selection criteria:

- 1. Primary selection is based on the highest line coverage among shards.
- 2. If line coverage is equal across multiple shards, the shard with the highest branch coverage is selected.

Parallel test execution for various test frameworks sample

You can use the codebuild-tests-run CLI command to split and run your tests across parallel execution environments. The following section provides buildspec.yml samples for various frameworks, illustrating the usage of the codebuild-tests-run command.

- Each example below includes a parallelism level of five, meaning that five identical execution environments will be created to split your tests across. You can choose a parallelism level to suit your project by modifying the parallelism value in the build-fanout section.
- Each example below shows configuring your tests to be split by the test file name, which is by default. This distributes the tests evenly across the parallel execution environments.

Before you get started, see Execute parallel tests in batch builds for more information.

For a full list of options when using the codebuild-tests-run CLI command, see <u>Use the</u> codebuild-tests-run CLI command.

Topics

- Configure parallel tests with Django
- Configure parallel tests with Elixir
- · Configure parallel tests with Go
- Configure parallel tests with Java (Maven)
- Configure parallel tests with Javascript (Jest)
- Configure parallel tests with Kotlin
- Configure parallel tests with PHPUnit
- Configure parallel tests with Pytest
- Configure parallel tests with Ruby (Cucumber)
- Configure parallel tests with Ruby (RSpec)

Configure parallel tests with Django

The following is sample of a buildspec.yml that shows parallel test execution with Django on an Ubuntu platform:

version: 0.2

```
batch:
  fast-fail: false
  build-fanout:
    parallelism: 5
phases:
  install:
    commands:
      - echo 'Installing Python dependencies'
      - sudo yum install -y python3 python3-pip
      - python3 -m ensurepip --upgrade
      - python3 -m pip install django
  pre_build:
    commands:
      - echo 'Prebuild'
  build:
    commands:
      - echo 'Running Django Tests'
      - |
        codebuild-tests-run \
         --test-command 'python3 manage.py test $(echo "$CODEBUILD_CURRENT_SHARD_FILES"
 | sed -E "s/\//__/g; s/\.py$//; s/__/./g")' \
         --files-search "codebuild-glob-search '**/tests/*test_*.py'" \
         --sharding-strategy 'equal-distribution'
  post_build:
    commands:
      - echo 'Test execution completed'
```

The above example shows the usage of the environment variable CODEBUILD_CURRENT_SHARD_FILES. Here CODEBUILD_CURRENT_SHARD_FILES is used to fetch dot notation file paths supported by Django. Use CODEBUILD_CURRENT_SHARD_FILES inside double quotes as shown above.

Configure parallel tests with Elixir

The following is sample of a buildspec.yml that shows parallel test execution with Elixir on an Ubuntu platform:

```
version: 0.2
batch:
```

```
fast-fail: false
  build-fanout:
    parallelism: 5
phases:
  install:
    commands:
      - echo 'Installing Elixir dependencies'
      - sudo apt update
      - sudo DEBIAN_FRONTEND=noninteractive apt install -y elixir
      - elixir --version
      - mix --version
  pre_build:
    commands:
      - echo 'Prebuild'
  build:
    commands:
      - echo 'Running Elixir Tests'
      - |
        codebuild-tests-run \
         --test-command 'mix test' \setminus
         --files-search "codebuild-glob-search '**/test/**/*_test.exs'" \
         --sharding-strategy 'equal-distribution'
  post_build:
    commands:
      - echo "Test execution completed"
```

Configure parallel tests with Go

The following is sample of a buildspec.yml that shows parallel test execution with Go on an Linux platform:

```
version: 0.2

batch:
    fast-fail: false
    build-fanout:
        parallelism: 5
        ignore-failure: false

phases:
    install:
        commands:
```

```
- echo 'Fetching Go version'
    - go version
pre_build:
  commands:
    - echo 'prebuild'
build:
  commands:
    - echo 'Running go Tests'
    - go mod init calculator
    - cd calc
    - |
      codebuild-tests-run \
       --test-command "go test -v calculator.go" \
       --files-search "codebuild-glob-search '**/*test.go'"
post_build:
  commands:
    - echo "Test execution completed"
```

In above example, calculator.go function contains simple mathematical functions to test and all test files and calculator.go file is inside calc folder.

Configure parallel tests with Java (Maven)

The following is sample of a buildspec.yml that shows parallel test execution with Java on an Linux platform:

```
version: 0.2

batch:
    fast-fail: false
    build-fanout:
        parallelism: 5
        ignore-failure: false

phases:
    pre_build:
        commands:
        - echo 'prebuild'
    build:
        commands:
        - echo "Running mvn test"
        - |
              codebuild-tests-run \
```

```
--test-command 'mvn test -Dtest=$(echo "$CODEBUILD_CURRENT_SHARD_FILES" | sed
"s|src/test/java/||g; s/\.java//g; s|/|.|g; s/ /,/g" | tr "\n" "," | sed "s/,$//")' \
--files-search "codebuild-glob-search '**/test/**/*.java'"

post_build:
    commands:
    - echo "Running post-build steps..."
    - echo "Test execution completed"
```

In the given example, the environment variable CODEBUILD_CURRENT_SHARD_FILES contains test files in the current shard, separated by newlines. These files are converted into a commaseparated list of class names in the format accepted by the -Dtest parameter for Maven.

Configure parallel tests with Javascript (Jest)

The following is sample of a buildspec.yml that shows parallel test execution with Javascript on an Ubuntu platform:

```
version: 0.2
batch:
  fast-fail: true
  build-fanout:
    parallelism: 5
    ignore-failure: false
phases:
  install:
    commands:
      - echo 'Installing Node.js dependencies'
      - apt-get update
      - apt-get install -y nodejs
      - npm install
      - npm install --save-dev jest-junit
  pre_build:
    commands:
      - echo 'prebuild'
  build:
    commands:
      - echo 'Running JavaScript Tests'
      - |
         codebuild-tests-run \
          --test-command "npx jest" \
```

```
--files-search "codebuild-glob-search '**/test/**/*.test.js'" \
--sharding-strategy 'stability'
post_build:
   commands:
   - echo 'Test execution completed'
```

Configure parallel tests with Kotlin

The following is sample of a buildspec.yml that shows parallel test execution with Kotlin on an Linux platform:

```
version: 0.2
batch:
  fast-fail: false
  build-fanout:
    parallelism: 2
    ignore-failure: false
phases:
  install:
    runtime-versions:
      java: corretto11
    commands:
      - echo 'Installing dependencies'
      - KOTLIN_VERSION="1.8.20" # Replace with your desired version
      - curl -o kotlin-compiler.zip -L "https://github.com/JetBrains/kotlin/releases/
download/v${KOTLIN_VERSION}/kotlin-compiler-${KOTLIN_VERSION}.zip"
      unzip kotlin-compiler.zip -d /usr/local
      - export PATH=$PATH:/usr/local/kotlinc/bin
      - kotlin -version
      - curl -0 https://repo1.maven.org/maven2/org/junit/platform/junit-platform-
console-standalone/1.8.2/junit-platform-console-standalone-1.8.2.jar
  pre_build:
    commands:
      - echo 'prebuild'
  build:
    commands:
      - echo 'Running Kotlin Tests'
        codebuild-tests-run \
```

```
--test-command 'kotlinc src/main/kotlin/*.kt $(echo
 "$CODEBUILD_CURRENT_SHARD_FILES" | tr "\n" " ") -d classes -cp junit-platform-console-
standalone-1.8.2.jar' \
          --files-search "codebuild-glob-search 'src/test/kotlin/*.kt'"
      - |
        codebuild-tests-run \
          --test-command '
            java -jar junit-platform-console-standalone-1.8.2.jar --class-path classes
/
              $(for file in $CODEBUILD_CURRENT_SHARD_FILES; do
                 class_name=$(basename "$file" .kt)
                 echo "--select-class $class_name"
               done)
          --files-search "codebuild-glob-search 'src/test/kotlin/*.kt'"
 post_build:
    commands:
      - echo "Test execution completed"
```

In the above example, the codebuild-tests-run CLI is used twice. During the first run, kotlinc compiles the files. The CODEBUILD_CURRENT_SHARD_FILES variable retrieves the test files assigned to the current shard, which are then converted into a space-separated list. In the second run, JUnit executes the tests. Again, CODEBUILD_CURRENT_SHARD_FILES fetches the test files assigned to the current shard, but this time they are converted into class names.

Configure parallel tests with PHPUnit

The following is sample of a buildspec.yml that shows parallel test execution with PHPUnit on an Linux platform:

```
version: 0.2

batch:
    fast-fail: false
    build-fanout:
    parallelism: 5
    ignore-failure: false

phases:
    install:
    commands:
        - echo 'Install dependencies'
```

```
- composer require --dev phpunit/phpunit
pre_build:
    commands:
        - echo 'prebuild'
build:
    commands:
        - echo 'Running phpunit Tests'
        - composer dump-autoload
        - |
            codebuild-tests-run \
              --test-command "./vendor/bin/phpunit --debug" \
              --files-search "codebuild-glob-search '**/tests/*Test.php'"
post_build:
    commands:
        - echo 'Test execution completed'
```

Configure parallel tests with Pytest

The following is sample of a buildspec.yml that shows parallel test execution with Pytest on an Ubuntu platform:

```
version: 0.2
batch:
  fast-fail: false
  build-fanout:
    parallelism: 5
    ignore-failure: false
phases:
  install:
    commands:
      - echo 'Installing Python dependencies'
      - apt-get update
      - apt-get install -y python3 python3-pip
      - pip3 install --upgrade pip
      - pip3 install pytest
  build:
    commands:
      - echo 'Running Python Tests'
      - |
         codebuild-tests-run \
          --test-command 'python -m pytest' \
```

The following is sample of a buildspec.yml that shows parallel test execution with Pytest on an Windows platform:

```
version: 0.2
batch:
  fast-fail: false
  build-fanout:
    parallelism: 5
    ignore-failure: false
phases:
  install:
    commands:
      - echo 'Installing Python dependencies'
      - pip install pytest
  pre_build:
    commands:
      - echo 'prebuild'
  build:
    commands:
      - echo 'Running pytest'
      - |
        & codebuild-tests-run `
         --test-command 'pytest @("$env:CODEBUILD_CURRENT_SHARD_FILES" -split \"`r?`n
("/
         --files-search "codebuild-glob-search '**/test_*.py' '**/*_test.py'" `
         --sharding-strategy 'equal-distribution'
  post_build:
    commands:
      - echo "Test execution completed"
```

In above example, CODEBUILD_CURRENT_SHARD_FILES environment variable is used to fetch test files assigned to current shard and passed as array to pytest command.

Configure parallel tests with Ruby (Cucumber)

The following is sample of a buildspec.yml that shows parallel test execution with Cucumber on an Linux platform:

```
version: 0.2
batch:
  fast-fail: false
  build-fanout:
    parallelism: 5
    ignore-failure: false
phases:
  install:
    commands:
      - echo 'Installing Ruby dependencies'
      - gem install bundler
      - bundle install
  pre_build:
    commands:
      - echo 'prebuild'
  build:
    commands:
      - echo 'Running Cucumber Tests'
      - cucumber --init
        codebuild-tests-run \
         --test-command "cucumber" \
         --files-search "codebuild-glob-search '**/*.feature'"
  post_build:
    commands:
      - echo "Test execution completed"
```

Configure parallel tests with Ruby (RSpec)

The following is sample of a buildspec.yml that shows parallel test execution with RSpec on an Ubuntu platform:

```
version: 0.2 batch:
```

```
fast-fail: false
  build-fanout:
    parallelism: 5
    ignore-failure: false
phases:
  install:
    commands:
      - echo 'Installing Ruby dependencies'
      - apt-get update
      - apt-get install -y ruby ruby-dev build-essential
      - gem install bundler
      - bundle install
  build:
    commands:
      - echo 'Running Ruby Tests'
      - 1
         codebuild-tests-run \
          --test-command 'bundle exec rspec' \
          --files-search "codebuild-glob-search 'spec/**/*_spec.rb'" \
          --sharding-strategy 'equal-distribution'
  post_build:
    commands:
      - echo "Test execution completed"
```

Cache builds to improve performance

You can save time when your project builds by using a cache. A cache can store reusable pieces of your build environment and use them across multiple builds. Your build project can use one of two types of caching: Amazon S3 or local. If you use a local cache, you must choose one or more of three cache modes: source cache, Docker layer cache, and custom cache.



Docker layer cache mode is available for the Linux environment only. If you choose this mode, you must run your build in privileged mode. CodeBuild projects granted privileged mode grants its container access to all devices. For more information, see Runtime privilege and Linux capabilities on the Docker Docs website.

Topics

Cache builds API Version 2016-10-06 623

- Amazon S3 caching
- Local caching
- Specify a local cache

Amazon S3 caching

Amazon S3 caching stores the cache in an Amazon S3 bucket that is available across multiple build hosts. This is a good option for small to intermediate sized build artifacts that are more expensive to build than to download.

To use Amazon S3 in a build, you can specify the paths for the files you want to cache in buildspec.yml. CodeBuild will automatically store and update the cache to the Amazon S3 location configured on the project. If you don't specify the file paths, CodeBuild will best-effort cache common language dependencies to help you speed up the builds. You can view the cache details in the build logs.

Additionally, if you want to have multiple versions of cache, you can define a cache key in the buildspec.yml. CodeBuild stores the cache under the context of this cache key, and create a unique cache copy that will not be updated once created. The cache keys can be shared across projects as well. Features such as dynamic keys, cache versioning, and cache sharing across builds are only available when a key is specified.

To learn more about the cache syntax in buildspec file, see cache in the buildspec reference.

Topics

- Generate dynamic keys
- codebuild-hash-files
- Cache version
- Cache sharing between projects
- Buildspec examples

Generate dynamic keys

A cache key can include shell commands and environment variables to make it unique, enabling automatic cache updates when key changes. For example, you can define a key using the hash of the package-lock.json file. When the dependencies in that file change, the hash—and therefore the cache key—changes, triggering the automatic creation of a new cache.

```
cache:
    key: npm-key-$(codebuild-hash-files package-lock.json)
```

CodeBuild will evaluate the expression \$(codebuild-hash-files package-lock.json) to get the final key:

```
npm-key-abc123
```

You can also define a cache key using environment variables, such as CODEBUILD_RESOLVED_SOURCE_VERSION. This ensures that whenever your source changes, a new key is generated, resulting in a new cache being saved automatically:

```
cache:
   key: npm-key-$CODEBUILD_RESOLVED_SOURCE_VERSION
```

CodeBuild will evaluate the expression and get the final key:

```
npm-key-046e8b67481d53bdc86c3f6affdd5d1afae6d369
```

codebuild-hash-files

codebuild-hash-files is a CLI tool that calculates a SHA-256 hash for a set of files in the CodeBuild source directory using glob patterns:

```
codebuild-hash-files <glob-pattern-1> <glob-pattern-2> ...
```

Here are some examples using codebuild-hash-files:

```
codebuild-hash-files package-lock.json
codebuild-hash-files '**/*.md'
```

Cache version

The cache version is a hash generated from the paths of the directories being cached. If two caches have different versions, they are treated as distinct caches during the matching process. For example, the following two caches are considered different because they reference different paths:

```
version: 0.2
```

```
phases:
    build:
    commands:
        - pip install pandas==2.2.3 --target pip-dependencies
cache:
    key: pip-dependencies
    paths:
        - "pip-dependencies/**/*"
```

```
version: 0.2

phases:
    build:
    commands:
        - pip install pandas==2.2.3 --target tmp/pip-dependencies
cache:
    key: pip-dependencies
    paths:
        - "tmp/pip-dependencies/**/*"
```

Cache sharing between projects

You can use the cacheNamespace API field under the cache section to share a cache across multiple projects. This field defines the scope of the cache. To share a cache, must do the following:

- Use the same cacheNamespace.
- Specify the same cache key.
- Define identical cache paths.
- Use the same Amazon S3 buckets and pathPrefix if set.

This ensures consistency and enables cache sharing across projects.

Specify a cache namespace (console)

- Open the AWS CodeBuild console at https://console.aws.amazon.com/codesuite/codebuild/
 home.
- Choose Create project. For information, see <u>Create a build project (console)</u> and <u>Run a build</u> (console).
- 3. In Artifacts, choose Additional configuration.

- 4. For Cache type, choose Amazon S3.
- 5. For **Cache namespace optional**, enter a namespace value.

▼ Additional configuration Cache, encryption key Encryption key - optional Provide the AWS KMS customer master key used to encrypt this build's output artifacts. The default is your AWS-managed customer master key for \$3.		
Provide the AWS KMS customer master key used to encrypt this build's output artifacts. The default is your AWS-managed customer master key for S3. arm:aws:kms: <region-id>:<account-id>:key/<key-id> Cache type</key-id></account-id></region-id>		
Cache type Amazon S3 Cache bucket Q	Provide the AWS KMS customer master key used to encrypt this build's output artifacts. The default is y	our AWS-managed customer master
Cache type Amazon S3 Cache bucket Q		
Amazon S3 Cache bucket Q	arn:aws:kms: <region-id>:<account-id>:key/<key-id></key-id></account-id></region-id>	
Cache bucket Q	Cache type	_
Q	Amazon S3 ▼	
	Cache bucket	
Cache path prefix - optional	Q	
	Cache path prefix - <i>optional</i>	_
Cache lifecycle (days) - optional	Cache lifecycle (days) - optional	
You can apply a lifecycle expiration action to all or a subset of objects in the cache bucket based on the path prefix.	You can apply a lifecycle expiration action to all or a subset of objects in the cache bucket based on the	path prefix.
+ Add expiration	+ Add expiration	
Cache namespace - optional	Cache namespace - optional	
test-cache-namespace	test-cache-namespace	
Provide a cache namespace if you want to share caches across projects.	Provide a cache namespace if you want to share caches across projects.	

6. Continue with the default values and then choose Create build project.

Specify a cache namespace (AWS CLI)

You can use the the --cache parameter in the AWS CLI to specify a cache namespace.

```
--cache '{"type": "S3", "location": "your-s3-bucket", "cacheNamespace": "test-cache-namespace"}'
```

Buildspec examples

Here are several buildspec examples for common languages:

Topics

- Cache Node.js dependencies
- Cache Python dependencies
- Cache Ruby dependencies
- Cache Go dependencies

Cache Node.js dependencies

If your project includes a package-lock.json file and uses npm to manage Node.js dependencies, the following example shows how to set up caching. By default, npm installs dependencies into the node_modules directory.

Cache Python dependencies

If your project includes a requirements.txt file and uses pip to manage Python dependencies, the following example demonstrates how to configure caching. By default, pip installs packages into the system's site-packages directory.

```
version: 0.2

phases:
    build:
    commands:
        - pip install -r requirements.txt
cache:
    key: python-$(codebuild-hash-files requirements.txt)
    paths:
```

```
- "/root/.pyenv/versions/${python_version}/lib/python${python_major_version}/site-packages/**/*"
```

Additionally, you can install dependencies into a specific directory and configure caching for that directory.

Cache Ruby dependencies

If your project includes a Gemfile.lock file and uses Bundler to manage gem dependencies, the following example demonstrates how to configure caching effectively.

```
version: 0.2

phases:
   build:
      commands:
      - bundle install --path vendor/bundle
cache:
   key: ruby-$(codebuild-hash-files Gemfile.lock)
   paths:
      - "vendor/bundle/**/*"
```

Cache Go dependencies

If your project includes a go. sum file and uses Go modules to manage dependencies, the following example demonstrates how to configure caching. By default, Go modules are downloaded and stored in the \${GOPATH}/pkg/mod directory.

```
version: 0.2
```

```
phases:
   build:
    commands:
        - go mod download

cache:
   key: go-$(codebuild-hash-files go.sum)
   paths:
        - "/go/pkg/mod/**/*"
```

Local caching

Local caching stores a cache locally on a build host that is available to that build host only. This is a good option for intermediate to large build artifacts because the cache is immediately available on the build host. This is not the best option if your builds are infrequent. This means that build performance is not impacted by network transfer time.

If you choose local caching, you must choose one or more of the following cache modes:

- Source cache mode caches Git metadata for primary and secondary sources. After the cache is created, subsequent builds pull only the change between commits. This mode is a good choice for projects with a clean working directory and a source that is a large Git repository. If you choose this option and your project does not use a Git repository (AWS CodeCommit, GitHub, GitHub Enterprise Server, or Bitbucket), the option is ignored.
- Docker layer cache mode caches existing Docker layers. This mode is a good choice for projects that build or pull large Docker images. It can prevent the performance issues caused by pulling large Docker images down from the network.

Note

- You can use a Docker layer cache in the Linux environment only.
- The privileged flag must be set so that your project has the required Docker permissions.

By default, Docker daemon is enabled for non-VPC builds. If you would like to use Docker containers for VPC builds, see Runtime Privilege and Linux Capabilities on the Docker Docs website and enable privileged mode. Also, Windows does not support privileged mode.

• You should consider the security implication before you use a Docker layer cache.

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• Custom cache mode caches directories you specify in the buildspec file. This mode is a good choice if your build scenario is not suited to one of the other two local cache modes. If you use a custom cache:

- Only directories can be specified for caching. You cannot specify individual files.
- Symlinks are used to reference cached directories.
- Cached directories are linked to your build before it downloads its project sources. Cached items overrides source items if they have the same name. Directories are specified using cache paths in the buildspec file. For more information, see Buildspec syntax.
- Avoid directory names that are the same in the source and in the cache. Locally-cached directories may override, or delete the contents of, directories in the source repository that have the same name.

Note

Local caching is not supported with the LINUX_GPU_CONTAINER environment type and the BUILD_GENERAL1_2XLARGE compute type. For more information, see <u>Build</u> environment compute modes and types.

Note

Local caching is not supported when you configure CodeBuild to work with a VPC. For more information on using VPCs with CodeBuild, see <u>Use AWS CodeBuild with Amazon Virtual</u> Private Cloud.

Specify a local cache

You can use the AWS CLI, console, SDK, or AWS CloudFormation to specify a local cache. For more information about local caching, see Local caching.

Topics

- Specify local caching (CLI)
- Specify local caching (console)
- Specify local caching (AWS CloudFormation)

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Specify local caching (CLI)

You can use the the --cache parameter in the AWS CLI to specify each of the three local cache types.

• To specify a source cache:

```
--cache type=LOCAL,mode=[LOCAL_SOURCE_CACHE]
```

• To specify a Docker layer cache:

```
--cache type=LOCAL,mode=[LOCAL_DOCKER_LAYER_CACHE]
```

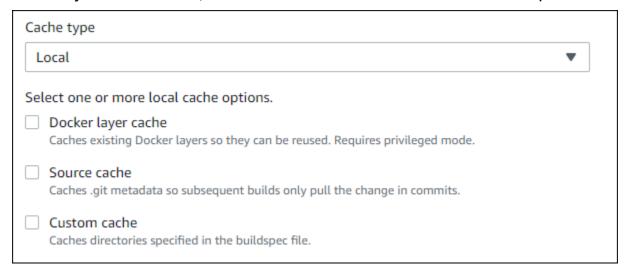
• To specify a custom cache:

```
--cache type=LOCAL,mode=[LOCAL_CUSTOM_CACHE]
```

For more information, see Create a build project (AWS CLI).

Specify local caching (console)

You specify a cache in the **Artifacts** section of the console. For **Cache type**, choose **Amazon S3** or **Local**. If you choose **Local**, choose one or more of the three local cache options.



For more information, see Create a build project (console).

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Specify local caching (AWS CloudFormation)

If you use AWS CloudFormation to specify a local cache, on the Cache property, for Type, specify LOCAL. The following sample YAML-formatted AWS CloudFormation code specifies all three local cache types. You can specify any combination of the types. If you use a Docker layer cache, under Environment, you must set PrivilegedMode to true and Type to LINUX_CONTAINER.

```
CodeBuildProject:
    Type: AWS::CodeBuild::Project
    Properties:
      Name: MyProject
      ServiceRole: <service-role>
      Artifacts:
        Type: S3
        Location: <bucket-name>
        Name: myArtifact
        EncryptionDisabled: true
        OverrideArtifactName: true
      Environment:
        Type: LINUX_CONTAINER
        ComputeType: BUILD_GENERAL1_SMALL
        Image: aws/codebuild/standard:5.0
        Certificate: <bucket/cert.zip>
        # PrivilegedMode must be true if you specify LOCAL_DOCKER_LAYER_CACHE
        PrivilegedMode: true
      Source:
        Type: GITHUB
        Location: <github-location>
        InsecureSsl: true
        GitCloneDepth: 1
        ReportBuildStatus: false
      TimeoutInMinutes: 10
      Cache:
        Type: LOCAL
        Modes: # You can specify one or more cache mode,
          - LOCAL_CUSTOM_CACHE
          - LOCAL_DOCKER_LAYER_CACHE
          - LOCAL_SOURCE_CACHE
```

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Note

By default, Docker daemon is enabled for non-VPC builds. If you would like to use Docker containers for VPC builds, see Runtime Privilege and Linux Capabilities on the Docker Docs website and enable privileged mode. Also, Windows does not support privileged mode.

For more information, see Create a build project (AWS CloudFormation).

Debug builds in AWS CodeBuild

AWS CodeBuild provides two methods for debugging builds during development and troubleshooting. You can use the CodeBuild Sandbox environment to investigate issues and validate fixes in real-time, or you can use AWS Systems Manager Session Manager to connect to the build container and view the container state.

Debug builds with CodeBuild sandbox

The CodeBuild sandbox environment provides an interactive debug session in a secure and isolated environment. You can interact with the environment directly through the AWS Management Console or AWS CLI, execute commands, and validate your build process step by step. It uses a cost-effective per-second billing model and supports the same native integration with source providers and AWS services as your build environment. You can also connect to a sandbox environment using SSH clients or from your integrated development environments (IDEs).

To learn more about the CodeBuild sandbox pricing, visit the CodeBuild pricing documentation. For detailed instructions, visit the Debug builds with CodeBuild sandbox documentation.

Debug builds with Session Manager

AWS Systems Manager Session Manager enables direct access to running builds in their actual execution environment. This approach allows you to connect to active build containers and inspect the build process in real-time. You can examine the file system, monitor running processes, and troubleshoot issues as they occur.

For detailed instructions, visit the Debug builds with Session Manager documentation.

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Debug builds with CodeBuild sandbox

In AWS CodeBuild, you can debug a build by using CodeBuild sandbox to run custom commands and troubleshoot your build.

Topics

- Prerequisites
- Debug builds with CodeBuild sandbox (console)
- Debug builds with CodeBuild sandbox (AWS CLI)
- Tutorial: Connecting to a sandbox using SSH
- Troubleshooting AWS CodeBuild sandbox SSH connection issues

Prerequisites

Before using a CodeBuild sandbox, make sure that your CodeBuild service role has the following SSM policy:

```
{
   "Version": "2012-10-17",
   "Statement": [
     {
       "Effect": "Allow",
       "Action": [
          "ssmmessages:CreateControlChannel",
          "ssmmessages:CreateDataChannel",
          "ssmmessages:OpenControlChannel",
          "ssmmessages:OpenDataChannel"
       ],
       "Resource": "*"
     },
     {
       "Effect": "Allow",
       "Action": [
          "ssm:StartSession"
       ],
       "Resource": [
          "arn:aws:codebuild:<region>:<account-id>:build/*",
          "arn:aws:ssm:<region>::document/AWS-StartSSHSession"
       ]
```

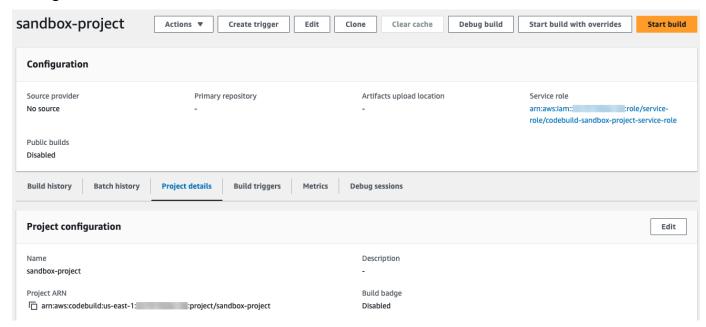
```
}
]
}
```

Debug builds with CodeBuild sandbox (console)

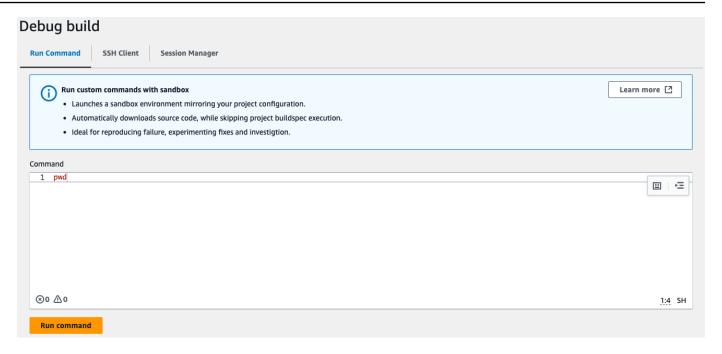
Use the following instructions to run commands and connect your SSH client with CodeBuild sandbox in the console.

Run commands with CodeBuild sandbox (console)

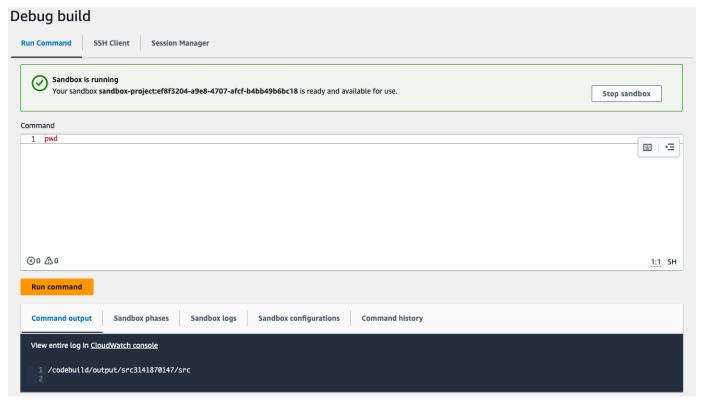
- Open the AWS CodeBuild console at https://console.aws.amazon.com/codesuite/codebuild/ home.
- In the navigation pane, choose Build projects. Choose the build project, and then choose Debug build.



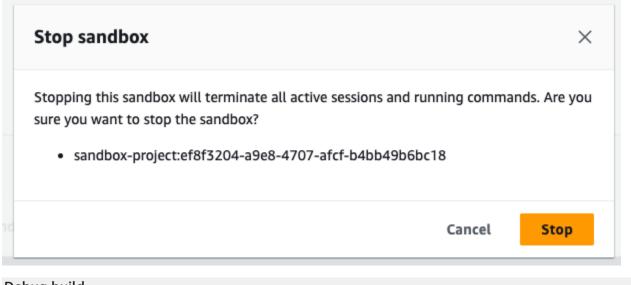
3. In the **Run command** tab, enter your custom commands, and then choose **Run command**.

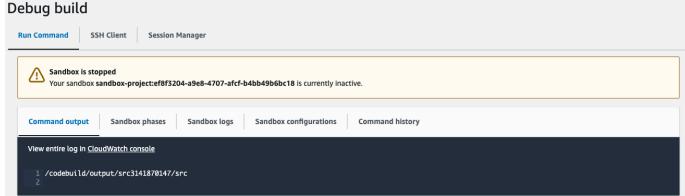


4. Your CodeBuild sandbox will then be initialized and start running your custom commands. The output will be shown in the **Output** tab when it's completed.



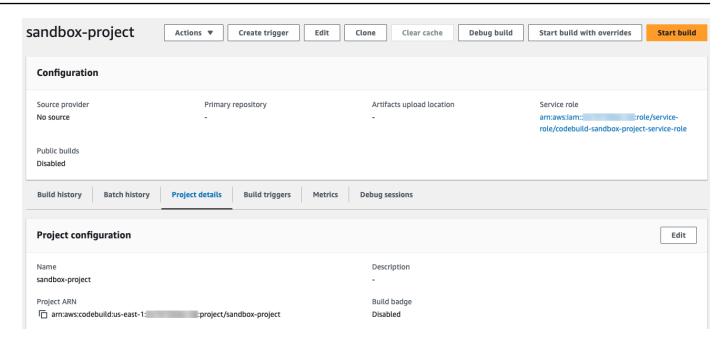
5. When troubleshooting is completed, you can stop the sandbox by choosing **Stop sandbox**. Then choose **Stop** to confirm that your sandbox will be stopped.





Connect to your SSH client with CodeBuild sandbox (console)

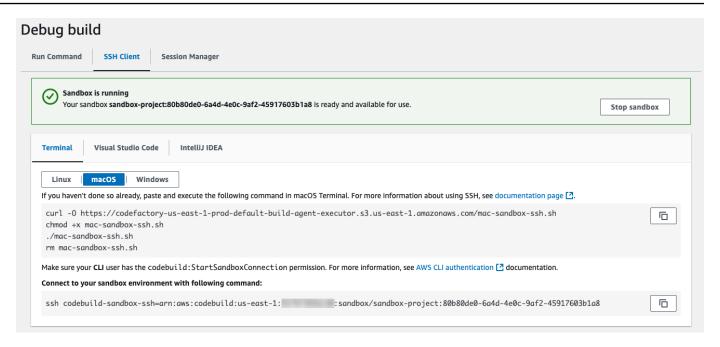
- 1. Open the AWS CodeBuild console at https://console.aws.amazon.com/codesuite/codebuild/ home.
- 2. In the navigation pane, choose **Build projects**. Choose the build project, and then choose **Debug build**.



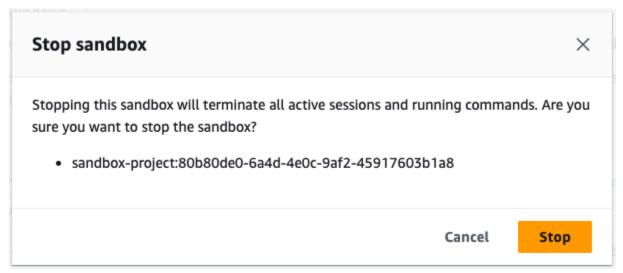
3. In the **SSH Client** tab and choose **Start sandbox**.

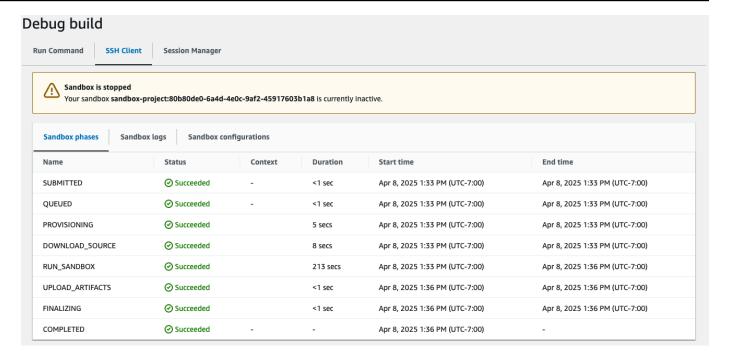


4. After the CodeBuild sandbox starts running, follow the console instructions to connect your SSH client with the sandbox.



5. When troubleshooting is completed, you can stop the sandbox by choosing **Stop sandbox**. Then choose **Stop** to confirm that your sandbox will be stopped.





Debug builds with CodeBuild sandbox (AWS CLI)

Use the following instructions to run commands and connect your SSH client with CodeBuild sandbox.

Start a CodeBuild sandbox (AWS CLI)

CLI command

```
aws codebuild start-sandbox --project-name $PROJECT_NAME
```

• --project-name : CodeBuild project name

Sample request

```
aws codebuild start-sandbox --project-name "project-name"
```

```
{
    "id": "project-name",
    "arn": "arn:aws:codebuild:us-west-2:962803963624:sandbox/project-name",
    "projectName": "project-name",
```

```
"requestTime": "2025-02-06T11:24:15.560000-08:00",
    "status": "QUEUED",
    "source": {
        "type": "S3",
        "location": "arn:aws:s3:::cofa-e2e-test-1-us-west-2-beta-default-build-
sources/eb-sample-jetty-v4.zip",
        "insecureSsl": false
    },
    "environment": {
        "type": "LINUX_CONTAINER",
        "image": "aws/codebuild/standard:6.0",
        "computeType": "BUILD_GENERAL1_SMALL",
        "environmentVariables": [{
                "name": "foo",
                "value": "bar",
                "type": "PLAINTEXT"
            },
            {
                "name": "bar",
                "value": "baz",
                "type": "PLAINTEXT"
            }
        ],
        "privilegedMode": false,
        "imagePullCredentialsType": "CODEBUILD"
    },
    "timeoutInMinutes": 10,
    "queuedTimeoutInMinutes": 480,
    "logConfig": {
        "cloudWatchLogs": {
            "status": "ENABLED",
            "groupName": "group",
            "streamName": "stream"
        },
        "s3Logs": {
            "status": "ENABLED",
            "location": "codefactory-test-pool-1-us-west-2-beta-default-build-logs",
            "encryptionDisabled": false
        }
    },
    "encryptionKey": "arn:aws:kms:us-west-2:962803963624:alias/SampleEncryptionKey",
    "serviceRole": "arn:aws:iam::962803963624:role/BuildExecutionServiceRole",
    "currentSession": {
        "id": "0103e0e7-52aa-4a3d-81dd-bfc27226fa54",
```

```
"currentPhase": "QUEUED",
        "status": "QUEUED",
        "startTime": "2025-02-06T11:24:15.626000-08:00",
        "logs": {
            "groupName": "group",
            "streamName": "stream/0103e0e7-52aa-4a3d-81dd-bfc27226fa54",
            "deepLink": "https://console.aws.amazon.com/cloudwatch/home?
region=us-west-2#logsV2:log-groups/log-group/group/log-events/stream
$252F0103e0e7-52aa-4a3d-81dd-bfc27226fa54",
            "s3DeepLink": "https://s3.console.aws.amazon.com/s3/object/
codefactory-test-pool-1-us-west-2-beta-default-build-logs/0103e0e7-52aa-4a3d-81dd-
bfc27226fa54.gz?region=us-west-2",
            "cloudWatchLogsArn": "arn:aws:logs:us-west-2:962803963624:log-
group:group:log-stream:stream/0103e0e7-52aa-4a3d-81dd-bfc27226fa54",
            "s3LogsArn": "arn:aws:s3:::codefactory-test-pool-1-us-west-2-beta-
default-build-logs/0103e0e7-52aa-4a3d-81dd-bfc27226fa54.gz",
            "cloudWatchLogs": {
                "status": "ENABLED",
                "groupName": "group",
                "streamName": "stream"
            },
            "s3Logs": {
                "status": "ENABLED",
                "location": "codefactory-test-pool-1-us-west-2-beta-default-build-
logs",
                "encryptionDisabled": false
            }
        }
    }
}
```

Get information about the sandbox status (AWS CLI)

CLI command

```
aws codebuild batch-get-sandboxes --ids $SANDBOX_IDs
```

Sample request

```
aws codebuild stop-sandbox --id "arn:aws:codebuild:us-west-2:962803963624:sandbox/
project-name"
```

• --ids: Comma separated list of sandboxIds or sandboxArns.

You can either provide a sandbox ID or a sandbox ARN:

Sandbox ID: <codebuild-project-name>: <UUID>

For example, project-name:d25be134-05cb-404a-85da-ac5f85d2d72c.

Sandbox ARN: arn:aws:codebuild:<region>:<account-id>:sandbox/<codebuild-project-name>:<UUID>

For example, arn:aws:codebuild:us-west-2:962803963624:sandbox/project-name:d25be134-05cb-404a-85da-ac5f85d2d72c.

```
{
    "sandboxes": [{
        "id": "project-name",
        "arn": "arn:aws:codebuild:us-west-2:962803963624:sandbox/project-name",
        "projectName": "project-name",
        "requestTime": "2025-02-06T11:24:15.560000-08:00",
        "endTime": "2025-02-06T11:39:21.587000-08:00",
        "status": "STOPPED",
        "source": {
            "type": "S3",
            "location": "arn:aws:s3:::cofa-e2e-test-1-us-west-2-beta-default-build-
sources/eb-sample-jetty-v4.zip",
            "insecureSsl": false
        },
        "environment": {
            "type": "LINUX_CONTAINER",
            "image": "aws/codebuild/standard:6.0",
            "computeType": "BUILD_GENERAL1_SMALL",
            "environmentVariables": [{
                    "name": "foo",
                    "value": "bar",
                    "type": "PLAINTEXT"
                },
                {
                    "name": "bar",
                    "value": "baz",
```

```
"type": "PLAINTEXT"
                }
            ],
            "privilegedMode": false,
            "imagePullCredentialsType": "CODEBUILD"
        },
        "timeoutInMinutes": 10,
        "queuedTimeoutInMinutes": 480,
        "logConfig": {
            "cloudWatchLogs": {
                "status": "ENABLED",
                "groupName": "group",
                "streamName": "stream"
            },
            "s3Logs": {
                "status": "ENABLED",
                "location": "codefactory-test-pool-1-us-west-2-beta-default-build-
logs",
                "encryptionDisabled": false
            }
        },
        "encryptionKey": "arn:aws:kms:us-west-2:962803963624:alias/
SampleEncryptionKey",
        "serviceRole": "arn:aws:iam::962803963624:role/BuildExecutionServiceRole",
        "currentSession": {
            "id": "0103e0e7-52aa-4a3d-81dd-bfc27226fa54",
            "currentPhase": "COMPLETED",
            "status": "STOPPED",
            "startTime": "2025-02-06T11:24:15.626000-08:00",
            "endTime": "2025-02-06T11:39:21.600000-08:00",
            "phases": [{
                    "phaseType": "SUBMITTED",
                    "phaseStatus": "SUCCEEDED",
                    "startTime": "2025-02-06T11:24:15.577000-08:00",
                    "endTime": "2025-02-06T11:24:15.606000-08:00",
                    "durationInSeconds": 0
                },
                {
                    "phaseType": "QUEUED",
                    "phaseStatus": "SUCCEEDED",
                    "startTime": "2025-02-06T11:24:15.606000-08:00",
                    "endTime": "2025-02-06T11:24:16.067000-08:00",
                    "durationInSeconds": 0
                },
```

```
{
                    "phaseType": "PROVISIONING",
                    "phaseStatus": "SUCCEEDED",
                    "startTime": "2025-02-06T11:24:16.067000-08:00",
                    "endTime": "2025-02-06T11:24:20.519000-08:00",
                    "durationInSeconds": 4,
                    "contexts": [{
                        "statusCode": "",
                         "message": ""
                    }]
                },
                {
                    "phaseType": "DOWNLOAD_SOURCE",
                    "phaseStatus": "SUCCEEDED",
                    "startTime": "2025-02-06T11:24:20.519000-08:00",
                    "endTime": "2025-02-06T11:24:22.238000-08:00",
                    "durationInSeconds": 1,
                    "contexts": [{
                        "statusCode": "",
                        "message": ""
                    }]
                },
                {
                    "phaseType": "RUNNING_SANDBOX",
                    "phaseStatus": "TIMED_OUT",
                    "startTime": "2025-02-06T11:24:22.238000-08:00",
                    "endTime": "2025-02-06T11:39:21.560000-08:00",
                    "durationInSeconds": 899,
                    "contexts": [{
                         "statusCode": "BUILD_TIMED_OUT",
                         "message": "Build has timed out. "
                    }]
                },
                {
                    "phaseType": "COMPLETED",
                    "startTime": "2025-02-06T11:39:21.560000-08:00"
                }
            ],
            "logs": {
                "groupName": "group",
                "streamName": "stream/0103e0e7-52aa-4a3d-81dd-bfc27226fa54",
                "deepLink": "https://console.aws.amazon.com/cloudwatch/
home?region=us-west-2#logsV2:log-groups/log-group/group/log-events/stream
$252F0103e0e7-52aa-4a3d-81dd-bfc27226fa54",
```

```
"s3DeepLink": "https://s3.console.aws.amazon.com/s3/object/
codefactory-test-pool-1-us-west-2-beta-default-build-logs/0103e0e7-52aa-4a3d-81dd-
bfc27226fa54.gz?region=us-west-2",
                "cloudWatchLogsArn": "arn:aws:logs:us-west-2:962803963624:log-
group:group:log-stream:stream/0103e0e7-52aa-4a3d-81dd-bfc27226fa54",
                "s3LogsArn": "arn:aws:s3:::codefactory-test-pool-1-us-west-2-beta-
default-build-logs/0103e0e7-52aa-4a3d-81dd-bfc27226fa54.gz",
                "cloudWatchLogs": {
                    "status": "ENABLED",
                    "groupName": "group",
                    "streamName": "stream"
                },
                "s3Logs": {
                    "status": "ENABLED",
                    "location": "codefactory-test-pool-1-us-west-2-beta-default-
build-logs",
                    "encryptionDisabled": false
                }
            }
        }
    }],
    "sandboxesNotFound": []
}
```

Stop a sandbox (AWS CLI)

CLI command

```
aws codebuild stop-sandbox --id $SANDBOX-ID
```

• --id: A sandboxId or sandboxArn.

Sample request

```
aws codebuild stop-sandbox --id "arn:aws:codebuild:us-west-2:962803963624:sandbox/
project-name"
```

```
{
    "id": "project-name",
```

```
"arn": "arn:aws:codebuild:us-west-2:962803963624:sandbox/project-name",
    "projectName": "project-name",
    "requestTime": "2025-02-06T11:24:15.560000-08:00",
    "status": "STOPPING",
    "source": {
        "type": "S3",
        "location": "arn:aws:s3:::cofa-e2e-test-1-us-west-2-beta-default-build-
sources/eb-sample-jetty-v4.zip",
        "insecureSsl": false
    },
    "environment": {
        "type": "LINUX_CONTAINER",
        "image": "aws/codebuild/standard:6.0",
        "computeType": "BUILD_GENERAL1_SMALL",
        "environmentVariables": [{
                "name": "foo",
                "value": "bar",
                "type": "PLAINTEXT"
            },
            {
                "name": "bar",
                "value": "baz",
                "type": "PLAINTEXT"
            }
        ],
        "privilegedMode": false,
        "imagePullCredentialsType": "CODEBUILD"
    },
    "timeoutInMinutes": 10,
    "queuedTimeoutInMinutes": 480,
    "logConfig": {
        "cloudWatchLogs": {
            "status": "ENABLED",
            "groupName": "group",
            "streamName": "stream"
        },
        "s3Logs": {
            "status": "ENABLED",
            "location": "codefactory-test-pool-1-us-west-2-beta-default-build-logs",
            "encryptionDisabled": false
        }
    "encryptionKey": "arn:aws:kms:us-west-2:962803963624:alias/SampleEncryptionKey",
    "serviceRole": "arn:aws:iam::962803963624:role/BuildExecutionServiceRole",
```

```
"currentSession": {
    "id": "0103e0e7-52aa-4a3d-81dd-bfc27226fa54",
    "currentPhase": "RUN_SANDBOX",
    "status": "STOPPING",
    "startTime": "2025-02-06T11:24:15.626000-08:00",
    "phases": [{
            "phaseType": "SUBMITTED",
            "phaseStatus": "SUCCEEDED",
            "startTime": "2025-02-08T14:33:26.144000-08:00",
            "endTime": "2025-02-08T14:33:26.173000-08:00",
            "durationInSeconds": 0
        },
        {
            "phaseType": "QUEUED",
            "phaseStatus": "SUCCEEDED",
            "startTime": "2025-02-08T14:33:26.173000-08:00",
            "endTime": "2025-02-08T14:33:26.702000-08:00",
            "durationInSeconds": 0
        },
        {
            "phaseType": "PROVISIONING",
            "phaseStatus": "SUCCEEDED",
            "startTime": "2025-02-08T14:33:26.702000-08:00",
            "endTime": "2025-02-08T14:33:30.530000-08:00",
            "durationInSeconds": 3,
            "contexts": [{
                "statusCode": "",
                "message": ""
            }]
        },
        {
            "phaseType": "DOWNLOAD_SOURCE",
            "phaseStatus": "SUCCEEDED",
            "startTime": "2025-02-08T14:33:30.530000-08:00",
            "endTime": "2025-02-08T14:33:33.478000-08:00",
            "durationInSeconds": 2,
            "contexts": [{
                "statusCode": "",
                "message": ""
            }]
        },
        {
            "phaseType": "RUN_SANDBOX",
            "startTime": "2025-02-08T14:33:33.478000-08:00"
```

```
}
        ],
        "logs": {
            "groupName": "group",
            "streamName": "stream/0103e0e7-52aa-4a3d-81dd-bfc27226fa54",
            "deepLink": "https://console.aws.amazon.com/cloudwatch/home?
region=us-west-2#logsV2:log-groups/log-group/group/log-events/stream
$252F0103e0e7-52aa-4a3d-81dd-bfc27226fa54",
            "s3DeepLink": "https://s3.console.aws.amazon.com/s3/object/
codefactory-test-pool-1-us-west-2-beta-default-build-logs/0103e0e7-52aa-4a3d-81dd-
bfc27226fa54.gz?region=us-west-2",
            "cloudWatchLogsArn": "arn:aws:logs:us-west-2:962803963624:log-
group:group:log-stream:stream/0103e0e7-52aa-4a3d-81dd-bfc27226fa54",
            "s3LogsArn": "arn:aws:s3:::codefactory-test-pool-1-us-west-2-beta-
default-build-logs/0103e0e7-52aa-4a3d-81dd-bfc27226fa54.gz",
            "cloudWatchLogs": {
                "status": "ENABLED",
                "groupName": "group",
                "streamName": "stream"
            },
            "s3Logs": {
                "status": "ENABLED",
                "location": "codefactory-test-pool-1-us-west-2-beta-default-build-
logs",
                "encryptionDisabled": false
            }
        }
    }
}
```

Start a command execution (AWS CLI)

CLI command

```
aws codebuild start-command-execution --command COMMAND --type TYPE --sandbox-id SANDBOX-ID
```

- -- command: The command that needs to be executed.
- --sandbox-id: A sandboxId or sandboxArn.
- --type: The command type, SHELL.

Sample request

```
aws codebuild start-command-execution --command "echo "Hello World"" --type SHELL --sandbox-id "arn:aws:codebuild:us-west-2:962803963624:sandbox/project-name
```

```
{
    "id": "e1c658c2-02bb-42a8-9abb-94835241fcd6",
    "sandboxId": "f7126a4a-b0d5-452f-814c-fea73718f805",
    "submitTime": "2025-02-06T20:12:02.683000-08:00",
    "status": "SUBMITTED",
    "command": "echo \"Hello World\"",
    "type": "SHELL",
    "logs": {
        "groupName": "group",
        "streamName": "stream",
        "deepLink": "https://console.aws.amazon.com/cloudwatch/home?region=us-
west-2#logsV2:log-groups/log-group/group/log-events/stream",
        "s3DeepLink": "https://s3.console.aws.amazon.com/s3/object/codefactory-test-
pool-1-us-west-2-beta-default-build-logs/f7126a4a-b0d5-452f-814c-fea73718f805.gz?
region=us-west-2",
        "cloudWatchLogsArn": "arn:aws:logs:us-west-2:962803963624:log-
group:group:log-stream:stream",
        "s3LogsArn": "arn:aws:s3:::codefactory-test-pool-1-us-west-2-beta-default-
build-logs/f7126a4a-b0d5-452f-814c-fea73718f805.gz",
        "cloudWatchLogs": {
            "status": "ENABLED",
            "groupName": "group",
            "streamName": "stream"
        },
        "s3Logs": {
            "status": "ENABLED",
            "location": "codefactory-test-pool-1-us-west-2-beta-default-build-logs",
            "encryptionDisabled": false
        }
    }
}
```

Get information about the command executions (AWS CLI)

CLI command

```
aws codebuild batch-get-command-executions --command-execution-ids $COMMAND-IDs --sandbox-id $SANDBOX-IDs
```

- --command-execution-ids: Comma separated list of commandExecutionIds.
- --sandbox-id: A sandboxId or sandboxArn.

Sample request

```
aws codebuild batch-get-command-executions --command-execution-ids"c3c085ed-5a8f-4531-8e95-87d547f27ffd" --sandbox-id "arn:aws:codebuild:us-west-2:962803963624:sandbox/project-name"
```

```
{
    "commandExecutions": [{
        "id": "c3c085ed-5a8f-4531-8e95-87d547f27ffd",
        "sandboxId": "cd71e456-2a4c-4db4-ada5-da892b0bba05",
        "submitTime": "2025-02-10T20:18:17.118000-08:00",
        "startTime": "2025-02-10T20:18:17.939000-08:00",
        "endTime": "2025-02-10T20:18:17.976000-08:00",
        "status": "SUCCEEDED",
        "command": "echo \"Hello World\"",
        "type": "SHELL",
        "exitCode": "0",
        "standardOutputContent": "Hello World\n",
        "logs": {
            "groupName": "group",
            "streamName": "stream",
            "deepLink": "https://console.aws.amazon.com/cloudwatch/home?region=us-
west-2#logsV2:log-groups/log-group/group/log-events/stream",
            "s3DeepLink": "https://s3.console.aws.amazon.com/s3/object/
codefactory-test-pool-1-us-west-2-beta-default-build-logs/cd71e456-2a4c-4db4-ada5-
da892b0bba05.gz?region=us-west-2",
            "cloudWatchLogsArn": "arn:aws:logs:us-west-2:962803963624:log-
group:group:log-stream:stream",
```

```
"s3LogsArn": "arn:aws:s3:::codefactory-test-pool-1-us-west-2-beta-
default-build-logs/cd71e456-2a4c-4db4-ada5-da892b0bba05.gz",
            "cloudWatchLogs": {
                "status": "ENABLED",
                "groupName": "group",
                "streamName": "stream"
            },
            "s3Logs": {
                "status": "ENABLED",
                "location": "codefactory-test-pool-1-us-west-2-beta-default-build-
logs",
                "encryptionDisabled": false
            }
        }
    }],
    "commandExecutionsNotFound": []
}
```

List command executions for a sandbox (AWS CLI)

CLI command

```
aws codebuild list-command-executions-for-sandbox --sandbox-id $SANDBOX-ID --next-token $NEXT_TOKEN --max-results $MAX_RESULTS --sort-order $SORT_ORDER
```

- --next-token: The next token, if any, to get paginated results. You will get this value from previous execution of list sandboxes.
- --max-results: (Optional) The maximum number of sandbox records to be retrieved.
- --sort-order: The order in which sandbox records should be retrieved.

Sample request

```
aws codebuild list-command-executions-for-sandbox --sandbox-id
"arn:aws:codebuild:us-west-2:962803963624:sandbox/project-name"
```

```
{
    "commandExecutions": [{
        "id": "aad6687e-07bc-45ab-a1fd-f5440229b528",
```

```
"sandboxId": "cd71e456-2a4c-4db4-ada5-da892b0bba05",
            "submitTime": "2025-02-10T20:18:35.304000-08:00",
            "startTime": "2025-02-10T20:18:35.615000-08:00",
            "endTime": "2025-02-10T20:18:35.651000-08:00",
            "status": "FAILED",
            "command": "fail command",
            "type": "SHELL",
            "exitCode": "127",
            "standardErrContent": "/codebuild/output/tmp/script.sh: 4: fail: not
 found\n",
            "logs": {
                "groupName": "group",
                "streamName": "stream",
                "deepLink": "https://console.aws.amazon.com/cloudwatch/home?
region=us-west-2#logsV2:log-groups/log-group/group/log-events/stream",
                "s3DeepLink": "https://s3.console.aws.amazon.com/s3/object/
codefactory-test-pool-1-us-west-2-beta-default-build-logs/cd71e456-2a4c-4db4-ada5-
da892b0bba05.gz?region=us-west-2",
                "cloudWatchLogsArn": "arn:aws:logs:us-west-2:962803963624:log-
group:group:log-stream:stream",
                "s3LogsArn": "arn:aws:s3:::codefactory-test-pool-1-us-west-2-beta-
default-build-logs/cd71e456-2a4c-4db4-ada5-da892b0bba05.gz",
                "cloudWatchLogs": {
                    "status": "ENABLED",
                    "groupName": "group",
                    "streamName": "stream"
                },
                "s3Logs": {
                    "status": "ENABLED",
                    "location": "codefactory-test-pool-1-us-west-2-beta-default-
build-logs",
                    "encryptionDisabled": false
                }
            }
        },
        {
            "id": "c3c085ed-5a8f-4531-8e95-87d547f27ffd",
            "sandboxId": "cd71e456-2a4c-4db4-ada5-da892b0bba05",
            "submitTime": "2025-02-10T20:18:17.118000-08:00",
            "startTime": "2025-02-10T20:18:17.939000-08:00",
            "endTime": "2025-02-10T20:18:17.976000-08:00",
            "status": "SUCCEEDED",
            "command": "echo \"Hello World\"",
            "type": "SHELL",
```

```
"exitCode": "0",
            "standardOutputContent": "Hello World\n",
            "logs": {
                "groupName": "group",
                "streamName": "stream",
                "deepLink": "https://console.aws.amazon.com/cloudwatch/home?
region=us-west-2#logsV2:log-groups/log-group/group/log-events/stream",
                "s3DeepLink": "https://s3.console.aws.amazon.com/s3/object/
codefactory-test-pool-1-us-west-2-beta-default-build-logs/cd71e456-2a4c-4db4-ada5-
da892b0bba05.gz?region=us-west-2",
                "cloudWatchLogsArn": "arn:aws:logs:us-west-2:962803963624:log-
group:group:log-stream:stream",
                "s3LogsArn": "arn:aws:s3:::codefactory-test-pool-1-us-west-2-beta-
default-build-logs/cd71e456-2a4c-4db4-ada5-da892b0bba05.gz",
                "cloudWatchLogs": {
                    "status": "ENABLED",
                    "groupName": "group",
                    "streamName": "stream"
                },
                "s3Logs": {
                    "status": "ENABLED",
                    "location": "codefactory-test-pool-1-us-west-2-beta-default-
build-logs",
                    "encryptionDisabled": false
                }
            }
        }
    ]
}
```

List sandboxes (AWS CLI)

CLI command

```
aws codebuild list-sandboxes --next-token $NEXT_TOKEN --max-results $MAX_RESULTS --sort-order $SORT_ORDER
```

Sample request

```
aws codebuild list-sandboxes
```

```
{
    "ids": [
        "s3-log-project-integ-test-temp173925062814985d64e0f-7880-41df-9a3c-
fb6597a266d2:827a5243-0841-4b69-a720-4438796f6967",
        "s3-log-project-integ-test-temp1739249999716bbd438dd-8bb8-47bd-
ba6b-0133ac65b3d3:e2fa4eab-73af-42e3-8903-92fddaf9f378",
        "s3-log-project-integ-test-
temp17392474779450fbdacc2-2d6e-4190-9ad5-28f891bb7415:cd71e456-2a4c-4db4-ada5-
da892b0bba05",
        "s3-log-project-integ-test-temp17392246284164301421c-5030-4fa1-b4d3-
ca15e44771c5:9e26ab3f-65e4-4896-a19c-56b1a95e630a",
        "s3-log-project-integ-test-temp173921367319497056d8d-6d8e-4f5a-a37c-
a62f5686731f:22d91b06-df1e-4e9c-a664-c0abb8d5920b",
        "s3-log-project-integ-test-temp1739213439503f6283f19-390c-4dc8-95a9-
c8480113384a:82cc413e-fc46-47ab-898f-ae23c83a613f",
        "s3-log-project-integ-test-temp1739054385570b1f1ddc2-0a23-4062-
bd0c-24e9e4a99b99:c02562f3-2396-42ec-98da-38e3fe5da13a",
        "s3-log-project-integ-test-temp173905400540237dab1ac-1fde-4dfb-a8f5-
c0114333dc89:d2f30493-f65e-4fa0-a7b6-08a5e77497b9",
        "s3-log-project-integ-test-
temp17390534055719c534090-7bc4-48f1-92c5-34acaec5bf1e:df5f1c8a-f017-43b7-91ba-
ad2619e2c059",
        "s3-log-project-integ-test-temp1739052719086a61813cc-
ebb9-4db4-9391-7f43cc984ee4:d61917ec-8037-4647-8d52-060349272c4a",
        "s3-log-project-integ-test-temp173898670094078b67edb-
c42f-42ed-9db2-4b5c1a5fc66a:ce33dfbc-beeb-4466-8c99-a3734a0392c7",
        "s3-log-project-integ-test-
temp17389863425584d21b7cd-32e2-4f11-9175-72c89ecaffef:046dadf0-1f3a-4d51-a2c0-
e88361924acf",
        "s3-log-project-integ-test-
temp1738985884273977ccd23-394b-46cc-90d3-7ab94cf764dc:0370dc41-9339-4b0a-91ed-51929761b244",
        "s3-log-project-integ-test-temp1738985365972241b614f-8e41-4387-
bd25-2b8351fbc9e0:076c392a-9630-47d8-85a9-116aa34edfff",
        "s3-log-project-integ-test-
temp1738985043988a51a9e2b-09d6-4d24-9c3c-1e6e21ac9fa8:6ea3949c-435b-4177-
aa4d-614d5956244c",
        "s3-log-project-integ-test-temp1738984123354c68b31ad-49d1-4f4b-981d-
b66c00565ff6:6c3fff6c-815b-48b5-ada3-737400a6dee8",
        "s3-log-project-integ-test-
temp1738977263715d4d5bf6c-370a-48bf-8ea6-905358a6cf92:968a0f54-724a-42d1-9207-6ed854b2fae8",
```

```
"s3-log-project-integ-test-
temp173897358796816ce8d7d-2a5e-41ef-855b-4a94a8d2795d:80f9a7ce-930a-402e-934e-
d8b511d68b04",
        "s3-log-project-integ-test-temp17389730633301af5e452-0966-467c-
b684-4e36d47f568c:cabbe989-2e8a-473c-af25-32edc8c28646",
        "s3-log-project-integ-test-temp1738901503813173fd468-
b723-4d7b-9f9f-82e88d17f264:f7126a4a-b0d5-452f-814c-fea73718f805",
        "s3-log-project-integ-test-temp1738890502472c13616fb-
bd0f-4253-86cc-28b74c97a0ba:c6f197e5-3a53-45b6-863e-0e6353375437",
        "s3-log-project-integ-test-
temp17388903044683610daf3-8da7-43c6-8580-9978432432ce:d20aa317-8838-4966-
bbfc-85b908213df1",
        "s3-log-project-integ-test-temp173888857196780b5ab8b-e54b-44fd-a222-
c5a374fffe96:ab4b9970-ffae-47a0-b3a8-7b6790008cad",
        "s3-log-project-integ-test-temp1738888336931c11d378d-e74d-49a4-
a723-3b92e6f7daac:4922f0e8-9b7d-4119-9c9f-115cd85e703e",
        "s3-log-project-integ-test-temp17388881717651612a397-c23f-4d88-
ba87-2773cd3fc0c9:be91c3fc-418e-4feb-8a3a-ba58ff8f4e8a",
        "s3-log-project-integ-test-
temp17388879727174c3c62ed-6195-4afb-8a03-59674d0e1187:a48826a8-3c0d-43c5-
a1b5-1c98a0f978e9",
        "s3-log-project-integ-test-temp1738885948597cef305e4-b8b4-46b0-a65b-
e2d0a7b83294:c050e77d-e3f8-4829-9a60-46149628fe96",
        "s3-log-project-integ-test-temp173888561463001a7d2a8-
e4e4-4434-94db-09d3da9a9e17:8c3ac3f5-7111-4297-aec9-2470d3ead873",
        "s3-log-project-integ-test-
temp1738869855076eb19cafd-04fe-41bd-8aa0-40826d0c0d27:d25be134-05cb-404a-85da-
ac5f85d2d72c",
        "s3-project-integ-test-temp1738868157467148eacfc-d39b-49fc-a137-
e55381cd2978:4909557b-c221-4814-b4b6-7d9e93d37c35",
        "s3-project-integ-test-temp1738820926895abec0af2-
e33d-473c-9cf4-2122dd9d6876:8f5cf218-71d6-40a4-a4be-6cacebd7765f",
        "s3-project-integ-test-temp173881998877574f969a6-1c2e-4441-b463-
ab175b45ce32:04396851-c901-4986-9117-585528e3877f",
        "s3-project-integ-test-temp17388189812309abd2604-29ba-4cf6-
b6bf-073207b7db9c:540075c7-f5ec-41e8-9341-2233c09247eb",
        "s3-project-integ-test-temp1738818843474d3ea9ac1-b609-461b-
bbdb-2da245c9bc96:865d4c3c-fbfe-4ece-9c92-d0c928341404",
        "s3-project-integ-test-temp1738818542236006e9169-e6d9-4344-9b59-
f557e7aec619:1f9ffa87-da15-4290-83e2-eebdd877497b",
        "s3-project-integ-test-
temp173881809557486ad11fd-7931-48d7-81d5-499cea52a6bc:c4c2efc4-685f-4e13-8b0f-1ef85ec300b1",
        "s3-project-integ-test-temp173881794103322941020-3f0b-49c3-b836-
fcd818ec9484:0344cfba-de48-456d-b2a8-6566bd4a5d6e",
```

Tutorial: Connecting to a sandbox using SSH

This tutorial shows you how to connect to a CodeBuild sandbox using an SSH client.

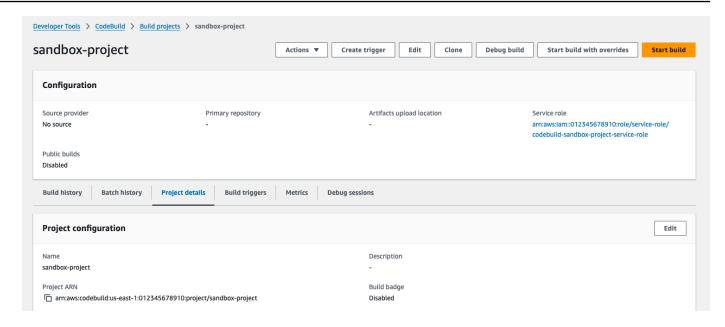
To complete this tutorial, you must first:

- Ensure you have an existing AWS CodeBuild project.
- Setup appropriate IAM permissions configured for your CodeBuild project role.
- Install and configure AWS CLI on your local machine.

Step 1: Start a sandbox

To start a CodeBuild sandbox in the console

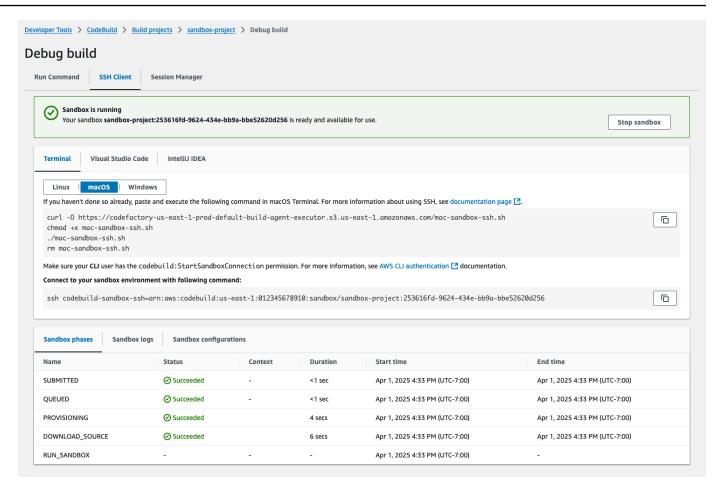
- Open the AWS CodeBuild console at https://console.aws.amazon.com/codesuite/codebuild/ home.
- In the navigation pane, choose Build projects. Choose the build project, and then choose Debug build.



3. In the **SSH Client** tab and choose **Start sandbox**.



4. The sandbox initialization process may take some time. You can connect to the sandbox when its status changes to RUN_SANDDBOX.

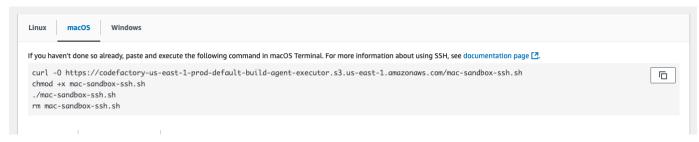


Step 2: Modify local SSH configuration

If you're connecting to sandbox for the first time, you need to perform a one-time setup process using the following steps:

To modify the local SSH configuration in the console

- 1. Locate the setup commands for your operating system.
- Open your local terminal, then copy and execute the provided commands to download and run the script to set up your local SSH configuration. For example, if your operating system is macOS, use the following command:



3. The configuration script will add the required configurations for connecting to your sandboxes. You'll be prompted to accept these changes.

4. Upon successful configuration, a new SSH configuration entry for CodeBuild sandbox will be created.

```
Host codebuild-sandbox-ssh*
StrictHostKeyChecking no
LogLevel INFO
ForwardAgent yes
ControlMaster auto
ControlPersist 10m
ProxvCommand sh -c "/Users/" /.aws/codebuild-dev-env/codebuild-sandbox-connect.sh %n"
```

Step 3: Connect to the sandbox

To modify the local SSH configuration in the console

- Configure AWS CLI Authentication and ensure your AWS CLI user has the codebuild:StartSandboxConnection permission. For more information, see <u>Authenticating using IAM user credentials for the AWS CLI</u> in the AWS Command Line Interface User Guide for Version 1.
- 2. Connect to your sandbox with following command:

```
ssh codebuild-sandbox-ssh=arn:aws:codebuild:us-east-1:<account-
id>:sandbox/<sandbox-id>
```

Note

To troubleshoot connection failures, use the -v flag to enable verbose output. For example, ssh -v codebuild-sandbox-ssh=arn:aws:codebuild:us-east-1:<account-id>:sandbox/<sandbox-id>. For additional troubleshooting guidance, see Troubleshooting AWS CodeBuild sandbox SSH connection issues.

Step 4: Review your results

Once connected, you can debug build failures, test build commands, experiment with configuration changes and verify environment variables and dependencies with your sandbox.

Troubleshooting AWS CodeBuild sandbox SSH connection issues

Use the information in this topic to help you identify, diagnose, and address CodeBuild sandbox SSH connection issues.

Topics

- <u>StartSandboxConnectionInvalidInputException error when SSH into CodeBuild sandbox</u> environment
- Error: "Unable to locate credentials" when SSH into CodeBuild sandbox environment
- <u>StartSandboxConnectionAccessDeniedException error when SSH into CodeBuild sandbox</u> environment
- Error: "ssh: Could not resolve hostname" when SSH into CodeBuild sandbox environment

StartSandboxConnectionInvalidInputException error when SSH into CodeBuild sandbox environment

Issue: When attempting to connect to a CodeBuild sandbox environment using the command ssh codebuild-sandbox-ssh=<<u>sandbox-arn</u>>, you may encounter an InvalidInputException error such as:

```
An error occurred (InvalidInputException) when calling the StartSandboxConnection operation: Failed to start SSM session for {sandbox-arn}

User: arn:aws:sts::<account-ID>:assumed-role/<service-role-name>/AWSCodeBuild-<UUID>
is not authorized to perform: ssm:StartSession on resource.
```

```
An error occurred (InvalidInputException) when calling the StartSandboxConnection operation: Failed to start SSM session for sandbox <sandbox-arn>: codebuild:<UUID> is not connected.
```

Possible cause:

- Missing Amazon EC2 Systems Manager Agent: The build image does not have the SSM agent properly installed or configured.
- Insufficient Permissions: The CodeBuild project service role lacks the required SSM permissions.

Recommended solution: If you are using a custom image for your build, do the following.

1. Install the SSM Agent. For more information, see <u>Manually installing and uninstalling</u>
<u>SSM Agent on Amazon EC2 instances for Linux</u> in the . The SSM Agent version must be 3.0.1295.0 or later.

- 2. Copy the file, https://github.com/aws/aws-codebuild-docker-images/blob/master/ubuntu/standard/7.0/amazon-ssm-agent.json to the /etc/amazon/ssm/ directory in your image. This enables Container Mode in the SSM agent.
- 3. Ensure your CodeBuild project's service role has the following permissions, then restart the sandbox environment:

```
{
   "Effect": "Allow",
      "Action": [
         "ssmmessages:CreateControlChannel",
         "ssmmessages:CreateDataChannel",
         "ssmmessages:OpenControlChannel",
         "ssmmessages:OpenDataChannel"
      ],
      "Resource": "*"
},
    "Effect": "Allow",
    "Action": Γ
       "ssm:StartSession"
     ],
     "Resource": [
        "arn:aws:codebuild:region:account-id:build/*",
        "arn:aws:ssm:region::document/AWS-StartSSHSession"
     ]
 }
```

Error: "Unable to locate credentials" when SSH into CodeBuild sandbox environment

Issue: When attempting to connect to a CodeBuild sandbox environment using the command ssh codebuild-sandbox-ssh=<<u>sandbox-arn</u>>, you may encounter the following credentials error:

```
Unable to locate credentials. You can configure credentials by running "aws configure".
```

Possible cause: AWS credentials have not been properly configured in your local environment.

Recommended solution: Configure your AWS CLI credentials by following the official documentation: Configuring settings for the AWS CLI in the AWS Command Line Interface User Guide for Version 2.

StartSandboxConnectionAccessDeniedException error when SSH into CodeBuild sandbox environment

Issue: When attempting to connect to a CodeBuild sandbox environment using the command ssh codebuild-sandbox-ssh=<<u>sandbox-arn</u>>, you may encounter the following permission error:

```
An error occurred (AccessDeniedException) when calling the StartSandboxConnection operation:

User: arn:aws:sts::account-id:assumed-role/role-name
is not authorized to perform: codebuild:StartSandboxConnection on resource:
sandbox-arn
because no identity-based policy allows the codebuild:StartSandboxConnection action
```

Possible cause: Your AWS credentials lack the necessary CodeBuild permissions to perform this operation.

Recommended solution: Ensure that the IAM user or role associated with your AWS CLI credentials has the following permissions:

```
{
    "Effect": "Allow",
    "Action": [
        "codebuild:StartSandboxConnection"
],
    "Resource": [
        "arn:aws:codebuild:region:account-id:sandbox/*"
]
}
```

Error: "ssh: Could not resolve hostname" when SSH into CodeBuild sandbox environment

Issue: When attempting to connect to a CodeBuild sandbox environment using the command ssh codebuild-sandbox-ssh=<<u>sandbox-arn</u>>, you encounter the following hostname resolution error:

```
ssh: Could not resolve hostname
```

Possible cause: This error typically occurs when the required CodeBuild sandbox connection script has not been properly executed in your local environment.

Recommended solution:

- Download the CodeBuild sandbox connection script. 1.
- Execute the script in your terminal to establish the necessary SSH configuration. 2.
- 3. Retry your SSH connection to the sandbox environment.

Debug builds with Session Manager

In AWS CodeBuild, you can pause a running build and then use AWS Systems Manager Session Manager to connect to the build container and view the state of the container.



Note

This feature is not available in Windows environments.

Topics

- Prerequisites
- Pause the build
- Start the build
- Connect to the build container
- Resume the build

Prerequisites

To allow Session Manager to be used with the build session, you must enable session connection for the build. There are two prerequisites:

 CodeBuild Linux standard curated images already have the SSM agent installed and the SSM agent ContainerMode enabled.

If you are using a custom image for your build, do the following:

Install the SSM Agent. For more information, see Manually install SSM Agent on EC2 instances for Linux in the AWS Systems Manager User Guide. The SSM Agent version must be 3.0.1295.0 or later.

Copy the file https://github.com/aws/aws-codebuild-docker-images/blob/master/ubuntu/ 2. standard/5.0/amazon-ssm-agent.json to the /etc/amazon/ssm/ directory in your image. This enables Container Mode in the SSM agent.

Note

Custom images would require most updated SSM agent for this feature to work as expected.

• The CodeBuild service role must have the following SSM policy:

```
{
   "Version": "2012-10-17",
   "Statement": [
     {
       "Effect": "Allow",
       "Action": [
          "ssmmessages:CreateControlChannel",
          "ssmmessages:CreateDataChannel",
          "ssmmessages:OpenControlChannel",
          "ssmmessages:OpenDataChannel"
       ],
       "Resource": "*"
     }
   ]
}
```

You can have the CodeBuild console automatically attach this policy to your service role when you start the build. Alternatively, you can attach this policy to your service role manually.

• If you have Auditing and logging session activity enabled in Systems Manager preferences, the CodeBuild service role must also have additional permissions. The permissions are different, depending on where the logs are stored.

CloudWatch Logs

If using CloudWatch Logs to store your logs, add the following permission to the CodeBuild service role:

```
"Version": "2012-10-17",
  "Statement": [
    {
      "Effect": "Allow",
      "Action": "logs:DescribeLogGroups",
      "Resource": "arn:aws:logs:<region-id>:<account-id>:log-group:*:*"
    },
    {
      "Effect": "Allow",
      "Action": [
        "logs:CreateLogStream",
        "logs:PutLogEvents"
      "Resource": "arn:aws:logs:<region-id>:<account-id>:log-group:<log-group-
name>:*"
    }
  ]
}
```

Amazon S3

If using Amazon S3 to store your logs, add the following permission to the CodeBuild service role:

```
]
]
]
}
```

For more information, see <u>Auditing and logging session activity</u> in the *AWS Systems Manager User Guide*.

Pause the build

To pause the build, insert the **codebuild-breakpoint** command in any of the build phases in your buildspec file. The build will be paused at this point, which allows you to connect to the build container and view the container in its current state.

For example, add the following to the build phases in your buildspec file.

```
phases:
    pre_build:
    commands:
        - echo Entered the pre_build phase...
        - echo "Hello World" > /tmp/hello-world
        - codebuild-breakpoint
```

This code creates the /tmp/hello-world file and then pauses the build at this point.

Start the build

To allow Session Manager to be used with the build session, you must enable session connections for the build. To do this, when starting the build, follow these steps:

- Open the AWS CodeBuild console at https://console.aws.amazon.com/codesuite/codebuild/
 home.
- 2. In the navigation pane, choose **Build projects**. Choose the build project, and then choose **Start build with overrides**.
- 3. Choose Advanced build overrides.
- 4. In the **Environment** section, choose the **Enable session connection** option. If this option is not selected, all of the **codebuild-breakpoint** and **codebuild-resume** commands are ignored.
- 5. Make any other desired changes, and choose **Start build**.

Monitor the build status in the console. When the session is available, the AWS Session **Manager** link appears in the **Build status** section.

Connect to the build container

You can connect to the build container in one of two ways:

CodeBuild console

In a web browser, open the AWS Session Manager link to connect to the build container. A terminal session opens that allows you to browse and control the build container.

AWS CLI



Note

Your local machine must have the Session Manager plugin installed for this procedure. For more information, see Install the Session Manager Plugin for the AWS CLI in the AWS Systems Manager User Guide.

1. Call the **batch-get-builds** api with the build ID to get information about the build, including the session target identifier. The session target identifier property name varies depending on the output type of the aws command. This is why --output json is added to the command.

```
aws codebuild batch-get-builds --ids <buildID> --region <region> --output json
```

- Copy the sessionTarget property value. The sessionTarget property name can vary depending on the output type of the aws command. This is why --output json is added to the command in the previous step.
- Use the following command to connect to the build container. 3.

```
aws ssm start-session --target <sessionTarget> --region <region>
```

For this example, verify that the /tmp/hello-world file exists and contains the text Hello World.

Resume the build

After you finish examining the build container, issue the **codebuild-resume** command from the container shell.

\$ codebuild-resume

Delete builds in AWS CodeBuild

You can use the AWS CLI or the AWS SDKs to delete builds in AWS CodeBuild.

Topics

- Delete builds (AWS CLI)
- Delete builds (AWS SDKs)

Delete builds (AWS CLI)

Run the batch-delete-builds command:

```
aws codebuild batch-delete-builds --ids ids
```

In the preceding command, replace the following placeholder:

- *ids*: Required string. The IDs of the builds to delete. To specify multiple builds, separate each build ID with a space. To get a list of build IDs, see the following topics:
 - View a list of build IDs (AWS CLI)
 - View a list of build IDs for a build project (AWS CLI)

If successful, a buildsDeleted array appears in the output, containing the Amazon Resource Name (ARN) of each build that was successfully deleted. Information about builds that were not successfully deleted appears in output within a buildsNotDeleted array.

For example, if you run this command:

aws codebuild batch-delete-builds --ids my-demo-build-project:f8b888d2-5e1e-4032-8645-b115195648EX my-other-demo-build-project:a18bc6ee-e499-4887-b36a-8c90349c7eEX

Delete builds API Version 2016-10-06 670

Information similar to the following appears in the output:

Delete builds (AWS SDKs)

For information about using AWS CodeBuild with the AWS SDKs, see the <u>AWS SDKs and tools</u> reference.

Retry builds manually in AWS CodeBuild

You can use the AWS CodeBuild console, AWS CLI, or AWS SDKs to manually retry either a single build or a batch build in AWS CodeBuild.

Topics

- Retry a build manually (console)
- Retry a build manually (AWS CLI)
- Retry a build manually (AWS SDKs)

Retry a build manually (console)

- 1. Open the AWS CodeBuild console at https://console.aws.amazon.com/codesuite/codebuild/ home.
- 2. Do one of the following:
 - If the **build-project-name:build-ID** page is displayed, choose **Retry build**.

Delete builds (AWS SDKs)

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• In the navigation pane, choose **Build history**. In the list of builds, select the box for the build, and then choose **Retry build**.

• In the navigation pane, choose **Build projects**. In the list of build projects, in the **Name** column, choose the link for the build project's name. In the list of builds, select the box for the build, and then choose **Retry build**.



By default, only the most recent 100 builds or build projects are displayed. To view more builds or build projects, choose the gear icon, and then choose a different value for **Builds per page** or **Projects per page** or use the back and forward arrows.

Retry a build manually (AWS CLI)

• Run the retry-build command:

```
aws codebuild retry-build --id <build-id> --idempotency-token <idempotencyToken>
```

In the preceding command, replace the following placeholder:

- <build-id>: Required string. The ID of the build or batch build to retry. To get a list of build IDs, see the following topics:
 - View a list of build IDs (AWS CLI)
 - View a list of batch build IDs (AWS CLI)
 - View a list of build IDs for a build project (AWS CLI)
 - View a list of batch build IDs for a build project (AWS CLI)
- --idempotency-token: Optional. If you run the retry-build command with the option, a
 unique case-sensitive identifier, or token, is included with the retry-build request. The
 token is valid for 5 minutes after the request. If you repeat the retry-build request with
 the same token, but change a parameter, CodeBuild returns a parameter mismatch error.

Retry a build manually (AWS SDKs)

For more information about using AWS CodeBuild with the AWS SDKs, see the AWS SDKs and tools reference.

Retry builds automatically in AWS CodeBuild

You can use the AWS CodeBuild console, AWS CLI, or AWS SDKs to automatically retry your builds in AWS CodeBuild. With auto-retry enabled, CodeBuild will automatically call RetryBuild using the project's service role after a failed build up to a specified limit. For example, if the auto-retry limit is set to two, CodeBuild will call the RetryBuild API to automatically retry your build for up to two additional times.



Note

CodeBuild does not support auto-retry for CodePipeline.

Topics

- Retry a build automatically (console)
- Retry a build automatically (AWS CLI)
- Automatically retry a build (AWS SDKs)

Retry a build automatically (console)

- 1. Open the AWS CodeBuild console at https://console.aws.amazon.com/codesuite/codebuild/ home.
- Choose Create project. For information, see Create a build project (console) and Run a build (console).
 - In Environment:
 - For Auto-retry limit, enter the maximum number of auto-retries desired after a failed build.
- In **Environment**, choose **Additional configuration**. 3.
- 4. Continue with the default values and then choose Create build project.

Retry a build automatically (AWS CLI)

Run the create-project command:

```
aws codebuild create-project \
    --name "<project-name>" \
    --auto-retry-limit <auto-retry-limit> \
    --source "<source>" \
    --artifacts {<artifacts>} \
    --environment "{\"type\": \"environment-type>\",\"image\": \"image-type>\",\"computeType\": \"compute-type>\"}" \
    --service-role "service-role>"
```

In the preceding command, replace the following placeholders:

- <auto-retry-limit>: Set the auto-retry limit to the maximum number of auto-retries
 desired after a failed build.
- <project-name>, <source>, <artifacts>, environment-type>, image-type>,
 compute-type>, and service-role>: Set your desired project configuration settings.

Automatically retry a build (AWS SDKs)

For more information about using AWS CodeBuild with the AWS SDKs, see the <u>AWS SDKs and tools</u> reference.

Stop builds in AWS CodeBuild

You can use the AWS CodeBuild console, AWS CLI, or AWS SDKs to stop a build in AWS CodeBuild.

Topics

- Stop a build (console)
- Stop a build (AWS CLI)
- Stop a build (AWS SDKs)

Stop a build (console)

1. Open the AWS CodeBuild console at https://console.aws.amazon.com/codesuite/codebuild/ home.

- 2. Do one of the following:
 - If the build-project-name:build-ID page is displayed, choose Stop build.
 - In the navigation pane, choose **Build history**. In the list of builds, select the box for the build, and then choose **Stop build**.
 - In the navigation pane, choose **Build projects**. In the list of build projects, in the **Name** column, choose the link for the build project's name. In the list of builds, select the box for the build, and then choose **Stop build**.

Note

By default, only the most recent 100 builds or build projects are displayed. To view more builds or build projects, choose the gear icon, and then choose a different value for **Builds per page** or **Projects per page** or use the back and forward arrows.

If AWS CodeBuild cannot successfully stop a build (for example, if the build process is already complete), the **Stop** button is disabled or might not appear.

Stop a build (AWS CLI)

• Run the **stop-build** command:

```
aws codebuild stop-build --id id
```

In the preceding command, replace the following placeholder:

- id: Required string. The ID of the build to stop. To get a list of build IDs, see the following topics:
 - View a list of build IDs (AWS CLI)
 - View a list of build IDs for a build project (AWS CLI)

Stop a build (console)

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If AWS CodeBuild successfully stops the build, the buildStatus value in the build object in the output is STOPPED.

If CodeBuild cannot successfully stop the build (for example, if the build is already complete), the buildStatus value in the build object in the output is the final build status (for example, SUCCEEDED).

Stop a build (AWS SDKs)

For more information about using AWS CodeBuild with the AWS SDKs, see the AWS SDKs and tools reference.

Stop batch builds in AWS CodeBuild

You can use the AWS CodeBuild console, AWS CLI, or AWS SDKs to stop a batch build in AWS CodeBuild.



Note

If you use Lambda compute in your batch build, the in-progress Lambda build cannot be stopped.

Topics

- Stop a batch build (console)
- Stop a batch build (AWS CLI)
- Stop a batch build (AWS SDKs)

Stop a batch build (console)

- Open the AWS CodeBuild console at https://console.aws.amazon.com/codesuite/codebuild/ home.
- Do one of the following: 2.
 - If the build-project-name:build-ID page is displayed, choose Stop build.

Stop a build (AWS SDKs) API Version 2016-10-06 676

• In the navigation pane, choose **Build history**. In the list of builds, select the box for the build, and then choose **Stop build**.

• In the navigation pane, choose **Build projects**. In the list of build projects, in the **Name** column, choose the link for the build project's name. In the list of builds, select the box for the build, and then choose **Stop build**.



By default, only the most recent 100 builds or build projects are displayed. To view more builds or build projects, choose the gear icon, and then choose a different value for **Builds per page** or **Projects per page** or use the back and forward arrows.

Stop a batch build (AWS CLI)

Run the stop-build-batch command:

```
aws codebuild stop-build-batch --id <batch-build-id>
```

In the preceding command, replace the following placeholder:

- <batch-build-id>: Required string. The identifier of the batch build to stop. To get a list
 of batch build identifiers, see the following topics:
 - View a list of batch build IDs (AWS CLI)
 - View a list of batch build IDs for a build project (AWS CLI)

Stop a batch build (AWS SDKs)

For more information about using AWS CodeBuild with the AWS SDKs, see the <u>AWS SDKs and tools</u> reference.

Trigger AWS CodeBuild builds automatically

You can create a trigger on a project to schedule a build once every hour, day, or week. You can also edit a trigger to use a custom rule with an Amazon CloudWatch cron expression. For example, using a cron expression, you can schedule a build at a specific time on every weekday. For information

about creating and editing triggers, see Create AWS CodeBuild triggers and Edit AWS CodeBuild triggers.

Topics

- Create AWS CodeBuild triggers
- Edit AWS CodeBuild triggers

Create AWS CodeBuild triggers

You can create a trigger on a project to schedule a build once every hour, day, or week. You can also create a trigger using a custom rule with an Amazon CloudWatch cron expression. For example, using a cron expression, you can schedule a build at a specific time every weekday.



Note

It is not possible to start a batch build from a build trigger, an Amazon EventBridge event, or an AWS Step Functions task.

Topics

- Create AWS CodeBuild triggers (console)
- Create AWS CodeBuild triggers programmatically

Create AWS CodeBuild triggers (console)

Use the following procedure to create triggers using the AWS Management Console.

To create a trigger

- Open the AWS CodeBuild console at https://console.aws.amazon.com/codesuite/codebuild/ home.
- In the navigation pane, choose **Build projects**.
- 3. Choose the link for the build project to which you want to add a trigger, and then choose the Build triggers tab.

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Note

By default, the 100 most recent build projects are displayed. To view more build projects, choose the gear icon, and then choose a different value for **Projects per page** or use the back and forward arrows.

- Choose Create trigger. 4.
- 5. Enter a name in **Trigger name**.
- From the **Frequency** drop-down list, choose the frequency for your trigger. If you want to 6. create a frequency using a cron expression, choose **Custom**.
- Specify the parameters for the frequency of your trigger. You can enter the first few characters 7. of your selections in the text box to filter drop-down menu items.



Note

Start hours and minutes are zero-based. The start minute is a number between zero and 59. The start hour is a number between zero and 23. For example, a daily trigger that starts every day at 12:15 P.M. has a start hour of 12 and a start minute of 15. A daily trigger that starts every day at midnight has a start hour of zero and a start minute of zero. A daily trigger that starts every day at 11:59 P.M. has a start hour of 23 and a start minute of 59.

Frequency	Required Parameters	Details
Hourly	Start minute	Use the Start minute dropdown menu.
Daily	Start minute Start hour	Use the Start minute dropdown menu. Use the Start hour dropdown menu.
Weekly	Start minute Start hour	Use the Start minute dropdown menu.

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Frequency	Required Parameters	Details
	Start day	Use the Start hour drop-down menu.
		Use the Start day drop-down menu.
Custom	Cron expression	Enter a cron expression in Cron expression. A cron expression has six required fields that are separated by white space. The fields specify a start value for minute, hour, day of month, month, day of week, and year. You can use wildcards to specify a range, additional values, and more. For example, the cron expression 109? * MON-FRI* schedules a build every weekday at 9:00 A.M. For more information, see Cron Expressions in the Amazon CloudWatch Events User Guide.

- 8. Select Enable this trigger.
- 9. (Optional) Expand **Advanced section**. In **Source version**, type a version of your source.
 - For Amazon S3, enter the version ID that corresponds to the version of the input artifact you want to build. If **Source version** is left blank, the latest version is used.
 - For AWS CodeCommit, type a commit ID. If **Source version** is left blank, the default branch's HEAD commit ID is used.
 - For GitHub or GitHub Enterprise, type a commit ID, a pull request ID, a branch name, or a tag name that corresponds to the version of the source code you want to build. If you specify a pull request ID, it must use the format pr/pull-request-ID (for example, pr/25). If you

Create build triggers API Version 2016-10-06 680

specify a branch name, the branch's HEAD commit ID is used. If **Source version** is blank, the default branch's HEAD commit ID is used.

- For Bitbucket, type a commit ID, a branch name, or a tag name that corresponds to the
 version of the source code you want to build. If you specify a branch name, the branch's
 HEAD commit ID is used. If Source version is blank, the default branch's HEAD commit ID is
 used.
- 10. (Optional) Specify a timeout between 5 minutes and 2160 minutes (36 hours). This value specifies how long AWS CodeBuild attempts a build before it stops. If **Hours** and **Minutes** are left blank, the default timeout value specified in the project is used.
- 11. Choose **Create trigger**.

Create AWS CodeBuild triggers programmatically

CodeBuild uses Amazon EventBridge rules for build triggers. You can use the EventBridge API to programmatically create build triggers for your CodeBuild projects. See <u>Amazon EventBridge API</u> Reference for more information.

Edit AWS CodeBuild triggers

You can edit a trigger on a project to schedule a build once every hour, day, or week. You can also edit a trigger to use a custom rule with an Amazon CloudWatch cron expression. For example, using a cron expression, you can schedule a build at a specific time on every weekday. For information about creating a trigger, see Create AWS CodeBuild triggers.

Topics

- Edit AWS CodeBuild triggers (console)
- Edit AWS CodeBuild triggers programmatically

Edit AWS CodeBuild triggers (console)

Use the following procedure to edit triggers using the AWS Management Console.

To edit a trigger

 Open the AWS CodeBuild console at https://console.aws.amazon.com/codesuite/codebuild/ home.

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- In the navigation pane, choose **Build projects**. 2.
- 3. Choose the link for the build project you want to change, and then choose the **Build triggers** tab.

Note

By default, the 100 most recent build projects are displayed. To view more build projects, choose the gear icon, and then choose a different value for Projects per page or use the back and forward arrows.

- Choose the radio button next to the trigger you want to change, and then choose **Edit**.
- From the **Frequency** drop-down list, choose the frequency for your trigger. If you want to 5. create a frequency using a cron expression, choose **Custom**.
- Specify the parameters for the frequency of your trigger. You can enter the first few characters 6. of your selections in the text box to filter drop-down menu items.



Note

Start hours and minutes are zero-based. The start minute is a number between zero and 59. The start hour is a number between zero and 23. For example, a daily trigger that starts every day at 12:15 P.M. has a start hour of 12 and a start minute of 15. A daily trigger that starts every day at midnight has a start hour of zero and a start minute of zero. A daily trigger that starts every day at 11:59 P.M. has a start hour of 23 and a start minute of 59.

Frequency	Required Parameters	Details
Hourly	Start minute	Use the Start minute dropdown menu.
Daily	Start minute Start hour	Use the Start minute dropdown menu. Use the Start hour dropdown menu.

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Frequency	Required Parameters	Details
Weekly	Start minute Start hour Start day	Use the Start minute dropdown menu. Use the Start hour dropdown menu. Use the Start day dropdown menu.
Custom	Cron expression	Enter a cron expression in Cron expression. A cron expression has six required fields that are separated by white space. The fields specify a start value for minute, hour, day of month, month, day of week, and year. You can use wildcards to specify a range, additional values, and more. For example, the cron expression 109? * MON-FRI* schedules a build every weekday at 9:00 A.M. For more information, see Cron Expressions in the Amazon CloudWatch Events User Guide.

7. Select **Enable this trigger**.

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Note

You can use the Amazon CloudWatch console at https://console.aws.amazon.com/ cloudwatch/ to edit source version, timeout, and other options that are not available in AWS CodeBuild.

Edit AWS CodeBuild triggers programmatically

CodeBuild uses Amazon EventBridge rules for build triggers. You can use the EventBridge API to programmatically edit the build triggers for your CodeBuild projects. See Amazon EventBridge API Reference for more information.

View build details in AWS CodeBuild

You can use the AWS CodeBuild console, AWS CLI, or AWS SDKs to view details about builds managed by CodeBuild.

Topics

- View build details (console)
- View build details (AWS CLI)
- View build details (AWS SDKs)
- Build phase transitions

View build details (console)

- Open the AWS CodeBuild console at https://console.aws.amazon.com/codesuite/codebuild/ home.
- Do one of the following:
 - In the navigation pane, choose **Build history**. In the list of builds, in the **Build run** column, choose the link for the build.
 - In the navigation pane, choose **Build projects**. In the list of build projects, in the **Name** column, choose the link for the name of the build project. Then, in the list of builds, in the **Build run** column, choose the link for the build.

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Note

By default, only the 10 most recent builds or build projects are displayed. To view more builds or build projects, choose the gear icon, and then choose a different value for Builds per page or Projects per page or use the back and forward arrows.

View build details (AWS CLI)

For more information about using the AWS CLI with AWS CodeBuild, see the Command line reference.

Run the **batch-get-builds** command:

```
aws codebuild batch-get-builds --ids ids
```

Replace the following placeholder:

- ids: Required string. One or more build IDs to view details about. To specify more than one build ID, separate each build ID with a space. You can specify up to 100 build IDs. To get a list of build IDs, see the following topics:
 - View a list of build IDs (AWS CLI)
 - View a list of build IDs for a build project (AWS CLI)

For example, if you run this command:

```
aws codebuild batch-get-builds --ids codebuild-demo-project:e9c4f4df-3f43-41d2-
ab3a-60fe2EXAMPLE codebuild-demo-project:815e755f-bade-4a7e-80f0-efe51EXAMPLE my-other-
project:813bb6c6-891b-426a-9dd7-6d8a3EXAMPLE
```

If the command is successful, data similar to that described in To view summarized build information appears in the output.

View build details (AWS SDKs)

For more information about using AWS CodeBuild with the AWS SDKs, see the AWS SDKs and tools reference.

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Build phase transitions

Builds in AWS CodeBuild proceed in phases:



A Important

The UPLOAD_ARTIFACTS phase is always attempted, even if the BUILD phase fails.

View a list of build IDs in AWS CodeBuild

You can use the AWS CodeBuild console, AWS CLI, or AWS SDKs to view a list of build IDs for builds managed by CodeBuild.

Topics

- View a list of build IDs (console)
- View a list of build IDs (AWS CLI)
- View a list of batch build IDs (AWS CLI)
- View a list of build IDs (AWS SDKs)

View a list of build IDs (console)

- Open the AWS CodeBuild console at https://console.aws.amazon.com/codesuite/codebuild/ 1. home.
- In the navigation pane, choose **Build history**.

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Note

By default, only the 10 most recent builds are displayed. To view more builds, choose the gear icon, and then choose a different value for **Builds per page** or use the back and forward arrows.

View a list of build IDs (AWS CLI)

For more information about using the AWS CLI with CodeBuild, see the Command line reference.

Run the **list-builds** command:

```
aws codebuild list-builds --sort-order sort-order --next-token next-token
```

In the preceding command, replace the following placeholders:

- sort-order: Optional string used to indicate how to list the build IDs. Valid values include ASCENDING and DESCENDING.
- next-token: Optional string. During a previous run, if there were more than 100 items in the list, only the first 100 items are returned, along with a unique string called *next token*. To get the next batch of items in the list, run this command again, adding the next token to the call. To get all of the items in the list, keep running this command with each subsequent next token, until no more next tokens are returned.

For example, if you run this command:

```
aws codebuild list-builds --sort-order ASCENDING
```

A result similar to the following might appear in the output:

```
{
  "nextToken": "4AEA6u7J...The full token has been omitted for brevity...MzY2OA==",
  "ids": [
    "codebuild-demo-project:815e755f-bade-4a7e-80f0-efe51EXAMPLE"
    "codebuild-demo-project:84a7f3d1-d40e-4956-b4cf-7a9d4EXAMPLE"
    ... The full list of build IDs has been omitted for brevity ...
```

```
"codebuild-demo-project:931d0b72-bf6f-4040-a472-5c707EXAMPLE"
]
}
```

If you run this command again:

```
aws codebuild list-builds --sort-order ASCENDING --next-token 4AEA6u7J...The full token has been omitted for brevity...MzY2OA==
```

A result similar to the following might appear in the output:

```
"ids": [
    "codebuild-demo-project:49015049-21cf-4b50-9708-df115EXAMPLE",
    "codebuild-demo-project:543e7206-68a3-46d6-a4da-759abEXAMPLE",
    ... The full list of build IDs has been omitted for brevity ...
    "codebuild-demo-project:c282f198-4582-4b38-bdc0-26f96EXAMPLE"
]
}
```

View a list of batch build IDs (AWS CLI)

For more information about using the AWS CLI with CodeBuild, see the Command line reference.

Run the list-build-batches command:

```
aws codebuild list-build-batches --sort-order sort-order --next-token next-token
```

In the preceding command, replace the following placeholders:

- sort-order: Optional string used to indicate how to list the batch build IDs. Valid values include ASCENDING and DESCENDING.
- next-token: Optional string. During a previous run, if there were more than 100 items in the list, only the first 100 items are returned, along with a unique string called next token.
 To get the next batch of items in the list, run this command again, adding the next token to the call. To get all of the items in the list, keep running this command with each subsequent next token, until no more next tokens are returned.

For example, if you run this command:

```
aws codebuild list-build-batches --sort-order ASCENDING
```

A result similar to the following might appear in the output:

```
"nextToken": "4AEA6u7J...The full token has been omitted for brevity...MzY2OA==",
"ids": [
    "codebuild-demo-project:815e755f-bade-4a7e-80f0-efe51EXAMPLE"
    "codebuild-demo-project:84a7f3d1-d40e-4956-b4cf-7a9d4EXAMPLE"
    ... The full list of build IDs has been omitted for brevity ...
    "codebuild-demo-project:931d0b72-bf6f-4040-a472-5c707EXAMPLE"
]
```

If you run this command again:

```
aws codebuild list-build-batches --sort-order ASCENDING --next-token 4AEA6u7J...The full token has been omitted for brevity...MzY2OA==
```

A result similar to the following might appear in the output:

```
"ids": [
   "codebuild-demo-project:49015049-21cf-4b50-9708-df115EXAMPLE",
   "codebuild-demo-project:543e7206-68a3-46d6-a4da-759abEXAMPLE",
   ... The full list of build IDs has been omitted for brevity ...
   "codebuild-demo-project:c282f198-4582-4b38-bdc0-26f96EXAMPLE"
]
}
```

View a list of build IDs (AWS SDKs)

For more information about using CodeBuild with the AWS SDKs, see the <u>AWS SDKs and tools</u> reference.

View a list of build IDs for a build project in AWS CodeBuild

You can use the AWS CodeBuild console, AWS CLI, or AWS SDKs to view a list of build IDs for a build project in CodeBuild.

Topics

- View a list of build IDs for a build project (console)
- View a list of build IDs for a build project (AWS CLI)
- View a list of batch build IDs for a build project (AWS CLI)
- View a list of build IDs for a build project (AWS SDKs)

View a list of build IDs for a build project (console)

- 1. Open the CodeBuild console at https://console.aws.amazon.com/codebuild/.
- 2. In the navigation pane, choose **Build projects**. In the list of build projects, in the **Name** column, choose the build project.

Note

By default, only the most recent 100 builds or build projects are displayed. To view more builds or build projects, choose the gear icon, and then choose a different value for **Builds per page** or **Projects per page** or use the back and forward arrows.

View a list of build IDs for a build project (AWS CLI)

For more information about using the AWS CLI with AWS CodeBuild, see the <u>Command line</u> reference.

Run the list-builds-for-project command, as follows:

```
aws codebuild list-builds-for-project --project-name project-name --sort-order sort-order --next-token next-token
```

In the preceding command, replace the following placeholders:

• *project-name*: Required string used to indicate the name of the build project to list builds IDs for. To get a list of build projects, see View a list of build project names (AWS CLI).

- sort-order: Optional string used to indicate how to list the build IDs. Valid values include ASCENDING and DESCENDING.
- next-token: Optional string. During a previous run, if there were more than 100 items in the list, only the first 100 items are returned, along with a unique string called next token. To get the next batch of items in the list, run this command again, adding the next token to the call. To get all of the items in the list, keep running this command with each subsequent next token that is returned, until no more next tokens are returned.

For example, if you run this command similar to this:

```
aws codebuild list-builds-for-project --project-name codebuild-demo-project --sort-
order ASCENDING
```

A result like the following might appear in the output:

```
"nextToken": "4AEA6u7J...The full token has been omitted for brevity...MzY2OA==",
"ids": [
    "codebuild-demo-project:9b175d16-66fd-4e71-93a0-50a08EXAMPLE"
    "codebuild-demo-project:a9d1bd09-18a2-456b-8a36-7d65aEXAMPLE"
    ... The full list of build IDs has been omitted for brevity ...
    "codebuild-demo-project:fe70d102-c04f-421a-9cfa-2dc15EXAMPLE"
]
```

If you run this command again:

```
aws codebuild list-builds-for-project --project-name codebuild-demo-project --
sort-order ASCENDING --next-token 4AEA6u7J...The full token has been omitted for
brevity...MzY2OA==
```

You might see a result like the following in the output:

```
{
  "ids": [
  "codebuild-demo-project:98253670-7a8a-4546-b908-dc890EXAMPLE"
  "codebuild-demo-project:ad5405b2-1ab3-44df-ae2d-fba84EXAMPLE"
```

```
... The full list of build IDs has been omitted for brevity ...
"codebuild-demo-project:f721a282-380f-4b08-850a-e0ac1EXAMPLE"
]
}
```

View a list of batch build IDs for a build project (AWS CLI)

For more information about using the AWS CLI with AWS CodeBuild, see the <u>Command line</u> reference.

Run the list-build-batches-for-project command, as follows:

```
aws codebuild list-build-batches-for-project --project-name project-name --sort-order sort-order --next-token next-token
```

In the preceding command, replace the following placeholders:

- project-name: Required string used to indicate the name of the build project to list builds IDs
 for. To get a list of build projects, see View a list of build project names (AWS CLI).
- sort-order: Optional string used to indicate how to list the build IDs. Valid values include ASCENDING and DESCENDING.
- next-token: Optional string. During a previous run, if there were more than 100 items in the list, only the first 100 items are returned, along with a unique string called next token. To get the next batch of items in the list, run this command again, adding the next token to the call. To get all of the items in the list, keep running this command with each subsequent next token that is returned, until no more next tokens are returned.

For example, if you run this command similar to this:

```
aws codebuild list-build-batches-for-project --project-name codebuild-demo-project --
sort-order ASCENDING
```

A result like the following might appear in the output:

```
{
  "nextToken": "4AEA6u7J...The full token has been omitted for brevity...MzY20A==",
  "ids": [
    "codebuild-demo-project:9b175d16-66fd-4e71-93a0-50a08EXAMPLE"
```

```
"codebuild-demo-project:a9d1bd09-18a2-456b-8a36-7d65aEXAMPLE"
... The full list of build IDs has been omitted for brevity ...
"codebuild-demo-project:fe70d102-c04f-421a-9cfa-2dc15EXAMPLE"
]
}
```

If you run this command again:

```
aws codebuild list-build-batches-for-project --project-name codebuild-demo-project --sort-order ASCENDING --next-token 4AEA6u7J...The full token has been omitted for brevity...MzY2OA==
```

You might see a result like the following in the output:

```
"ids": [
   "codebuild-demo-project:98253670-7a8a-4546-b908-dc890EXAMPLE"
   "codebuild-demo-project:ad5405b2-1ab3-44df-ae2d-fba84EXAMPLE"
   ... The full list of build IDs has been omitted for brevity ...
   "codebuild-demo-project:f721a282-380f-4b08-850a-e0ac1EXAMPLE"
]
}
```

View a list of build IDs for a build project (AWS SDKs)

For more information about using AWS CodeBuild with the AWS SDKs, see the <u>AWS SDKs and tools</u> reference.

Test reports in AWS CodeBuild

You can create reports in CodeBuild that contain details about tests that are run during builds. You can create tests such as unit tests, configuration tests, and functional tests.

The following test report file formats are supported:

- Cucumber JSON (.json)
- JUnit XML (.xml)
- NUnit XML (.xml)
- NUnit3 XML (.xml)
- TestNG XML (.xml)
- Visual Studio TRX (.trx)
- Visual Studio TRX XML (.xml)



Note

The latest supported version of cucumber-js is 7.3.2.

Create your test cases with any test framework that can create report files in one of these formats (for example, Surefire JUnit plugin, TestNG, or Cucumber).

To create a test report, you add a report group name to the buildspec file of a build project with information about your test cases. When you run the build project, the test cases are run and a test report is created. A new test report is created in the report group each time the test cases run. You do not need to create a report group before you run your tests. If you specify a report group name, CodeBuild creates a report group for you when you run your reports. If you want to use a report group that already exists, you specify its ARN in the buildspec file.

You can use a test report to help troubleshoot a problem during a build run. If you have many test reports from multiple builds of a build project, you can use your test reports to view trends and test and failure rates to help you optimize builds.

A report expires 30 days after it was created. You cannot view an expired test report. If you want to keep test reports for more than 30 days, you can export your test results' raw data files to an

Amazon S3 bucket. Exported test files do not expire. Information about the S3 bucket is specified when you create the report group.



Note

The CodeBuild service role specified in the project is used for permissions to upload to the S3 bucket.

Topics

- Create test reports
- Create code coverage reports
- Auto-discover reports in CodeBuild
- Report groups
- Test frameworks
- View test reports
- Test report permissions
- Test report statuses

Create test reports

To create a test report, you run a build project that is configured with one to five report groups in its buildspec file. A test report is created during the run. It contains the results of the test cases that are specified for the report groups. A new test report is generated for each subsequent build that uses the same buildspec file.

To create a test report

- Create a build project. For information, see Create a build project in AWS CodeBuild. 1.
- Configure the buildspec file of your project with test report informaton: 2.
 - Add a reports: section and specify either the ARN of an existing report group, or the name of a report group.

If you specify an ARN, CodeBuild uses that report group.

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If you specify a name, CodeBuild creates a report group for you using your project name, and the name you specified, in the format project-name>-<report-group-name>. If the named report group already exists, CodeBuild uses that report group.

- b. Under the report group, specify the location of the files that contain the test results. If you use more than one report group, specify test result file locations for each one. A new test report is created each time your build project runs. For more information, see Specify test files.
- c. In the commands section of the build or post_build sequence, specify the commands that run the tests cases you specified for your report groups. For more information, see Specify test commands.

The following is an example of a buildspec reports section:

```
reports:
  php-reports:
    files:
        - "reports/php/*.xml"
    file-format: "JUNITXML"

nunit-reports:
    files:
        - "reports/nunit/*.xml"
    file-format: "NUNITXML"
```

- 3. Run a build of the build project. For more information, see Run AWS CodeBuild builds manually.
- 4. When the build is complete, choose the new build run from **Build history** on your project page. Choose **Reports** to view the test report. For more information, see <u>View test reports for</u> a build.

Create code coverage reports

CodeBuild allows you to generate code coverage reports for your tests. The following code coverage reports are provided:

Line coverage

Line coverage measures how many statements your tests cover. A statement is a single instruction, not including comments or conditionals.

```
line coverage = (total lines covered)/(total number of lines)
```

Branch coverage

Branch coverage measures how many branches your tests cover out of every possible branch of a control structure, such as an if or case statement.

```
branch coverage = (total branches covered)/(total number of branches)
```

The following code coverage report file formats are supported:

- JaCoCo XML
- SimpleCov JSON¹
- Clover XML
- Cobertura XML
- LCOV INFO

Create a code coverage report

To create a code coverage report, you run a build project that is configured with at least one code coverage report group in its buildspec file. CodeBuild will interpret the code coverage results and provide a code coverage report for the run. A new test report is generated for each subsequent build that uses the same buildspec file.

To create a test report

- 1. Create a build project. For information, see Create a build project in AWS CodeBuild.
- 2. Configure the buildspec file of your project with test report information:
 - a. Add a reports: section and specify the name for your report group. CodeBuild creates a report group for you using your project name and the name you specified in the format project-name-report-group-name-in-buildspec. If you already have a report

¹ CodeBuild accepts JSON code coverage reports generated by simplecov, not simplecov-json.

group you want to use, specify its ARN. If you use the name instead of the ARN, CodeBuild creates a new report group. For more information, see Reports syntax in the buildspec file.

Under the report group, specify the location of the files that contain the code coverage results. If you use more than one report group, specify result file locations for each report group. A new code coverage report is created each time your build project runs. For more information, see Specify test files.

This is an example that generates a code coverage report for a JaCoCo XML results file located in test-results/jacoco-coverage-report.xml.

```
reports:
  jacoco-report:
    files:
      - 'test-results/jacoco-coverage-report.xml'
    file-format: 'JACOCOXML'
```

- In the commands section of the build or post_build sequence, specify the commands that run the code coverage analysis. For more information, see Specify test commands.
- 3. Run a build of the build project. For more information, see Run AWS CodeBuild builds manually.
- When the build is complete, choose the new build run from **Build history** on your project page. Choose **Reports** to view the code coverage report. For more information, see View test reports for a build.

Auto-discover reports in CodeBuild

With auto-discovery, CodeBuild searches through all your build files after the build phase has completed, searches for any supported report file types, and automatically creates new test and code coverage report groups and reports. For any discovered report types, CodeBuild creates new report groups with the following pattern:

```
covered
```



Note

If the discovered report files have the same format type, they will be placed in to the same report group or report.

Report auto-discover is configured by your project environment variables:

CODEBUILD_CONFIG_AUTO_DISCOVER

This variable determines whether report auto-discover is disabled during the build. By default, report auto-discover is enabled for all builds. To disable this feature, set CODEBUILD_CONFIG_AUTO_DISCOVER to false.

CODEBUILD CONFIG AUTO DISCOVER DIR

(Optional) This variable determines where CodeBuild searches for potential report files. Note that by default, CodeBuild searches in **/* by default.

These environment variables can be modified during the build phase. For example, if you only want to enable report auto-discover for builds on the main git branch, you can check the git branch during the build process and set CODEBUILD_CONFIG_AUTO_DISCOVER to false if the build is not on the main branch. Report auto-discover can be disabled using the console or using project environment variables.

Topics

- Configure report auto-discover using the console
- Configure report auto-discover using project environment variables

Configure report auto-discover using the console

Use the following procedure to configure report auto-discovery using the console.

To configure report auto-discover using the console

- 1. Create a build project or choose a build project to edit. For information, see <u>Create a build</u> project in AWS CodeBuild or <u>Change build project settings in AWS CodeBuild</u>.
- 2. In **Environment**, select **Additional configuration**.
- 3. To disable report auto-discover, in **Report auto-discover**, select **Disable report auto-discover**.
- 4. (Optional) In **Auto-discover directory optional**, enter a directory pattern for CodeBuild to search for supported report format files. Note that CodeBuild searches in **/* by default.

Configure report auto-discover using project environment variables

Use the following procedure to configure report auto-discovery using project environment variables.

To configure report auto-discover using project environment variables

- 1. Create a build project or choose a build project to edit. For information, see <u>Create a build</u> project in AWS CodeBuild or Change build project settings in AWS CodeBuild.
- 2. In **Environment variables**, do the following:
 - a. To disable report auto-discover, for **Name**, enter **CODEBUILD_CONFIG_AUTO_DISCOVER** and for **Value**, enter **false**. This disables report auto-discover.
 - b. (Optional) For Name, enter CODEBUILD_CONFIG_AUTO_DISCOVER_DIR and for Value, enter the directory where CodeBuild should search for supported report format files. For example, output/*xml searches for .xml files in the output directory

Report groups

A report group contains test reports and specifies shared settings. You use the buildspec file to specify the test cases to run and the commands to run them when it builds. For each report group configured in a build project, a run of the build project creates a test report. Multiple runs of a build project configured with a report group create multiple test reports in that report group, each with results of the same test cases specified for that report group.

The test cases are specified for a report group in the buildspec file of a build project. You can specify up to five report groups in one build project. When you run a build, all the test cases run. A new test report is created with the results of each test case specified for a report group. Each time you run a new build, the test cases run and a new test report is created with the new test results.

Report groups can be used in more than one build project. All test reports created with one report group share the same configuration, such as its export option and permissions, even if the test reports are created using different build projects. Test reports created with one report group in multiple build projects can contain the results from running different sets of test cases (one set of test cases for each build project). This is because you can specify different test case files for the report group in each project's buildspec file. You can also change the test case files for a report group in a build project by editing its buildspec file. Subsequent build runs create new test reports that contain the results of the test case files in the updated buildspec.

Topics

- Create a report group
- Report group naming
- Share report groups
- Specify test files
- Specify test commands
- Tag a report group in AWS CodeBuild
- Update a report group

Create a report group

You can use the CodeBuild console, the AWS CLI, or a buildspec file to create a report group. Your IAM role must have the permissions required to create a report group. For more information, see Test report permissions.

Topics

- Create a report group (buildspec)
- Create a report group (console)
- Create a report group (CLI)
- Create a report group (AWS CloudFormation)

Create a report group (buildspec)

A report group created using the buildspec does not export raw test result files. You can view your report group and specify export settings. For more information, see Update a report group.

To create a report group using a buildspec file

- 1. Choose a report group name that is not associated with a report group in your AWS account.
- 2. Configure the reports section of the buildspec file with this name. In this example, the report group name is new-report-group and the use test cases are created with the JUnit framework:

```
reports:
new-report-group: #surefire junit reports
```

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```
files:
    - '**/*'
base-directory: 'surefire/target/surefire-reports'
```

The report group name can also be specified by using environment variables in the buildspec:

```
version: 0.2
env:
    variables:
        REPORT_GROUP_NAME: "new-report-group"
phases:
    build:
        commands:
        - ...
...
reports:
$REPORT_GROUP_NAME:
files:
        - '**/*'
base-directory: 'surefire/target/surefire-reports'
```

For more information, see Specify test files and Reports syntax in the buildspec file.

- 3. In the commands section, specify the command to run your tests. For more information, see Specify test commands.
- 4. Run the build. When the build is complete, a new report group is created with a name that uses the format project-name-report-group-name. For more information, see Report group naming.

Create a report group (console)

Use the following procedure to create a report group using the AWS Management Console.

To create a report group

- Open the AWS CodeBuild console at https://console.aws.amazon.com/codesuite/codebuild/
 home.
- 2. In the navigation pane, choose **Report groups**.
- Choose Create report group.

Create a report group API Version 2016-10-06 702

- For **Report group name**, enter a name for your report group. 4.
- (Optional) For **Tags**, enter the name and value of any tags that you want supporting AWS 5. services to use. Use **Add row** to add a tag. You can add up to 50 tags.
- 6. If you want to upload the raw data of your test report results to an Amazon S3 bucket:
 - Select **Export to Amazon S3**. a.
 - For **S3 bucket name**, enter the name of the S3 bucket. b.
 - (Optional) For S3 bucket owner, enter the AWS account identifier of the account that c. owns the S3 bucket. This allows report data to be exported to an Amazon S3 bucket that is owned by an account other than the account running the build.
 - For **Path prefix**, enter the path in your S3 bucket where you want to upload your test results.
 - Select **Compress test result data in a zip file** to compress your raw test result data files. e.
 - f. Expand Additional configuration to display encryption options. Choose one of the following:
 - **Default AWS managed key** to use a AWS managed key for Amazon S3. For more information, see Customer managed CMKs in the AWS Key Management Service User *Guide*. This is the default encryption option.
 - **Choose a custom key** to use a customer managed key that you create and configure. For **AWS KMS encryption key**, enter the ARN of your encryption key. Its format is arn:aws:kms:<region-id>: <aws-account-id>:key/<key-id> .For more information, see Creating KMS keys in the AWS Key Management Service User Guide.
 - Disable artifact encryption to disable encryption. You might choose this if you want to share your test results, or publish them to a static website. (A dynamic website can run code to decrypt test results.)

For more information about encryption of data at rest, see Data encryption.



Note

The CodeBuild service role specified in the project is used for permissions to upload to the S3 bucket.

Choose Create report group. 7.

API Version 2016-10-06 703 Create a report group

Create a report group (CLI)

Use the following procedure to create a report group using the AWS CLI.

To create a report group

- Create a file named CreateReportGroup.json.
- 2. Depending on your requirements, copy one of the following JSON code snippets into CreateReportGroup.json:
 - Use the following JSON to specify that your test report group exports raw test result files to an Amazon S3 bucket.

```
"name": "<report-name>",
  "type": "TEST",
  "exportConfig": {
    "exportConfigType": "S3",
    "s3Destination": {
      "bucket": "<bucket-name>",
      "bucket0wner": "<bucket-owner>",
      "path": "<path>",
      "packaging": "NONE | ZIP",
      "encryptionDisabled": "false",
      "encryptionKey": "<your-key>"
    },
    "tags": [
        "key": "tag-key",
        "value": "tag-value"
      }
    ]
  }
}
```

- Replace <bucket-name> with your Amazon S3 bucket name and <path> with the path in your bucket to where you want to export the files.
- If you want to compress the exported files, for packaging, specify ZIP. Otherwise, specify NONE.
- bucketOwner is optional and is only required if the Amazon S3 bucket is owned by an account other than the account running the build.

Create a report group API Version 2016-10-06 704

• Use encryptionDisabled to specify whether to encrypt the exported files. If you encrypt the exported files, enter your customer managed key. For more information, see Update a report group.

• Use the following JSON to specify that your test report does not export raw test files:

```
{
  "name": "<report-name>",
  "type": "TEST",
  "exportConfig": {
     "exportConfigType": "NO_EXPORT"
  }
}
```

Note

The CodeBuild service role specified in the project is used for permissions to upload to the S3 bucket.

3. Run the following command:

```
aws codebuild create-report-group --cli-input-json file://
CreateReportGroupInput.json
```

Create a report group (AWS CloudFormation)

Use the following instructions to create a report group using the AWS CloudFormation template

To create a report group using the AWS CloudFormation template

You can use an AWS CloudFormation template file to create and provision a report group. For more information, see AWS CloudFormation User Guide.

The following AWS CloudFormation YAML template creates a report group that does not export raw test result files.

```
Resources:
CodeBuildReportGroup:
Type: AWS::CodeBuild::ReportGroup
Properties:
```

Create a report group API Version 2016-10-06 705

Name: my-report-group-name
Type: TEST
ExportConfig:
 ExportConfigType: NO_EXPORT

The following AWS CloudFormation YAML template creates a report group that exports raw test result files to an Amazon S3 bucket.

```
Resources:
CodeBuildReportGroup:
Type: AWS::CodeBuild::ReportGroup
Properties:
Name: my-report-group-name
Type: TEST
ExportConfig:
ExportConfigType: S3
S3Destination:
Bucket: amzn-s3-demo-bucket
Path: path-to-folder-for-exported-files
Packaging: ZIP
EncryptionKey: my-KMS-encryption-key
EncryptionDisabled: false
```

Note

The CodeBuild service role specified in the project is used for permissions to upload to the S3 bucket.

Report group naming

When you use the AWS CLI or the AWS CodeBuild console to create a report group, you specify a name for the report group. If you use the buildspec to create a new report group, it is named using the format <code>project-name-report-group-name-specified-in-buildspec</code>. All reports created by running builds of that build project belong to the new report group that has the new name.

If you do not want CodeBuild to create a new report group, specify the ARN of the report group in a build project's buildspec file. You can specify a report group's ARN in multiple build projects. After each build project runs, the report group contains test reports created by each build project.

Report group naming API Version 2016-10-06 706

For example, if you create one report group with the name my-report-group, and then use its name in two different build projects named my-project-1 and my-project-2 and create a build of both projects, two new report groups are created. The result is three report groups with the following names:

- my-report-group: Does not have any test reports.
- my-project-1-my-report-group: Contains reports with results of tests run by the build project named my-project-1.
- my-project-2-my-report-group: Contains reports with results of tests run by the build project named my-project-2.

If you use the ARN of the report group named my-report-group in both projects, and then run builds of each project, you still have one report group (my-report-group). That report group contains test reports with results of tests run by both build projects.

If you choose a report group name that doesn't belong to a report group in your AWS account, and then use that name for a report group in a buildspec file and run a build of its build project, a new report group is created. The format of name of the new report group is <code>project-name-new-group-name</code>. For example, if there is not a report group in your AWS account with the name new-report-group, and specify it in a build project called test-project, a build run creates a new report group with the name test-project-new-report-group.

Share report groups

Report group sharing allows multiple AWS accounts or users to view a report group, its unexpired reports, and the test results of its reports. In this model, the account that owns the report group (owner) shares a report group with other accounts (consumers). A consumer cannot edit a report group. A report expires 30 days after it is created.

Topics

- Share a report group
- Related services
- Access report groups shared with you
- Unshare a shared report group
- Identify a shared report group
- Shared report group permissions

Share a report group

When you share a report group, the consumer is granted read-only access to the report group and its reports. The consumer can use the AWS CLI to view the report group, its reports, and the test case results for each report. The consumer cannot:

- View a shared report group or its reports in the CodeBuild console.
- Edit a shared report group.
- Use the ARN of the shared report group in a project to run a report. A project build that specifies a shared report group fails.

You can use the CodeBuild console to add a report group to an existing resource share. If you want to add the report group to a new resource share, you must first create it in the AWS RAM console.

To share a report group with organizational units or an entire organization, you must enable sharing with AWS Organizations. For more information, see Enable sharing with AWS Organizations in the AWS RAM User Guide.

You can use the CodeBuild console, AWS RAM console, or AWS CLI to share report groups that you own.

Prerequisite

To share a report group, your AWS account must own it. You cannot share a report group that has been shared with you.

To share a report group that you own (CodeBuild console)

- 1. Open the AWS CodeBuild console at https://console.aws.amazon.com/codesuite/codebuild/ home.
- 2. In the navigation pane, choose **Report groups**.
- 3. Choose the project you want to share, and then choose **Share**. For more information, see Create a resource share in the AWS RAM User Guide.

To share report groups that you own (AWS RAM console)

See Creating a resource share in the AWS RAM User Guide.

To share report groups that you own (AWS RAM command)

Use the create-resource-share command.

To share a report group that you own (CodeBuild command)

Use the put-resource-policy command:

1. Create a file named policy.json and copy the following into it.

```
{
  "Version":"2012-10-17",
  "Statement":[{
    "Effect":"Allow",
    "Principal":{
        "AWS":"consumer-aws-account-id-or-user"
    },
    "Action":[
        "codebuild:BatchGetReportGroups",
        "codebuild:BatchGetReports",
        "codebuild:ListReportsForReportGroup",
        "codebuild:DescribeTestCases"],
        "Resource":"arn-of-report-group-to-share"
    }]
}
```

2. Update policy.json with the report group ARN and identifiers to share it with.

The following example grants read-only access to the report group with the ARN

arn:aws:codebuild:us-west-2:123456789012:report-group/my-report-group to

Alice and the root user for the AWS account identified by 123456789012.

```
"codebuild:BatchGetReports",
    "codebuild:ListReportsForReportGroup",
    "codebuild:DescribeTestCases"],
    "Resource":"arn:aws:codebuild:us-west-2:123456789012:report-group/my-report-group"
    }]
}
```

3. Run the following command.

```
aws codebuild put-resource-policy --resource-arn report-group-arn --policy file://
policy.json
```

Related services

Report group sharing integrates with AWS Resource Access Manager (AWS RAM), a service that makes it possible for you to share your AWS resources with any AWS account or through AWS Organizations. With AWS RAM, you share resources that you own by creating a *resource share* that specifies the resources and the consumers to share them with. Consumers can be individual AWS accounts, organizational units in AWS Organizations, or an entire organization in AWS Organizations.

For more information, see the AWS RAM User Guide.

Access report groups shared with you

To access a shared report group, a consumer's IAM role requires the BatchGetReportGroups permission. You can attach the following policy to their IAM role:

For more information, see <u>Using identity-based policies for AWS CodeBuild</u>.

Unshare a shared report group

An unshared report group, including its reports and their test case results, can be accessed only by its owner. If you unshare a report group, any AWS account or user you previously shared it with cannot access the report group, its reports, or the results of test cases in the reports.

To unshare a shared report group that you own, you must remove it from the resource share. You can use the AWS RAM console or AWS CLI to do this.

To unshare a shared report group that you own (AWS RAM console)

See <u>Updating a resource share</u> in the AWS RAM User Guide.

To unshare a shared report group that you own (AWS RAM command)

Use the disassociate-resource-share command.

To unshare report group that you own CodeBuild command)

Run the <u>delete-resource-policy</u> command and specify the ARN of the report group you want to unshare:

```
aws codebuild delete-resource-policy --resource-arn report-group-arn
```

Identify a shared report group

Owners and consumers can use the AWS CLI to identify shared report groups.

To identify and get information about a shared report group and its reports, use the following commands:

To see the ARNs of report groups shared with you, run <u>list-shared-report-groups</u>:

```
aws codebuild list-shared-report-groups
```

To see the ARNs of the reports in a report group, run <u>list-reports-for-report-group</u> using the report group ARN:

```
aws codebuild list-reports-for-report-group --report-group-arn report-group-arn
```

 To see information about test cases in a report, run <u>describe-test-cases</u> using the report ARN:

```
aws codebuild describe-test-cases --report-arn report-arn
```

The output looks like the following:

```
{
    "testCases": [
        {
            "status": "FAILED",
            "name": "Test case 1",
            "expired": 1575916770.0,
            "reportArn": "report-arn",
            "prefix": "Cucumber tests for agent",
            "message": "A test message",
            "durationInNanoSeconds": 1540540,
            "testRawDataPath": "path-to-output-report-files"
        },
        {
            "status": "SUCCEEDED",
            "name": "Test case 2",
            "expired": 1575916770.0,
            "reportArn": "report-arn",
            "prefix": "Cucumber tests for agent",
            "message": "A test message",
            "durationInNanoSeconds": 1540540,
            "testRawDataPath": "path-to-output-report-files"
        }
    ]
}
```

Shared report group permissions

Permissions for owners

A report group owner can edit the report group and specify it in a project to run reports.

Permissions for consumers

A report group consumer can view a report group, its reports, and the test case results for its reports. A consumer cannot edit a report group or its reports, and cannot use it to create reports.

Specify test files

You specify the test result files and their location for each report group in the reports section of your build project's buildspec file. For more information, see Reports syntax in the buildspec file.

The following is a sample reports section that specifies two report groups for a build project. One is specified with its ARN, the other with a name. The files section specifies the files that contain the test case results. The optional base-directory section specifies the directory where the test case files are located. The optional discard-paths section specifies whether paths to test result files uploaded to an Amazon S3 bucket are discarded.

```
reports:
    arn:aws:codebuild:your-region:your-aws-account-id:report-group/report-group-name-1:
#surefire junit reports
    files:
        - '**/*'
    base-directory: 'surefire/target/surefire-reports'
    discard-paths: false

sampleReportGroup: #Cucumber reports from json plugin
    files:
        - 'cucumber-json/target/cucumber-json-report.json'
    file-format: CUCUMBERJSON #Type of the report, defaults to JUNITXML
```

Specify test commands

You specify the commands that run your test cases in the commands section of your buildspec file. These commands run the test cases specified for your report groups in the reports section of your buildspec file. The following is a sample commands section that includes commands to run the tests in test files:

```
commands:
    - echo Running tests for surefire junit
    - mvn test -f surefire/pom.xml -fn
    - echo
    - echo Running tests for cucumber with json plugin
    - mvn test -Dcucumber.options="--plugin json:target/cucumber-json-report.json" -f
cucumber-json/pom.xml -fn
```

For more information, see Buildspec syntax.

Specify test files API Version 2016-10-06 713

Tag a report group in AWS CodeBuild

A *tag* is a custom attribute label that you or AWS assigns to an AWS resource. Each AWS tag has two parts:

- A tag key (for example, CostCenter, Environment, Project, or Secret). Tag keys are case sensitive.
- An optional field known as a *tag value* (for example, 111122223333, Production, or a team name). Omitting the tag value is the same as using an empty string. Like tag keys, tag values are case sensitive.

Together these are known as key-value pairs. For limits on the number of tags you can have on a report group and restrictions on tag keys and values, see Tags.

Tags help you identify and organize your AWS resources. Many AWS services support tagging, so you can assign the same tag to resources from different services to indicate that the resources are related. For example, you can assign the same tag to a CodeBuild report group that you assign to an Amazon S3 bucket. For more information about using tags, see the <u>Tagging best practices</u> whitepaper.

In CodeBuild, the primary resources are the report group and the project. You can use the CodeBuild console, the AWS CLI, CodeBuild APIs, or AWS SDKs to add, manage, and remove tags for a report group. In addition to identifying, organizing, and tracking your report group with tags, you can use tags in IAM policies to help control who can view and interact with your report group. For examples of tag-based access policies, see Using tags to control access to AWS CodeBuild resources.

Topics

- Add tags to a report group
- View tags for a report group
- Edit tags for a report group
- Remove tags from a report group

Add tags to a report group

Adding tags to a report group can help you identify and organize your AWS resources and manage access to them. First, you add one or more tags (key-value pairs) to a report group. Keep in mind

Tag a report group API Version 2016-10-06 714

that there are limits on the number of tags you can have on a report group. There are restrictions on the characters you can use in the key and value fields. For more information, see Tags. After you have tags, you can create IAM policies to manage access to the report group based on these tags. You can use the CodeBuild console or the AWS CLI to add tags to a report group.

Important

Adding tags to a report group can impact access to that report group. Before you add a tag to a report group, make sure to review any IAM policies that might use tags to control access to resources such as report groups. For examples of tag-based access policies, see Using tags to control access to AWS CodeBuild resources.

For more information about adding tags to a report group when you create it, see Create a report group (console).

Topics

- Add a tag to a report group (console)
- Add a tag to a report group (AWS CLI)

Add a tag to a report group (console)

You can use the CodeBuild console to add one or more tags to a CodeBuild report group.

- 1. Open the CodeBuild console at https://console.aws.amazon.com/codebuild/.
- 2. In **Report groups**, choose the name of the report group where you want to add tags.
- 3. In the navigation pane, choose **Settings**.
- If no tags have been added to the report group, choose Add tag. You can also choose Edit, and 4. then choose **Add tag**.
- In **Key**, enter a name for the tag. You can add an optional value for the tag in **Value**. 5.
- 6. (Optional) To add another tag, choose Add tag again.
- 7. When you have finished adding tags, choose **Submit**.

Tag a report group API Version 2016-10-06 715

Add a tag to a report group (AWS CLI)

To add a tag to a report group when you create it, see <u>Create a report group (CLI)</u>. In CreateReportGroup.json, add your tags.

To add tags to an existing report group, see Update a report group (CLI) and add your tags in UpdateReportGroupInput.json.

In these steps, we assume that you have already installed a recent version of the AWS CLI or updated to the current version. For more information, see <u>Installing the AWS Command Line</u> <u>Interface</u>.

View tags for a report group

Tags can help you identify and organize your AWS resources and manage access to them. For more information about using tags, see the <u>Tagging best practices</u> whitepaper. For examples of tagbased access policies, see <u>Deny or allow actions on report groups based on resource tags</u>.

View tags for a report group (console)

You can use the CodeBuild console to view the tags associated with a CodeBuild report group.

- 1. Open the CodeBuild console at https://console.aws.amazon.com/codebuild/.
- 2. In **Report groups**, choose the name of the report group where you want to view tags.
- 3. In the navigation pane, choose **Settings**.

View tags for a report group (AWS CLI)

Follow these steps to use the AWS CLI to view the AWS tags for a report group. If no tags have been added, the returned tags list is empty.

1. Use the console or the AWS CLI to locate the ARN of your report group. Make a note of it.

AWS CLI

Run the following command.

aws list-report-groups

This command returns JSON-formatted information similar to the following:

Tag a report group API Version 2016-10-06 716

```
{
    "reportGroups": [
        "arn:aws:codebuild:region:123456789012:report-group/report-group-1",
        "arn:aws:codebuild:region:123456789012:report-group/report-group-2",
        "arn:aws:codebuild:region:123456789012:report-group/report-group-3"
]
}
```

A report group ARN ends with its name, which you can use to identify the ARN for your report group.

Console

- 1. Open the CodeBuild console at https://console.aws.amazon.com/codebuild/.
- 2. In **Report groups**, choose the name of your report group with the tags you want to view.
- 3. In **Configuration** locate your report group's ARN.
- 2. Run the following command. Use the ARN you made a note of for the --report-group-arns parameter.

```
aws codebuild batch-get-report-groups --report-group-arns arn:aws:codebuild:region:123456789012:report-group/report-group-name
```

If successful, this command returns JSON-formatted information that contains a tags section similar to the following:

```
{
    ...
"tags": {
        "Status": "Secret",
        "Project": "TestBuild"
    }
    ...
}
```

Tag a report group API Version 2016-10-06 717

Edit tags for a report group

You can change the value for a tag associated with a report group. You can also change the name of the key, which is equivalent to removing the current tag and adding a different one with the new name and the same value as the other key. Keep in mind that there are restrictions on the characters you can use in the key and value fields. For more information, see Tags.

Important

Editing tags for a report group can impact access to that report group. Before you edit the name (key) or value of a tag for a report group, make sure to review any IAM policies that might use the key or value for a tag to control access to resources such as report groups. For examples of tag-based access policies, see Deny or allow actions on report groups based on resource tags.

Edit a tag for a report group (console)

You can use the CodeBuild console to edit the tags associated with a CodeBuild report group.

- 1. Open the CodeBuild console at https://console.aws.amazon.com/codebuild/.
- 2. In **Report groups**, choose the name of the report group where you want to edit tags.
- In the navigation pane, choose **Settings**. 3.
- Choose **Edit**. 4.
- 5. Do one of the following:
 - To change the tag, enter a new name in **Key**. Changing the name of the tag is the equivalent of removing a tag and adding a new tag with the new key name.
 - To change the value of a tag, enter a new value. If you want to change the value to nothing, delete the current value and leave the field blank.
- When you have finished editing tags, choose **Submit**.

Edit tags for a report group (AWS CLI)

To add, change, or delete tags from a report group, see Update a report group (CLI). Update the tags in UpdateReportGroupInput.json.

Tag a report group API Version 2016-10-06 718

Remove tags from a report group

You can remove one or more tags associated with a report group. Removing a tag does not delete the tag from other AWS resources that are associated with that tag.

Important

Removing tags for a report group can impact access to that report group. Before you remove a tag from a report group, make sure to review any IAM policies that might use the key or value for a tag to control access to resources such as report groups. For examples of tag-based access policies, see Using tags to control access to AWS CodeBuild resources.

Remove a tag from a report group (console)

You can use the CodeBuild console to remove the association between a tag and a CodeBuild report group.

- 1. Open the CodeBuild console at https://console.aws.amazon.com/codebuild/.
- 2. In **Report groups**, choose the name of the report group where you want to remove tags.
- In the navigation pane, choose **Settings**. 3.
- 4. Choose **Edit**.
- Find the tag you want to remove, and then choose **Remove tag**. 5.
- 6. When you have finished removing tags, choose **Submit**.

Remove a tag from a report group (AWS CLI)

Follow these steps to use the AWS CLI to remove a tag from a CodeBuild report group. Removing a tag does not delete it, but simply removes the association between the tag and the report group.



(i) Note

If you delete a CodeBuild report group, all tag associations are removed from the deleted report group. You do not have to remove tags before you delete a report group.

API Version 2016-10-06 719 Tag a report group

To delete one or more tags from a report group, see Edit tags for a report group (AWS CLI). Update the tags section in the JSON-formatted data with an updated list of tags that does not contain the ones you want to delete. If you want to delete all tags, update the tags section to:

"tags: []"

Update a report group

When you update a report group, you can specify information about whether to export the raw test result data to files in an Amazon S3 bucket. If you choose to export to an S3 bucket, you can specify the following for your report group:

- Whether the raw test results files are compressed in a ZIP file.
- Whether the raw test result files are encrypted. You can specify encryption with one of the following:
 - An AWS managed key for Amazon S3.
 - A customer managed key that you create and configure.

For more information, see Data encryption.

If you use the AWS CLI to update a report group, you can also update or add tags. For more information, see Tag a report group in AWS CodeBuild.



Note

The CodeBuild service role specified in the project is used for permissions to upload to the S3 bucket.

Topics

- Update a report group (console)
- Update a report group (CLI)

Update a report group (console)

Use the following procedure to update a report group using the AWS Management Console.

Update a report group API Version 2016-10-06 720

To update a report group

 Open the AWS CodeBuild console at https://console.aws.amazon.com/codesuite/codebuild/ home.

- 2. In the navigation pane, choose **Report groups**.
- 3. Choose the report group you want to update.
- 4. Choose **Edit**.
- 5. Select or clear **Backup to Amazon S3**. If you selected this option, specify your export settings:
 - a. For **S3 bucket name**, enter the name of the S3 bucket.
 - b. For **Path prefix**, enter the path in your S3 bucket where you want to upload your test results.
 - c. Select **Compress test result data in a zip file** to compress your raw test result data files.
 - d. Expand **Additional configuration** to display encryption options. Choose one of the following:
 - Default AWS managed key to use a AWS managed key for Amazon S3. For more
 information, see <u>Customer managed CMKs</u> in the AWS Key Management Service User
 Guide. This is the default encryption option.
 - Choose a custom key to use a customer managed key that you create and configure.
 For AWS KMS encryption key, enter the ARN of your encryption key. Its format is arn:aws:kms:
 <aws-account-id>:key/<key-id>
 . For more information, see Creating KMS keys in the AWS Key Management Service User Guide.
 - **Disable artifact encryption** to disable encryption. You might choose this if you want to share your test results, or publish them to a static website. (A dynamic website can run code to decrypt test results.)

Update a report group (CLI)

Use the following procedure to update a report group using the AWS CLI.

To update a report group

- Create a file named UpdateReportGroupInput.json.
- Copy the following into UpdateReportGroupInput.json:

Update a report group API Version 2016-10-06 721

```
{
    "arn": "",
    "exportConfig": {
        "exportConfigType": "S3",
        "s3Destination": {
            "bucket": "bucket-name",
            "path": "path",
            "packaging": "NONE | ZIP",
            "encryptionDisabled": "false",
            "encryptionKey": "your-key"
         }
     },
     "tags": [
        {
            "key": "tag-key",
            "value": "tag-value"
        }
     ]
}
```

- 3. Enter the ARN of your report group in the arn line (for example, "arn": "arn: aws:codebuild: region: 123456789012: report-group/report-group-1").
- 4. Update UpdateReportGroupInput.json with the updates you want to apply to your report group.
 - If you want to update your report group to export raw test result files to an S3 bucket, update the exportConfig section. Replace bucket-name with your S3 bucket name and path with the path in your S3 bucket that you want to export the files to. If you want to compress the exported files, for packaging, specify ZIP. Otherwise, specify NONE. Use encryptionDisabled to specify whether to encrypt the exported files. If you encrypt the exported files, enter your customer managed key.
 - If you want to update your report group so that it does not export raw test result files to an S3 bucket, update the exportConfig section with the following JSON:

```
{
   "exportConfig": {
      "exportConfigType": "NO_EXPORT"
}
```

Update a report group API Version 2016-10-06 722

}

• If you want to update the report group's tags, update the tags section. You can change, add, or remove tags. If you want to remove all tags, update it with the following JSON:

```
"tags": []
```

5. Run the following command:

```
aws codebuild update-report-group \
--cli-input-json file://UpdateReportGroupInput.json
```

Test frameworks

The topics in this section demonstrate how to set up test reporting in AWS CodeBuild for various test frameworks.

Topics

- Set up test reporting with Jasmine
- Set up test reporting with Jest
- Set up test reporting with pytest
- Set up test reporting with RSpec

Set up test reporting with Jasmine

The following procedure demonstrates how to set up test reporting in AWS CodeBuild with the JasmineBDD testing framework.

The procedure requires the following prerequisites:

- You have an existing CodeBuild project.
- Your project is a Node.js project that is set up to use the Jasmine testing framework.

Add the <u>jasmine-reporters</u> package to the devDependencies section of your project's package.json file. This package has a collection of JavaScript reporter classes that can be used with Jasmine.

Test frameworks API Version 2016-10-06 723

```
npm install --save-dev jasmine-reporters
```

If it's not already present, add the test script to your project's package.json file. The test script ensures that Jasmine is called when **npm test** is run.

```
{
  "scripts": {
    "test": "npx jasmine"
  }
}
```

CodeBuild supports the following Jasmine test reporters:

JUnitXmlReporter

Used to generate reports in the JunitXml format.

NUnitXmlReporter

Used to generate reports in the NunitXml format.

A Node.js project with Jasmine will, by default, have a spec sub-directory, which contains the Jasmine configuration and test scripts.

To configure Jasmine to generate reports in the JunitXML format, instantiate the JUnitXmlReporter reporter by adding the following code to your tests.

```
var reporters = require('jasmine-reporters');

var junitReporter = new reporters.JUnitXmlReporter({
    savePath: <test report directory>,
    filePrefix: <report filename>,
    consolidateAll: true
});

jasmine.getEnv().addReporter(junitReporter);
```

To configure Jasmine to generate reports in the NunitXML format, instantiate the NUnitXmlReporter reporter by adding the following code to your tests.

```
var reporters = require('jasmine-reporters');
```

Set up Jasmine API Version 2016-10-06 724

```
var nunitReporter = new reporters.NUnitXmlReporter({
   savePath: <test report directory>,
   filePrefix: <report filename>,
   consolidateAll: true
});
jasmine.getEnv().addReporter(nunitReporter)
```

The test reports are exported to the file specified by <test report directory>/<report filename>.

In your buildspec.yml file, add/update the following sections.

```
version: 0.2

phases:
    pre_build:
    commands:
        - npm install
    build:
    commands:
        - npm build
        - npm test

reports:
    jasmine_reports:
    files:
        - <report filename>
        file-format: JUNITXML
        base-directory: <test report directory>
```

If you are using the the NunitXml report format, change the file-format value to the following.

```
file-format: NUNITXML
```

Set up test reporting with Jest

The following procedure demonstrates how to set up test reporting in AWS CodeBuild with the <u>Jest</u> testing framework.

The procedure requires the following prerequisites:

Set up Jest API Version 2016-10-06 725

- You have an existing CodeBuild project.
- Your project is a Node.js project that is set up to use the Jest testing framework.

Add the <u>jest-junit</u> package to the devDependencies section of your project's package.json file. CodeBuild uses this package to generate reports in the JunitXml format.

```
npm install --save-dev jest-junit
```

If it's not already present, add the test script to your project's package.json file. The test script ensures that Jest is called when **npm test** is run.

```
{
   "scripts": {
    "test": "jest"
   }
}
```

Configure Jest to use the JunitXml reporter by adding the following to your Jest configuration file. If your project does not have a Jest configuration file, create a file named jest.config.js in the root of your project and add the following. The test reports are exported to the file specified by <test report directory>/<report filename>.

```
module.exports = {
  reporters: [
    'default',
    [ 'jest-junit', {
      outputDirectory: <test report directory>,
      outputName: <report filename>,
    } ]
  ]
};
```

In your buildspec.yml file, add/update the following sections.

```
version: 0.2

phases:
    pre_build:
    commands:
        - npm install
```

Set up Jest API Version 2016-10-06 726

```
build:
    commands:
        - npm build
        - npm test

reports:
    jest_reports:
    files:
        - <report filename>
        file-format: JUNITXML
        base-directory: <test report directory>
```

Set up test reporting with pytest

The following procedure demonstrates how to set up test reporting in AWS CodeBuild with the pytest testing framework.

The procedure requires the following prerequisites:

- You have an existing CodeBuild project.
- Your project is a Python project that is set up to use the pytest testing framework.

Add the following entry to either the build or post_build phase of your buildspec.yml file. This code automatically discovers tests in the current directory and exports the test reports to the file specified by <test report directory>/<report filename>. The report uses the lunitXml format.

```
- python -m pytest --junitxml=<test report directory>/<report filename>
```

In your buildspec.yml file, add/update the following sections.

```
version: 0.2

phases:
    install:
       runtime-versions:
        python: 3.7
       commands:
        - pip3 install pytest
    build:
```

Set up pytest API Version 2016-10-06 727

```
commands:
    - python -m pytest --junitxml=<test report directory>/<report filename>

reports:
    pytest_reports:
    files:
        - <report filename>
        base-directory: <test report directory>
        file-format: JUNITXML
```

Set up test reporting with RSpec

The following procedure demonstrates how to set up test reporting in AWS CodeBuild with the RSpec testing framework.

The procedure requires the following prerequisites:

- You have an existing CodeBuild project.
- Your project is a Ruby project that is set up to use the RSpec testing framework.

Add/update the following in your buildspec.yml file. This code runs the tests in the <test source directory> directory and exports the test reports to the file specified by <test report directory>/<report filename>. The report uses the JunitXml format.

```
version: 0.2
phases:
  install:
    runtime-versions:
      ruby: 2.6
  pre_build:
    commands:
      - gem install rspec
      - gem install rspec_junit_formatter
  build:
    commands:
      - rspec <test source directory>/* --format RspecJunitFormatter --out <test report
 directory>/<report filename>
reports:
    rspec_reports:
        files:
```

Set up RSpec API Version 2016-10-06 728

- <report filename>

base-directory: <test report directory>

file-format: JUNITXML

View test reports

You can view details about a test report, such as information about its test cases, pass and fail numbers, and how long it took for it to run. You can view test reports grouped by build run, report group, or your AWS account. Choose a test report in the console to see its details and results of its test cases.

You can see view test reports that are not expired. Test reports expire 30 days after they are created. You cannot view an expired report in CodeBuild.

Topics

- View test reports for a build
- View test reports for a report group
- View test reports in your AWS account

View test reports for a build

To view test reports for a build

- Open the AWS CodeBuild console at https://console.aws.amazon.com/codesuite/codebuild/ home.
- 2. Locate the build you want to view. If you know the project that ran the build that created the test report:
 - 1. In the navigation pane, choose **Build projects**, and then choose the project with the build that ran the test report you want to view.
 - 2. Choose **Build history**, and then choose the build that ran created the reports you want to view.

You can also locate the build in the build history for your AWS account:

1. In the navigation pane, choose **Build history**, and then choose the build that created the test reports you want to view.

View test reports API Version 2016-10-06 729

3. In the build page, choose **Reports**, and then choose a test report to see its details.

View test reports for a report group

To view test reports in a report group

1. Open the AWS CodeBuild console at https://console.aws.amazon.com/codesuite/codebuild/ home.

- 2. In the navigation pane, choose **Report groups**.
- 3. Choose the report group that contains the test reports you want to view.
- 4. Choose a test report to see its details.

View test reports in your AWS account

To view test reports in your AWS account

- Open the AWS CodeBuild console at https://console.aws.amazon.com/codesuite/codebuild/ home.
- 2. In the navigation pane, choose **Report history**.
- 3. Choose a test report to see its details.

Test report permissions

This topic describes important information about permissions related to test reporting.

Topics

- IAM role for test reports
- Permissions for test reporting operations
- Test reporting permissions examples

IAM role for test reports

To run a test report, and to update a project to include test reports, your IAM role requires the following permissions. These permissions are included in the predefined AWS managed policies.

If you want to add test reporting to an existing build project, you must add these permissions yourself.

- CreateReportGroup
- CreateReport
- UpdateReport
- BatchPutTestCases

To run a code coverage report, your IAM role must also include the BatchPutCodeCoverages permission.



Note

BatchPutTestCases, CreateReport, UpdateReport, and BatchPutCodeCoverages are not public permissions. You cannot call a corresponding AWS CLI command or SDK method for these permissions.

To make sure you have these permissions, you can attach the following policy to your IAM role:

```
{
    "Effect": "Allow",
    "Resource": [
        11 * 11
    ٦,
    "Action": [
        "codebuild:CreateReportGroup",
        "codebuild:CreateReport",
        "codebuild:UpdateReport",
        "codebuild:BatchPutTestCases",
        "codebuild:BatchPutCodeCoverages"
    ]
}
```

We recommend that you restrict this policy to only those report groups you must use. The following restricts permissions to only the report groups with the two ARNs in the policy:

```
{
    "Effect": "Allow",
```

IAM role for test reports API Version 2016-10-06 731

The following restricts permissions to only report groups created by running builds of a project named my-project:

Note

The CodeBuild service role specified in the project is used for permissions to upload to the S3 bucket.

Permissions for test reporting operations

You can specify permissions for the following test reporting CodeBuild API operations:

- BatchGetReportGroups
- BatchGetReports
- CreateReportGroup
- DeleteReportGroup
- DeleteReport
- DescribeTestCases
- ListReportGroups
- ListReports
- ListReportsForReportGroup
- UpdateReportGroup

For more information, see AWS CodeBuild permissions reference.

Test reporting permissions examples

For information about sample policies related to test reporting, see the following:

- Allow a user to change a report group
- Allow a user to create a report group
- Allow a user to delete a report
- Allow a user to delete a report group
- Allow a user to get information about report groups
- Allow a user to get information about reports
- Allow a user to get a list of report groups
- Allow a user to get a list of reports
- Allow a user to get a list of reports for a report group
- Allow a user to get a list of test cases for a report

Test report statuses

The status of a test report can be one of the following:

GENERATING: The run of the test cases is still in progress.

• DELETING: The test report is being deleted. When a test report is deleted, its test cases are also deleted. Raw test result data files exported to an S3 bucket are not deleted.

- INCOMPLETE: The test report was not completed. This status might be returned for one of the following reasons:
 - A problem with the configuration of the report group that specifies this report's test cases. For example, the path to the test cases under the report group in the buildspec file might be incorrect.
 - The IAM user that ran the build does not have permissions to run tests. For more information, see <u>Test report permissions</u>.
 - The build was not completed because of an error that is not related to the tests.
- SUCCEEDED: All test cases were successful.
- FAILED: Some of the test cases were not successful.

Each test case returns a status. The status for a test case can be one of the following:

- SUCCEEDED: The test case passed.
- FAILED: The test case failed.
- ERROR: The test case resulted in an unexpected error.
- SKIPPED: The test case did not run.
- UNKNOWN: The test case returned a status other than SUCCEEDED, FAILED, ERROR, or SKIPPED.

A test report can have a maximum of 500 test case results. If more than 500 test cases are run, CodeBuild prioritizes tests with the status FAILED and truncates the test case results.

Test report statuses API Version 2016-10-06 734

Use AWS CodeBuild with Amazon Virtual Private Cloud

Typically, AWS CodeBuild cannot access resources in a VPC. To enable access, you must provide additional VPC-specific configuration information in your CodeBuild project configuration. This includes the VPC ID, the VPC subnet IDs, and the VPC security group IDs. VPC-enabled builds can then access resources inside your VPC. For more information about setting up a VPC in Amazon VPC, see the Amazon VPC User Guide.

Topics

- Use cases
- Best practices for VPCs
- Limitations of VPCs
- Allow Amazon VPC access in your CodeBuild projects
- Troubleshoot your VPC setup
- Use VPC endpoints
- Use AWS CodeBuild with a managed proxy server
- Use AWS CodeBuild with a proxy server
- AWS CloudFormation VPC template

Use cases

VPC connectivity from AWS CodeBuild builds makes it possible to:

- Run integration tests from your build against data in an Amazon RDS database that's isolated on a private subnet.
- Query data in an Amazon ElastiCache cluster directly from tests.
- Interact with internal web services hosted on Amazon EC2, Amazon ECS, or services that use internal Elastic Load Balancing.
- Retrieve dependencies from self-hosted, internal artifact repositories, such as PyPI for Python,
 Maven for Java, and npm for Node.js.
- · Access objects in an S3 bucket configured to allow access through an Amazon VPC endpoint only.
- Query external web services that require fixed IP addresses through the Elastic IP address of the NAT gateway or NAT instance associated with your subnet.

Use cases API Version 2016-10-06 735

Your builds can access any resource that's hosted in your VPC.

Best practices for VPCs

Use this checklist when you set up a VPC to work with CodeBuild.

 Set up your VPC with public and private subnets, and a NAT gateway. The NAT gateway must reside in a public subnet. For more information, see VPC with public and private subnets (NAT) in the Amazon VPC User Guide.

Important

You need a NAT gateway or NAT instance to use CodeBuild with your VPC so that CodeBuild can reach public endpoints (for example, to run CLI commands when running builds). You cannot use the internet gateway instead of a NAT gateway or a NAT instance because CodeBuild does not support assigning Elastic IP addresses to the network interfaces that it creates, and auto-assigning a public IP address is not supported by Amazon EC2 for any network interfaces created outside of Amazon EC2 instance launches.

- Include multiple Availability Zones with your VPC.
- Make sure that your security groups have no inbound (ingress) traffic allowed to your builds. CodeBuild does not have specific requirements for outbound traffic, but you must allow access to any Internet resources required for your build, such as GitHub or Amazon S3.

For more information, see Security groups rules in the Amazon VPC User Guide.

- Set up separate subnets for your builds.
- When you set up your CodeBuild projects to access your VPC, choose private subnets only.

For more information about setting up a VPC in Amazon VPC, see the Amazon VPC User Guide.

For more information about using AWS CloudFormation to configure a VPC to use the CodeBuild VPC feature, see the AWS CloudFormation VPC template.

Limitations of VPCs

VPC connectivity from CodeBuild is not supported for shared VPCs.

Best practices for VPCs API Version 2016-10-06 736

Allow Amazon VPC access in your CodeBuild projects

Include these settings in your VPC configuration:

- For VPC ID, choose the VPC ID that CodeBuild uses.
- For **Subnets**, choose a private subnet with NAT translation that includes or has routes to the resources used by CodeBuild.
- For **Security Groups**, choose the security groups that CodeBuild uses to allow access to resources in the VPCs.

To use the console to create a build project, see <u>Create a build project (console)</u>. When you create or change your CodeBuild project, in **VPC**, choose your VPC ID, subnets, and security groups.

To use the AWS CLI to create a build project, see <u>Create a build project (AWS CLI)</u>. If you are using the AWS CLI with CodeBuild, the service role used by CodeBuild to interact with services on behalf of the IAM user must have a policy attached. For information, see <u>Allow CodeBuild access to AWS</u> services required to create a VPC network interface.

The *vpcConfig* object should include your *vpcId*, *securityGroupIds*, and *subnets*.

 vpcId: Required. The VPC ID that CodeBuild uses. Run this command to get a list of all Amazon VPC IDs in your Region:

```
aws ec2 describe-vpcs
```

• *subnets*: Required. The subnet IDs that include resources used by CodeBuild. Run this command obtain these IDs:

```
aws ec2 describe-subnets --filters "Name=vpc-id, Values=<vpc-id>" --region us-east-1
```



Replace us-east-1 with your Region.

 securityGroupIds: Required. The security group IDs used by CodeBuild to allow access to resources in the VPCs. Run this command to obtain these IDs:

aws ec2 describe-security-groups --filters "Name=vpc-id, Values=<vpc-id>" --region useast-1



Note

Replace us-east-1 with your Region.

Troubleshoot your VPC setup

Use the information that appears in the error message to help you identify, diagnose, and address issues.

The following are some guidelines to assist you when troubleshooting a common CodeBuild VPC error: Build does not have internet connectivity. Please check subnet network configuration.

- 1. Make sure that your internet gateway is attached to VPC.
- 2. Make sure that the route table for your public subnet points to the internet gateway.
- 3. Make sure that your network ACLs allow traffic to flow.
- Make sure that your security groups allow traffic to flow. 4.
- 5. Troubleshoot your NAT gateway.
- 6. Make sure that the route table for private subnets points to the NAT gateway.
- Make sure that the service role used by CodeBuild to interact with services on behalf of the IAM user has the permissions in this policy. For more information, see Allow CodeBuild to interact with other AWS services.

If CodeBuild is missing permissions, you might receive an error that says, Unexpected EC2 error: UnauthorizedOperation. This error can occur if CodeBuild does not have the Amazon EC2 permissions required to work with a VPC.

Use VPC endpoints

You can improve the security of your builds by configuring AWS CodeBuild to use an interface VPC endpoint. Interface endpoints are powered by PrivateLink, a technology that you can use to

privately access Amazon EC2 and CodeBuild by using private IP addresses. PrivateLink restricts all network traffic between your managed instances, CodeBuild, and Amazon EC2 to the Amazon network. (Managed instances don't have access to the internet.) Also, you don't need an internet gateway, NAT device, or virtual private gateway. You are not required to configure PrivateLink, but it's recommended. For more information about PrivateLink and VPC endpoints, see What is AWS PrivateLink?.

Before you create VPC endpoints

Before you configure VPC endpoints for AWS CodeBuild, be aware of the following restrictions and limitations.



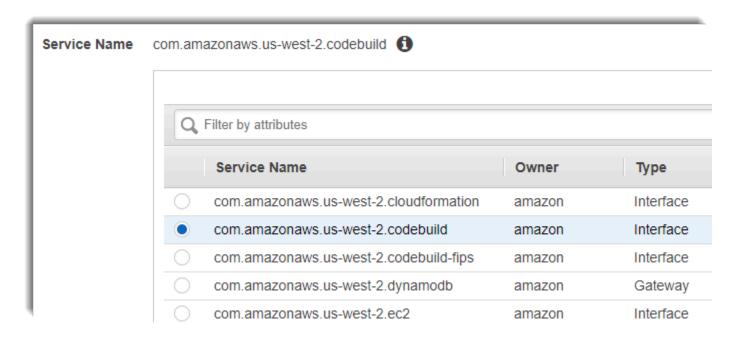
Note

Use a NAT gateway if you want to use CodeBuild with AWS services that do not support Amazon VPC PrivateLink connections.

- VPC endpoints support Amazon-provided DNS through Amazon Route 53 only. If you want to use your own DNS, you can use conditional DNS forwarding. For more information, see DHCP option sets in the Amazon VPC User Guide.
- VPC endpoints currently do not support cross-Region requests. Make sure that you create your endpoint in the same AWS Region as any S3 buckets that store your build input and output. You can use the Amazon S3 console or the get-bucket-location command to find the location of your bucket. Use a Region-specific Amazon S3 endpoint to access your bucket (for example, <bucket-name>.s3-us-west-2.amazonaws.com). For more information about Regionspecific endpoints for Amazon S3, see Amazon Simple Storage Service in the Amazon Web Services General Reference. If you use the AWS CLI to make requests to Amazon S3, set your default Region to the same Region where your bucket was created, or use the --region parameter in your requests.

Create VPC endpoints for CodeBuild

Follow the instructions in Creating an interface endpoint to create the endpoint com. amazonaws. region. codebuild. This is a VPC endpoint for AWS CodeBuild.



region represents the region identifier for an AWS Region supported by CodeBuild, such as useast-2 for the US East (Ohio) Region. For a list of supported AWS Regions, see <u>CodeBuild</u> in the AWS General Reference. The endpoint is prepopulated with the Region you specified when you signed in to AWS. If you change your Region, the VPC endpoint is updated accordingly.

Create a VPC endpoint policy for CodeBuild

You can create a policy for Amazon VPC endpoints for AWS CodeBuild in which you can specify:

- The principal that can perform actions.
- The actions that can be performed.
- The resources that can have actions performed on them.

The following example policy specifies that all principals can only start and view builds for the project-name project.

```
"Effect": "Allow",
            "Resource": "arn:aws:codebuild:region-ID:account-ID:project/project-name",
            "Principal": "*"
        }
    ]
}
```

For more information, see Controlling access to services with VPC endpoints in the Amazon VPC User Guide.

Use AWS CodeBuild with a managed proxy server

To run AWS CodeBuild reserved capacity fleets in a managed proxy server, you must configure the proxy server to allow or deny traffic to and from external sites using proxy rules. Note that running reserved capacity fleets in a managed proxy server is not supported for VPC, Windows, or MacOS.



Important

There are additional costs based on the duration that a proxy configuration is present in the fleet. For more information, see https://aws.amazon.com/codebuild/pricing/.

Topics

- Configure a managed proxy configuration for reserved capacity fleets
- Run a CodeBuild reserved capacity fleet

Configure a managed proxy configuration for reserved capacity fleets

To configure a managed proxy server for your reserved capacity fleet, you must enable this feature when creating your fleet in your console or using the AWS CLI. There are several properties which you need to define:

Define proxy configurations - optional

Proxy configurations that apply network access control to your reserved capacity instances.

Default behavior

Defines the behavior of outgoing traffic.

Allow

Allows outgoing traffic to all destinations by default.

Deny

Denies outgoing traffic to all destinations by default.

Proxy rules

Specifies destination domains to restrict network access control to.

To define proxy configurations in your console, see <u>Create a reserved capacity fleet</u> for instructions. To define proxy configurations using the AWS CLI, you can do so by modifying the following JSON syntax and saving your results:

Your JSON file may look similar to the following:

Run a CodeBuild reserved capacity fleet

When running AWS CodeBuild reserved capacity fleets with your managed proxy server, CodeBuild will automatically set its HTTP_PROXY and HTTPS_PROXY environment variables with the managed proxy addresses. If your dependency software has its own configuration and does not adhere to the environment variables, you can refer to these values and update your software configuration in your build commands to properly route your build traffic through the managed proxy. For more information, see Create a build project in AWS CodeBuild and Change build project settings in AWS CodeBuild.

Use AWS CodeBuild with a proxy server

You can use AWS CodeBuild with a proxy server to regulate HTTP and HTTPS traffic to and from the internet. To run CodeBuild with a proxy server, you install a proxy server in a public subnet and CodeBuild in a private subnet in a VPC.

There are two primary use cases for running CodeBuild in a proxy server:

- It eliminates the use of a NAT gateway or NAT instance in your VPC.
- It lets you specify the URLs that instances in the proxy server can access and the URLs to which the proxy server denies access.

You can use CodeBuild with two types of proxy servers. For both, the proxy server runs in a public subnet and CodeBuild runs in a private subnet.

- Explicit proxy: If you use an explicit proxy server, you must configure NO_PROXY, HTTP_PROXY, and HTTPS_PROXY environment variables in CodeBuild at the project level. For more information, see Change build project settings in AWS CodeBuild and Create a build project in AWS CodeBuild.
- Transparent proxy: If you use a transparent proxy server, no special configuration is required.

Topics

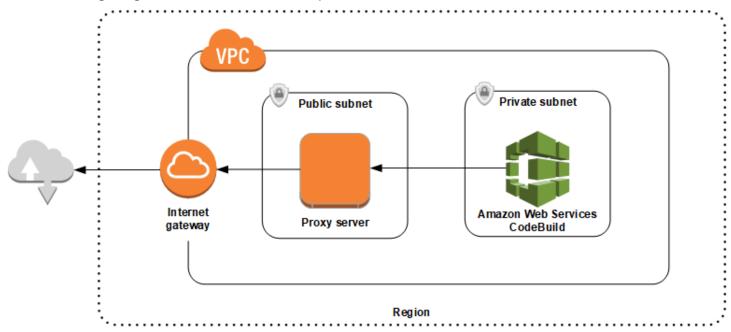
- Set up components required to run CodeBuild in a proxy server
- Run CodeBuild in an explicit proxy server
- Run CodeBuild in a transparent proxy server
- Run a package manager and other tools in a proxy server

Set up components required to run CodeBuild in a proxy server

You need these components to run AWS CodeBuild in a transparent or explicit proxy server:

- A VPC.
- One public subnet in your VPC for the proxy server.
- One private subnet in your VPC for CodeBuild.
- An internet gateway that allows communcation between the VPC and the internet.

The following diagram shows how the components interact.



Set up a VPC, subnets, and a network gateway

The following steps are required to run AWS CodeBuild in a transparent or explicit proxy server.

- 1. Create a VPC. For information, see Creating a VPC in the Amazon VPC User Guide.
- 2. Create two subnets in your VPC. One is a public subnet named Public Subnet in which your proxy server runs. The other is a private subnet named Private Subnet in which CodeBuild runs.

For information, see Creating a subnet in your VPC.

 Create and attach an internet gateway to your VPC. For more information, see <u>Creating and</u> attaching an internet gateway.

4. Add a rule to the default route table that routes outgoing traffic from the VPC (0.0.0.0/0) to the internet gateway. For information, see Adding and removing routes from a route table.

- 5. Add a rule to the default security group of your VPC that allows ingress SSH traffic (TCP 22) from your VPC (0.0.0.0/0).
- 6. Follow the instructions in <u>Launching an instance using the launch instance wizard</u> in the *Amazon EC2 User Guide* to launch an Amazon Linux instance. When you run the wizard, choose the following options:
 - In **Choose an Instance Type**, choose an Amazon Linux Amazon Machine Image (AMI).
 - In **Subnet**, choose the public subnet you created earlier in this topic. If you used the suggested name, it is **Public Subnet**.
 - In Auto-assign Public IP, choose Enable.
 - On the **Configure Security Group** page, for **Assign a security group**, choose **Select an existing security group**. Next, choose the default security group.
 - After you choose **Launch**, choose an existing key pair or create one.

Choose the default settings for all other options.

- 7. After your EC2 instance is running, disable source/destination checks. For information, see <u>Disabling Source/Destination checks</u> in the *Amazon VPC User Guide*.
- 8. Create a route table in your VPC. Add a rule to the route table that routes traffic destined for the internet to your proxy server. Associate this route table with your private subnet. This is required so that outbound requests from instances in your private subnet, where CodeBuild runs, are always routed through the proxy server.

Install and configure a proxy server

There are many proxy servers from which to choose. An open-source proxy server, Squid, is used here to demonstrate how AWS CodeBuild runs in a proxy server. You can apply the same concepts to other proxy servers.

To install Squid, use a yum repo by running the following commands:

```
sudo yum update -y
sudo yum install -y squid
```

After you install Squid, edit its squid.conf file using the instructions later in this topic.

Configure Squid for HTTPS traffic

For HTTPS, the HTTP traffic is encapsulated in a Transport Layer Security (TLS) connection. Squid uses a feature called SslPeekAndSplice to retrieve the Server Name Indication (SNI) from the TLS initiation that contains the requested internet host. This is required so Squid does not need to unencrypt HTTPS traffic. To enable SslPeekAndSplice, Squid requires a certificate. Create this certificate using OpenSSL:

```
sudo mkdir /etc/squid/ssl
cd /etc/squid/ssl
sudo openssl genrsa -out squid.key 2048
sudo openssl req -new -key squid.key -out squid.csr -subj "/C=XX/ST=XX/L=squid/0=squid/
CN=squid"
sudo openssl x509 -req -days 3650 -in squid.csr -signkey squid.key -out squid.crt
sudo cat squid.key squid.crt | sudo tee squid.pem
```



Note

For HTTP, Squid does not require configuration. From all HTTP/1.1 request messages, it can retrieve the host header field, which specifies the internet host that is being requested.

Run CodeBuild in an explicit proxy server

To run AWS CodeBuild in an explicit proxy server, you must configure the proxy server to allow or deny traffic to and from external sites, and then configure the HTTP_PROXY and HTTPS_PROXY environment variables.

Topics

- Configure Squid as an explicit proxy server
- Create a CodeBuild project
- Explicit proxy server sample squid.conf file

Configure Squid as an explicit proxy server

To configure the Squid proxy server to be explicit, you must make the following modifications to its /etc/squid/squid.conf file:

Remove the following default access control list (ACL) rules.

```
acl localnet src 10.0.0.0/8
acl localnet src 172.16.0.0/12
acl localnet src 192.168.0.0/16
acl localnet src fc00::/7
acl localnet src fe80::/10
```

Add the following in place of the default ACL rules you removed. The first line allows requests from your VPC. The next two lines grant your proxy server access to destination URLs that might be used by AWS CodeBuild. Edit the regular expression in the last line to specify S3 buckets or a CodeCommit repository in an AWS Region. For example:

- If your source is Amazon S3, use the command acl download_src dstdom_regex .*s3\.us-west-1\.amazonaws\.comto grant access to S3 buckets in the us-west-1 Region.
- If your source is AWS CodeCommit, use git-codecommit.
 region>.amazonaws.com to add an AWS Region to an allow list.

```
acl localnet src 10.1.0.0/16 #Only allow requests from within the VPC acl allowed_sites dstdomain .github.com #Allows to download source from GitHub acl allowed_sites dstdomain .bitbucket.com #Allows to download source from Bitbucket acl download_src dstdom_regex .*\.amazonaws\.com #Allows to download source from Amazon S3 or CodeCommit
```

• Replace http_access allow localnet with the following:

```
http_access allow localnet allowed_sites
http_access allow localnet download_src
```

- If you want your build to upload logs and artifacts, do one of the following:
 - 1. Before the http_access deny all statement, insert the following statements. They allow CodeBuild to access CloudWatch and Amazon S3. Access to CloudWatch is required so that CodeBuild can create CloudWatch logs. Access to Amazon S3 is required for uploading artifacts and Amazon S3 caching.

```
https_port 3130 cert=/etc/squid/ssl/squid.pem ssl-bump intercept
acl SSL_port port 443
http_access allow SSL_port
acl allowed_https_sites ssl::server_name .amazonaws.com
acl step1 at_step SslBump1
acl step2 at_step SslBump2
```

```
acl step3 at_step SslBump3
ssl_bump peek step1 all
ssl_bump peek step2 allowed_https_sites
ssl_bump splice step3 allowed_https_sites
ssl_bump terminate step2 all
```

• After you save squid.conf, run the following command:

```
sudo iptables -t nat -A PREROUTING -p tcp --dport 443 -j REDIRECT --to-port 3130 sudo service squid restart
```

2. Add proxy to your buildspec file. For more information, see Buildspec syntax.

```
version: 0.2
proxy:
  upload-artifacts: yes
  logs: yes
phases:
  build:
    commands:
    - command
```

Note

If you receive a RequestError timeout error, see RequestError timeout error when running CodeBuild in a proxy server.

For more information, see Explicit proxy server sample squid.conf file later in this topic.

Create a CodeBuild project

To run AWS CodeBuild with your explicit proxy server, set its HTTP_PROXY and HTTPS_PROXY environment variables with the private IP address of the EC2 instance you created for your proxy server and port 3128 at the project level. The private IP address looks like http://your-ec2-private-ip-address:3128. For more information, see Create a build project in AWS CodeBuild and Change build project settings in AWS CodeBuild.

Use the following command to view the Squid proxy access log:

```
sudo tail -f /var/log/squid/access.log
```

Explicit proxy server sample squid.conf file

The following is an example of a squid.conf file that is configured for an explicit proxy server.

```
acl localnet src 10.0.0.0/16 #Only allow requests from within the VPC
 # add all URLS to be whitelisted for download source and commands to be run in build
environment
 acl allowed_sites dstdomain .github.com
                                            #Allows to download source from github
 acl allowed_sites dstdomain .bitbucket.com #Allows to download source from bitbucket
 acl allowed_sites dstdomain ppa.launchpad.net #Allows to run apt-get in build
environment
 acl download_src dstdom_regex .*\.amazonaws\.com #Allows to download source from S3
or CodeCommit
 acl SSL_ports port 443
 acl Safe_ports port 80 # http
 acl Safe_ports port 21 # ftp
 acl Safe_ports port 443 # https
 acl Safe_ports port 70 # gopher
 acl Safe_ports port 210 # wais
 acl Safe_ports port 1025-65535 # unregistered ports
 acl Safe_ports port 280 # http-mgmt
 acl Safe_ports port 488 # gss-http
 acl Safe_ports port 591 # filemaker
 acl Safe_ports port 777 # multiling http
 acl CONNECT method CONNECT
 # Recommended minimum Access Permission configuration:
 # Deny requests to certain unsafe ports
 http_access deny !Safe_ports
 # Deny CONNECT to other than secure SSL ports
 http_access deny CONNECT !SSL_ports
 # Only allow cachemgr access from localhost
 http_access allow localhost manager
 http_access deny manager
 # We strongly recommend the following be uncommented to protect innocent
 # web applications running on the proxy server who think the only
 # one who can access services on "localhost" is a local user
 #http_access deny to_localhost
 # INSERT YOUR OWN RULE(S) HERE TO ALLOW ACCESS FROM YOUR CLIENTS
```

```
#
# Example rule allowing access from your local networks.
# Adapt localnet in the ACL section to list your (internal) IP networks
# from where browsing should be allowed
http_access allow localnet allowed_sites
http_access allow localnet download_src
http_access allow localhost
# Add this for CodeBuild to access CWL end point, caching and upload artifacts S3
bucket end point
https_port 3130 cert=/etc/squid/ssl/squid.pem ssl-bump intercept
acl SSL_port port 443
http_access allow SSL_port
acl allowed_https_sites ssl::server_name .amazonaws.com
acl step1 at_step SslBump1
acl step2 at_step SslBump2
acl step3 at_step SslBump3
ssl_bump peek step1 all
ssl_bump peek step2 allowed_https_sites
ssl_bump splice step3 allowed_https_sites
ssl_bump terminate step2 all
# And finally deny all other access to this proxy
http_access deny all
# Squid normally listens to port 3128
http_port 3128
# Uncomment and adjust the following to add a disk cache directory.
#cache_dir ufs /var/spool/squid 100 16 256
# Leave coredumps in the first cache dir
coredump_dir /var/spool/squid
# Add any of your own refresh_pattern entries above these.
refresh_pattern ^ftp: 1440 20% 10080
refresh_pattern ^gopher: 1440 0% 1440
refresh_pattern -i (/cgi-bin/|\?) 0 0% 0
refresh_pattern . 0 20% 4320
```

Run CodeBuild in a transparent proxy server

To run AWS CodeBuild in a transparent proxy server, you must configure the proxy server with access to the websites and domains it interacts with.

Topics

Configure Squid as a transparent proxy server

Create a CodeBuild project

Configure Squid as a transparent proxy server

To configure a proxy server to be transparent, you must grant it access to the domains and websites you want it to access. To run AWS CodeBuild with a transparent proxy server, you must grant it access to amazonaws.com. You must also grant access to other websites CodeBuild uses. These vary, depending on how you create your CodeBuild projects. Example websites are those for repositories such as GitHub, Bitbucket, Yum, and Maven. To grant Squid access to specific domains and websites, use a command similar to the following to update the squid.conf file. This sample command grants access to amazonaws.com, github.com, and bitbucket.com. You can edit this sample to grant access to other websites.

```
cat | sudo tee /etc/squid/squid.conf #EOF
visible_hostname squid
#Handling HTTP requests
http_port 3129 intercept
acl allowed_http_sites dstdomain .amazonaws.com
#acl allowed_http_sites dstdomain domain_name [uncomment this line to add another
 domain]
http_access allow allowed_http_sites
#Handling HTTPS requests
https_port 3130 cert=/etc/squid/ssl/squid.pem ssl-bump intercept
acl SSL_port port 443
http_access allow SSL_port
acl allowed_https_sites ssl::server_name .amazonaws.com
acl allowed_https_sites ssl::server_name .github.com
acl allowed_https_sites ssl::server_name .bitbucket.com
#acl allowed_https_sites ssl::server_name [uncomment this line to add another website]
acl step1 at_step SslBump1
acl step2 at_step SslBump2
acl step3 at_step SslBump3
ssl_bump peek step1 all
ssl_bump peek step2 allowed_https_sites
ssl_bump splice step3 allowed_https_sites
ssl_bump terminate step2 all
http_access deny all
E0F
```

Incoming requests from instances in the private subnet must redirect to the Squid ports. Squid listens on port 3129 for HTTP traffic (instead of 80) and 3130 for HTTPS traffic (instead of 443). Use the **iptables** command to route traffic:

```
sudo iptables -t nat -A PREROUTING -p tcp --dport 80 -j REDIRECT --to-port 3129 sudo iptables -t nat -A PREROUTING -p tcp --dport 443 -j REDIRECT --to-port 3130 sudo service iptables save sudo service squid start
```

Create a CodeBuild project

After you configure your proxy server, you can use it with AWS CodeBuild in a private subnet without more configuration. Every HTTP and HTTPS request goes through the public proxy server. Use the following command to view the Squid proxy access log:

```
sudo tail -f /var/log/squid/access.log
```

Run a package manager and other tools in a proxy server

Use the following procedures to run a package manager and other tools in a proxy server.

To run a tool, such as a package manager, in a proxy server

- Add the tool to the allow list in your proxy server by adding statements to your squid.conf file.
- 2. Add a line to your buildspec file that points to the private endpoint of your proxy server.

The following examples demonstrate how to do this for apt-get, curl, and maven. If you use a different tool, the same principles apply. Add it to an allow list in the squid.conf file and add a command to your buildspec file to make CodeBuild aware of your proxy server's endpoint.

To run apt-get in a proxy server

1. Add the following statements to your squid.conf file to add apt-get to an allow list in your proxy server. The first three lines allow apt-get to run in the build environment.

```
acl allowed_sites dstdomain ppa.launchpad.net # Required for apt-get to run in the build environment
```

```
acl apt_get dstdom_regex .*\.launchpad.net # Required for CodeBuild to run apt-get
in the build environment
acl apt_get dstdom_regex .*\.ubuntu.com # Required for CodeBuild to run apt-get
in the build environment
http_access allow localnet allowed_sites
http_access allow localnet apt_get
```

2. Add the following statement in your buildspec file so that apt-get commands look for the proxy configuration in /etc/apt/apt.conf.d/00proxy.

```
echo 'Acquire::http::Proxy "http://<private-ip-of-proxy-server>:3128";
Acquire::https::Proxy "http://<private-ip-of-proxy-server>:3128";
Acquire::ftp::Proxy "http://<private-ip-of-proxy-server>:3128";' > /etc/apt/apt.conf.d/00proxy
```

To run curl in a proxy server

1. Add the following to your squid.conf file to add curl to an allow list in your build environment.

```
acl allowed_sites dstdomain ppa.launchpad.net # Required to run apt-get in the build environment acl allowed_sites dstdomain google.com # Required for access to a webiste. This example uses www.google.com. http_access allow localnet allowed_sites http_access allow localnet apt_get
```

2. Add the following statement in your buildspec file so curl uses the private proxy server to access the website you added to the squid.conf. In this example, the website is google.com.

```
curl -x <private-ip-of-proxy-server>:3128 https://www.google.com
```

To run maven in a proxy server

 Add the following to your squid.conf file to add maven to an allow list in your build environment.

```
acl allowed_sites dstdomain ppa.launchpad.net # Required to run apt-get in the
  build environment
acl maven dstdom_regex .*\.maven.org # Allows access to the maven repository in the
  build environment
http_access allow localnet allowed_sites
http_access allow localnet maven
```

2. Add the following statement to your buildspec file.

```
maven clean install -DproxySet=true -DproxyHost=<private-ip-of-proxy-server> -
DproxyPort=3128
```

AWS CloudFormation VPC template

AWS CloudFormation enables you to create and provision AWS infrastructure deployments predictably and repeatedly, by using template files to create and delete a collection of resources together as a single unit (a *stack*). For more information, see the <u>AWS CloudFormation User Guide</u>.

The following is an AWS CloudFormation YAML template for configuring a VPC to use AWS CodeBuild. This file is also available in samples.zip.

```
Description: This template deploys a VPC, with a pair of public and private subnets
 spread
  across two Availability Zones. It deploys an internet gateway, with a default
  route on the public subnets. It deploys a pair of NAT gateways (one in each AZ),
  and default routes for them in the private subnets.
Parameters:
  EnvironmentName:
    Description: An environment name that is prefixed to resource names
    Type: String
  VpcCIDR:
    Description: Please enter the IP range (CIDR notation) for this VPC
   Type: String
    Default: 10.192.0.0/16
  PublicSubnet1CIDR:
    Description: Please enter the IP range (CIDR notation) for the public subnet in the
 first Availability Zone
```

Type: String Default: 10.192.10.0/24 PublicSubnet2CIDR: Description: Please enter the IP range (CIDR notation) for the public subnet in the second Availability Zone Type: String Default: 10.192.11.0/24 PrivateSubnet1CIDR: Description: Please enter the IP range (CIDR notation) for the private subnet in the first Availability Zone Type: String Default: 10.192.20.0/24 PrivateSubnet2CIDR: Description: Please enter the IP range (CIDR notation) for the private subnet in the second Availability Zone Type: String Default: 10.192.21.0/24 Resources: VPC: Type: AWS::EC2::VPC Properties: CidrBlock: !Ref VpcCIDR EnableDnsSupport: true EnableDnsHostnames: true Tags: - Key: Name Value: !Ref EnvironmentName InternetGateway: Type: AWS::EC2::InternetGateway Properties: Tags: - Key: Name Value: !Ref EnvironmentName InternetGatewayAttachment: Type: AWS::EC2::VPCGatewayAttachment Properties: InternetGatewayId: !Ref InternetGateway VpcId: !Ref VPC

```
PublicSubnet1:
  Type: AWS::EC2::Subnet
  Properties:
    VpcId: !Ref VPC
    AvailabilityZone: !Select [ 0, !GetAZs '' ]
    CidrBlock: !Ref PublicSubnet1CIDR
    MapPublicIpOnLaunch: true
    Tags:
      - Key: Name
        Value: !Sub ${EnvironmentName} Public Subnet (AZ1)
PublicSubnet2:
  Type: AWS::EC2::Subnet
  Properties:
    VpcId: !Ref VPC
    AvailabilityZone: !Select [ 1, !GetAZs '' ]
    CidrBlock: !Ref PublicSubnet2CIDR
    MapPublicIpOnLaunch: true
    Tags:
      - Key: Name
        Value: !Sub ${EnvironmentName} Public Subnet (AZ2)
PrivateSubnet1:
  Type: AWS::EC2::Subnet
  Properties:
    VpcId: !Ref VPC
    AvailabilityZone: !Select [ 0, !GetAZs '' ]
    CidrBlock: !Ref PrivateSubnet1CIDR
    MapPublicIpOnLaunch: false
   Tags:
      - Key: Name
        Value: !Sub ${EnvironmentName} Private Subnet (AZ1)
PrivateSubnet2:
  Type: AWS::EC2::Subnet
  Properties:
    VpcId: !Ref VPC
    AvailabilityZone: !Select [ 1, !GetAZs '' ]
    CidrBlock: !Ref PrivateSubnet2CIDR
    MapPublicIpOnLaunch: false
    Tags:
      - Key: Name
        Value: !Sub ${EnvironmentName} Private Subnet (AZ2)
```

NatGateway1EIP: Type: AWS::EC2::EIP DependsOn: InternetGatewayAttachment Properties: Domain: vpc NatGateway2EIP: Type: AWS::EC2::EIP DependsOn: InternetGatewayAttachment Properties: Domain: vpc NatGateway1: Type: AWS::EC2::NatGateway Properties: AllocationId: !GetAtt NatGateway1EIP.AllocationId SubnetId: !Ref PublicSubnet1 NatGateway2: Type: AWS::EC2::NatGateway Properties: AllocationId: !GetAtt NatGateway2EIP.AllocationId SubnetId: !Ref PublicSubnet2 PublicRouteTable: Type: AWS::EC2::RouteTable Properties: VpcId: !Ref VPC Tags: - Key: Name Value: !Sub \${EnvironmentName} Public Routes DefaultPublicRoute: Type: AWS::EC2::Route DependsOn: InternetGatewayAttachment Properties: RouteTableId: !Ref PublicRouteTable DestinationCidrBlock: 0.0.0.0/0 GatewayId: !Ref InternetGateway PublicSubnet1RouteTableAssociation: Type: AWS::EC2::SubnetRouteTableAssociation Properties:

```
RouteTableId: !Ref PublicRouteTable
    SubnetId: !Ref PublicSubnet1
PublicSubnet2RouteTableAssociation:
  Type: AWS::EC2::SubnetRouteTableAssociation
  Properties:
    RouteTableId: !Ref PublicRouteTable
    SubnetId: !Ref PublicSubnet2
PrivateRouteTable1:
  Type: AWS::EC2::RouteTable
  Properties:
    VpcId: !Ref VPC
    Tags:
      - Key: Name
        Value: !Sub ${EnvironmentName} Private Routes (AZ1)
DefaultPrivateRoute1:
  Type: AWS::EC2::Route
  Properties:
    RouteTableId: !Ref PrivateRouteTable1
    DestinationCidrBlock: 0.0.0.0/0
    NatGatewayId: !Ref NatGateway1
PrivateSubnet1RouteTableAssociation:
  Type: AWS::EC2::SubnetRouteTableAssociation
  Properties:
    RouteTableId: !Ref PrivateRouteTable1
    SubnetId: !Ref PrivateSubnet1
PrivateRouteTable2:
  Type: AWS::EC2::RouteTable
  Properties:
    VpcId: !Ref VPC
    Tags:
      - Key: Name
        Value: !Sub ${EnvironmentName} Private Routes (AZ2)
DefaultPrivateRoute2:
  Type: AWS::EC2::Route
  Properties:
    RouteTableId: !Ref PrivateRouteTable2
    DestinationCidrBlock: 0.0.0.0/0
```

```
NatGatewayId: !Ref NatGateway2
  PrivateSubnet2RouteTableAssociation:
    Type: AWS::EC2::SubnetRouteTableAssociation
    Properties:
      RouteTableId: !Ref PrivateRouteTable2
      SubnetId: !Ref PrivateSubnet2
  NoIngressSecurityGroup:
    Type: AWS::EC2::SecurityGroup
    Properties:
      GroupName: "no-ingress-sg"
      GroupDescription: "Security group with no ingress rule"
      VpcId: !Ref VPC
Outputs:
  VPC:
    Description: A reference to the created VPC
    Value: !Ref VPC
  PublicSubnets:
    Description: A list of the public subnets
    Value: !Join [ ",", [ !Ref PublicSubnet1, !Ref PublicSubnet2 ]]
  PrivateSubnets:
    Description: A list of the private subnets
    Value: !Join [ ",", [ !Ref PrivateSubnet1, !Ref PrivateSubnet2 ]]
  PublicSubnet1:
    Description: A reference to the public subnet in the 1st Availability Zone
    Value: !Ref PublicSubnet1
  PublicSubnet2:
    Description: A reference to the public subnet in the 2nd Availability Zone
    Value: !Ref PublicSubnet2
  PrivateSubnet1:
    Description: A reference to the private subnet in the 1st Availability Zone
    Value: !Ref PrivateSubnet1
  PrivateSubnet2:
    Description: A reference to the private subnet in the 2nd Availability Zone
    Value: !Ref PrivateSubnet2
```

NoIngressSecurityGroup:

Description: Security group with no ingress rule

Value: !Ref NoIngressSecurityGroup

Logging and monitoring in AWS CodeBuild

Logging and monitoring is an important part of maintaining the reliability, availability, and performance of AWS CodeBuild and your AWS solutions. You should collect monitoring data from all of the parts of your AWS solution so that you can more easily debug a multi-point failure, if one occurs. AWS provides the following tools for monitoring your CodeBuild resources and builds and for responding to potential incidents.

Topics

- Log AWS CodeBuild API calls with AWS CloudTrail
- Monitor CodeBuild builds with CloudWatch

Log AWS CodeBuild API calls with AWS CloudTrail

AWS CodeBuild is integrated with AWS CloudTrail, a service that provides a record of actions taken by a user, role, or an AWS service in CodeBuild. CloudTrail captures all API calls for CodeBuild as events, including calls from the CodeBuild console and from code calls to the CodeBuild APIs. If you create a trail, you can enable continuous delivery of CloudTrail events to an S3 bucket, including events for CodeBuild. If you don't configure a trail, you can still view the most recent events in the CloudTrail console in **Event history**. Using the information collected by CloudTrail, you can determine the request that was made to CodeBuild, the IP address from which the request was made, who made the request, when it was made, and additional details.

To learn more about CloudTrail, see the AWS CloudTrail User Guide.

Topics

- About AWS CodeBuild information in CloudTrail
- About AWS CodeBuild log file entries

About AWS CodeBuild information in CloudTrail

CloudTrail is enabled on your AWS account when you create the account. When activity occurs in CodeBuild, that activity is recorded in a CloudTrail event along with other AWS service events in **Event history**. You can view, search, and download recent events in your AWS account. For more information, see Viewing events with CloudTrail event history in the AWS CloudTrail User Guide.

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For an ongoing record of events in your AWS account, including events for CodeBuild, create a trail. A trail enables CloudTrail to deliver log files to an S3 bucket. By default, when you create a trail in the console, the trail applies to all regions. The trail logs events from all regions in the AWS partition and delivers the log files to the S3 bucket that you specify. You can configure other AWS services to further analyze and act upon the event data collected in CloudTrail logs. For more information, see:

- Overview for creating a trail
- CloudTrail supported services and integrations
- Configuring Amazon SNS notifications for CloudTrail
- Receiving CloudTrail log files from multiple regions and Receiving CloudTrail log files from multiple accounts

All CodeBuild actions are logged by CloudTrail and are documented in the <u>CodeBuild API</u>

<u>Reference</u>. For example, calls to the CreateProject (in the AWS CLI, create-project),

StartBuild (in the AWS CLI, start-project), and UpdateProject (in the AWS CLI, update-project) actions generate entries in the CloudTrail log files.

Every event or log entry contains information about who generated the request. The identity information helps you determine the following:

- Whether the request was made with root or user credentials.
- Whether the request was made with temporary security credentials for a role or federated user.
- Whether the request was made by another AWS service.

For more information, see the CloudTrail userIdentity elementin the AWS CloudTrail User Guide.

About AWS CodeBuild log file entries

A trail is a configuration that enables delivery of events as log files to an S3 bucket that you specify. CloudTrail log files contain one or more log entries. An event represents a single request from any source and includes information about the requested action, the date and time of the action, request parameters, and so on. CloudTrail log files are not an ordered stack trace of the public API calls, so they do not appear in any specific order.



Note

To protect sensitive information, the following are hidden in CodeBuild logs:

 AWS access key IDs. For more information, see Managing Access Keys for IAM Users in the AWS Identity and Access Management User Guide.

- Strings specified using the Parameter Store. For more information, see Systems Manager Parameter Store and Systems Manager Parameter Store Console Walkthrough in the Amazon EC2 Systems Manager User Guide.
- Strings specified using AWS Secrets Manager. For more information, see Key management.

The following example shows a CloudTrail log entry that demonstrates creating a build project in CodeBuild.

```
"eventVersion": "1.05",
"userIdentity": {
  "type": "FederatedUser",
  "principalId": "account-ID:user-name",
  "arn": "arn:aws:sts::account-ID:federated-user/user-name",
  "accountId": "account-ID",
  "accessKeyId": "access-key-ID",
  "sessionContext": {
    "attributes": {
      "mfaAuthenticated": "false",
      "creationDate": "2016-09-06T17:59:10Z"
    },
    "sessionIssuer": {
      "type": "IAMUser",
      "principalId": "access-key-ID",
      "arn": "arn:aws:iam::account-ID:user/user-name",
      "accountId": "account-ID",
      "userName": "user-name"
    }
  }
},
"eventTime": "2016-09-06T17:59:11Z",
"eventSource": "codebuild.amazonaws.com",
"eventName": "CreateProject",
```

```
"awsRegion": "region-ID",
  "sourceIPAddress": "127.0.0.1",
  "userAgent": "user-agent",
  "requestParameters": {
    "awsActId": "account-ID"
  },
  "responseElements": {
    "project": {
      "environment": {
        "image": "image-ID",
        "computeType": "BUILD_GENERAL1_SMALL",
        "type": "LINUX_CONTAINER",
        "environmentVariables": []
      },
      "name": "codebuild-demo-project",
      "description": "This is my demo project",
      "arn": "arn:aws:codebuild:region-ID:account-ID:project/codebuild-demo-
project:project-ID",
      "encryptionKey": "arn:aws:kms:region-ID:key-ID",
      "timeoutInMinutes": 10,
      "artifacts": {
        "location": "arn:aws:s3:::codebuild-region-ID-account-ID-output-bucket",
        "type": "S3",
        "packaging": "ZIP",
        "outputName": "MyOutputArtifact.zip"
      },
      "serviceRole": "arn:aws:iam::account-ID:role/CodeBuildServiceRole",
      "lastModified": "Sep 6, 2016 10:59:11 AM",
      "source": {
        "type": "GITHUB",
        "location": "https://github.com/my-repo.git"
      "created": "Sep 6, 2016 10:59:11 AM"
    }
  },
  "requestID": "9d32b228-745b-11e6-98bb-23b67EXAMPLE",
  "eventID": "581f7dd1-8d2e-40b0-aeee-0dbf7EXAMPLE",
  "eventType": "AwsApiCall",
  "recipientAccountId": "account-ID"
}
```

Monitor CodeBuild builds with CloudWatch

You can use Amazon CloudWatch to watch your builds, report when something is wrong, and take automatic actions when appropriate. You can monitor your builds at two levels:

Project level

These metrics are for all builds in the specified project. To see metrics for a project, specify ProjectName for the dimension in CloudWatch.

AWS account level

These metrics are for all builds in an account. To see metrics at the AWS account level, do not enter a dimension in CloudWatch. Build resource utilization metrics are not available at the AWS account level.

CloudWatch metrics show the behavior of your builds over time. For example, you can monitor:

- How many builds were attempted in a build project or an AWS account over time.
- How many builds were successful in a build project or an AWS account over time.
- How many builds failed in a build project or an AWS account over time.
- How much time CodeBuild spent running builds in a build project or an AWS account over time.
- Build resource utilization for a build or an entire build project. Build resource utilization metrics include metrics such as CPU, memory, and storage utilization.

For more information, see View CodeBuild metrics.

CodeBuild CloudWatch metrics

The following metrics can be tracked per AWS account or build project. For more information about using CloudWatch with CodeBuild, see Monitor CodeBuild builds with CloudWatch.

BuildDuration

Measures the duration of the build's BUILD phase.

Units: Seconds

Valid CloudWatch statistics: Average (recommended), Maximum, Minimum

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Builds

Measures the number of builds triggered.

Units: Count

Valid CloudWatch statistics: Sum

DownloadSourceDuration

Measures the duration of the build's DOWNLOAD_SOURCE phase.

Units: Seconds

Valid CloudWatch statistics: Average (recommended), Maximum, Minimum

Duration

Measures the duration of all builds over time.

Units: Seconds

Valid CloudWatch statistics: Average (recommended), Maximum, Minimum

FailedBuilds

Measures the number of builds that failed because of client error or a timeout.

Units: Count

Valid CloudWatch statistics: Sum

FinalizingDuration

Measures the duration of the build's FINALIZING phase.

Units: Seconds

Valid CloudWatch statistics: Average (recommended), Maximum, Minimum

InstallDuration

Measures the duration of the build's INSTALL phase.

Units: Seconds

CloudWatch metrics API Version 2016-10-06 766

Valid CloudWatch statistics: Average (recommended), Maximum, Minimum

PostBuildDuration

Measures the duration of the build's POST_BUILD phase

Units: Seconds

Valid CloudWatch statistics: Average (recommended), Maximum, Minimum

PreBuildDuration

Measures the duration of the build's PRE_BUILD phase.

Units: Seconds

Valid CloudWatch statistics: Average (recommended), Maximum, Minimum ProvisioningDuration

Measures the duration of the build's PROVISIONING phase.

Units: Seconds

Valid CloudWatch statistics: Average (recommended), Maximum, Minimum

QueuedDuration

Measures the duration of the build's QUEUED phase.

Units: Seconds

Valid CloudWatch statistics: Average (recommended), Maximum, Minimum SubmittedDuration

Measures the duration of the build's SUBMITTED phase.

Units: Seconds

Valid CloudWatch statistics: Average (recommended), Maximum, Minimum

SucceededBuilds

Measures the number of successful builds.

CloudWatch metrics API Version 2016-10-06 767

Units: Count

Valid CloudWatch statistics: Sum

UploadArtifactsDuration

Measures the duration of the build's UPLOAD_ARTIFACTS phase.

Units: Seconds

Valid CloudWatch statistics: Average (recommended), Maximum, Minimum

CodeBuild CloudWatch resource utilization metrics

Note

CodeBuild resource utilization metrics are only available in the following regions:

- Asia Pacific (Tokyo) Region
- Asia Pacific (Seoul) Region
- Asia Pacific (Mumbai) Region
- Asia Pacific (Singapore) Region
- Asia Pacific (Sydney) Region
- Canada (Central) Region
- Europe (Frankfurt) Region
- Europe (Ireland) Region
- Europe (London) Region
- Europe (Paris) Region
- South America (São Paulo) Region
- US East (N. Virginia) Region
- US East (Ohio) Region
- US West (N. California) Region
- US West (Oregon) Region

The following resource utilization metrics can be tracked. For more information about using CloudWatch with CodeBuild, see Monitor CodeBuild builds with CloudWatch.

CPUUtilized

The number of CPU units of allocated processing used by the build container.

Units: CPU units

Valid CloudWatch statistics: Average (recommended), Maximum, Minimum CPUUtilizedPercent

The percentage of allocated processing used by the build container.

Units: Percent

Valid CloudWatch statistics: Average (recommended), Maximum, Minimum MemoryUtilized

The number of megabytes of memory used by the build container.

Units: Megabytes

Valid CloudWatch statistics: Average (recommended), Maximum, Minimum MemoryUtilizedPercent

The percentage of allocated memory used by the build container.

Units: Percent

Valid CloudWatch statistics: Average (recommended), Maximum, Minimum StorageReadBytes

The storage read speed used by the build container.

Units: Bytes/second

Valid CloudWatch statistics: Average (recommended), Maximum, Minimum StorageWriteBytes

The storage write speed used by the build container.

Units: Bytes/second

Valid CloudWatch statistics: Average (recommended), Maximum, Minimum

CodeBuild CloudWatch dimensions

CodeBuild provides the following CloudWatch metric dimensions. If none of these are specified, the metrics are for the current AWS account.

BuildId, BuildNumber, ProjectName

Metrics are provided for a build identifier, build number, and project name.

ProjectName

Metrics are provided for a project name.

CodeBuild CloudWatch alarms

You can use the CloudWatch console to create alarms based on CodeBuild metrics so you can react if something goes wrong with your builds. The two metrics that are most useful with alarms are described in the following bullets. For more information about using CloudWatch with CodeBuild, see Monitor CodeBuild builds with CloudWatch.

- FailedBuild. You can create an alarm that is triggered when a certain number of failed builds are detected within a predetermined number of seconds. In CloudWatch, you specify the number of seconds and how many failed builds trigger an alarm.
- Duration. You can create an alarm that is triggered when a build takes longer than expected.
 You specify how many seconds must elapse after a build is started and before a build is completed before the alarm is triggered.

For information about how to create alarms for CodeBuild metrics, see <u>Monitor CodeBuild builds</u> <u>with CloudWatch alarms</u>. For more information about alarms, see <u>Creating Amazon CloudWatch</u> <u>alarms</u> in the *Amazon CloudWatch User Guide*.

View CodeBuild metrics

AWS CodeBuild monitors functions on your behalf and reports metrics through Amazon CloudWatch. These metrics include the number of total builds, failed builds, successful builds, and the duration of builds.

You can use the CodeBuild console or the CloudWatch console to monitor metrics for CodeBuild. The following procedures show you how to view metrics.

CloudWatch dimensions API Version 2016-10-06 770

Topics

- View build metrics (CodeBuild console)
- View build metrics (Amazon CloudWatch console)

View build metrics (CodeBuild console)



Note

You can't customize the metrics or the graphs used to display them in the CodeBuild console. If you want to customize the display, use the Amazon CloudWatch console to view your build metrics.

Account-level metrics

To view AWS account-level metrics

- Sign in to the AWS Management Console and open the AWS CodeBuild console at https:// console.aws.amazon.com/codesuite/codebuild/home.
- In the navigation pane, choose Account metrics.

Project-level metrics

To view project-level metrics

- Sign in to the AWS Management Console and open the AWS CodeBuild console at https:// console.aws.amazon.com/codesuite/codebuild/home.
- 2. In the navigation pane, choose **Build projects**.
- 3. In the list of build projects, in the **Name** column, choose the project where you want to view metrics.
- Choose the **Metrics** tab.

View build metrics (Amazon CloudWatch console)

You can customize the metrics and the graphs used to display them with the CloudWatch console.

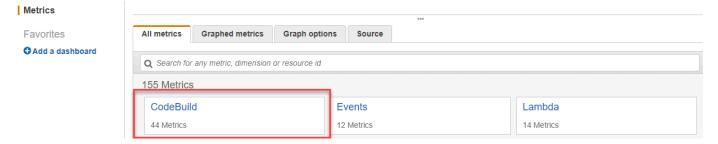
View CodeBuild metrics API Version 2016-10-06 771

Account-level metrics

To view account-level metrics

1. Sign in to the AWS Management Console and open the CloudWatch console at https://console.aws.amazon.com/cloudwatch/.

- 2. In the navigation pane, choose **Metrics**.
- 3. On the All metrics tab, choose CodeBuild.

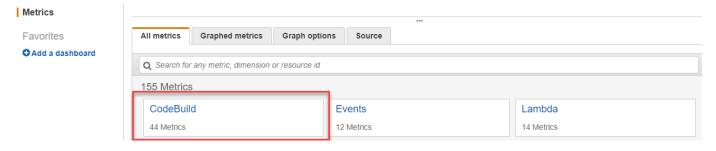


- Choose Account Metrics.
- 5. Choose one or more projects and metrics. For each project, you can choose the **SucceededBuilds**, **FailedBuilds**, **Builds**, and **Duration** metrics. All selected project and metric combinations are displayed in the graph on the page.

Project-level metrics

To view project-level metrics

- 1. Sign in to the AWS Management Console and open the CloudWatch console at https://console.aws.amazon.com/cloudwatch/.
- 2. In the navigation pane, choose Metrics.
- 3. On the All metrics tab, choose CodeBuild.



4. Choose By Project.

View CodeBuild metrics API Version 2016-10-06 772

5. Choose one or more project and metric combinations. For each project, you can choose the **SucceededBuilds**, **FailedBuilds**, **Builds**, and **Duration** metrics. All selected project and metric combinations are displayed in the graph on the page.

6. (Optional) You can customize your metrics and graphs. For example, from the drop-down list in the **Statistic** column, you can choose a different statistic to display. Or from the drop-down menu in the **Period** column, you can choose a different time period to use to monitor the metrics.

For more information, see <u>Graph metrics</u> and <u>View available metrics</u> in the *Amazon CloudWatch User Guide*.

View CodeBuild resource utilization metrics

AWS CodeBuild monitors build resource utilization on your behalf and reports metrics through Amazon CloudWatch. These include metrics such as CPU, memory, and storage utilization.



CodeBuild resource utilization metrics are only recorded for builds that run for more than one minute.

You can use the CodeBuild console or the CloudWatch console to monitor resource utilization metrics for CodeBuild.

Note

CodeBuild resource utilization metrics are only available in the following regions:

- Asia Pacific (Tokyo) Region
- Asia Pacific (Seoul) Region
- Asia Pacific (Mumbai) Region
- Asia Pacific (Singapore) Region
- Asia Pacific (Sydney) Region
- Canada (Central) Region
- Europe (Frankfurt) Region

- Europe (Ireland) Region
- Europe (London) Region
- Europe (Paris) Region
- South America (São Paulo) Region
- US East (N. Virginia) Region
- US East (Ohio) Region
- US West (N. California) Region
- US West (Oregon) Region

The following procedures show you how to access your resource utilization metrics.

Topics

- Access resource utilization metrics (CodeBuild console)
- Access resource utilization metrics (Amazon CloudWatch console)

Access resource utilization metrics (CodeBuild console)



You can't customize the metrics or the graphs used to display them in the CodeBuild console. If you want to customize the display, use the Amazon CloudWatch console to view your build metrics.

Project-level resource utilization metrics

To access project-level resource utilization metrics

- 1. Sign in to the AWS Management Console and open the AWS CodeBuild console at https://console.aws.amazon.com/codesuite/codebuild/home.
- 2. In the navigation pane, choose **Build projects**.
- 3. In the list of build projects, in the **Name** column, choose the project you want to view the utilization metrics for.

4. Choose the **Metrics** tab. The resource utilization metrics are displayed in the **Resource utilization metrics** section.

 To view the project-level resource utilization metrics in the CloudWatch console, choose View in CloudWatch in the Resource utilization metrics section.

Build-level resource utilization metrics

To access build-level resource utilization metrics

- 1. Sign in to the AWS Management Console and open the AWS CodeBuild console at https://codebuild/home.
- 2. In the navigation pane, choose **Build history**.
- In the list of builds, in the Build run column, choose the build you want to view the utilization metrics for.
- Choose the Resource utilization tab.
- 5. To view the build-level resource utilization metrics in the CloudWatch console, choose **View in CloudWatch** in the **Resource utilization metrics** section.

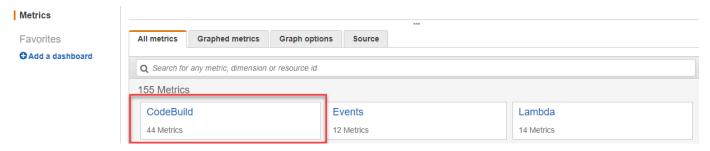
Access resource utilization metrics (Amazon CloudWatch console)

The Amazon CloudWatch console can be used to access CodeBuild resource utilization metrics.

Project-level resource utilization metrics

To access project-level resource utilization metrics

- 1. Sign in to the AWS Management Console and open the CloudWatch console at https://console.aws.amazon.com/cloudwatch/.
- 2. In the navigation pane, choose **Metrics**.
- 3. On the All metrics tab, choose CodeBuild.



4. Choose By Project.

5. Choose one or more project and metric combinations to add to the graph. All selected project and metric combinations are displayed in the graph on the page.

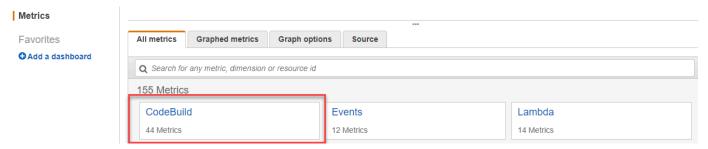
6. (Optional) You can customize your metrics and graphs from the **Graphed metrics** tab. For example, from the drop-down list in the **Statistic** column, you can choose a different statistic to display. Or from the drop-down menu in the **Period** column, you can choose a different time period to use to monitor the metrics.

For more information, see <u>Graphing metrics</u> and <u>Viewing available metrics</u> in the *Amazon CloudWatch User Guide*.

Build-level resource utilization metrics

To access build-level resource utilization metrics

- 1. Sign in to the AWS Management Console and open the CloudWatch console at https://console.aws.amazon.com/cloudwatch/.
- 2. In the navigation pane, choose **Metrics**.
- 3. On the All metrics tab, choose CodeBuild.



- 4. Choose BuildId, BuildNumber, ProjectName.
- 5. Choose one or more build and metric combinations to add to the graph. All selected build and metric combinations are displayed in the graph on the page.
- 6. (Optional) You can customize your metrics and graphs from the **Graphed metrics** tab. For example, from the drop-down list in the **Statistic** column, you can choose a different statistic to display. Or from the drop-down menu in the **Period** column, you can choose a different time period to use to monitor the metrics.

For more information, see <u>Graphing metrics</u> and <u>Viewing available metrics</u> in the *Amazon CloudWatch User Guide*.

Monitor CodeBuild builds with CloudWatch alarms

You can create a CloudWatch alarm for your builds. An alarm watches a single metric over a period of time that you specify and performs one or more actions based on the value of the metric relative to a specified threshold over a number of time periods. Using native CloudWatch alarm functionality, you can specify any of the actions supported by CloudWatch when a threshold is exceeded. For example, you can specify that an Amazon SNS notification is sent when more than three builds in your account fail within fifteen minutes.

To create a CloudWatch alarm for a CodeBuild metric

- 1. Sign in to the AWS Management Console and open the CloudWatch console at https://console.aws.amazon.com/cloudwatch/.
- 2. In the navigation pane, choose **Alarms**.
- Choose Create Alarm.
- 4. Under CloudWatch Metrics by Category, choose CodeBuild Metrics. If you know you want only project-level metrics, choose By Project. If you know you want only account-level metrics, choose Account Metrics.
- 5. On **Create Alarm**, if it isn't already selected, choose **Select Metric**.
- 6. Choose a metric for which you want to create an alarm. The options are **By Project** or **Account Metrics**.
- 7. Choose **Next** or **Define Alarm** and then create your alarm. For more information, see <u>Creating Amazon CloudWatch alarms</u> in the *Amazon CloudWatch User Guide*. For more information about setting up Amazon SNS notifications when an alarm is triggered, see <u>Set up Amazon SNS notifications</u> in the *Amazon SNS Developer Guide*.
- 8. Choose Create Alarm.

Security in AWS CodeBuild

Cloud security at AWS is the highest priority. As an AWS customer, you benefit from a data center and network architecture that is built to meet the requirements of the most security-sensitive organizations.

Security and compliance is a shared responsibility between AWS and you. This shared model can help relieve your operational burden: AWS operates, manages, and controls the components from the host operating system and virtualization layer down to the physical security of the service facilities. You assume responsibility and management of the guest operating system (including updates and security patches) and other associated application software. You're also responsible for the configuration of the AWS provided security group firewall. Your responsibilities vary with the services you use, the integration of those services into your IT environment, and applicable laws and regulations. Therefore, you should carefully consider the services that your organization uses. For more information, see Shared responsibility model.

To learn how to secure your CodeBuild resources, see the following topics.

Topics

- Data protection in AWS CodeBuild
- Identity and access management in AWS CodeBuild
- Compliance validation for AWS CodeBuild
- Resilience in AWS CodeBuild
- Infrastructure security in AWS CodeBuild
- Access your source provider in CodeBuild
- Cross-service confused deputy prevention

Data protection in AWS CodeBuild

The AWS <u>shared responsibility model</u> applies to data protection in AWS CodeBuild. As described in this model, AWS is responsible for protecting the global infrastructure that runs all of the AWS Cloud. You are responsible for maintaining control over your content that is hosted on this infrastructure. You are also responsible for the security configuration and management tasks for the AWS services that you use. For more information about data privacy, see the Data Privacy FAQ.

Data protection API Version 2016-10-06 778

For information about data protection in Europe, see the <u>AWS Shared Responsibility Model and</u> GDPR blog post on the *AWS Security Blog*.

For data protection purposes, we recommend that you protect AWS account credentials and set up individual users with AWS IAM Identity Center or AWS Identity and Access Management (IAM). That way, each user is given only the permissions necessary to fulfill their job duties. We also recommend that you secure your data in the following ways:

- Use multi-factor authentication (MFA) with each account.
- Use SSL/TLS to communicate with AWS resources. We require TLS 1.2 and recommend TLS 1.3.
- Set up API and user activity logging with AWS CloudTrail. For information about using CloudTrail trails to capture AWS activities, see <u>Working with CloudTrail trails</u> in the AWS CloudTrail User Guide.
- Use AWS encryption solutions, along with all default security controls within AWS services.
- Use advanced managed security services such as Amazon Macie, which assists in discovering and securing sensitive data that is stored in Amazon S3.
- If you require FIPS 140-3 validated cryptographic modules when accessing AWS through a command line interface or an API, use a FIPS endpoint. For more information about the available FIPS endpoints, see Federal Information Processing Standard (FIPS) 140-3.

We strongly recommend that you never put confidential or sensitive information, such as your customers' email addresses, into tags or free-form text fields such as a **Name** field. This includes when you work with CodeBuild or other AWS services using the console, API, AWS CLI, or AWS SDKs. Any data that you enter into tags or free-form text fields used for names may be used for billing or diagnostic logs. If you provide a URL to an external server, we strongly recommend that you do not include credentials information in the URL to validate your request to that server.

To protect sensitive information, the following are hidden in CodeBuild logs:

- Strings specified using the Parameter Store in CodeBuild project environment variables or the buildspec env/parameter-store section. For more information, see <u>Systems Manager</u> <u>Parameter Store</u> and <u>Systems Manager Parameter Store console walkthrough</u> in the <u>Amazon EC2</u> <u>Systems Manager User Guide</u>.
- Strings specified using AWS Secrets Manager in CodeBuild project environment variables or the buildspec env/secrets-manager section. For more information, see Key management.

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For more information about data protection, see the <u>AWS shared responsibility model and GDPR</u> blog post on the *AWS Security Blog*.

Topics

- Data encryption
- Key management
- Traffic privacy

Data encryption

Encryption is an important part of CodeBuild security. Some encryption, such as for data in-transit, is provided by default and does not require you to do anything. Other encryption, such as for data at-rest, you can configure when you create your project or build.

- Encryption of data at-rest Build artifacts, such as a cache, logs, exported raw test report
 data files, and build results, are encrypted by default using AWS managed keys. If you do not
 want to use these KMS keys, you must create and configure a customer managed key. For more
 information Creating KMS Keys and AWS Key Management Service User Guide.
 - You can store the identifier of the AWS KMS key that CodeBuild uses to encrypt the build output artifact in the CODEBUILD_KMS_KEY_ID environment variable. For more information, see Environment variables in build environments
 - You can specify a customer managed key when you create a build project. For more
 information, see <u>Set the Encryption Key Using the Console</u> and <u>Set the encryption key using</u>
 the CLI.

The Amazon Elastic Block Store volumes of your build fleet are encrypted by default using AWS managed keys.

- Encryption of data in-transit All communication between customers and CodeBuild and between CodeBuild and its downstream dependencies is protected using TLS connections that are signed using the Signature Version 4 signing process. All CodeBuild endpoints use SHA-256 certificates that are managed by AWS Private Certificate Authority. For more information, see Signature Version 4 signing process and What is ACM PCA.
- Build artifact encryption The CodeBuild service role associated with the build project requires access to a KMS key in order to encrypt its build output artifacts. By default, CodeBuild uses an AWS managed key for Amazon S3 in your AWS account. If you do not want to use this AWS

Data encryption API Version 2016-10-06 780

managed key, you must create and configure a customer managed key. For more information, see Encrypt build outputs and Creating keys in the AWS KMS Developer Guide.

Key management

You can protect your content from unauthorized use through encryption. Store your encryption keys in AWS Secrets Manager, and then give the CodeBuild service role associated with the build project permission to obtain the encryption keys from your Secrets Manager account. For more information, see Encrypt build outputs using a customer managed key, Create a build project in AWS CodeBuild, Run AWS CodeBuild builds manually, and Tutorial: Storing and retrieving a secret.

Use the CODEBUILD_KMS_KEY_ID environment variable in a build command to obtain the AWS KMS key identifier. For more information, see Environment variables in build environments.

You can use Secrets Manager to protect credentials to a private registry that stores a Docker image used for your runtime environment. For more information, see Private registry with AWS Secrets Manager sample for CodeBuild.

Traffic privacy

You can improve the security of your builds by configuring CodeBuild to use an interface VPC endpoint. To do this, you do not need an internet gateway, NAT device, or virtual private gateway. It also is not required to configure PrivateLink, though it is recommended. For more information, see Use VPC endpoints. For more information about PrivateLink and VPC endpoints, see AWS PrivateLink and Accessing AWS services through PrivateLink.

Identity and access management in AWS CodeBuild

Access to AWS CodeBuild requires credentials. Those credentials must have permissions to access AWS resources, such as storing and retrieving build artifacts in S3 buckets and viewing Amazon CloudWatch Logs for builds. The following sections describe how you can use AWS Identity and Access Management (IAM) and CodeBuild to help secure access to your resources:

Key management API Version 2016-10-06 781

Overview of managing access permissions to your AWS CodeBuild resources

Every AWS resource is owned by an AWS account, and permissions to create or access a resource are governed by permissions policies. An account administrator can attach permissions policies to IAM identities (that is, users, groups, and roles).



Note

An account administrator (or administrator user) is a user with administrator privileges. For more information, see IAM Best Practices in the IAM User Guide.

When you grant permissions, you decide who is getting the permissions, the resources they can access, and the actions that can be performed on those resources.

Topics

- AWS CodeBuild resources and operations
- Understanding resource ownership
- Managing access to resources
- Specifying policy elements: Actions, effects, and principals

AWS CodeBuild resources and operations

In AWS CodeBuild, the primary resource is a build project. In a policy, you use an Amazon Resource Name (ARN) to identify the resource the policy applies to. Builds are also resources and have ARNs associated with them. For more information, see Amazon Resource Names (ARN) and AWS Service Namespaces in the Amazon Web Services General Reference.

Resource type	ARN format	
Build project	<pre>arn:aws:codebuild: project-name</pre>	<pre>region-ID :account-ID :project/</pre>
Build	<pre>arn:aws:codebuild: D :build/build-ID</pre>	region-ID :account-I

Resource type	ARN format
Report group	<pre>arn:aws:codebuild: region-ID :account-ID :report-g roup/ report-group-name</pre>
Report	<pre>arn:aws:codebuild: region-ID :account-I D :report/report-ID</pre>
Fleet	<pre>arn:aws:codebuild: region-ID :account-I D :fleet/fleet-ID</pre>
All CodeBuild resources	arn:aws:codebuild:*
All CodeBuild resources owned by the specified account in the specified AWS Region	<pre>arn:aws:codebuild: region-ID :account-ID :*</pre>

When using the reserved capacity feature, data cached on fleet instances, including source files, Docker layers, and cached directories specified in the buildspec, can be accessible to other projects within the same account. This is by design and allows projects within the same account to share fleet instances.

Note

Most AWS services treat a colon (:) or a forward slash (/) as the same character in ARNs. However, CodeBuild uses an exact match in resource patterns and rules. Be sure to use the correct characters when you create event patterns so that they match the ARN syntax in the resource.

For example, you can indicate a specific build project (myBuildProject) in your statement using its ARN as follows:

```
"Resource": "arn:aws:codebuild:us-east-2:123456789012:project/myBuildProject"
```

To specify all resources, or if an API action does not support ARNs, use the wildcard character (*) in the Resource element as follows:

```
"Resource": "*"
```

Some CodeBuild API actions accept multiple resources (for example, BatchGetProjects). To specify multiple resources in a single statement, separate their ARNs with commas, as follows:

```
"Resource": [
   "arn:aws:codebuild:us-east-2:123456789012:project/myBuildProject",
   "arn:aws:codebuild:us-east-2:123456789012:project/myOtherBuildProject"
]
```

CodeBuild provides a set of operations to work with the CodeBuild resources. For a list, see <u>AWS</u> CodeBuild permissions reference.

Understanding resource ownership

The AWS account owns the resources that are created in the account, regardless of who created the resources. Specifically, the resource owner is the AWS account of the <u>principal entity</u> (that is, the root account, an user, or an IAM role) that authenticates the resource creation request. The following examples illustrate how this works:

- If you use the root account credentials of your AWS account to create a rule, your AWS account is the owner of the CodeBuild resource.
- If you create an user in your AWS account and grant permissions to create CodeBuild resources to that user, the user can create CodeBuild resources. However, your AWS account, to which the user belongs, owns the CodeBuild resources.
- If you create an IAM role in your AWS account with permissions to create CodeBuild resources, anyone who can assume the role can create CodeBuild resources. Your AWS account, to which the role belongs, owns the CodeBuild resources.

Managing access to resources

A permissions policy describes who has access to which resources.



Note

This section discusses the use of IAM in AWS CodeBuild. It doesn't provide detailed information about the IAM service. For complete IAM documentation, see What Is IAM? in the IAM User Guide. For information about IAM policy syntax and descriptions, see AWS IAM Policy Reference in the IAM User Guide.

Policies attached to an IAM identity are referred to as identity-based policies (IAM policies). Policies attached to a resource are referred to as resource-based policies. CodeBuild supports identitybased policies, and resource-based policies for certain read only APIs for the purpose of crossaccount resource sharing.

Secure access to S3 buckets

We strongly recommend that you include the following permissions in your IAM role to verify the S3 bucket associated with your CodeBuild project is owned by you or someone you trust. These permissions are not included in AWS managed policies and roles. You must add them yourself.

- s3:GetBucketAcl
- s3:GetBucketLocation

If the owner of an S3 bucket used by your project changes, you must verify you still own the bucket and update permissions in your IAM role if not. For more information, see Allow users to interact with CodeBuild and Allow CodeBuild to interact with other AWS services.

Specifying policy elements: Actions, effects, and principals

For each AWS CodeBuild resource, the service defines a set of API operations. To grant permissions for these API operations, CodeBuild defines a set of actions that you can specify in a policy. Some API operations can require permissions for more than one action in order to perform the API operation. For more information, see AWS CodeBuild resources and operations and AWS CodeBuild permissions reference.

The following are the basic policy elements:

• Resource – You use an Amazon Resource Name (ARN) to identify the resource that the policy applies to.

• Action – You use action keywords to identify resource operations you want to allow or deny. For example, the codebuild: CreateProject permission gives the user permissions to perform the CreateProject operation.

- Effect You specify the effect, either allow or deny, when the user requests the action. If you don't explicitly grant access to (allow) a resource, access is implicitly denied. You can also explicitly deny access to a resource. You might do this to make sure a user cannot access a resource, even if a different policy grants access.
- Principal In identity-based policies (IAM policies), the user the policy is attached to is the implicit principal. For resource-based policies, you specify the user, account, service, or other entity that you want to receive permissions.

To learn more about IAM policy syntax and descriptions, see AWS IAM Policy Reference in the IAM User Guide.

For a table showing all of the CodeBuild API actions and the resources they apply to, see the AWS CodeBuild permissions reference.

Using identity-based policies for AWS CodeBuild

This topic provides examples of identity-based policies that demonstrate how an account administrator can attach permissions policies to IAM identities (that is, users, groups, and roles) and thereby grant permissions to perform operations on AWS CodeBuild resources.

Important

We recommend that you first review the introductory topics that explain the basic concepts and options available to manage access to your CodeBuild resources. For more information, see Overview of managing access permissions to your AWS CodeBuild resources.

Topics

- Permissions required to use the AWS CodeBuild console
- Permissions required for AWS CodeBuild to connect to Amazon Elastic Container Registry
- Permissions required for the AWS CodeBuild console to connect to source providers
- AWS managed (predefined) policies for AWS CodeBuild
- CodeBuild managed policies and notifications

- CodeBuild updates to AWS managed policies
- Customer-managed policy examples

The following shows an example of a permissions policy that allows a user to get information about build projects only in the us-east-2 region for account 123456789012 for any build project that starts with the name my:

```
{
  "Version": "2012-10-17",
  "Statement": [
    {
      "Effect": "Allow",
      "Action": "codebuild:BatchGetProjects",
      "Resource": "arn:aws:codebuild:us-east-2:123456789012:project/my*"
    }
  ]
}
```

Permissions required to use the AWS CodeBuild console

A user who uses the AWS CodeBuild console must have a minimum set of permissions that allows the user to describe other AWS resources for the AWS account. You must have permissions from the following services:

- AWS CodeBuild
- Amazon CloudWatch
- CodeCommit (if you are storing your source code in an AWS CodeCommit repository)
- Amazon Elastic Container Registry (Amazon ECR) (if you are using a build environment that relies on a Docker image in an Amazon ECR repository)

Note

As of July 26, 2022, the default IAM policy has been updated. For more information, see Permissions required for AWS CodeBuild to connect to Amazon Elastic Container Registry.

 Amazon Elastic Container Service (Amazon ECS) (if you are using a build environment that relies on a Docker image in an Amazon ECR repository)

- AWS Identity and Access Management (IAM)
- AWS Key Management Service (AWS KMS)
- Amazon Simple Storage Service (Amazon S3)

If you create an IAM policy that is more restrictive than the minimum required permissions, the console won't function as intended.

Permissions required for AWS CodeBuild to connect to Amazon Elastic Container Registry

As of July 26, 2022, AWS CodeBuild has updated its default IAM policy for Amazon ECR permission. The following permissions have been removed from the default policy:

```
"ecr:PutImage",
"ecr:InitiateLayerUpload",
"ecr:UploadLayerPart",
"ecr:CompleteLayerUpload"
```

For CodeBuild projects that were created before July 26, 2022, we recommend you update your policy with the following Amazon ECR policy:

```
"Action": [
    "ecr:BatchCheckLayerAvailability",
    "ecr:GetDownloadUrlForLayer",
    "ecr:BatchGetImage"
]
```

For more information on updating your policy, see Allow users to interact with CodeBuild.

Permissions required for the AWS CodeBuild console to connect to source providers

The AWS CodeBuild console uses the following API actions to connect to source providers (for example, GitHub repositories).

- codebuild:ListConnectedOAuthAccounts
- codebuild:ListRepositories

- codebuild:PersistOAuthToken
- codebuild:ImportSourceCredentials

You can associate source providers (such as GitHub repositories) with your build projects using the AWS CodeBuild console. To do this, you must first add the preceding API actions to IAM access policies associated with the user you use to access the AWS CodeBuild console.

The ListConnectedOAuthAccounts, ListRepositories, and PersistOAuthToken API actions are not intended to be called by your code. Therefore, these API actions are not included in the AWS CLI and AWS SDKs.

AWS managed (predefined) policies for AWS CodeBuild

AWS addresses many common use cases by providing standalone IAM policies that are created and administered by AWS. These AWS managed policies grant necessary permissions for common use cases so you can avoid having to investigate what permissions are needed. The managed policies for CodeBuild also provide permissions to perform operations in other services, such as IAM, AWS CodeCommit,Amazon EC2, Amazon ECR, Amazon SNS, and Amazon CloudWatch Events, as required for the responsibilities for the users who have been granted the policy in question. For example, the AWSCodeBuildAdminAccess policy is an administrative-level user policy that allows users with this policy to create and manage CloudWatch Events rules for project builds and Amazon SNS topics for notifications about project-related events (topics whose names are prefixed with arn:aws:codebuild:), as well as administer projects and report groups in CodeBuild. For more information, see AWS Managed Policies in the IAM User Guide.

The following AWS managed policies, which you can attach to users in your account, are specific to AWS CodeBuild.

AWSCodeBuildAdminAccess

Provides full access to CodeBuild including permissions to administrate CodeBuild build projects.

AWSCodeBuildDeveloperAccess

Provides access to CodeBuild but does not allow build project administration.

AWSCodeBuildReadOnlyAccess

Provides read-only access to CodeBuild.

To access build output artifacts that CodeBuild creates, you must also attach the AWS managed policy named AmazonS3ReadOnlyAccess.

To create and manage CodeBuild service roles, you must also attach the AWS managed policy named IAMFullAccess.

You can also create your own custom IAM policies to allow permissions for CodeBuild actions and resources. You can attach these custom policies to the users or groups that require those permissions.

Topics

- AWSCodeBuildAdminAccess
- AWSCodeBuildDeveloperAccess
- AWSCodeBuildReadOnlyAccess

AWSCodeBuildAdminAccess

The AWSCodeBuildAdminAccess policy provides full access to CodeBuild, including permissions to administer CodeBuild build projects. Apply this policy only to administrative-level users to grant them full control over CodeBuild projects, report groups, and related resources in your AWS account, including the ability to delete projects and report groups.

The AWSCodeBuildAdminAccess policy contains the following policy statement:

```
"Version": "2012-10-17",
"Statement": [
  {
    "Sid": "AWSServicesAccess",
    "Action": [
      "codebuild:*",
      "codecommit:GetBranch",
      "codecommit:GetCommit",
      "codecommit:GetRepository",
      "codecommit:ListBranches",
      "codecommit:ListRepositories",
      "cloudwatch:GetMetricStatistics",
      "ec2:DescribeVpcs",
      "ec2:DescribeSecurityGroups",
      "ec2:DescribeSubnets",
      "ecr:DescribeRepositories",
```

```
"ecr:ListImages",
    "elasticfilesystem:DescribeFileSystems",
    "events:DeleteRule",
    "events:DescribeRule",
    "events:DisableRule",
    "events: EnableRule",
    "events:ListTargetsByRule",
    "events:ListRuleNamesByTarget",
    "events:PutRule",
    "events:PutTargets",
    "events: RemoveTargets",
    "logs:GetLogEvents",
    "s3:GetBucketLocation",
    "s3:ListAllMyBuckets"
  ],
  "Effect": "Allow",
  "Resource": "*"
},
{
  "Sid": "CWLDeleteLogGroupAccess",
  "Action": [
    "logs:DeleteLogGroup"
  ],
  "Effect": "Allow",
  "Resource": "arn:aws:logs:*:*:log-group:/aws/codebuild/*:log-stream:*"
},
{
  "Sid": "SSMParameterWriteAccess",
  "Effect": "Allow",
  "Action": [
    "ssm:PutParameter"
  "Resource": "arn:aws:ssm:*:*:parameter/CodeBuild/*"
},
  "Sid": "SSMStartSessionAccess",
  "Effect": "Allow",
  "Action": [
    "ssm:StartSession"
  ],
 "Resource": "arn:aws:ecs:*:*:task/*/*"
},
{
  "Sid": "CodeStarConnectionsReadWriteAccess",
```

```
"Effect": "Allow",
     "Action": [
       "codestar-connections:CreateConnection",
       "codestar-connections:DeleteConnection",
       "codestar-connections:UpdateConnectionInstallation",
       "codestar-connections: TagResource",
       "codestar-connections:UntagResource",
       "codestar-connections:ListConnections",
       "codestar-connections:ListInstallationTargets",
       "codestar-connections:ListTagsForResource",
       "codestar-connections:GetConnection",
       "codestar-connections:GetIndividualAccessToken",
       "codestar-connections:GetInstallationUrl",
       "codestar-connections:PassConnection",
       "codestar-connections:StartOAuthHandshake",
       "codestar-connections:UseConnection"
     ],
     "Resource": [
       "arn:aws:codestar-connections:*:*:connection/*",
       "arn:aws:codeconnections:*:*:*"
     1
   },
     "Sid": "CodeStarNotificationsReadWriteAccess",
     "Effect": "Allow",
     "Action": [
       "codestar-notifications:CreateNotificationRule",
       "codestar-notifications:DescribeNotificationRule",
       "codestar-notifications:UpdateNotificationRule",
       "codestar-notifications:DeleteNotificationRule",
       "codestar-notifications:Subscribe",
       "codestar-notifications:Unsubscribe"
     ],
     "Resource": "*",
     "Condition": {
       "ArnLike": {
         "codestar-notifications:NotificationsForResource":
"arn:aws:codebuild:*:*:project/*"
       }
     }
  },
     "Sid": "CodeStarNotificationsListAccess",
     "Effect": "Allow",
```

```
"Action": [
        "codestar-notifications:ListNotificationRules",
        "codestar-notifications:ListEventTypes",
        "codestar-notifications:ListTargets",
        "codestar-notifications:ListTagsforResource"
      ],
      "Resource": "*"
    },
    {
      "Sid": "CodeStarNotificationsSNSTopicCreateAccess",
      "Effect": "Allow",
      "Action": [
        "sns:CreateTopic",
        "sns:SetTopicAttributes"
      ],
      "Resource": "arn:aws:sns:*:*:codestar-notifications*"
    },
    {
      "Sid": "SNSTopicListAccess",
      "Effect": "Allow",
      "Action": [
        "sns:ListTopics",
        "sns:GetTopicAttributes"
      ],
      "Resource": "*"
    },
      "Sid": "CodeStarNotificationsChatbotAccess",
      "Effect": "Allow",
      "Action": [
        "chatbot:DescribeSlackChannelConfigurations",
        "chatbot:ListMicrosoftTeamsChannelConfigurations"
      ],
      "Resource": "*"
    }
  ]
}
```

AWSCodeBuildDeveloperAccess

The AWSCodeBuildDeveloperAccess policy allows access to all of the functionality of CodeBuild and project and report group-related resources. This policy does not allow users to

delete CodeBuild projects or report groups, or related resources in other AWS services, such as CloudWatch Events. We recommend that you apply this policy to most users.

The AWSCodeBuildDeveloperAccess policy contains the following policy statement:

```
{
  "Statement": [
    {
      "Sid": "AWSServicesAccess",
      "Action": Γ
        "codebuild:StartBuild",
        "codebuild:StopBuild",
        "codebuild:StartBuildBatch",
        "codebuild:StopBuildBatch",
        "codebuild:RetryBuild",
        "codebuild:RetryBuildBatch",
        "codebuild:BatchGet*",
        "codebuild:GetResourcePolicy",
        "codebuild:DescribeTestCases",
        "codebuild:DescribeCodeCoverages",
        "codebuild:List*",
        "codecommit:GetBranch",
        "codecommit:GetCommit",
        "codecommit:GetRepository",
        "codecommit:ListBranches",
        "cloudwatch:GetMetricStatistics",
        "events:DescribeRule",
        "events:ListTargetsByRule",
        "events:ListRuleNamesByTarget",
        "logs:GetLogEvents",
        "s3:GetBucketLocation",
        "s3:ListAllMyBuckets"
      ],
      "Effect": "Allow",
      "Resource": "*"
    },
    {
      "Sid": "SSMParameterWriteAccess",
      "Effect": "Allow",
      "Action": [
        "ssm:PutParameter"
      ],
      "Resource": "arn:aws:ssm:*:*:parameter/CodeBuild/*"
    },
```

```
{
     "Sid": "SSMStartSessionAccess",
     "Effect": "Allow",
     "Action": [
       "ssm:StartSession"
     ],
     "Resource": "arn:aws:ecs:*:*:task/*/*"
  },
   {
     "Sid": "CodeStarConnectionsUserAccess",
     "Effect": "Allow",
     "Action": [
       "codestar-connections:ListConnections",
       "codestar-connections:GetConnection"
     ],
     "Resource": [
       "arn:aws:codestar-connections:*:*:connection/*",
       "arn:aws:codeconnections:*:*:*"
     1
  },
   {
     "Sid": "CodeStarNotificationsReadWriteAccess",
     "Effect": "Allow",
     "Action": [
       "codestar-notifications:CreateNotificationRule",
       "codestar-notifications:DescribeNotificationRule",
       "codestar-notifications:UpdateNotificationRule",
       "codestar-notifications:Subscribe",
       "codestar-notifications:Unsubscribe"
     ],
     "Resource": "*",
     "Condition": {
       "ArnLike": {
         "codestar-notifications:NotificationsForResource":
"arn:aws:codebuild:*:*:project/*"
       }
     }
  },
   {
     "Sid": "CodeStarNotificationsListAccess",
     "Effect": "Allow",
     "Action": [
       "codestar-notifications:ListNotificationRules",
       "codestar-notifications:ListEventTypes",
```

```
"codestar-notifications:ListTargets",
        "codestar-notifications:ListTagsforResource"
      ],
      "Resource": "*"
    },
    {
      "Sid": "SNSTopicListAccess",
      "Effect": "Allow",
      "Action": [
        "sns:ListTopics",
        "sns:GetTopicAttributes"
      ],
      "Resource": "*"
    },
      "Sid": "CodeStarNotificationsChatbotAccess",
      "Effect": "Allow",
      "Action": [
        "chatbot:DescribeSlackChannelConfigurations",
        "chatbot:ListMicrosoftTeamsChannelConfigurations"
      "Resource": "*"
    }
  ],
  "Version": "2012-10-17"
}
```

AWSCodeBuildReadOnlyAccess

The AWSCodeBuildReadOnlyAccess policy grants read-only access to CodeBuild and related resources in other AWS services. Apply this policy to users who can view and run builds, view projects, and view report groups, but cannot make any changes to them.

The AWSCodeBuildReadOnlyAccess policy contains the following policy statement:

```
{
    "Statement": [
    {
        "Sid": "AWSServicesAccess",
        "Action": [
            "codebuild:BatchGet*",
            "codebuild:GetResourcePolicy",
            "codebuild:List*",
```

```
"codebuild:DescribeTestCases",
       "codebuild:DescribeCodeCoverages",
       "codecommit:GetBranch",
       "codecommit:GetCommit",
       "codecommit:GetRepository",
       "cloudwatch:GetMetricStatistics",
       "events:DescribeRule",
       "events:ListTargetsByRule",
       "events:ListRuleNamesByTarget",
       "logs:GetLogEvents"
     "Effect": "Allow",
     "Resource": "*"
  },
     "Sid": "CodeStarConnectionsUserAccess",
     "Effect": "Allow",
     "Action": [
       "codestar-connections:ListConnections",
       "codestar-connections:GetConnection"
     ],
     "Resource": [
       "arn:aws:codestar-connections:*:*:connection/*",
      "arn:aws:codeconnections:*:*:*"
     1
  },
     "Sid": "CodeStarNotificationsPowerUserAccess",
     "Effect": "Allow",
     "Action": [
       "codestar-notifications:DescribeNotificationRule"
     "Resource": "*",
     "Condition": {
       "ArnLike": {
         "codestar-notifications:NotificationsForResource":
"arn:aws:codebuild:*:*:project/*"
       }
     }
   },
     "Sid": "CodeStarNotificationsListAccess",
     "Effect": "Allow",
     "Action": [
```

```
"codestar-notifications:ListNotificationRules",
    "codestar-notifications:ListEventTypes",
    "codestar-notifications:ListTargets"
    ],
    "Resource": "*"
    }
],
"Version": "2012-10-17"
}
```

CodeBuild managed policies and notifications

CodeBuild supports notifications, which can notify users of important changes to build projects. Managed policies for CodeBuild include policy statements for notification functionality. For more information, see What are notifications?.

Permissions related to notifications in read-only managed policies

The AWSCodeBuildReadOnlyAccess managed policy includes the following statements to allow read-only access to notifications. Users with this managed policy applied can view notifications for resources, but cannot create, manage, or subscribe to them.

```
{
       "Sid": "CodeStarNotificationsPowerUserAccess",
       "Effect": "Allow",
       "Action": [
           "codestar-notifications:DescribeNotificationRule"
       ],
       "Resource": "*",
       "Condition" : {
           "ArnLike" : {"codestar-notifications:NotificationsForResource" :
"arn:aws:codebuild:*:*:project/*"}
   },
   {
       "Sid": "CodeStarNotificationsListAccess",
       "Effect": "Allow",
       "Action": [
           "codestar-notifications:ListNotificationRules",
           "codestar-notifications:ListEventTypes",
           "codestar-notifications:ListTargets"
       ],
       "Resource": "*"
```

}

Permissions related to notifications in other managed policies

The AWSCodeBuildDeveloperAccess managed policy includes the following statements to allow users to create, edit, and subscribe to notifications. Users cannot delete notification rules or manage tags for resources.

```
{
       "Sid": "CodeStarNotificationsReadWriteAccess",
       "Effect": "Allow",
       "Action": [
           "codestar-notifications:CreateNotificationRule",
           "codestar-notifications:DescribeNotificationRule",
           "codestar-notifications:UpdateNotificationRule",
           "codestar-notifications:Subscribe",
           "codestar-notifications:Unsubscribe"
       ],
       "Resource": "*",
       "Condition" : {
           "ArnLike" : {"codestar-notifications:NotificationsForResource" :
"arn:aws:codebuild:*:*:project/*"}
       }
  },
   {
       "Sid": "CodeStarNotificationsListAccess",
       "Effect": "Allow",
       "Action": [
           "codestar-notifications:ListNotificationRules",
           "codestar-notifications:ListTargets",
           "codestar-notifications:ListTagsforResource",
           "codestar-notifications:ListEventTypes"
       ],
       "Resource": "*"
  },
   {
       "Sid": "SNSTopicListAccess",
       "Effect": "Allow",
       "Action": [
           "sns:ListTopics"
       ],
       "Resource": "*"
   },
```

```
{
    "Sid": "CodeStarNotificationsChatbotAccess",
    "Effect": "Allow",
    "Action": [
        "chatbot:DescribeSlackChannelConfigurations",
        "chatbot:ListMicrosoftTeamsChannelConfigurations"
    ],
    "Resource": "*"
}
```

For more information about IAM and notifications, see <u>Identity and Access Management for AWS</u> CodeStar Notifications.

CodeBuild updates to AWS managed policies

View details about updates to AWS managed policies for CodeBuild since this service began tracking these changes. For automatic alerts about changes to this page, subscribe to the RSS feed on AWS CodeBuild User Guide document history .

Change	Description	Date
AWSCodeBuildAdminA ccess , AWSCodeBu ildDeveloperAccess , and AWSCodeBuildReadOn lyAccess - Update to existing policies	CodeBuild updated a resource to these policies. The AWSCodeBuildAdminA ccess , AWSCodeBu ildDeveloperAccess , and AWSCodeBuildReadOn lyAccess policies have been changed to update an existing resource. The original resource arn:aws:c odebuild:* has been updated to arn:aws:c odebuild:*:*:proje ct/* .	November 15, 2024
AWSCodeBuildAdminA ccess , AWSCodeBu	CodeBuild added a resource to these policies to support	April 18, 2024

Change	Description	Date
<pre>ildDeveloperAccess , and AWSCodeBuildReadOn lyAccess - Update to existing policies</pre>	the AWS CodeConnections rebranding. The AWSCodeBuildAdminA ccess , AWSCodeBu ildDeveloperAccess , and AWSCodeBuildReadOn lyAccess policies have been changed to add a resource, arn:aws:c odeconnections:*:* :* .	
AWSCodeBuildAdminA ccess and AWSCodeBu ildDeveloperAccess — Update to existing policies	CodeBuild added a permissio n to these policies to support an additional notificat ion type using Amazon Q Developer in chat applicati ons.	May 16, 2023
	The AWSCodeBuildAdminA ccess and AWSCodeBu ildDeveloperAccess policies have been changed to add a permission, chatbot:ListMicrosoftTeamsC hannelConfigurations.	
CodeBuild started tracking changes	CodeBuild started tracking changes for its AWS managed policies.	May 16, 2021

Customer-managed policy examples

In this section, you can find example user policies that grant permissions for AWS CodeBuild actions. These policies work when you are using the CodeBuild API, AWS SDKs, or AWS CLI. When you are using the console, you must grant additional, console-specific permissions. For information, see Permissions required to use the AWS CodeBuild console.

You can use the following sample IAM policies to limit CodeBuild access for your users and roles.

Topics

- Allow a user to get information about build projects
- Allow a user to get information about fleets
- Allow a user to get information about report groups
- Allow a user to get information about reports
- Allow a user to create build projects
- Allow a user to create a fleet
- Allow a user to create a report group
- · Allow a user to delete a fleet
- Allow a user to delete a report group
- Allow a user to delete a report
- Allow a user to delete build projects
- Allow a user to get a list of build project names
- Allow a user to change information about build projects
- Allow a user to change a fleet
- Allow a user to change a report group
- Allow a user to get information about builds
- Allow a user to get a list of build IDs for a build project
- Allow a user to get a list of build IDs
- Allow a user to get a list of fleets
- Allow a user to get a list of report groups
- Allow a user to get a list of reports
- Allow a user to get a list of reports for a report group
- Allow a user to get a list of test cases for a report

- · Allow a user to start running builds
- Allow a user to attempt to stop builds
- Allow a user to attempt to delete builds
- Allow a user to get information about Docker images that are managed by CodeBuild
- Allow a user to add a permission policy for a fleet service role
- Allow CodeBuild access to AWS services required to create a VPC network interface
- Use a deny statement to prevent AWS CodeBuild from disconnecting from source providers

Allow a user to get information about build projects

The following example policy statement allows a user to get information about build projects in the us-east-2 Region for account 123456789012 for any build project that starts with the name my:

```
{
  "Version": "2012-10-17",
  "Statement": [
     {
        "Effect": "Allow",
        "Action": "codebuild:BatchGetProjects",
        "Resource": "arn:aws:codebuild:us-east-2:123456789012:project/my*"
     }
  ]
}
```

Allow a user to get information about fleets

The following example policy statement allows a user to get information about fleets in the useast-2 Region for account 123456789012:

```
{
  "Version": "2012-10-17",
  "Statement": [
    {
        "Effect": "Allow",
        "Action": "codebuild:BatchGetFleets",
        "Resource": "arn:aws:codebuild:us-east-2:123456789012:fleet/*"
    }
]
```

}

Allow a user to get information about report groups

The following example policy statement allows a user to get information about report groups in the us-east-2 Region for account 123456789012:

```
{
  "Version": "2012-10-17",
  "Statement": [
    {
        "Effect": "Allow",
        "Action": "codebuild:BatchGetReportGroups",
        "Resource": "arn:aws:codebuild:us-east-2:123456789012:report-group/*"
    }
]
}
```

Allow a user to get information about reports

The following example policy statement allows a user to get information about reports in the useast-2 Region for account 123456789012:

```
{
  "Version": "2012-10-17",
  "Statement": [
    {
        "Effect": "Allow",
        "Action": "codebuild:BatchGetReports",
        "Resource": "arn:aws:codebuild:us-east-2:123456789012:report-group/*"
    }
  ]
}
```

Allow a user to create build projects

The following example policy statement allows a user to create build projects with any name but only in the us-east-2 Region for account 123456789012 and only using the specified CodeBuild service role:

```
{
    "Version": "2012-10-17",
```

The following example policy statement allows a user to create build projects with any name but only in the us-east-2 Region for account 123456789012 and only using the specified CodeBuild service role. It also enforces that the user can only use the specified service role with AWS CodeBuild and not any other AWS services.

```
{
  "Version": "2012-10-17",
  "Statement": [
      "Effect": "Allow",
      "Action": "codebuild:CreateProject",
      "Resource": "arn:aws:codebuild:us-east-2:123456789012:project/*"
    },
    {
      "Effect": "Allow",
      "Action": "iam:PassRole",
      "Resource": "arn:aws:iam::123456789012:role/CodeBuildServiceRole",
          "StringEquals": {"iam:PassedToService": "codebuild.amazonaws.com"}
      }
    }
  ]
}}
```

Allow a user to create a fleet

The following example policy statement allows a user to create a fleet in the us-east-2 Region for account 123456789012:

Allow a user to create a report group

The following example policy statement allows a user to create a report group in the us-east-2 Region for account 123456789012:

```
{
  "Version": "2012-10-17",
  "Statement": [
    {
        "Effect": "Allow",
        "Action": "codebuild:CreateReportGroup",
        "Resource": "arn:aws:codebuild:us-east-2:123456789012:report-group/*"
    }
  ]
}
```

Allow a user to delete a fleet

The following example policy statement allows a user to delete a fleet in the us-east-2 Region for account 123456789012:

Allow a user to delete a report group

The following example policy statement allows a user to delete a report group in the us-east-2 Region for account 123456789012:

```
{
  "Version": "2012-10-17",
  "Statement": [
    {
        "Effect": "Allow",
        "Action": "codebuild:DeleteReportGroup",
        "Resource": "arn:aws:codebuild:us-east-2:123456789012:report-group/*"
    }
  ]
}
```

Allow a user to delete a report

The following example policy statement allows a user to delete a report in the us-east-2 Region for account 123456789012:

```
{
  "Version": "2012-10-17",
  "Statement": [
    {
        "Effect": "Allow",
        "Action": "codebuild:DeleteReport",
        "Resource": "arn:aws:codebuild:us-east-2:123456789012:report-group/*"
    }
]
}
```

Allow a user to delete build projects

The following example policy statement allows a user to delete build projects in the us-east-2 Region for account 123456789012 for any build project that starts with the name my:

```
{
  "Version": "2012-10-17",
  "Statement": [
     {
        "Effect": "Allow",
```

```
"Action": "codebuild:DeleteProject",
    "Resource": "arn:aws:codebuild:us-east-2:123456789012:project/my*"
}
]
```

Allow a user to get a list of build project names

The following example policy statement allows a user to get a list of build project names for the same account:

Allow a user to change information about build projects

The following example policy statement allows a user to change information about build projects with any name but only in the us-east-2 Region for account 123456789012 and only using the specified AWS CodeBuild service role:

}

Allow a user to change a fleet

The following example policy statement allows a user to change a fleet in the us-east-2 Region for account 123456789012:

```
{
  "Version": "2012-10-17",
  "Statement": [
    {
        "Effect": "Allow",
        "Action": "codebuild:UpdateFleet",
        "Resource": "arn:aws:codebuild:us-east-2:123456789012:fleet/*"
    }
  ]
}
```

Allow a user to change a report group

The following example policy statement allows a user to change a report group in the us-east-2 Region for account 123456789012:

```
{
  "Version": "2012-10-17",
  "Statement": [
    {
        "Effect": "Allow",
        "Action": "codebuild:UpdateReportGroup",
        "Resource": "arn:aws:codebuild:us-east-2:123456789012:report-group/*"
    }
  ]
}
```

Allow a user to get information about builds

The following example policy statement allows a user to get information about builds in the useast-2 Region for account 123456789012 for the build projects named my-build-project and my-other-build-project:

```
{
    "Version": "2012-10-17",
```

Allow a user to get a list of build IDs for a build project

The following example policy statement allows a user to get a list of build IDs in the us-east-2 Region for account 123456789012 for the build projects named my-build-project and my-other-build-project:

Allow a user to get a list of build IDs

The following example policy statement allows a user to get a list of all build IDs for the same account:

```
{
  "Version": "2012-10-17",
  "Statement": [
     {
        "Effect": "Allow",
```

Allow a user to get a list of fleets

The following example policy statement allows a user to get a list of fleets in the us-east-2 Region for account 123456789012:

Allow a user to get a list of report groups

The following example policy statement allows a user to get a list of report groups in the useast-2 Region for account 123456789012:

Allow a user to get a list of reports

The following example policy statement allows a user to get a list of reports in the us-east-2 Region for account 123456789012:

Allow a user to get a list of reports for a report group

The following example policy statement allows a user to get a list of reports for a report group in the us-east-2 Region for account 123456789012:

```
{
  "Version": "2012-10-17",
  "Statement": [
    {
        "Effect": "Allow",
        "Action": "codebuild:ListReportsForReportGroup",
        "Resource": "arn:aws:codebuild:us-east-2:123456789012:report-group/*"
    }
  ]
}
```

Allow a user to get a list of test cases for a report

The following example policy statement allows a user to get a list of test cases for a report in the us-east-2 Region for account 123456789012:

```
{
  "Version": "2012-10-17",
  "Statement": [
     {
        "Effect": "Allow",
        "Action": "codebuild:DescribeTestCases",
        "Resource": "arn:aws:codebuild:us-east-2:123456789012:report-group/*"
    }
  ]
}
```

Allow a user to start running builds

The following example policy statement allows a user to run builds in the us-east-2 Region for account 123456789012 for a build project that starts with the name my:

```
{
  "Version": "2012-10-17",
  "Statement": [
    {
        "Effect": "Allow",
        "Action": "codebuild:StartBuild",
        "Resource": "arn:aws:codebuild:us-east-2:123456789012:project/my*"
    }
  ]
}
```

Allow a user to attempt to stop builds

The following example policy statement allows a user to attempt to stop running builds only in the us-east-2 region for account 123456789012 for any build project that starts with the name my:

```
{
  "Version": "2012-10-17",
  "Statement": [
    {
        "Effect": "Allow",
        "Action": "codebuild:StopBuild",
        "Resource": "arn:aws:codebuild:us-east-2:123456789012:project/my*"
    }
  ]
}
```

Allow a user to attempt to delete builds

The following example policy statement allows a user to attempt to delete builds only in the useast-2 Region for account 123456789012 for any build project that starts with the name my:

```
{
  "Version": "2012-10-17",
  "Statement": [
     {
        "Effect": "Allow",
```

```
"Action": "codebuild:BatchDeleteBuilds",
    "Resource": "arn:aws:codebuild:us-east-2:123456789012:project/my*"
    }
]
```

Allow a user to get information about Docker images that are managed by CodeBuild

The following example policy statement allows a user to get information about all Docker images that are managed by CodeBuild:

```
{
  "Version": "2012-10-17",
  "Statement": [
    {
        "Effect": "Allow",
        "Action": "codebuild:ListCuratedEnvironmentImages",
        "Resource": "*"
    }
  ]
}
```

Allow a user to add a permission policy for a fleet service role

The following example resource policy statement allows a user to add a VPC permission policy for a fleet service role:

```
{
  "Version": "2012-10-17",
  "Statement": [
    {
        "Sid": "CodeBuildFleetVpcCreateNI",
        "Effect": "Allow",
        "Action": [
            "ec2:CreateNetworkInterface"
        ],
        "Resource": [
            "arn:aws:ec2:region:account-id:subnet/subnet-id-1",
            "arn:aws:ec2:region:account-id:security-group/security-group-id-1",
            "arn:aws:ec2:region:account-id:network-interface/*"
        ]
    },
```

```
{
      "Sid": "CodeBuildFleetVpcPermission",
      "Effect": "Allow",
      "Action": [
        "ec2:DescribeDhcpOptions",
        "ec2:DescribeNetworkInterfaces",
        "ec2:DescribeSecurityGroups",
        "ec2:DescribeSubnets",
        "ec2:DescribeVpcs",
        "ec2:ModifyNetworkInterfaceAttribute",
        "ec2:DeleteNetworkInterface"
      ],
      "Resource": "*"
    },
    {
      "Sid": "CodeBuildFleetVpcNIPermission",
      "Effect": "Allow",
      "Action": [
        "ec2:CreateNetworkInterfacePermission"
      ],
      "Resource": "arn:aws:ec2:region:account-id:network-interface/*",
      "Condition": {
        "StringEquals": {
          "ec2:Subnet": [
            "arn:aws:ec2:region:account-id:subnet/subnet-id-1"
          ]
        }
    }
  ]
}
```

The following example resource policy statement allows a user to add a custom Amazon Managed Image (AMI) permission policy for a fleet service role:

```
]
```

The following example trust policy statement allows a user to add a permission policy for a fleet service role:

```
{
  "Version": "2012-10-17",
  "Statement": [
    {
      "Sid": "CodeBuildFleetVPCTrustPolicy",
      "Effect": "Allow",
      "Principal": {
        "Service": "codebuild.amazonaws.com"
      },
      "Action": "sts:AssumeRole",
      "Condition": {
        "StringEquals": {
          "aws:SourceAccount": "account-id"
        }
      }
    }
  ]
}
```

Allow CodeBuild access to AWS services required to create a VPC network interface

The following example policy statement grants AWS CodeBuild permission to create a network interface in a VPC with two subnets:

```
{
  "Version": "2012-10-17",
  "Statement": [
    {
        "Effect": "Allow",
        "Action": [
            "ec2:CreateNetworkInterface",
            "ec2:DescribeDhcpOptions",
            "ec2:DescribeNetworkInterfaces",
            "ec2:DeleteNetworkInterface",
            "ec2:DescribeSubnets",
            "ec2:DescribeSecurityGroups",
            "ec2:DescribeVpcs"
```

```
],
      "Resource": "*"
    },
    {
      "Effect": "Allow",
      "Action": [
        "ec2:CreateNetworkInterfacePermission"
      ],
      "Resource": "arn:aws:ec2:region:account-id:network-interface/*",
      "Condition": {
        "StringEquals": {
          "ec2:AuthorizedService": "codebuild.amazonaws.com"
        },
        "ArnEquals": {
          "ec2:Subnet": [
            "arn:aws:ec2:region:account-id:subnet/subnet-id-1",
            "arn:aws:ec2:region:account-id:subnet/subnet-id-2"
          ]
        }
      }
    }
  ]
}
```

Use a deny statement to prevent AWS CodeBuild from disconnecting from source providers

The following example policy statement uses a deny statement to prevent AWS CodeBuild from disconnecting from source providers. It uses codebuild:DeleteOAuthToken, which is the inverse of codebuild:PersistOAuthToken and codebuild:ImportSourceCredentials, to connect with source providers. For more information, see Permissions required for the AWS CodeBuild console to connect to source providers.

AWS CodeBuild permissions reference

You can use AWS-wide condition keys in your AWS CodeBuild policies to express conditions. For a list, see <u>Available Keys</u> in the *IAM User Guide*.

You specify the actions in the policy's Action field. To specify an action, use the codebuild: prefix followed by the API operation name (for example, codebuild:CreateProject and codebuild:StartBuild). To specify multiple actions in a single statement, separate them with commas (for example, "Action": ["codebuild:CreateProject", "codebuild:StartBuild"]).

Using Wildcard Characters

You specify an ARN, with or without a wildcard character (*), as the resource value in the policy's Resource field. You can use a wildcard to specify multiple actions or resources. For example, codebuild: * specifies all CodeBuild actions and codebuild: Batch* specifies all CodeBuild actions that begin with the word Batch. The following example grants access to all build project with names that begin with my:

```
arn:aws:codebuild:us-east-2:123456789012:project/my*
```

CodeBuild API operations and required permissions for actions

BatchDeleteBuilds

Action: codebuild: BatchDeleteBuilds

Required to delete builds.

Resource: arn:aws:codebuild:region-ID:account-ID:project/project-name

BatchGetBuilds

Action: codebuild: BatchGetBuilds

Required to get information about builds.

Resource: arn:aws:codebuild:region-ID:account-ID:project/project-name

BatchGetProjects

Action: codebuild:BatchGetProjects

Required to get information about build projects.

```
Resource: arn:aws:codebuild:region-ID:account-ID:project/project-name
BatchGetReportGroups
  Action: codebuild:BatchGetReportGroups
  Required to get information about report groups.
  Resource: arn:aws:codebuild:region-ID:account-ID:report-group/report-
  group-name
BatchGetReports
  Action: codebuild:BatchGetReports
  Required to get information about reports.
  Resource: arn:aws:codebuild:region-ID:account-ID:report-group/report-
  group-name
BatchPutTestCases 1
  Action: codebuild: BatchPutTestCases
  Required to create or update a test report.
  Resource: arn:aws:codebuild:region-ID:account-ID:report-group/report-
  group-name
CreateProject
  Actions: codebuild:CreateProject, iam:PassRole
  Required to create build projects.
```

Resources:

- arn:aws:codebuild:region-ID:account-ID:project/project-name
- arn:aws:iam::account-ID:role/role-name

CreateReport ¹

Action: codebuild:CreateReport

Required to create a test report.

Resource: arn:aws:codebuild:region-ID:account-ID:report-group/report-group-name

CreateReportGroup

Action: codebuild:CreateReportGroup

Required to create a report group.

Resource: arn:aws:codebuild:region-ID:account-ID:report-group/report-group-name

CreateWebhook

Action: codebuild: CreateWebhook

Required to create a webhook.

Resource: arn:aws:codebuild:region-ID:account-ID:project/project-name

DeleteProject

Action: codebuild:DeleteProject

Required to delete a CodeBuild project.

Resource: arn:aws:codebuild:region-ID:account-ID:project/project-name

DeleteReport

Action: codebuild:DeleteReport

Required to delete a report.

Resource: arn:aws:codebuild:region-ID:account-ID:report-group/report-group-name

DeleteReportGroup

Action: codebuild: DeleteReportGroup

Required to delete a report group.

Resource: arn:aws:codebuild:region-ID:account-ID:report-group/report-group-name

DeleteSourceCredentials

Action: codebuild: DeleteSourceCredentials

Required to delete a set of SourceCredentialsInfo objects that contain information about credentials for a GitHub, GitHub Enterprise Server, or Bitbucket repository.

Resource: *

DeleteWebhook

Action: codebuild: DeleteWebhook

Required to create a webhook.

Resource: arn:aws:codebuild:region-ID:account-ID:project/project-name

DescribeTestCases

Action: codebuild: DescribeTestCases

Required to return a paginated list of test cases.

Resource: arn:aws:codebuild:region-ID:account-ID:report-group/report-group-name

ImportSourceCredentials

Action: codebuild: ImportSourceCredentials

Required to import a set of SourceCredentialsInfo objects that contain information about credentials for a GitHub, GitHub Enterprise Server, or Bitbucket repository.

Resource: *

InvalidateProjectCache

Action: codebuild: InvalidateProjectCache

Required to reset the cache for a project.

Resource: arn:aws:codebuild:region-ID:account-ID:project/project-name

ListBuildBatches

Action: codebuild:ListBuildBatches

Required to get a list of build batch IDs.

Resource: *

ListBuildBatchesForProject

Action: codebuild:ListBuildBatchesForProject

Required to get a list of build batch IDs for a specific project.

Resource: arn:aws:codebuild:region-ID:account-ID:project/project-name

ListBuilds

Action: codebuild:ListBuilds

Required to get a list of build IDs.

Resource: *

ListBuildsForProject

Action: codebuild:ListBuildsForProject

Required to get a list of build IDs for a build project.

Resource: arn: aws:codebuild: region-ID: account-ID: project/project-name

ListCuratedEnvironmentImages

Action: codebuild:ListCuratedEnvironmentImages

Required to get information about all Docker images that are managed by AWS CodeBuild.

Resource: * (required, but does not refer to an addressable AWS resource)

ListProjects

Action: codebuild:ListProjects

Required to get a list of build project names.

Resource: * ListReportGroups Action: codebuild:ListReportGroups Required to get a list of report groups. Resource: * ListReports **Action:** codebuild:ListReports Required to get a list of reports. Resource: * ListReportsForReportGroup Action: codebuild:ListReportsForReportGroup Required to get a list of reports for a report group. **Resource:** arn:aws:codebuild:region-ID:account-ID:report-group/reportgroup-name RetryBuild Action: codebuild: RetryBuild Required to retry builds. **Resource:** arn:aws:codebuild:region-ID:account-ID:project/project-name StartBuild Action: codebuild:StartBuild Required to start running builds. **Resource:** arn:aws:codebuild:region-ID:account-ID:project/project-name

StopBuild

Action: codebuild: StopBuild

Required to attempt to stop running builds.

Resource: arn:aws:codebuild:region-ID:account-ID:project/project-name
UpdateProject

Actions: codebuild: UpdateProject, iam: PassRole

Required to change information about builds.

Resources:

- arn:aws:codebuild:region-ID:account-ID:project/project-name
- arn:aws:iam::account-ID:role/role-name

UpdateProjectVisibility

Actions: codebuild: UpdateProjectVisibility, iam: PassRole

Required to change the public visibility of a project's builds.

Resources:

- arn:aws:codebuild:region-ID:account-ID:project/project-name
- arn:aws:iam::account-ID:role/role-name

UpdateReport 1

Action: codebuild: UpdateReport

Required to create or update a test report.

Resource: arn:aws:codebuild:region-ID:account-ID:report-group/report-group-name

UpdateReportGroup

Action: codebuild:UpdateReportGroup

Required to update a report group.

Resource: arn:aws:codebuild:region-ID:account-ID:report-group/report-group-name

UpdateWebhook

Action: codebuild: UpdateWebhook

Required to update a webhook.

Resource: arn:aws:codebuild:region-ID:account-ID:project/project-name

Using tags to control access to AWS CodeBuild resources

Conditions in IAM policy statements are part of the syntax that you can use to specify permissions to CodeBuild project-based actions. You can create a policy that allows or denies actions on projects based on the tags associated with those projects, and then apply those policies to the IAM groups you configure for managing users. For information about applying tags to a project using the console or AWS CLI, see Create a build project in AWS CodeBuild. For information about applying tags using the CodeBuild SDK, see CreateProject and Tags in the CodeBuild API Reference. For information about using tags to control access to AWS resources, see Controlling Access to AWS Resources Using Resource Tags in the IAM User Guide.

▲ Important

When using the reserved capacity feature, data cached on fleet instances, including source files, Docker layers, and cached directories specified in the buildspec, can be accessible to other projects within the same account. This is by design and allows projects within the same account to share fleet instances.

Example Example 1: Limit CodeBuild project actions based on resource tags

The following example denies all BatchGetProjects actions on projects tagged with the key Environment with the key value of Production. A user's administrator must attach this IAM policy in addition to the managed user policy to unauthorized users. The aws:ResourceTag condition key is used to control access to resources based on their tags.

```
{
    "Version": "2012-10-17",
```

¹ Used for permission only. There is no API for this action.

Example Example 2: Limit CodeBuild project actions based on request tags

The following policy denies users permission to the CreateProject action if the request contains a tag with the key Environment and the key value Production. In addition, the policy prevents these unauthorized users from modifying projects by using the aws:TagKeys condition key to not allow UpdateProject if the request contains a tag with the key Environment. An administrator must attach this IAM policy in addition to the managed user policy to users who are not authorized to perform these actions. The aws:RequestTag condition key is used to control which tags can be passed in an IAM request

```
"Effect": "Deny",
   "Action": [
        "codebuild:UpdateProject"
],
   "Resource": "*",
   "Condition": {
        "ForAnyValue:StringEquals": {
            "aws:TagKeys": ["Environment"]
        }
    }
}
```

Example Example 3: Deny or allow actions on report groups based on resource tags

You can create a policy that allows or denies actions on CodeBuild resources (projects and report groups) based on the AWS tags associated with those resources, and then apply those policies to the IAM groups you configure for managing users. For example, you can create a policy that denies all CodeBuild actions on any report group with the AWS tag key Status and the key value of Secret, and then apply that policy to the IAM group you created for general developers (*Developers*). You then need to make sure that the developers working on those tagged report groups are not members of that general *Developers* group, but belong instead to a different IAM group that does not have the restrictive policy applied (SecretDevelopers).

The following example denies all CodeBuild actions on report groups tagged with the key Status and the key value of Secret:

```
"Resource" : "*",
    "Condition" : {
        "StringEquals" : "aws:ResourceTag/Status": "Secret"
      }
    }
}
```

Example Example 4: Limit CodeBuild actions to AWSCodeBuildDeveloperAccess based on resource tags

You can create policies that allow CodeBuild actions on all report groups and projects that are not tagged with specific tags. For example, the following policy allows the equivalent of AWSCodeBuildDeveloperAccess permissions for all report groups and projects except those tagged with the specified tags:

```
{
   "Version": "2012-10-17",
   "Statement": [
      {
         "Effect": "Allow",
         "Action": [
            "codebuild:StartBuild",
            "codebuild:StopBuild",
            "codebuild:BatchGet*",
            "codebuild:GetResourcePolicy",
            "codebuild:DescribeTestCases",
            "codebuild:List*",
            "codecommit:GetBranch",
            "codecommit:GetCommit",
            "codecommit:GetRepository",
            "codecommit:ListBranches",
            "cloudwatch:GetMetricStatistics",
            "events:DescribeRule",
            "events:ListTargetsByRule",
            "events:ListRuleNamesByTarget",
            "logs:GetLogEvents",
            "s3:GetBucketLocation",
            "s3:ListAllMyBuckets"
         ],
         "Resource": "*",
         "Condition": {
            "StringNotEquals": {
```

Viewing resources in the console

The AWS CodeBuild console requires the ListRepositories permission to display a list of repositories for your AWS account in the AWS Region where you are signed in. The console also includes a **Go to resource** function to quickly perform a case insensitive search for resources. This search is performed in your AWS account in the AWS Region where you are signed in. The following resources are displayed across the following services:

AWS CodeBuild: Build projects

AWS CodeCommit: Repositories

AWS CodeDeploy: Applications

AWS CodePipeline: Pipelines

To perform this search across resources in all services, you must have the following permissions:

CodeBuild: ListProjects

CodeCommit: ListRepositories

CodeDeploy: ListApplications

CodePipeline: ListPipelines

Results are not returned for a service's resources if you do not have permissions for that service. Even if you have permissions for viewing resources, some resources are not returned if there is an explicit Deny to view those resources.

Compliance validation for AWS CodeBuild

Third-party auditors assess the security and compliance of AWS CodeBuild as part of multiple AWS compliance programs. These include SOC, PCI, FedRAMP, HIPAA, and others.

For a list of AWS services in scope of specific compliance programs, see <u>AWS services in scope by</u> compliance program. For general information, see AWS compliance programs.

You can download third-party audit reports using AWS Artifact. For more information, see Downloading reports in AWS Artifact.

Your compliance responsibility when using CodeBuild is determined by the sensitivity of your data, your company's compliance objectives, and applicable laws and regulations. If your use of CodeBuild is subject to compliance with standards such as HIPAA, PCI, or FedRAMP, AWS provides resources to help:

- <u>Security and compliance quick start guides</u> These deployment guides discuss architectural
 considerations and provide steps for deploying security- and compliance-focused baseline
 environments on AWS.
- Architecting for HIPAA Security and Compliance Whitepaper This whitepaper describes how companies can use AWS to create HIPAA-compliant applications.
- <u>AWS compliance resources</u> This collection of workbooks and guides might apply to your industry and location.
- <u>AWS Config</u> This AWS service assesses how well your resource configurations comply with internal practices, industry guidelines, and regulations.
- <u>AWS Security Hub</u> Monitor your usage of AWS CodeBuild as it relates to security best practices by using <u>AWS Security Hub</u>. Security Hub uses security controls to evaluate resource configurations and security standards to help you comply with various compliance frameworks. For more information about using Security Hub to evaluate CodeBuild resources, see <u>AWS</u> CodeBuild controls in the AWS Security Hub User Guide.

Resilience in AWS CodeBuild

The AWS global infrastructure is built around AWS Regions and Availability Zones. AWS Regions provide multiple physically separated and isolated Availability Zones, which are connected with low-latency, high-throughput, and highly redundant networking. With Availability Zones, you can design and operate applications and databases that automatically fail over between Availability Zones without interruption. Availability Zones are more highly available, fault tolerant, and scalable than traditional single or multiple data center infrastructures.

For more information about AWS Regions and Availability Zones, see AWS global infrastructure.

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Infrastructure security in AWS CodeBuild

As a managed service, AWS CodeBuild is protected by AWS global network security. For information about AWS security services and how AWS protects infrastructure, see AWS Cloud Security. To design your AWS environment using the best practices for infrastructure security, see Infrastructure Protection in Security Pillar AWS Well-Architected Framework.

You use AWS published API calls to access CodeBuild through the network. Clients must support the following:

- Transport Layer Security (TLS). We require TLS 1.2 and recommend TLS 1.3.
- Cipher suites with perfect forward secrecy (PFS) such as DHE (Ephemeral Diffie-Hellman) or ECDHE (Elliptic Curve Ephemeral Diffie-Hellman). Most modern systems such as Java 7 and later support these modes.

Additionally, requests must be signed by using an access key ID and a secret access key that is associated with an IAM principal. Or you can use the <u>AWS Security Token Service</u> (AWS STS) to generate temporary security credentials to sign requests.

Access your source provider in CodeBuild

For GitHub or GitHub Enterprise Server, you use a personal access token, a Secrets Manager secret, a connection, or an OAuth app to access the source provider. For Bitbucket, you use either an access token, an app password, a Secrets Manager secret, a connection, or an OAuth app to access the source provider.

Topics

- Create and store a token in a Secrets Manager secret
- GitHub and GitHub Enterprise Server access in CodeBuild
- Bitbucket access in CodeBuild
- GitLab access in CodeBuild

Create and store a token in a Secrets Manager secret

If you choose to use to store your access token using Secrets Manager, you can use either an existing secret connection or create a new secret. To create a new secret, do the following:

Infrastructure security API Version 2016-10-06 831

AWS Management Console

To create a Secrets Manager secret in the AWS Management Console

- 1. For **Source provider**, choose **Bitbucket**, **GitHub**, or **GitHub Enterprise**.
- 2. For **Credential**, do one of the following:
 - Choose Default source credential to use your account's default source credential to apply to all projects.
 - a. If you aren't connected to your source provider, choose Manage default source credential.
 - b. For **Credential type**, choose a credential type other than **CodeConnections**.
 - c. For Service, choose Secrets Manager and for Secrets choose New secret.
 - d. In **Secret name**, enter the name of your secret.
 - e. In **Secret description optional**, enter a description for your secret.
 - f. Depending on the source provider you chose, enter your token or username and app password and choose **Save**.
 - Choose Custom source credential to use a custom source credential to override your account's default settings.
 - a. For **Credential type**, choose a credential type other than **CodeConnections**.
 - b. In **Connection**, choose **Create a secret**.
 - c. In **Secret name**, enter the name of your secret.
 - d. In **Secret description optional**, enter a description for your secret.
 - e. Depending on the source provider you chose, enter your token or username and app password, and choose **Create**.

AWS CLI

To create a Secrets Manager secret in the AWS CLI

 Open a terminal (Linux, macOS, or Unix) or command prompt (Windows). Use the AWS CLI to run the Secrets Manager create-secret command.

```
--description '<secret-description>' \
--secret-string '{
    "ServerType":"<server-type>",
    "AuthType":"<auth-type>",
    "Token":"<token>"
    }' \
--tags Key=codebuild:source, Value='' \
    Key=codebuild:source:type, Value=<type> \
    Key=codebuild:source:provider, Value=<provider>
```

The Secrets Manager secrets that CodeBuild accept must be in the same account and AWS Region as the CodeBuild project and must be in the following JSON format:

```
{
    "ServerType": ServerType,
    "AuthType: AuthType,
    "Token": string,
    "Username": string // Optional and is only used for Bitbucket app
password
}
```

Field	Valid values	Description
ServerType	GITHUB GITHUB_ENTERPRISE BITBUCKET	The third party source provider for your Secrets Manager secret.
AuthType	PERSONAL_ACCESS_TO KEN BASIC_AUTH	The type of access token used by the credentials. For GitHub, only PERSONAL_ACCESS_TOKEN is valid. BASIC_AUTH is only valid for Bitbucket app password.

Field	Valid values	Description
Token	string	For GitHub or GitHub Enterprise, this is the personal access token. For Bitbucket, this is either the access token or the Bitbucket app password.
Username	string	The Bitbucket username when the AuthType is BASIC_AUTH. This parameter is not valid for other types of source providers.

Additionally, CodeBuild uses the following resource tags on the secret to ensure the secrets are easily selectable when creating or editing projects.

Tag key	Tag value	Description
codebuild:source:provider	github github_enterprise	Tells CodeBuild which provider this secret is intended for.
	bitbucket	
codebuild:source:type	personal_access_token	Tells CodeBuild the type of access token in this secret.
	basic_auth	

GitHub and GitHub Enterprise Server access in CodeBuild

For GitHub, you can use a personal access token, an OAuth app, a Secrets Manager secret, or a GitHub App connection to access the source provider. For GitHub Enterprise Server, you can use a personal access token, a Secrets Manager secret, or a GitHub App connection to access the source provider.

Topics

- GitHub App connections for GitHub and GitHub Enterprise Server
- GitHub and GitHub Enterprise Server access token
- GitHub OAuth app

GitHub App connections for GitHub and GitHub Enterprise Server

You can use GitHub App to connect with CodeBuild. GitHub App connections are supported through AWS CodeConnections.

The source provider access enables you to trigger a build by subscribing to GitHub webhook events using CreateWebhook, or to use Tutorial: Configure a CodeBuild-hosted GitHub Actions runner in CodeBuild.



Note

CodeConnections is available in fewer regions than CodeBuild. You can use cross-region connections in CodeBuild. Connections created in opt-in regions, cannot be used in other regions. For more information, see AWS CodeConnections endpoints and quotas.

Topics

- Step 1: Create a connection to GitHub App (console)
- Step 2: Grant CodeBuild project IAM role access to use the connection
- Step 3: Configure CodeBuild to use the new connection
- Troubleshooting problems with the GitHub App

Step 1: Create a connection to GitHub App (console)

Use these steps to use the CodeBuild console to add a connection for your project in GitHub.

To create a connection to GitHub

Follow the instructions in the Developer Tools User Guide for Create a connection to GitHub.



Note

Instead of creating or using an existing connection in your account, you can use a connection shared from another AWS account. For more information, see Share connections with AWS accounts.

Step 2: Grant CodeBuild project IAM role access to use the connection

You can grant CodeBuild project IAM role access to use the GitHub tokens vended by your connection.

To grant CodeBuild project IAM role access

- Create an IAM role for your CodeBuild project by following the instructions to Allow CodeBuild to interact with other AWS services for your CodeBuild project.
- While following the instructions, add the following IAM policy to your CodeBuild project role to grant access to the connection.

```
{
  "Version": "2012-10-17",
  "Statement": [
      "Effect": "Allow",
      "Action": [
        "codeconnections:GetConnectionToken",
        "codeconnections:GetConnection"
      ],
      "Resource": [
        <connection-arn>
      ]
    }
  ]
}
```

Step 3: Configure CodeBuild to use the new connection

You can configure a connection as an account level credential and use it in a project.

AWS Management Console

To configure a connection as an account level credential in the AWS Management Console

- 1. For **Source provider**, choose **GitHub**.
- 2. For **Credential**, do one of the following:
 - Choose Default source credential to use your account's default source credential to apply to all projects.
 - a. If you aren't connected to GitHub, choose Manage default source credential.
 - For Credential type, choose GitHub App.
 - c. In **Connection**, choose to use an existing connection or create a new connection.
 - Choose Custom source credential to use a custom source credential to override your account's default settings.
 - For Credential type, choose GitHub App.
 - b. In **Connection**, choose to use an existing connection or create a new connection.

AWS CLI

To configure a connection as an account level credential in the AWS CLI

Open a terminal (Linux, macOS, or Unix) or command prompt (Windows). Use the AWS
 CLI to run the import-source-credentials command, specifying the --auth-type, - server-type, and --token for your connection.

Use the following command:

```
aws codebuild import-source-credentials --auth-type CODECONNECTIONS --server-
type GITHUB --token <connection-arn>
```

You can also set up multiple tokens for your CodeBuild projects. For more information, see Configure multiple tokens as source level credentials.

Troubleshooting problems with the GitHub App

The following information can help you troubleshoot common issues with the GitHub App.

Topics

- Install the AWS Connector for GitHub app in an undesired region
- The GitHub App connection doesn't have access to repositories
- The AWS service's IAM role is missing necessary IAM permissions.

Install the AWS Connector for GitHub app in an undesired region

Issue: You installed the AWS Connector for GitHub from the GitHub Marketplace, but the connection was created in an undesired region. If you attempt to reconfigure the app on the GitHub website, it won't work because the app is already installed on your GitHub account.

Possible cause: The app is already installed in your GitHub account, so you can only reconfigure the app permissions.

Recommended solution: You can create a new connection with the installation ID in the desired region.

- Open the CodeConnections console at https://console.aws.amazon.com/codesuite/settings/ connections and navigate to the desired region using the region selector in the AWS console navigation bar.
- Follow the instructions in the Developer Tools User Guide for Create a connection to GitHub.



Note

Since you've already installed the AWS Connector for GitHub app, you can choose it instead of installing a new app.

The GitHub App connection doesn't have access to repositories

Issue: An AWS service using the connection, such as CodeBuild or CodePipeline, reports that it doesn't have access to the repository or the repository doesn't exist. Some possible error messages include:

- Authentication required for primary source.
- Unable to create webhook at this time. Please try again later.
- Failed to create webhook. GitHub API limit reached. Please try again later.

Possible cause: You might have been using the GitHub app and haven't granted the webhook permission scope.

Recommended solution: To grant the required permission scope, follow the instructions in Navigating to the GitHub App you want to review or modify to configure the installed app. Under the permissions section, you'll see the app doesn't have webhooks permission, and there is an option for you to review the newly requested permissions. Review and accept the new permissions. For more infomation, see Approving updated permissions for a GitHub App.

Possible cause: The connection was working as expected, but suddenly doesn't have access to the repositories.

Possible solution: Start by reviewing your <u>authorizations</u> and your <u>installations</u>, then verify the GitHub App is authorized and installed. If the GitHub App installation is suspended, then you need to unsuspended it. If the GitHub App is not authorized for a <u>UAT (User Access Token)</u> connection, or not installed for an <u>IAT (Installation Access Token)</u> connection, the existing connection is not usable any more, and you will need to create a new connection. Note that reinstalling the GitHub App will not revive the previous connection that was associated to the old installation.

Possible solution: If the connection is a UAT connection, make sure the connection is not concurrently being used, such as a being used in multiple CodeBuild concurrent runs of build. This is because GitHub immediately invalidates a previously issued UAT if an expiring token is refreshed by the connection. If you need to use UAT connection for multiple concurrent CodeBuild builds, you can create multiple connections and use each connection independently.

Possible solution: If the UAT connection hasn't been used in the past 6 months, the connection will be invalidated by GitHub. To fix this, create a new connection.

Possible cause: You might have been using a UAT connection without installing the app.

Recommended solution: Though creating a UAT connection doesn't require associating the connection with a GitHub App installation, an installation is required for the repository to be accessible. Follow the instructions to <u>review installations</u> to make sure the GitHub App is installed. If it is not installed, navigate to the <u>GitHub App's page</u> to install the app. For more information about UAT's access, see About user access tokens.

The AWS service's IAM role is missing necessary IAM permissions.

Issue: You see any of the following error messages:

- Access denied to connection <connection-arn>
- Failed to get access token from <connection-arn>

Recommended solution: Typically you use a connection with an AWS service, such as CodePipeline or CodeBuild. When you give the AWS service an IAM role, the AWS service can use the role's permission to act on your behalf. Make sure the IAM role has necessary permission. For more information about the necessary IAM permission, see Grant CodeBuild project IAM role access to use the connection and Identity and access management for AWS CodeStar Notifications and CodeConnections in the Developer Tools console User Guide.

GitHub and GitHub Enterprise Server access token

Access token prerequisites

Before you begin, you must add the proper permission scopes to your GitHub access token.

For GitHub, your personal access token must have the following scopes.

- repo: Grants full control of private repositories.
- repo:status: Grants read/write access to public and private repository commit statuses.
- admin:repo_hook: Grants full control of repository hooks. This scope is not required if your token has the repo scope.
- admin:org_hook: Grants full control of organization hooks. This scope is only required if you are using the organization webhook feature.

For more information, see Understanding scopes for OAuth apps on the GitHub website.

If you are using fine-grained personal access tokens, depending on your use case, your personal access token might need the following permissions:

- **Contents: Read-only**: Grants access to private repositories. This permission is required if you are using private repositories as source.
- **Commit statuses: Read and write**: Grants permission to create commit statuses. This permission is required if your project has webhook set up, or you have report build status feature enabled.
- **Webhooks: Read and write**: Grants permission to manage webhooks. This permission is required if your project has webhook set up.

• Pull requests: Read-only: Grants permission to access pull requests. This permission is required if your webhook has a FILE PATH filter on pull request events.

• Administration: Read and write: This permission is required if you are using the self-hosted GitHub Actions runner feature with CodeBuild. For more details, see Create a registration token for a repository and Tutorial: Configure a CodeBuild-hosted GitHub Actions runner.



Note

If you want to access organization repositories, make sure you specify the organization as the resource owner of the access token.

For more information, see Permissions required for fine-grained personal access tokens on the GitHub website.

Connect GitHub with an access token (console)

To use the console to connect your project to GitHub using an access token, do the following when you create a project. For information, see Create a build project (console).

- 1. For **Source provider**, choose **GitHub**.
- For **Credential**, do one of the following:
 - Choose to use account credentials to apply your account's default source credential to all projects.
 - If you aren't connected to GitHub, choose Manage account credential. a.
 - For **Credential type**, choose **Personal access token**.
 - If you chose to use account level credentials for **Service**, choose which service you'd like to use to store your token and do the following:
 - If you choose to use **Secrets Manager**, you can choose to use an existing secret connection or create a new secret, and then choose Save. For more information how to create a new secret, see Create and store a token in a Secrets Manager secret.
 - b. If you choose to use **CodeBuild**, enter your GitHub personal access token, and then choose Save.
 - Select **Use override credentials for this project only** to use a custom source credential to override your account's credential settings.

a. From the populated credential list, choose one of the options under **Personal access** token.

b. You can also create new personal access token by selecting **create a new personal** access token connection in the description.

Connect GitHub with an access token (CLI)

Follow these steps to use the AWS CLI to connect your project to GitHub using an access token. For information about using the AWS CLI with AWS CodeBuild, see the Command line reference.

1. Run the **import-source-credentials** command:

```
aws codebuild import-source-credentials --generate-cli-skeleton
```

JSON-formatted data appears in the output. Copy the data to a file (for example, import-source-credentials.json) in a location on the local computer or instance where the AWS CLI is installed. Modify the copied data as follows, and save your results.

```
{
    "serverType": "server-type",
    "authType": "auth-type",
    "shouldOverwrite": "should-overwrite",
    "token": "token",
    "username": "username"
}
```

Replace the following:

- *server-type*: Required value. The source provider used for this credential. Valid values are GITHUB, BITBUCKET, GITHUB_ENTERPRISE, GITLAB, and GITLAB_SELF_MANAGED.
- auth-type: Required value. The type of authentication used to connect to a repository.
 Valid values are OAUTH, BASIC_AUTH, PERSONAL_ACCESS_TOKEN, CODECONNECTIONS, and SECRETS_MANAGER. For GitHub, only PERSONAL_ACCESS_TOKEN is allowed.
 BASIC_AUTH is only allowed with Bitbucket app password.
- **should-overwrite**: Optional value. Set to false to prevent overwriting the repository source credentials. Set to true to overwrite the repository source credentials. The default value is true.

• *token*: Required value. For GitHub or GitHub Enterprise Server, this is the personal access token. For Bitbucket, this is the personal access token or app password. For the auth-type CODECONNECTIONS, this is the connection ARN. For the auth-type SECRETS_MANAGER, this is the secret ARN.

- *username*: Optional value. This parameter is ignored for GitHub and GitHub Enterprise Server source providers.
- To connect your account with an access token, switch to the directory that contains the import-source-credentials.json file you saved in step 1 and run the import-sourcecredentials command again.

```
aws codebuild import-source-credentials --cli-input-json file://import-source-credentials.json
```

JSON-formatted data appears in the output with an Amazon Resource Name (ARN).

```
{
    "arn": "arn:aws:codebuild:region:account-id:token/server-type"
}
```

Note

If you run the **import-source-credentials** command with the same server type and auth type a second time, the stored access token is updated.

After your account is connected with an access token, you can use create-project to create your CodeBuild project. For more information, see Create a build project (AWS CLI).

3. To view the connected access tokens, run the **list-source-credentials** command.

```
aws codebuild list-source-credentials
```

A JSON-formatted sourceCredentialsInfos object appears in the output:

The sourceCredentialsObject contains a list of connected source credentials information:

- The authType is the type of authentication used by credentials. This can be OAUTH, BASIC_AUTH, PERSONAL_ACCESS_TOKEN, CODECONNECTIONS, or SECRETS_MANAGER.
- The serverType is the type of source provider. This can be GITHUB, GITHUB_ENTERPRISE, BITBUCKET, GITLAB, or GITLAB_SELF_MANAGED.
- The arn is the ARN of the token.
- 4. To disconnect from a source provider and remove its access tokens, run the **delete-source-credentials** command with its ARN.

```
aws codebuild delete-source-credentials --arn arn-of-your-credentials
```

JSON-formatted data is returned with an ARN of the deleted credentials.

```
{
    "arn": "arn:aws:codebuild:region:account-id:token/server-type"
}
```

GitHub OAuth app

Connect GitHub using OAuth (console)

To use the console to connect your project to GitHub using an OAuth app, do the following when you create a project. For information, see Create a build project (console).

- 1. For **Source provider**, choose **GitHub**.
- 2. For **Credential**, do one of the following:
 - Choose to use account credentials to apply your account's default source credential to all projects.
 - a. If you aren't connected to GitHub, choose Manage account credential.

- b. For **Credential type**, choose **OAuth app**.
- If you chose to use account level credentials for **Service**, choose which service you'd like to use to store your token and do the following:
 - a. If you choose to use **Secrets Manager**, you can choose to use an existing secret connection or create a new secret, and then choose **Save**. For more information how to create a new secret, see Create and store a token in a Secrets Manager secret.
 - b. If you choose to use **CodeBuild** and then choose **Save**.
- Select Use override credentials for this project only to use a custom source credential to override your account's credential settings.
 - a. From the populated credential list, choose one of the options under **OAuth app**.
 - b. You can also create new OAuth app token by selecting **create a new Oauth app token connection** in the description.

To review your authorized OAuth apps, navigate to <u>Applications</u> on GitHub, and verify that an application named AWS CodeBuild (<u>region</u>) owned by aws-codesuite is listed.

Bitbucket access in CodeBuild

For Bitbucket, you use either an access token, an app password, an OAuth app, or a Bitbucket connection to access the source provider.

Topics

- Bitbucket App connections
- Bitbucket app password or access token
- Bitbucket OAuth app

Bitbucket App connections

You can use Bitbucket to connect with CodeBuild. Bitbucket App connections are supported through <u>AWS CodeConnections</u>.



Note

CodeConnections is available in less regions than CodeBuild. You can use cross-region connections in CodeBuild. Connections created in opt-in regions, cannot be used in other regions. For more information, see AWS CodeConnections endpoints and quotas.

Topics

- Step 1: Create a connection to Bitbucket (console)
- Step 2: Grant CodeBuild project IAM role access to use the connection
- Step 3: Configure CodeBuild to use the new connection

Step 1: Create a connection to Bitbucket (console)

Use these steps to use the CodeBuild console to add a connection for your project in Bitbucket.

To create a connection to Bitbucket

Follow the instructions in the Developer Tools User Guide for Create a connection to Bitbucket.



Note

Instead of creating or using an existing connection in your account, you can use a connection shared from another AWS account. For more information, see Share connections with AWS accounts.

Step 2: Grant CodeBuild project IAM role access to use the connection

You can grant CodeBuild project IAM role access to use the Bitbucket tokens vended by your connection.

To grant CodeBuild project IAM role access

- Create an IAM role for your CodeBuild project by following the instructions to Allow CodeBuild 1. to interact with other AWS services for your CodeBuild project.
- While following the instructions, add the following IAM policy to your CodeBuild project role to grant access to the connection.

Step 3: Configure CodeBuild to use the new connection

You can configure a connection as an account level credential and use it in a project.

AWS Management Console

To configure a connection as an account level credential in the AWS Management Console

- 1. For **Source provider**, choose **Bitbucket**.
- 2. For **Credential**, do one of the following:
 - Choose Default source credential to use your account's default source credential to apply to all projects.
 - a. If you aren't connected to Bitbucket, choose Manage default source credential.
 - b. For **Credential type**, choose **CodeConnections**.
 - c. In **Connection**, choose to use an existing connection or create a new connection.
 - Choose **Custom source credential** to use a custom source credential to override your account's default settings.
 - a. For **Credential type**, choose **CodeConnections**.
 - b. In **Connection**, choose to use an existing connection or create a new connection.

AWS CLI

To configure a connection as an account level credential in the AWS CLI

Open a terminal (Linux, macOS, or Unix) or command prompt (Windows). Use the AWS
 CLI to run the import-source-credentials command, specifying the --auth-type, - server-type, and --token for your connection.

Use the following command:

```
aws codebuild import-source-credentials --auth-type CODECONNECTIONS --server-
type BITBUCKET --token <connection-arn>
```

For more information on setting up multiple tokens in your CodeBuild project, see <u>Configure</u> multiple tokens as source level credentials.

Bitbucket app password or access token

Prerequisites

Before you begin, you must add the proper permission scopes to your Bitbucket app password or access token.

For Bitbucket, your app password or access token must have the following scopes.

- repository:read: Grants read access to all the repositories to which the authorizing user has access.
- **pullrequest:read**: Grants read access to pull requests. If your project has a Bitbucket webhook, then your app password or access token must have this scope.
- **webhook**: Grants access to webhooks. If your project has a webhook operation, then your app password or access token must have this scope.

For more information, see <u>Scopes for Bitbucket Cloud REST API</u> and <u>OAuth on Bitbucket Cloud</u> on the Bitbucket website.

Connect Bitbucket with an app password (console)

To use the console to connect your project to Bitbucket using an app password, do the following when you create a project. For information, see Create a build project (console).

- 1. For **Source provider**, choose **Bitbucket**.
- 2. For **Credential**, do one of the following:
 - Choose to use account credentials to apply your account's default source credential to all projects.
 - a. If you aren't connected to Bitbucket, choose Manage account credential.
 - b. For **Credential type**, choose **App password**.
 - If you chose to use account level credentials for **Service**, choose which service you'd like to use to store your token and do the following:
 - a. If you choose to use **Secrets Manager**, you can choose to use an existing secret connection or create a new secret, and then choose **Save**. For more information how to create a new secret, see Create and store a token in a Secrets Manager secret.
 - b. If you choose to use **CodeBuild**, enter your Bitbucket username and app password, and then choose **Save**.
 - Select **Use override credentials for this project only** to use a custom source credential to override your account's credential settings.
 - a. From the populated credential list, choose one of the options under **App password**.
 - b. You can also create new App password token by selecting **create a new app password connection** in the description.

Connect Bitbucket with an access token (console)

To use the console to connect your project to Bitbucket using an access token, do the following when you create a project. For information, see Create a build project (console).

- 1. For **Source provider**, choose **Bitbucket**.
- 2. For **Credential**, do one of the following:
 - Choose to use account credentials to apply your account's default source credential to all projects.
 - a. If you aren't connected to Bitbucket, choose Manage account credential.
 - b. For **Credential type**, choose **Personal access token**.
 - If you chose to use account level credentials for **Service**, choose which service you'd like to use to store your token and do the following:

a. If you choose to use **Secrets Manager**, you can choose to use an existing secret connection or create a new secret, and then choose **Save**. For more information how to create a new secret, see Create and store a token in a Secrets Manager secret.

- b. If you choose to use **CodeBuild**, enter your Bitbucket personal access token, and then choose **Save**.
- Select Use override credentials for this project only to use a custom source credential to override your account's credential settings.
 - a. From the populated credential list, choose one of the options under **Personal access** token.
 - b. You can also create new personal access token by selecting **create a new personal** access token connection in the description.

Connect Bitbucket with an app password or access token(CLI)

Follow these steps to use the AWS CLI to connect your project to Bitbucket using an app password or access token. For information about using the AWS CLI with AWS CodeBuild, see the Command line reference.

1. Run the **import-source-credentials** command:

```
aws codebuild import-source-credentials --generate-cli-skeleton
```

JSON-formatted data appears in the output. Copy the data to a file (for example, *import-source-credentials.json*) in a location on the local computer or instance where the AWS CLI is installed. Modify the copied data as follows, and save your results.

```
{
    "serverType": "BITBUCKET",
    "authType": "auth-type",
    "shouldOverwrite": "should-overwrite",
    "token": "token",
    "username": "username"
}
```

Replace the following:

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• *server-type*: Required value. The source provider used for this credential. Valid values are GITHUB, BITBUCKET, GITHUB_ENTERPRISE, GITLAB, and GITLAB_SELF_MANAGED.

- auth-type: Required value. The type of authentication used to connect to a repository.
 Valid values are OAUTH, BASIC_AUTH, PERSONAL_ACCESS_TOKEN, CODECONNECTIONS, and SECRETS_MANAGER. For GitHub, only PERSONAL_ACCESS_TOKEN is allowed.
 BASIC_AUTH is only allowed with Bitbucket app password.
- **should-overwrite**: Optional value. Set to false to prevent overwriting the repository source credentials. Set to true to overwrite the repository source credentials. The default value is true.
- *token*: Required value. For GitHub or GitHub Enterprise Server, this is the personal access token. For Bitbucket, this is the personal access token or app password. For the auth-type CODECONNECTIONS, this is the connection ARN. For the auth-type SECRETS_MANAGER, this is the secret ARN.
- *username*: Optional value. This parameter is ignored for GitHub and GitHub Enterprise Server source providers.
- 2. To connect your account with an app password or an access token, switch to the directory that contains the import-source-credentials.json file you saved in step 1 and run the import-source-credentials command again.

```
aws codebuild import-source-credentials --cli-input-json file://import-source-credentials.json
```

JSON-formatted data appears in the output with an Amazon Resource Name (ARN).

```
{
    "arn": "arn:aws:codebuild:region:account-id:token/server-type"
}
```

Note

If you run the **import-source-credentials** command with the same server type and auth type a second time, the stored access token is updated.

Bitbucket access API Version 2016-10-06 851

After your account is connected with an app password, you can use create-project to create your CodeBuild project. For more information, see Create a build project (AWS CLI).

3. To view the connected app passwords or access tokens, run the **list-source-credentials** command.

```
aws codebuild list-source-credentials
```

A JSON-formatted sourceCredentialsInfos object appears in the output:

The sourceCredentialsObject contains a list of connected source credentials information:

- The authType is the type of authentication used by credentials. This can be 0AUTH,
 BASIC_AUTH, PERSONAL_ACCESS_TOKEN, CODECONNECTIONS, or SECRETS_MANAGER.
- The serverType is the type of source provider. This can be GITHUB, GITHUB_ENTERPRISE, BITBUCKET, GITLAB, or GITLAB_SELF_MANAGED.
- The arn is the ARN of the token.
- 4. To disconnect from a source provider and remove its app password or access tokens, run the **delete-source-credentials** command with its ARN.

```
aws codebuild delete-source-credentials --arn arn-of-your-credentials
```

JSON-formatted data is returned with an ARN of the deleted credentials.

```
{
    "arn": "arn:aws:codebuild:region:account-id:token/server-type"
```

Bitbucket access API Version 2016-10-06 852

}

Bitbucket OAuth app

Connect Bitbucket using OAuth (console)

To use the console to connect your project to Bitbucket using an OAuth app, do the following when you create a project. For information, see Create a build project (console).

- 1. For **Source provider**, choose **Bitbucket**.
- For Credential, do one of the following:
 - Choose to use account credentials to apply your account's default source credential to all projects.
 - a. If you aren't connected to Bitbucket, choose Manage account credential.
 - b. For **Credential type**, choose **OAuth app**.
 - If you chose to use account level credentials for **Service**, choose which service you'd like to use to store your token and do the following:
 - a. If you choose to use **Secrets Manager**, you can choose to use an existing secret connection or create a new secret, and then choose **Save**. For more information how to create a new secret, see Create and store a token in a Secrets Manager secret.
 - b. If you choose to use **CodeBuild** and then choose **Save**.
 - Select Use override credentials for this project only to use a custom source credential to override your account's credential settings.
 - a. From the populated credential list, choose one of the options under **OAuth app**.
 - b. You can also create new OAuth app token by selecting **create a new Oauth app token connection** in the description.

To review your authorized OAuth apps, navigate to <u>Application authorizations</u> on Bitbucket, and verify that an application named AWS CodeBuild (*region*) is listed.

GitLab access in CodeBuild

For GitLab, you use a GitLab connection to access the source provider.

GitLab access API Version 2016-10-06 853

Topics

Connect CodeBuild to GitLab

Connect CodeBuild to GitLab

Connections allow you to authorize and establish configurations that associate your third-party provider with your AWS resources using AWS CodeConnections. To associate your third-party repository as a source for your build project, you use a connection.

To add a GitLab or GitLab Self Managed source provider in CodeBuild, you can choose either to:

- Use the CodeBuild console Create build project wizard or Edit Source page to choose the GitLab
 or GitLab Self Managed provider option. See Create a connection to GitLab (console) to add the
 source provider. The console helps you create a connections resource.
- Use the CLI to create your connections resources, see <u>Create a connection to GitLab (CLI)</u> to create a connections resource with the CLI.



You can also create a connection using the Developer Tools console under **Settings**. See Create a Connection.

Note

By authorizing this connection installation in GitLab, you grant our service permissions to process your data by accessing your account, and you can revoke the permissions at any time by uninstalling the application.

Create a connection to GitLab

This section describes how to connect GitLab to CodeBuild. For more information about GitLab connections, see Connect CodeBuild to GitLab.

Before you begin:

You must have already created an account with GitLab.

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Note

Connections only provide access to repositories owned by the account that was used to create and authorize the connection.



Note

You can create connections to a repository where you have the **Owner** role in GitLab, and then the connection can be used with the repository with resources such as CodeBuild. For repositories in groups, you do not need to be the group owner.

To specify a source for your build project, you must have already created a repository on GitLab.

Topics

- Create a connection to GitLab (console)
- Create a connection to GitLab (CLI)

Create a connection to GitLab (console)

Use these steps to use the CodeBuild console to add a connection for your project (repository) in GitLab.



Note

Instead of creating or using an existing connection in your account, you can use a connection shared from another AWS account. For more information, see Share connections with AWS accounts.

To create or edit your build project

- Sign in to the CodeBuild console. 1.
- 2. Choose one of the following.

GitLab access API Version 2016-10-06 855

• Choose to create a build project. Follow the steps in Create a build project (console) to complete the first screen and in the **Source** section, under **Source Provider**, choose **GitLab**.

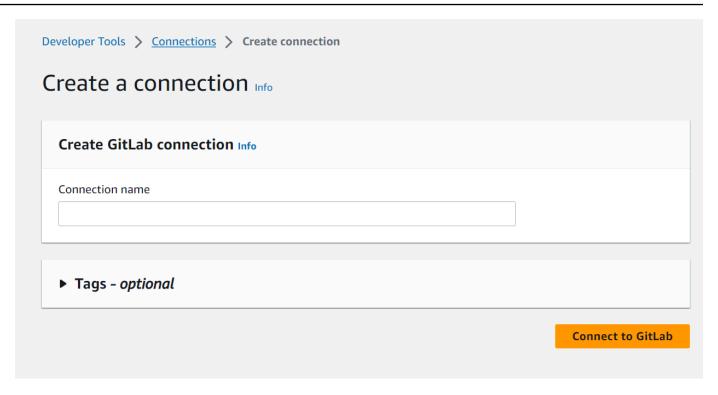
- Choose to edit an existing build project. Choose Edit, and then choose Source. In the Edit **Source** page, under **Source provider**, choose **GitLab**.
- 3. Choose one of the following:
 - Under Connection, choose **Default connection**. Default connection applies a default GitLab connection across all projects.
 - Under Connection, choose Custom connection. Custom connection applies a custom GitLab connection that overrides your account's default settings.
- Do one of the following:
 - Under **Default connection** or **Custom connection**, if you have not already created a connection to your provider, choose Create a new GitLab connection. Proceed to step 5 to create the connection.
 - Under **Connection**, if you have already created a connection to your provider, choose the connection. Proceed to step 10.

Note

If you close the pop-up window before a GitLab connection is created, you need to refresh the page.

To create a connection to a GitLab repository, under **Select a provider**, choose **GitLab**. In **Connection name**, enter the name for the connection that you want to create. Choose Connect to GitLab.

GitLab access API Version 2016-10-06 856



6. When the sign-in page for GitLab displays, log in with your credentials, and then choose **Sign** in.

7. If this is your first time authorizing the connection, an authorization page displays with a message requesting authorization for the connection to access your GitLab account.

Choose Authorize.

GitLab access API Version 2016-10-06 857

Authorize AWS Connector for GitLab to use your account?

An application called AWS Connector for GitLab is requesting access to your GitLab account. This application was created by Amazon AWS. Please note that this application is not provided by GitLab and you should verify its authenticity before allowing access.

This application will be able to:

- Access the authenticated user's API
 Grants complete read/write access to the API, including all groups and projects, the container registry, the dependency proxy, and the package registry.
- Read the authenticated user's personal information
 Grants read-only access to the authenticated user's profile through the /user API endpoint, which includes username, public email, and full name. Also grants access to read-only API endpoints under /users.
- Read Api

Grants read access to the API, including all groups and projects, the container registry, and the package registry.

- Allows read-only access to the repository
 Grants read-only access to repositories on private projects using Git-over-HTTP or the Repository Files API.
- Allows read-write access to the repository
 Grants read-write access to repositories on private projects using Git-over-HTTP (not using the API).

GitLab access Deny Authorize 10-06 858

The browser returns to the connections console page. Under **GitLab connection settings**, the new connection is shown in **Connection name**.

Choose Connect. 9.

After a GitLab connection is successfully created, a success banner will be displayed at the top.

- 10. On the Create build project page, in the Default connection or Custom connection dropdown list, make sure your connection ARN is listed. If not, choose the refresh button to have it appear.
- 11. In **Repository**, choose the name of your project in GitLab by specifying the project path with the namespace. For example, for a group-level repository, enter the repository name in the following format: group-name/repository-name. For more information about the path and namespace, see the path_with_namespace field in https://docs.gitlab.com/ee/api/ projects.html#get-single-project. For more information about the namespace in GitLab, see https://docs.gitlab.com/ee/user/namespace/.



Note

For groups in GitLab, you must manually specify the project path with the namespace. For example, for a repository named myrepo in a group mygroup, enter the following: mygroup/myrepo. You can find the project path with the namespace in the URL in GitLab.

12. In Source version - optional, enter a pull request ID, branch, commit ID, tag, or reference and a commit ID. For more information, see Source version sample with AWS CodeBuild.



Note

We recommend that you choose Git branch names that don't look like commit IDs, such as 811dd1ba1aba14473856cee38308caed7190c0d or 5392f7. This helps you avoid Git checkout collisions with actual commits.

13. In Git clone depth - optional, you can create a shallow clone with a history truncated to the specified number of commits. If you want a full clone, choose Full.

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14. In Build Status - optional, select Report build statuses to source provider when your builds start and finish if you want the status of your build's start and completion reported to your source provider.

To be able to report the build status to the source provider, the user associated with the source provider must have write access to the repo. If the user does not have write access, the build status cannot be updated. For more information, see Source provider access.

Create a connection to GitLab (CLI)

You can use the AWS Command Line Interface (AWS CLI) to create a connection.

To do this, use the **create-connection** command.



Important

A connection created through the AWS CLI or AWS CloudFormation is in PENDING status by default. After you create a connection with the CLI or AWS CloudFormation, use the console to edit the connection to make its status AVAILABLE.

To create a connection

Follow the instructions in the Developer Tools console User Guide for Create a connection to GitLab (CLI).

Cross-service confused deputy prevention

The confused deputy problem is a security issue where an entity that doesn't have permission to perform an action can coerce a more-privileged entity to perform the action. In AWS, cross-service impersonation can result in the confused deputy problem. Cross-service impersonation can occur when one service (the calling service) calls another service (the called service). The calling service can be manipulated to use its permissions to act on another customer's resources in a way it should not otherwise have permission to access. To prevent this, AWS provides tools that help you protect your data for all services with service principals that have been given access to resources in your account.

We recommend using the aws:SourceArn and aws:SourceArn global condition context keys in resource policies to limit the permissions that AWS CodeBuild gives another service to the resource. Use aws:SourceArn if you want only one resource to be associated with the cross-service access. Use aws:SourceAccount if you want to allow any resource in that account to be associated with the cross-service use.

The most effective way to protect against the confused deputy problem is to use the aws:SourceArn global condition context key with the full ARN of the resource. If you don't know the full ARN of the resource or if you are specifying multiple resources, use the aws:SourceArn global context condition key with wildcard characters (*) for the unknown portions of the ARN. For example, arn:aws:codebuild:*:123456789012:*.

If the aws: SourceArn value does not contain the account ID, such as an Amazon S3 bucket ARN, you must use both global condition context keys to limit permissions.

The value of aws: SourceArn must be the CodeBuild project ARN.

The following example shows how you can use the aws: SourceArn and aws: SourceAccount global condition context keys in CodeBuild to prevent the confused deputy problem.

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Effect": "Allow",
            "Principal": {
                "Service": "codebuild.amazonaws.com"
            },
            "Action": "sts:AssumeRole",
            "Condition": {
                "StringEquals": {
                     "aws:SourceArn": "arn:aws:codebuild:region-ID:account-
ID:project/project-name"
                }
        }
    ]
}
```

Advanced topics

This section includes several advanced topics that are useful to more experienced AWS CodeBuild users.

Topics

- Allow users to interact with CodeBuild
- Allow CodeBuild to interact with other AWS services
- Encrypt build outputs using a customer managed key
- Interact with CodeBuild using the AWS CLI
- Command line reference for AWS CodeBuild
- AWS SDKs and tools reference for AWS CodeBuild
- Using this service with an AWS SDK
- Specify the AWS CodeBuild endpoint
- Use AWS CodeBuild with AWS CodePipeline to test code and run builds
- Use AWS CodeBuild with Codecov
- Use AWS CodeBuild with Jenkins
- Use AWS CodeBuild with serverless applications
- Third party notices for AWS CodeBuild for Windows
- Use CodeBuild condition keys as IAM service role variables to control build access
- AWS CodeBuild condition keys

Allow users to interact with CodeBuild

If you follow the steps in <u>Getting started using the console</u> to access AWS CodeBuild for the first time, you most likely do not need the information in this topic. However, as you continue using CodeBuild, you might want to do things such as give other users and groups in your organization the ability to interact with CodeBuild.

To allow an IAM user or group to interact with AWS CodeBuild, you must give them access permissions to CodeBuild. This section describes how to do this with the IAM console or the AWS CLI.

If you will access CodeBuild with your AWS root account (not recommended) or an administrator user in your AWS account, then you do not need to follow these instructions.

For information about AWS root accounts and administrator users, see <u>The AWS account root user</u> and Creating Your First AWS account root user and Group in the *user Guide*.

To add CodeBuild access permissions to an IAM group or user (console)

1. Open the IAM console at https://console.aws.amazon.com/iam/.

You should have already signed in to the AWS Management Console by using one of the following:

- Your AWS root account. This is not recommended. For more information, see The AWS account root user in the user Guide.
- An administrator user in your AWS account. For more information, see <u>Creating Your First</u> AWS account root user and Group in the *user Guide*.
- An user in your AWS account with permission to perform the following minimum set of actions:

iam:AttachGroupPolicy
iam:AttachUserPolicy

iam:CreatePolicy

iam:ListAttachedGroupPolicies
iam:ListAttachedUserPolicies

iam:ListGroups
iam:ListPolicies
iam:ListUsers

For more information, see Overview of IAM Policies in the user Guide.

- 2. In the navigation pane, choose Policies.
- 3. To add a custom set of AWS CodeBuild access permissions to an IAM group or IAM user, skip ahead to step 4 in this procedure.

To add a default set of CodeBuild access permissions to an IAM group or IAM user, choose **Policy Type**, **AWS Managed**, and then do the following:

To add full access permissions to CodeBuild, select the box named
 AWSCodeBuildAdminAccess, choose Policy Actions, and then choose Attach. Select the

box next to the target IAM group or user, and then choose **Attach Policy**. Repeat this for the policies named **AmazonS3ReadOnlyAccess** and **IAMFullAccess**.

- To add access permissions to CodeBuild for everything except build project administration, select the box named AWSCodeBuildDeveloperAccess, choose Policy Actions, and then choose Attach. Select the box next to the target IAM group or user, and then choose Attach Policy. Repeat this for the policy named AmazonS3ReadOnlyAccess.
- To add read-only access permissions to CodeBuild, select the boxes named AWSCodeBuildReadOnlyAccess. Select the box next to the target IAM group or user, and then choose Attach Policy. Repeat this for the policy named AmazonS3ReadOnlyAccess.

You have now added a default set of CodeBuild access permissions to an IAM group or user. Skip the rest of the steps in this procedure.

- 4. Choose Create Policy.
- 5. On the Create Policy page, next to Create Your Own Policy, choose Select.
- 6. On the **Review Policy** page, for **Policy Name**, enter a name for the policy (for example, **CodeBuildAccessPolicy**). If you use a different name, be sure to use it throughout this procedure.
- 7. For **Policy Document**, enter the following, and then choose **Create Policy**.

```
{
  "Version": "2012-10-17",
  "Statement": [
      "Sid": "CodeBuildAccessPolicy",
      "Effect": "Allow",
      "Action": [
        "codebuild: *"
      ],
      "Resource": "*"
    },
      "Sid": "CodeBuildRolePolicy",
      "Effect": "Allow",
      "Action": [
        "iam:PassRole"
      "Resource": "arn:aws:iam::account-ID:role/role-name"
    },
```

```
{
      "Sid": "CloudWatchLogsAccessPolicy",
      "Effect": "Allow",
      "Action": [
        "logs:FilterLogEvents",
        "logs:GetLogEvents"
      "Resource": "*"
    },
      "Sid": "S3AccessPolicy",
      "Effect": "Allow",
      "Action": [
        "s3:CreateBucket",
        "s3:GetObject",
        "s3:List*",
        "s3:PutObject"
      ],
      "Resource": "*"
    },
      "Sid": "S3BucketIdentity",
      "Effect": "Allow",
      "Action": [
        "s3:GetBucketAcl",
        "s3:GetBucketLocation"
      ],
      "Resource": "*"
    }
  ]
}
```

Note

This policy allows access to all CodeBuild actions and to a potentially large number of AWS resources. To restrict permissions to specific CodeBuild actions, change the value of codebuild: * in the CodeBuild policy statement. For more information, see Identity and access management. To restrict access to specific AWS resources, change the value of the Resource object. For more information, see Identity and access management.

8. In the navigation pane, choose **Groups** or **Users**.

9. In the list of groups or users, choose the name of the IAM group or IAM user to which you want to add CodeBuild access permissions.

10. For a group, on the group settings page, on the **Permissions** tab, expand **Managed Policies**, and then choose **Attach Policy**.

For a user, on the user settings page, on the **Permissions** tab, choose **Add permissions**.

11. For a group, on the **Attach Policy** page, select **CodeBuildAccessPolicy**, and then choose **Attach Policy**.

For a user, on the **Add permissions** page, choose **Attach existing policies directly**. Select **CodeBuildAccessPolicy**, choose **Next: Review**, and then choose **Add permissions**.

To add CodeBuild access permissions to an IAM group or user (AWS CLI)

- Make sure you have configured the AWS CLI with the AWS access key and AWS secret access
 key that correspond to one of the IAM entities, as described in the previous procedure. For
 more information, see <u>Getting Set Up with the AWS Command Line Interface</u> in the AWS
 Command Line Interface User Guide.
- 2. To add a custom set of AWS CodeBuild access permissions to an IAM group or IAM user, skip to step 3 in this procedure.

To add a default set of CodeBuild access permissions to an IAM group or IAM user, do the following:

Run one of the following commands, depending on whether you want to add permissions to an IAM group or user:

```
aws iam attach-group-policy --group-name group-name --policy-arn policy-arn
aws iam attach-user-policy --user-name user-name --policy-arn policy-arn
```

You must run the command three times, replacing *group-name* or *user-name* with the IAM group name or user name, and replacing *policy-arn* once for each of the following policy Amazon Resource Names (ARNs):

- To add full access permissions to CodeBuild, use the following policy ARNs:
 - arn:aws:iam::aws:policy/AWSCodeBuildAdminAccess

- arn:aws:iam::aws:policy/AmazonS3ReadOnlyAccess
- arn:aws:iam::aws:policy/IAMFullAccess
- To add access permissions to CodeBuild for everything except build project administration, use the following policy ARNs:
 - arn:aws:iam::aws:policy/AWSCodeBuildDeveloperAccess
 - arn:aws:iam::aws:policy/AmazonS3ReadOnlyAccess
- To add read-only access permissions to CodeBuild, use the following policy ARNs:
 - arn:aws:iam::aws:policy/AWSCodeBuildReadOnlyAccess
 - arn:aws:iam::aws:policy/AmazonS3ReadOnlyAccess

You have now added a default set of CodeBuild access permissions to an IAM group or user. Skip the rest of the steps in this procedure.

3. In an empty directory on the local workstation or instance where the AWS CLI is installed, create a file named put-group-policy.json or put-user-policy.json. If you use a different file name, be sure to use it throughout this procedure.

```
"Version": "2012-10-17",
"Statement": [
  {
    "Sid": "CodeBuildAccessPolicy",
    "Effect": "Allow",
    "Action": [
      "codebuild: *"
    "Resource": "*"
  },
    "Sid": "CodeBuildRolePolicy",
    "Effect": "Allow",
    "Action": [
      "iam:PassRole"
    ],
    "Resource": "arn:aws:iam::account-ID:role/role-name"
  },
    "Sid": "CloudWatchLogsAccessPolicy",
    "Effect": "Allow",
```

```
"Action": [
        "logs:FilterLogEvents",
        "logs:GetLogEvents"
      ],
      "Resource": "*"
    },
    {
      "Sid": "S3AccessPolicy",
      "Effect": "Allow",
      "Action": [
        "s3:CreateBucket",
        "s3:GetObject",
        "s3:List*",
        "s3:PutObject"
      ],
      "Resource": "*"
    },
      "Sid": "S3BucketIdentity",
      "Effect": "Allow",
      "Action": [
        "s3:GetBucketAcl",
        "s3:GetBucketLocation"
      ],
      "Resource": "*"
    }
  ]
}
```

Note

This policy allows access to all CodeBuild actions and to a potentially large number of AWS resources. To restrict permissions to specific CodeBuild actions, change the value of codebuild:* in the CodeBuild policy statement. For more information, see Identity and access management. To restrict access to specific AWS resources, change the value of the related Resource object. For more information, see Identity and access management or the specific AWS service's security documentation.

4. Switch to the directory where you saved the file, and then run one of the following commands. You can use different values for CodeBuildGroupAccessPolicy and CodeBuildUserAccessPolicy. If you use different values, be sure to use them here.

For an IAM group:

```
aws iam put-group-policy --group-name group-name --policy-name CodeBuildGroupAccessPolicy --policy-document file://put-group-policy.json
```

For an user:

```
aws iam put-user-policy --user-name user-name --policy-name

CodeBuildUserAccessPolicy --policy-document file://put-user-policy.json
```

In the preceding commands, replace *group-name* or *user-name* with the name of the target IAM group or user.

Allow CodeBuild to interact with other AWS services

If you follow the steps in <u>Getting started using the console</u> to access AWS CodeBuild for the first time, you most likely do not need the information in this topic. However, as you continue using CodeBuild, you might want to do things such as allow CodeBuild to interact with other AWS services.

To allow CodeBuild to interact with dependent AWS services on your behalf, you need an AWS CodeBuild service role. You can create a CodeBuild service role by using the CodeBuild or AWS CodePipeline consoles. For information, see:

- Create a build project (console)
- Create a pipeline that uses CodeBuild (CodePipeline console)
- Add a CodeBuild build action to a pipeline (CodePipeline console)
- Change a build project's settings (console)

If you do not plan to use these consoles, this section describes how to create a CodeBuild service role with the IAM console or the AWS CLI.



CodeBuild uses the service role for all operations that are performed on your behalf. If the role includes permissions that the user shouldn't have, you can unintentionally escalate a user's permissions. Ensure that the role grants least privilege.

The service role described on this page contains a policy that grants the minimum permissions required to use CodeBuild. You may need to add additional permissions, depending on your use case.

To create a CodeBuild service role (console)

1. Open the IAM console at https://console.aws.amazon.com/iam/.

You should have already signed in to the console by using one of the following:

- Your AWS root account. This is not recommended. For more information, see The AWS account root user in the user Guide.
- An administrator user in your AWS account. For more information, see Creating Your First AWS account root user and Group in the user Guide.
- An user in your AWS account with permission to perform the following minimum set of actions:

iam:AddRoleToInstanceProfile

iam:AttachRolePolicy

iam:CreateInstanceProfile

iam:CreatePolicy iam:CreateRole

iam:GetRole

iam:ListAttachedRolePolicies

iam:ListPolicies iam:ListRoles iam:PassRole iam:PutRolePolicy

iam:UpdateAssumeRolePolicy

For more information, see Overview of IAM Policies in the user Guide.

- 2. In the navigation pane, choose **Policies**.
- 3. Choose **Create Policy**.

- 4. On the **Create Policy** page, choose **JSON**.
- 5. For the JSON policy, enter the following, and then choose **Review Policy**:

```
{
  "Version": "2012-10-17",
  "Statement": [
    {
      "Sid": "CloudWatchLogsPolicy",
      "Effect": "Allow",
      "Action": [
        "logs:CreateLogGroup",
        "logs:CreateLogStream",
        "logs:PutLogEvents"
      ],
      "Resource": "*"
    },
      "Sid": "CodeCommitPolicy",
      "Effect": "Allow",
      "Action": [
        "codecommit:GitPull"
      ],
      "Resource": "*"
    },
      "Sid": "S3GetObjectPolicy",
      "Effect": "Allow",
      "Action": [
        "s3:GetObject",
        "s3:GetObjectVersion"
      ],
      "Resource": "*"
    },
      "Sid": "S3PutObjectPolicy",
      "Effect": "Allow",
      "Action": [
        "s3:PutObject"
      ],
      "Resource": "*"
    },
      "Sid": "ECRPullPolicy",
```

```
"Effect": "Allow",
      "Action": [
        "ecr:BatchCheckLayerAvailability",
        "ecr:GetDownloadUrlForLayer",
        "ecr:BatchGetImage"
      ],
      "Resource": "*"
    },
      "Sid": "ECRAuthPolicy",
      "Effect": "Allow",
      "Action": [
        "ecr:GetAuthorizationToken"
      ],
      "Resource": "*"
    },
      "Sid": "S3BucketIdentity",
      "Effect": "Allow",
      "Action": [
        "s3:GetBucketAcl",
        "s3:GetBucketLocation"
      ],
      "Resource": "*"
    }
  ]
}
```

Note

This policy contains statements that allow access to a potentially large number of AWS resources. To restrict AWS CodeBuild to access specific AWS resources, change the value of the Resource array. For more information, see the security documentation for the AWS service.

6. On the **Review Policy** page, for **Policy Name**, enter a name for the policy (for example, **CodeBuildServiceRolePolicy**), and then choose **Create policy**.

Note

If you use a different name, be sure to use it throughout this procedure.

- 7. In the navigation pane, choose **Roles**.
- 8. Choose Create role.
- 9. On the **Create role** page, with **AWS Service** already selected, choose **CodeBuild**, and then choose **Next:Permissions**.
- On the Attach permissions policies page, select CodeBuildServiceRolePolicy, and then choose Next: Review.
- 11. On the **Create role and review** page, for **Role name**, enter a name for the role (for example, **CodeBuildServiceRole**), and then choose **Create role**.

To create a CodeBuild service role (AWS CLI)

- Make sure you have configured the AWS CLI with the AWS access key and AWS secret access
 key that correspond to one of the IAM entities, as described in the previous procedure. For
 more information, see <u>Getting Set Up with the AWS Command Line Interface</u> in the AWS
 Command Line Interface User Guide.
- 2. In an empty directory on the local workstation or instance where the AWS CLI is installed, create two files named create-role.json and put-role-policy.json. If you choose different file names, be sure to use them throughout this procedure.

create-role.json:

Note

We recommend that you use the aws:SourceAccount and aws:SourceArn condition keys to protect yourself against the confused deputy problem. For example,

you can edit the previous trust policy with the following condition blocks. The aws:SourceAccount is the owner of the CodeBuild project and the aws:SourceArn is the CodeBuild project ARN.

If you would like to restrict your service role to an AWS account, create-role.json might look similar to this:

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Effect": "Allow",
            "Principal": {
                "Service": "codebuild.amazonaws.com"
            },
            "Action": "sts:AssumeRole",
            "Condition": {
                 "StringEquals": {
                     "aws:SourceAccount": [
                         "account-ID"
                     ]
                }
            }
        }
    ]
}
```

If you would like to restrict your service role to a specific CodeBuild project, createrole.json might look similar to this:

Note

If you don't know or haven't decided on a name for your CodeBuild project and want a trust policy restriction on a particular ARN pattern, you can replace that portion of the ARN with a wildcard (*). After you create your project, you can then update the trust policy.

put-role-policy.json:

```
{
  "Version": "2012-10-17",
  "Statement": [
      "Sid": "CloudWatchLogsPolicy",
      "Effect": "Allow",
      "Action": [
        "logs:CreateLogGroup",
        "logs:CreateLogStream",
        "logs:PutLogEvents"
      ],
      "Resource": "*"
    },
    {
      "Sid": "CodeCommitPolicy",
      "Effect": "Allow",
      "Action": [
        "codecommit:GitPull"
      "Resource": "*"
    },
```

```
"Sid": "S3GetObjectPolicy",
      "Effect": "Allow",
      "Action": [
        "s3:GetObject",
        "s3:GetObjectVersion"
      ],
      "Resource": "*"
    },
    {
      "Sid": "S3PutObjectPolicy",
      "Effect": "Allow",
      "Action": [
        "s3:PutObject"
      ],
      "Resource": "*"
    },
      "Sid": "S3BucketIdentity",
      "Effect": "Allow",
      "Action": [
        "s3:GetBucketAcl",
        "s3:GetBucketLocation"
      ],
      "Resource": "*"
    }
  ]
}
```

Note

This policy contains statements that allow access to a potentially large number of AWS resources. To restrict AWS CodeBuild to access specific AWS resources, change the value of the Resource array. For more information, see the security documentation for the AWS service.

3. Switch to the directory where you saved the preceding files, and then run the following two commands, one at a time, in this order. You can use different values for CodeBuildServiceRole and CodeBuildServiceRolePolicy, but be sure to use them here.

```
aws iam create-role --role-name CodeBuildServiceRole --assume-role-policy-document
file://create-role.json
```

```
aws iam put-role-policy --role-name CodeBuildServiceRole --policy-name CodeBuildServiceRolePolicy --policy-document file://put-role-policy.json
```

Encrypt build outputs using a customer managed key

If you follow the steps in <u>Getting started using the console</u> to access AWS CodeBuild for the first time, you most likely do not need the information in this topic. However, as you continue using CodeBuild, you might want to do things such as encrypt build artifacts.

For AWS CodeBuild to encrypt its build output artifacts, it needs access to a KMS key. By default, CodeBuild uses the AWS managed key for Amazon S3 in your AWS account.

If you do not want to use the AWS managed key, you must create and configure a customer managed key yourself. This section describes how to do this with the IAM console.

For information about customer managed keys, see <u>AWS Key Management Service Concepts</u> and <u>Creating Keys in the AWS KMS Developer Guide</u>.

To configure a customer managed key for use by CodeBuild, follow the instructions in the "How to Modify a Key Policy" section of Modifying a Key Policy in the AWS KMS Developer Guide. Then add the following statements (between ### BEGIN ADDING STATEMENTS HERE ### and ### END ADDING STATEMENTS HERE ###) to the key policy. Ellipses (...) are used for brevity and to help you locate where to add the statements. Do not remove any statements, and do not type these ellipses into the key policy.

```
{
  "Version": "2012-10-17",
  "Id": "...",
  "Statement": [
    ### BEGIN ADDING STATEMENTS HERE ###
    {
        "Sid": "Allow access through Amazon S3 for all principals in the account that are authorized to use Amazon S3",
        "Effect": "Allow",
        "Principal": {
            "AWS": "*"
```

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```
},
  "Action": [
    "kms:Encrypt",
    "kms:Decrypt",
    "kms:ReEncrypt*",
    "kms:GenerateDataKey*",
    "kms:DescribeKey"
  ],
  "Resource": "*",
  "Condition": {
    "StringEquals": {
      "kms:ViaService": "s3.region-ID.amazonaws.com",
      "kms:CallerAccount": "account-ID"
    }
  }
},
{
  "Effect": "Allow",
  "Principal": {
    "AWS": "arn:aws:iam::account-ID:role/CodeBuild-service-role"
  },
  "Action": [
    "kms:Encrypt",
    "kms:Decrypt",
    "kms:ReEncrypt*",
    "kms:GenerateDataKey*",
    "kms:DescribeKey"
  "Resource": "*"
},
### END ADDING STATEMENTS HERE ###
  "Sid": "Enable IAM User Permissions",
  . . .
},
  "Sid": "Allow access for Key Administrators",
},
  "Sid": "Allow use of the key",
  . . .
},
```

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```
"Sid": "Allow attachment of persistent resources",
...
}
]
```

• region-ID represents the ID of the AWS region where the Amazon S3 buckets associated with CodeBuild are located (for example, us-east-1).

- account ID represents the ID of the of the AWS account that owns the customer managed key.
- *CodeBuild-service-role* represents the name of the CodeBuild service role you created or identified earlier in this topic.

Note

To create or configure a customer managed key through the IAM console, you must first sign in to the AWS Management Console by using one of the following:

- Your AWS root account. This is not recommended. For more information, see <u>The Account Root User</u> in the *user Guide*.
- An administrator user in your AWS account. For more information, see <u>Creating Your First</u> AWS account root user and Group in the *user Guide*.
- An user in your AWS account with permission to create or modify the customer managed key. For more information, see <u>Permissions Required to Use the AWS KMS Console</u> in the AWS KMS Developer Guide.

Interact with CodeBuild using the AWS CLI

If you follow the steps in <u>Getting started using the console</u> to access AWS CodeBuild for the first time, you most likely do not need the information in this topic. However, as you continue using CodeBuild, you might want to do things such as allow users to use the AWS CLI to interact with CodeBuild instead of (or in addition to) the CodeBuild console, the CodePipeline console, or the AWS SDKs.

To install and configure the AWS CLI, see <u>Getting Set Up with the AWS Command Line Interface</u> in the *AWS Command Line Interface User Guide*.

After installing the AWS CLI, complete the following tasks:

1. Run the following command to confirm whether your installation of the AWS CLI supports CodeBuild:

```
aws codebuild list-builds
```

If successful, information similar to the following will appear in the output:

```
{
    "ids": []
}
```

The empty square brackets indicate that you have not yet run any builds.

2. If an error is output, you must uninstall your current version of the AWS CLI and then install the latest version. For more information, see Uninstalling the AWS CLI and Installing the AWS Command Line Interface in the AWS Command Line Interface User Guide.

Command line reference for AWS CodeBuild

The AWS CLI provides commands for automating AWS CodeBuild. Use the information in this topic as a supplement to the <u>AWS Command Line Interface User Guide</u> and the <u>AWS CLI Reference for AWS CodeBuild</u>.

Not what you're looking for? If you want to use the AWS SDKs to call CodeBuild, see the <u>AWS SDKs</u> and tools reference.

To use the information in this topic, you should have already installed the AWS CLI and configured it for use with CodeBuild, as described in Interact with CodeBuild using the AWS CLI.

To use the AWS CLI to specify the endpoint for CodeBuild, see <u>Specify the AWS CodeBuild endpoint</u> (AWS CLI).

Run this command to get a list of CodeBuild commands.

```
aws codebuild help
```

Run this command to get information about a CodeBuild command, where *command-name* is the name of the command.

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aws codebuild command-name help

CodeBuild commands include:

 batch-delete-builds: Deletes one or more builds in CodeBuild. For more information, see Delete builds (AWS CLI).

- batch-get-builds: Gets information about multiple builds in CodeBuild. For more information, see View build details (AWS CLI).
- batch-get-projects: Gets information about one or more specified build projects. For more information, see View a build project's details (AWS CLI).
- create-project: Creates a build project. For more information, see <u>Create a build project (AWS</u> CLI).
- delete-project: Deletes a build project. For more information, see <u>Delete a build project (AWS CLI)</u>.
- list-builds: Lists Amazon Resource Names (ARNs) for builds in CodeBuild. For more information, see View a list of build IDs (AWS CLI).
- list-builds-for-project: Gets a list of build IDs that are associated with a specified build project. For more information, see View a list of build IDs for a build project (AWS CLI).
- list-curated-environment-images: Gets a list of Docker images managed by CodeBuild that you can use for your builds. For more information, see <u>Docker images provided by</u> CodeBuild.
- list-projects: Gets a list of build project names. For more information, see <u>View a list of</u> build project names (AWS CLI).
- start-build: Starts running a build. For more information, see Run a build (AWS CLI).
- stop-build: Attempts to stop the specified build from running. For more information, see Stop a build (AWS CLI).
- update-project: Changes information about the specified build project. For more information, see Change a build project's settings (AWS CLI).

AWS SDKs and tools reference for AWS CodeBuild

To use one the AWS SDKs or tools to automate AWS CodeBuild, see the following resources.

If you want to use the AWS CLI to run CodeBuild, see the Command line reference.

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Supported AWS SDKs and tools for AWS CodeBuild

The following AWS SDKs and tools support CodeBuild:

• The <u>AWS SDK for C++</u>. For more information, see the <u>Aws::CodeBuild</u> namespace section of the AWS SDK for C++ API Reference.

- The <u>AWS SDK for Go</u>. For more information, see the <u>codebuild</u> section of the AWS SDK for Go API Reference.
- The <u>AWS SDK for Java</u>. For more information, see the com.amazonaws.services.codebuild and com.amazonaws.services.codebuild.model sections of the <u>AWS SDK for Java API</u> reference.
- The <u>AWS SDK for JavaScript in the browser</u> and the <u>AWS SDK for JavaScript in Node.js</u>. For more information, see the Class: AWS.CodeBuild section of the *AWS SDK for JavaScript API Reference*.
- The <u>AWS SDK for .NET</u>. For more information, see the <u>Amazon.CodeBuild</u> and Amazon.CodeBuild.Model namespace sections of the AWS SDK for .NET API Reference.
- The <u>AWS SDK for PHP</u>. For more information, see the <u>Namespace Aws\CodeBuild</u> section of the AWS SDK for PHP API Reference.
- The <u>AWS SDK for Python (Boto3)</u>. For more information, see the <u>CodeBuild</u> section of the *Boto 3* Documentation.
- The <u>AWS SDK for Ruby</u>. For more information, see the <u>Module: Aws::CodeBuild</u> section of the AWS SDK for Ruby API Reference.
- The <u>AWS Tools for PowerShell</u>. For more information, see the <u>AWS CodeBuild</u> section of the <u>AWS Tools for PowerShell Cmdlet Reference</u>.

Using this service with an AWS SDK

AWS software development kits (SDKs) are available for many popular programming languages. Each SDK provides an API, code examples, and documentation that make it easier for developers to build applications in their preferred language.

SDK documentation	Code examples
AWS SDK for C++	AWS SDK for C++ code examples
AWS CLI	AWS CLI code examples

SDK documentation	Code examples		
AWS SDK for Go	AWS SDK for Go code examples		
AWS SDK for Java	AWS SDK for Java code examples		
AWS SDK for JavaScript	AWS SDK for JavaScript code examples		
AWS SDK for Kotlin	AWS SDK for Kotlin code examples		
AWS SDK for .NET	AWS SDK for .NET code examples		
AWS SDK for PHP	AWS SDK for PHP code examples		
AWS Tools for PowerShell	Tools for PowerShell code examples		
AWS SDK for Python (Boto3)	AWS SDK for Python (Boto3) code examples		
AWS SDK for Ruby	AWS SDK for Ruby code examples		
AWS SDK for Rust	AWS SDK for Rust code examples		
AWS SDK for SAP ABAP	AWS SDK for SAP ABAP code examples		
AWS SDK for Swift	AWS SDK for Swift code examples		

For examples specific to this service, see <u>Code examples for CodeBuild using AWS SDKs</u>.

Example availability

Can't find what you need? Request a code example by using the **Provide feedback** link at the bottom of this page.

Specify the AWS CodeBuild endpoint

You can use the AWS Command Line Interface (AWS CLI) or one of the AWS SDKs to specify the endpoint used by AWS CodeBuild. There is an endpoint for each region in which CodeBuild is available. In addition to a regional endpoint, four regions also have a Federal Information

Processing Standards (FIPS) endpoint. For more information about FIPS endpoints, see FIPS 140-2 overview.

Specifying an endpoint is optional. If you don't explicitly tell CodeBuild which endpoint to use, the service uses the endpoint associated with the region your AWS account uses. CodeBuild never defaults to a FIPS endpoint. If you want to use a FIPS endpoint, you must associate CodeBuild with it using one of the following methods.



Note

You can use an alias or region name to specify an endpoint using an AWS SDK. If you use the AWS CLI, then you must use the full endpoint name.

For endpoints that can be used with CodeBuild, see CodeBuild regions and endpoints.

Topics

- Specify the AWS CodeBuild endpoint (AWS CLI)
- Specify the AWS CodeBuild endpoint (AWS SDK)

Specify the AWS CodeBuild endpoint (AWS CLI)

You can use the AWS CLI to specify the endpoint through which AWS CodeBuild is accessed by using the --endpoint-url argument in any CodeBuild command. For example, run this command to get a list of project build names using the Federal Information Processing Standards (FIPS) endpoint in the US East (N. Virginia) Region:

```
aws codebuild list-projects --endpoint-url https://codebuild-fips.us-
east-1.amazonaws.com
```

Include the https:// at the begining of the endpoint.

The --endpoint-url AWS CLI argument is available to all AWS services. For more information about this and other AWS CLI arguments, see AWS CLI Command Reference.

Specify the AWS CodeBuild endpoint (AWS SDK)

You can use an AWS SDK to specify the endpoint through which AWS CodeBuild is accessed. Although this example uses the <u>AWS SDK for Java</u>, you can specify the endpoint with the other AWS SDKs.

Use the withEndpointConfiguration method when constructing the AWSCodeBuild client. Here is format to use:

```
AWSCodeBuild awsCodeBuild = AWSCodeBuildClientBuilder.standard().
   withEndpointConfiguration(new AwsClientBuilder.EndpointConfiguration("endpoint",
"region")).
   withCredentials(new AWSStaticCredentialsProvider(sessionCredentials)).
   build();
```

For information about AWSCodeBuildClientBuilder, see Class AWSCodeBuildClientBuilder.

The credentials used in withCredentials must be of type AWSCredentialsProvider. For more information, see Working with AWS credentials.

Do not include https:// at the begining of the endpoint.

If you want to specify a non-FIPS endpoint, you can use the region instead of the actual endpoint. For example, to specify the endpoint in the US East (N. Virginia) region, you can use us-east-1 instead of the full endpoint name, codebuild.us-east-1.amazonaws.com.

If you want to specify a FIPS endpoint, you can use an alias to simplify your code. Only FIPS endpoints have an alias. Other endpoints must be specified using their region or full name.

The following table lists the alias for each of the four available FIPS endpoints:

Region name	Region	Endpoint	Alias
US East (N. Virginia)	us-east-1	codebuild-fips.us-east-1.amazonaws.com	us-east-1- fips
US East (Ohio)	us-east-2	codebuild-fips.us-east-2.amazonaws.com	us-east-2- fips

Region name	Region	Endpoint	Alias
US West (N. California)	us-west-1	codebuild-fips.us-west-1.amazonaws.com	us-west-1- fips
US West (Oregon)	us-west-2	codebuild-fips.us-west-2.amazonaws.com	us-west-2- fips

To specify use of the FIPS endpoint in the US West (Oregon) region using an alias:

```
AWSCodeBuild awsCodeBuild = AWSCodeBuildClientBuilder.standard().
   withEndpointConfiguration(new AwsClientBuilder.EndpointConfiguration("us-west-2-
fips", "us-west-2")).
   withCredentials(new AWSStaticCredentialsProvider(sessionCredentials)).
   build();
```

To specify use of the non-FIPS endpoint in the US East (N. Virginia) region:

```
AWSCodeBuild awsCodeBuild = AWSCodeBuildClientBuilder.standard().
    withEndpointConfiguration(new AwsClientBuilder.EndpointConfiguration("us-east-1",
    "us-east-1")).
    withCredentials(new AWSStaticCredentialsProvider(sessionCredentials)).
    build();
```

To specify use of the non-FIPS endpoint in the Asia Pacific (Mumbai) region:

```
AWSCodeBuild awsCodeBuild = AWSCodeBuildClientBuilder.standard().
   withEndpointConfiguration(new AwsClientBuilder.EndpointConfiguration("ap-south-1",
   "ap-south-1")).
   withCredentials(new AWSStaticCredentialsProvider(sessionCredentials)).
   build();
```

Use AWS CodeBuild with AWS CodePipeline to test code and run builds

You can automate your release process by using AWS CodePipeline to test your code and run your builds with AWS CodeBuild.

The following table lists tasks and the methods available for performing them. Using the AWS SDKs to accomplish these tasks is outside the scope of this topic.

Task	Available approaches	Approaches described in this topic
Create a continuous delivery (CD) pipeline with CodePipeline that automates builds with CodeBuild	CodePipeline consoleAWS CLIAWS SDKs	 Use the CodePipeline console Use the AWS CLI You can adapt the information in this topic to use the AWS SDKs. For more information, see the create-pi peline action documentation for your programmi ng language in the SDKs section of Tools for Amazon Web Services or see CreatePipeline in the AWS CodePipeline API Reference.
Add test and build automation with CodeBuild to an existing pipeline in CodePipeline	 CodePipeline console AWS CLI AWS SDKs 	 Use the CodePipeline console to add build automation Use the CodePipeline console to add test automation For the AWS CLI, you can adapt the information in this topic to create a pipeline that contains a CodeBuild build action or test action. For more information, see Edit a pipeline (AWS CLI) and the CodePipeline pipeline structure reference in the AWS CodePipeline User Guide. You can adapt the information in this topic to use the AWS SDKs. For more information, see the update-pi peline action documentation for your programming language through the SDKs section of Tools for Amazon Web Services or see UpdatePipeline in the AWS CodePipeline API Reference.

Topics

- Prerequisites
- Create a pipeline that uses CodeBuild (CodePipeline console)
- Create a pipeline that uses CodeBuild (AWS CLI)
- Add a CodeBuild build action to a pipeline (CodePipeline console)
- Add a CodeBuild test action to a pipeline (CodePipeline console)

Prerequisites

- Answer the questions in Plan a build.
- 2. If you are using an user to access CodePipeline instead of an AWS root account or an administrator user, attach the managed policy named AWSCodePipelineFullAccess to the user (or to the IAM group to which the user belongs). Using an AWS root account is not recommended. This policy grants the user permission to create the pipeline in CodePipeline. For more information, see Attaching managed policies in the user Guide.



Note

The IAM entity that attaches the policy to the user (or to the IAM group to which the user belongs) must have permission in IAM to attach policies. For more information, see Delegating permissions to administer IAM users, groups, and credentials in the user Guide.

Create a CodePipeline service role, if you do not already have one available in your AWS 3. account. CodePipeline uses this service role to interact with other AWS services, including AWS CodeBuild, on your behalf. For example, to use the AWS CLI to create a CodePipeline service role, run the IAM create-role command:

For Linux, macOS, or Unix:

```
aws iam create-role --role-name AWS-CodePipeline-CodeBuild-Service-Role
 --assume-role-policy-document '{"Version":"2012-10-17", "Statement":
{"Effect": "Allow", "Principal":
{"Service":"codepipeline.amazonaws.com"}, "Action":"sts:AssumeRole"}}'
```

For Windows:

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aws iam create-role --role-name AWS-CodePipeline-CodeBuild-Service-Role --assumerole-policy-document "{\"Version\":\"2012-10-17\",\"Statement\":{\"Effect\": \"Allow\",\"Principal\":{\"Service\":\"codepipeline.amazonaws.com\"},\"Action\": \"sts:AssumeRole\"}}"



Note

The IAM entity that creates this CodePipeline service role must have permission in IAM to create service roles.

4. After you create a CodePipeline service role or identify an existing one, you must add the default CodePipeline service role policy to the service role as described in Review the default CodePipeline service role policy in the AWS CodePipeline User Guide, if it isn't already a part of the policy for the role.



Note

The IAM entity that adds this CodePipeline service role policy must have permission in IAM to add service role policies to service roles.

Create and upload the source code to a repository type supported by CodeBuild and CodePipeline, such as CodeCommit, Amazon S3, Bitbucket, or GitHub. The source code should contain a buildspec file, but you can declare one when you define a build project later in this topic. For more information, see the Buildspec reference.



Important

If you plan to use the pipeline to deploy built source code, the build output artifact must be compatible with the deployment system you use.

 For AWS OpsWorks, see Application source and Using CodePipeline with AWS OpsWorks in the AWS OpsWorks User Guide.

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Create a pipeline that uses CodeBuild (CodePipeline console)

Use the following procedure to create a pipeline that uses CodeBuild to build and deploy your source code.

To create a pipeline that only tests your source code:

- Use the following procedure to create the pipeline, and then delete the Build and Beta stages
 from the pipeline. Then use the <u>Add a CodeBuild test action to a pipeline (CodePipeline console)</u>
 procedure in this topic to add to the pipeline a test action that uses CodeBuild.
- Use one of the other procedures in this topic to create the pipeline, and then use the <u>Add a CodeBuild test action to a pipeline (CodePipeline console)</u> procedure in this topic to add to the pipeline a test action that uses CodeBuild.

To use the create pipeline wizard in CodePipeline to create a pipeline that uses CodeBuild

- 1. Sign in to the AWS Management Console by using:
 - Your AWS root account. This is not recommended. For more information, see <u>The account</u> root user in the user Guide.
 - An administrator user in your AWS account. For more information, see <u>Creating your first</u> AWS account root user and group in the *user Guide*.
 - An user in your AWS account with permission to use the following minimum set of actions:

```
codepipeline:*
iam:ListRoles
iam:PassRole
s3:CreateBucket
s3:GetBucketPolicy
s3:GetObject
s3:ListAllMyBuckets
s3:ListBucket
s3:PutBucketPolicy
codecommit:ListBranches
codecommit:ListRepositories
codedeploy:GetApplication
codedeploy:GetDeploymentGroup
codedeploy:ListApplications
codedeploy:ListDeploymentGroups
elasticbeanstalk:DescribeApplications
```

elasticbeanstalk:DescribeEnvironments

lambda:GetFunctionConfiguration

lambda:ListFunctions opsworks:DescribeStacks opsworks:DescribeApps opsworks:DescribeLayers

Open the AWS CodePipeline console at https://console.aws.amazon.com/codesuite/ 2. codepipeline/home.

- In the AWS Region selector, choose the AWS Region where your build project AWS resources are located. This must be an AWS Region where CodeBuild is supported. For more information, see AWS CodeBuild in the Amazon Web Services General Reference.
- 4. Create a pipeline. If a CodePipeline information page is displayed, choose **Create pipeline**. If a **Pipelines** page is displayed, choose **Create pipeline**.
- On the **Step 1: Choose pipeline settings** page, for **Pipeline name**, enter a name for the pipeline (for example, CodeBuildDemoPipeline). If you choose a different name, be sure to use it throughout this procedure.
- For **Role name**, do one of the following:

Choose **New service role**, and in **Role Name**, enter the name for your new service role.

Choose Existing service role, and then choose the CodePipeline service role you created or identified as part of this topic's prerequisites.

- 7. For **Artifact store**, do one of the following:
 - Choose Default location to use the default artifact store, such as the S3 artifact bucket designated as the default, for your pipeline in the AWS Region you have selected for your pipeline.
 - Choose **Custom location** if you already have an existing artifact store you have created, such as an S3 artifact bucket, in the same AWS Region as your pipeline.

Note

This is not the source bucket for your pipeline's source code. This is the artifact store for your pipeline. A separate artifact store, such as an S3 bucket, is required for each pipeline, in the same AWS Region as the pipeline.

- Choose Next. 8.
- 9. On the **Step 2: Add source stage** page, for **Source provider**, do one of the following:
 - If your source code is stored in an S3 bucket, choose Amazon S3. For Bucket, select the S3 bucket that contains your source code. For S3 object key, enter the name of the file the contains the source code (for example, file-name.zip). Choose Next.
 - If your source code is stored in an AWS CodeCommit repository, choose CodeCommit. For **Repository name**, choose the name of the repository that contains the source code. For **Branch name**, choose the name of the branch that contains the version of the source code you want to build. Choose Next.
 - If your source code is stored in a GitHub repository, choose GitHub. Choose Connect to **GitHub**, and follow the instructions to authenticate with GitHub. For **Repository**, choose the name of the repository that contains the source code. For **Branch**, choose the name of the branch that contains the version of the source code you want to build.

Choose Next.

- 10. On the Step 3: Add build stage page, for Build provider, choose CodeBuild.
- 11. If you already have a build project you want to use, for **Project name**, choose the name of the build project and skip to the next step in this procedure.

If you need to create a new CodeBuild build project, follow the instructions in Create a build project (console) and return to this procedure.

If you choose an existing build project, it must have build output artifact settings already defined (even though CodePipeline overrides them). For more information, see Change a build project's settings (console).

Important

If you enable webhooks for a CodeBuild project, and the project is used as a build step in CodePipeline, then two identical builds are created for each commit. One build is triggered through webhooks, and one through CodePipeline. Because billing is on a per-build basis, you are billed for both builds. Therefore, if you are using CodePipeline, we recommend that you disable webhooks in CodeBuild. In the AWS CodeBuild console, clear the Webhook box. For more information, see Change a build project's settings (console).

12. On the **Step 4: Add deploy stage** page, do one of the following:

 If you do not want to deploy the build output artifact, choose Skip, and confirm this choice when prompted.

 If you want to deploy the build output artifact, for Deploy provider, choose a deployment provider, and then specify the settings when prompted.

Choose **Next**.

- 13. On the **Review** page, review your choices, and then choose **Create pipeline**.
- 14. After the pipeline runs successfully, you can get the build output artifact. With the pipeline displayed in the CodePipeline console, in the **Build** action, choose the tooltip. Make a note of the value for **Output artifact** (for example, **MyAppBuild**).



Note

You can also get the build output artifact by choosing the Build artifacts link on the build details page in the CodeBuild console. To get to this page, skip the rest of the steps in this procedure, and see View build details (console).

- 15. Open the Amazon S3 console at https://console.aws.amazon.com/s3/.
- 16. In the list of buckets, open the bucket used by the pipeline. The name of the bucket should follow the format codepipeline-region-ID-random-number. You can use the AWS CLI to run the CodePipeline get-pipeline command to get the name of the bucket, where mypipeline-name is the display name of your pipeline:

```
aws codepipeline get-pipeline --name my-pipeline-name
```

In the output, the pipeline object contains an artifactStore object, which contains a location value with the name of the bucket.

- 17. Open the folder that matches the name of your pipeline (depending on the length of the pipeline's name, the folder name might be truncated), and then open the folder that matches the value for **Output artifact** that you noted earlier.
- 18. Extract the contents of the file. If there are multiple files in that folder, extract the contents of the file with the latest **Last Modified** timestamp. (You might need to give the file the .zip extension so that you can work with it in your system's ZIP utility.) The build output artifact is in the extracted contents of the file.

19. If you instructed CodePipeline to deploy the build output artifact, use the deployment provider's instructions to get to the build output artifact on the deployment targets.

Create a pipeline that uses CodeBuild (AWS CLI)

Use the following procedure to create a pipeline that uses CodeBuild to build your source code.

To use the AWS CLI to create a pipeline that deploys your built source code or that only tests your source code, you can adapt the instructions in Edit a pipeline (AWS CLI) and the CodePipeline pipeline structure reference in the AWS CodePipeline User Guide.

Create or identify a build project in CodeBuild. For more information, see Create a build project.

Important

The build project must define build output artifact settings (even though CodePipeline overrides them). For more information, see the description of artifacts in Create a build project (AWS CLI).

- Make sure you have configured the AWS CLI with the AWS access key and AWS secret access key that correspond to one of the IAM entities described in this topic. For more information, see Getting set up with the AWS Command Line Interface in the AWS Command Line Interface User Guide.
- Create a JSON-formatted file that represents the structure of the pipeline. Name the file create-pipeline.json or similar. For example, this JSON-formatted structure creates a pipeline with a source action that references an S3 input bucket and a build action that uses CodeBuild:

```
{
  "pipeline": {
    "roleArn": "arn:aws:iam::<account-id>:role/<AWS-CodePipeline-service-role-
name>",
    "stages": [
      {
        "name": "Source",
        "actions": [
            "inputArtifacts": [],
```

```
"name": "Source",
      "actionTypeId": {
        "category": "Source",
        "owner": "AWS",
        "version": "1",
        "provider": "S3"
      },
      "outputArtifacts": [
        {
          "name": "MyApp"
      ],
      "configuration": {
        "S3Bucket": "<bucket-name>",
        "S30bjectKey": "<source-code-file-name.zip>"
      },
      "runOrder": 1
  ]
},
  "name": "Build",
  "actions": [
    {
      "inputArtifacts": [
        {
          "name": "MyApp"
      ],
      "name": "Build",
      "actionTypeId": {
        "category": "Build",
        "owner": "AWS",
        "version": "1",
        "provider": "CodeBuild"
      },
      "outputArtifacts": [
        {
          "name": "default"
        }
      ],
      "configuration": {
        "ProjectName": "<build-project-name>"
      },
```

Create a pipeline (AWS CLI)

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In this JSON-formatted data:

- The value of roleArn must match the ARN of the CodePipeline service role you created or identified as part of the prerequisites.
- The values of S3Bucket and S30bjectKey in configuration assume the source code is stored in an S3 bucket. For settings for other source code repository types, see the CodePipeline pipeline structure reference in the AWS CodePipeline User Guide.
- The value of ProjectName is the name of the CodeBuild build project you created earlier in this procedure.
- The value of location is the name of the S3 bucket used by this pipeline. For more information, see CodePipeline in the AWS CodePipeline User Guide.
- The value of name is the name of this pipeline. All pipeline names must be unique to your account.

Although this data describes only a source action and a build action, you can add actions for activities related to testing, deploying the build output artifact, invoking AWS Lambda functions, and more. For more information, see the AWS CodePipeline pipeline structure reference in the AWS CodePipeline User Guide.

4. Switch to the folder that contains the JSON file, and then run the CodePipeline create-pipeline command, specifying the file name:

```
aws codepipeline create-pipeline --cli-input-json file://create-pipeline.json
```



Note

You must create the pipeline in an AWS Region where CodeBuild is supported. For more information, see AWS CodeBuild in the Amazon Web Services General Reference.

The JSON-formatted data appears in the output, and CodePipeline creates the pipeline.

To get information about the pipeline's status, run the CodePipeline get-pipeline-state command, specifying the name of the pipeline:

```
aws codepipeline get-pipeline-state --name <my-pipeline-name>
```

In the output, look for information that confirms the build was successful. Ellipses (...) are used to show data that has been omitted for brevity.

```
{
  "stageStates": [
    . . .
    {
      "actionStates": [
        {
           "actionName": "CodeBuild",
           "latestExecution": {
             "status": "SUCCEEDED",
             . . .
           },
        }
      ]
    }
  ]
}
```

If you run this command too early, you might not see any information about the build action. You might need to run this command multiple times until the pipeline has finished running the build action.

After a successful build, follow these instructions to get the build output artifact. Open the Amazon S3 console at https://console.aws.amazon.com/s3/.



Note

You can also get the build output artifact by choosing the **Build artifacts** link on the related build details page in the CodeBuild console. To get to this page, skip the rest of the steps in this procedure, and see View build details (console).

In the list of buckets, open the bucket used by the pipeline. The name of the bucket should follow the format codepipeline-<region-ID>-<random-number>. You can get the bucket name from the create-pipeline. json file or you can run the CodePipeline get**pipeline** command to get the bucket's name.

```
aws codepipeline get-pipeline --name <pipeline-name>
```

In the output, the pipeline object contains an artifactStore object, which contains a location value with the name of the bucket.

- Open the folder that matches the name of your pipeline (for example, <pipeline-name>).
- In that folder, open the folder named default. 9.
- 10. Extract the contents of the file. If there are multiple files in that folder, extract the contents of the file with the latest Last Modified timestamp. (You might need to give the file a .zip extension so that you can work with it in your system's ZIP utility.) The build output artifact is in the extracted contents of the file.

Add a CodeBuild build action to a pipeline (CodePipeline console)

- Sign in to the AWS Management Console by using:
 - Your AWS root account. This is not recommended. For more information, see The account root user in the user Guide.
 - An administrator user in your AWS account. For more information, see Creating your first AWS account root user and group in the user Guide.
 - An user in your AWS account with permission to perform the following minimum set of actions:

codepipeline:* iam:ListRoles iam:PassRole s3:CreateBucket s3:GetBucketPolicv s3:GetObject s3:ListAllMyBuckets s3:ListBucket s3:PutBucketPolicy codecommit:ListBranches codecommit:ListRepositories codedeploy:GetApplication codedeploy:GetDeploymentGroup codedeploy:ListApplications codedeploy:ListDeploymentGroups elasticbeanstalk:DescribeApplications elasticbeanstalk:DescribeEnvironments lambda:GetFunctionConfiguration lambda:ListFunctions opsworks:DescribeStacks opsworks:DescribeApps opsworks:DescribeLayers

- Open the CodePipeline console at https://console.aws.amazon.com/codesuite/codepipeline/ 2. home.
- In the AWS region selector, choose the AWS Region where your pipeline is located. This must be a Region where CodeBuild is supported. For more information, see CodeBuild in the Amazon Web Services General Reference.
- 4. On the **Pipelines** page, choose the name of the pipeline.
- On the pipeline details page, in the **Source** action, choose the tooltip. Make a note of the value for **Output artifact** (for example, **MyApp**).



(i) Note

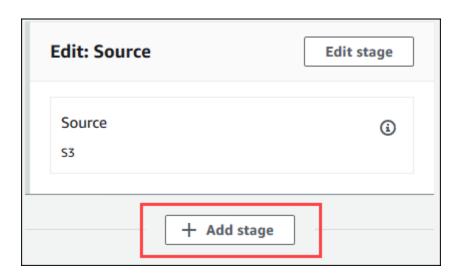
This procedure shows you how to add a build action in a build stage between the **Source** and **Beta** stages. If you want to add the build action somewhere else, choose the tooltip on the action just before the place where you want to add the build action, and make a note of the value for **Output artifact**.

- Choose Edit. 6.
- 7. Between the **Source** and **Beta** stages, choose **Add stage**.



Note

This procedure shows you how to add a build stage between the Source and Beta stages to your pipeline. To add a build action to an existing stage, choose **Edit stage** in the stage, and then skip to step 8 of this procedure. To add the build stage somewhere else, choose Add stage in the desired place.



- For **Stage name**, enter the name of the build stage (for example, **Build**). If you choose a 8. different name, use it throughout this procedure.
- 9. Inside of the selected stage, choose **Add action**.



Note

This procedure shows you how to add the build action inside of a build stage. To add the build action somewhere else, choose **Add action** in the desired place. You might first need to choose **Edit stage** in the existing stage where you want to add the build action.

- 10. In Edit action, for Action name, enter a name for the action (for example, CodeBuild). If you choose a different name, use it throughout this procedure.
- 11. For Action provider, choose CodeBuild.

12. If you already have a build project you want to use, for **Project name**, choose the name of the build project and skip to the next step in this procedure.

If you need to create a new CodeBuild build project, follow the instructions in Create a build project (console) and return to this procedure.

If you choose an existing build project, it must have build output artifact settings already defined (even though CodePipeline overrides them). For more information, see the description of Artifacts in Create a build project (console) or Change a build project's settings (console).

Important

If you enable webhooks for a CodeBuild project, and the project is used as a build step in CodePipeline, then two identical builds are created for each commit. One build is triggered through webhooks and one through CodePipeline. Because billing is on a per-build basis, you are billed for both builds. Therefore, if you are using CodePipeline, we recommend that you disable webhooks in CodeBuild. In the CodeBuild console, clear the **Webhook** box. For more information, see Change a build project's settings (console)

- 13. For **Input artifacts**, choose the output artifact that you noted earlier in this procedure.
- 14. For **Output artifacts**, enter a name for the output artifact (for example, **MyAppBuild**).
- 15. Choose Add action.
- 16. Choose **Save**, and then choose **Save** to save your changes to the pipeline.
- 17. Choose **Release change**.
- 18. After the pipeline runs successfully, you can get the build output artifact. With the pipeline displayed in the CodePipeline console, in the **Build** action, choose the tooltip. Make a note of the value for Output artifact (for example, MyAppBuild).



Note

You can also get the build output artifact by choosing the **Build artifacts** link on the build details page in the CodeBuild console. To get to this page, see View build details (console), and then skip to step 31 of this procedure.

19. Open the Amazon S3 console at https://console.aws.amazon.com/s3/.

20. In the list of buckets, open the bucket used by the pipeline. The name of the bucket should follow the format codepipeline-*region-ID-random-number*. You can use the AWS CLI to run the CodePipeline **qet-pipeline** command to get the name of the bucket:

```
aws codepipeline get-pipeline --name my-pipeline-name
```

In the output, the pipeline object contains an artifactStore object, which contains a location value with the name of the bucket.

- 21. Open the folder that matches the name of your pipeline (depending on the length of the pipeline's name, the folder name might be truncated), and then open the folder matching the value for **Output artifact** that you noted earlier in this procedure.
- 22. Extract the contents of the file. If there are multiple files in that folder, extract the contents of the file with the latest **Last Modified** timestamp. (You might need to give the file the .zip extension so that you can work with it in your system's ZIP utility.) The build output artifact is in the extracted contents of the file.
- 23. If you instructed CodePipeline to deploy the build output artifact, use the deployment provider's instructions to get to the build output artifact on the deployment targets.

Add a CodeBuild test action to a pipeline (CodePipeline console)

- 1. Sign in to the AWS Management Console by using:
 - Your AWS root account. This is not recommended. For more information, see <u>The account</u> root user in the user Guide.
 - An administrator user in your AWS account. For more information, see <u>Creating your first</u> AWS account root user and group in the *user Guide*.
 - An user in your AWS account with permission to perform the following minimum set of actions:

```
codepipeline:*
iam:ListRoles
iam:PassRole
s3:CreateBucket
s3:GetBucketPolicy
s3:GetObject
s3:ListAllMyBuckets
s3:ListBucket
```

Add a test action API Version 2016-10-06 902

s3:PutBucketPolicy codecommit:ListBranches codecommit:ListRepositories codedeploy:GetApplication codedeploy:GetDeploymentGroup codedeploy:ListApplications codedeploy:ListDeploymentGroups

elasticbeanstalk:DescribeApplications elasticbeanstalk:DescribeEnvironments

lambda:GetFunctionConfiguration

lambda:ListFunctions opsworks:DescribeStacks opsworks:DescribeApps opsworks:DescribeLayers

Open the CodePipeline console at https://console.aws.amazon.com/codesuite/codepipeline/ home.

- In the AWS region selector, choose the AWS Region where your pipeline is located. This must be an AWS Region where CodeBuild is supported. For more information, see AWS CodeBuild in the Amazon Web Services General Reference.
- 4. On the **Pipelines** page, choose the name of the pipeline.
- On the pipeline details page, in the **Source** action, choose the tooltip. Make a note of the value for Output artifact (for example, MyApp).



This procedure shows you how to add a test action inside of a test stage between the **Source** and **Beta** stages. If you want to add the test action somewhere else, rest your mouse pointer on the action just before, and make a note of the value for Output artifact.

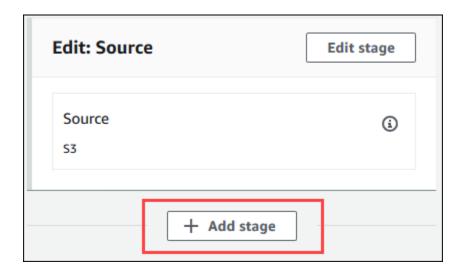
- 6. Choose Edit.
- Immediately after the **Source** stage, choose **Add stage**. 7.



This procedure shows you how to add a test stage immediately after the **Source** stage to your pipeline. To add a test action to an existing stage, choose **Edit stage** in the

Add a test action API Version 2016-10-06 903

stage, and then skip to step 8 of this procedure. To add the test stage somewhere else, choose **Add stage** in the desired place.



- 8. For **Stage name**, enter the name of the test stage (for example, **Test**). If you choose a different name, use it throughout this procedure.
- 9. In the selected stage, choose **Add action**.

Note

This procedure shows you how to add the test action in a test stage. To add the test action somewhere else, choose **Add action** in the desired place. You might first need to choose **Edit** in the existing stage where you want to add the test action.

- 10. In **Edit action**, for **Action name**, enter a name for the action (for example, **Test**). If you choose a different name, use it throughout this procedure.
- 11. For Action provider, under Test, choose CodeBuild.
- 12. If you already have a build project you want to use, for **Project name**, choose the name of the build project and skip to the next step in this procedure.

If you need to create a new CodeBuild build project, follow the instructions in Create a build project (console) and return to this procedure.

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Important

If you enable webhooks for a CodeBuild project, and the project is used as a build step in CodePipeline, then two identical builds are created for each commit. One build is triggered through webhooks and one through CodePipeline. Because billing is on a per-build basis, you are billed for both builds. Therefore, if you are using CodePipeline, we recommend that you disable webhooks in CodeBuild. In the CodeBuild console, clear the **Webhook**box. For more information, see Change a build project's settings (console)

- 13. For Input artifacts, select the value for Output artifact that you noted earlier in this procedure.
- 14. (Optional) If you want your test action to produce an output artifact, and you set up your buildspec accordingly, then for **Output artifact**, enter the value you want to assign to the output artifact.
- 15. Choose Save.
- Choose Release change.
- 17. After the pipeline runs successfully, you can get the test results. In the **Test** stage of the pipeline, choose the **CodeBuild** hyperlink to open the related build project page in the CodeBuild console.
- 18. On the build project page, in **Build history**, choose the **Build run** hyperlink.
- 19. On the build run page, in Build logs, choose the View entire log hyperlink to open the build log in the Amazon CloudWatch console.
- 20. Scroll through the build log to view the test results.

Use AWS CodeBuild with Codecov

Codecov is a tool that measures the test coverage of your code. Codecov identifies which methods and statements in your code are not tested. Use the results to determine where to write tests to improve the quality of your code. Codecov is available for three of the source repositories supported by CodeBuild: GitHub, GitHub Enterprise Server, and Bitbucket. If your build project uses GitHub Enterprise Server, you must use Codecov Enterprise.

Use CodeBuild with Codecov API Version 2016-10-06 905

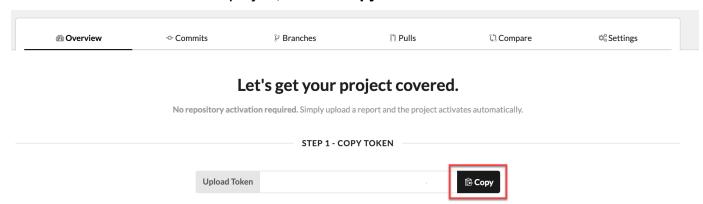
When you run a build of a CodeBuild project that is integrated with Codecov, Codecov reports that analyzes code in your repository are uploaded to Codecov. The build logs include a link to the reports. This sample shows you how to integrate a Python and a Java build project with Codecov. For a list of languages supported by Codecov, see Codecov supported languages on the Codecov website.

Integrate Codecov into a build project

Use the following procedure to integration Codecov into a build project.

To integrate Codecov with your build project

- 1. Go to https://codecov.io/signup and sign up for a GitHub or Bitbucket source repository. If you use GitHub Enterprise, see Codecov Enterprise on the Codecov website.
- 2. In Codecov, add the repository for which you want coverage.
- 3. When token information is displayed, choose **Copy**.



- 4. Add the copied token as an environment variable named CODECOV_TOKEN to your build project. For more information, see Change a build project's settings (console).
- 5. Create a text file named my_script.sh in your repository. Enter the following into the file:

```
#/bin/bash
bash <(curl -s https://codecov.io/bash) -t $CODECOV_TOKEN</pre>
```

6. Choose the **Python** or **Java** tab, as appropriate for your build project uses, and follow these steps.

Java

1. Add the following JaCoCo plugin to pom.xml in your repository.

```
<build>
 <plugins>
   <plugin>
      <groupId>org.jacoco</groupId>
      <artifactId>jacoco-maven-plugin</artifactId>
      <version>0.8.2
      <executions>
          <execution>
              <goals>
                  <goal>prepare-agent</goal>
              </goals>
          </execution>
          <execution>
              <id>report</id>
              <phase>test</phase>
              <goals>
                  <goal>report</goal>
              </goals>
          </execution>
      </executions>
   </plugin>
 </plugins>
</build>
```

 Enter the following commands in your buildspec file. For more information, see <u>Buildspec syntax</u>.

```
build:
    - mvn test -f pom.xml -fn
postbuild:
    - echo 'Connect to CodeCov'
    - bash my_script.sh
```

Python

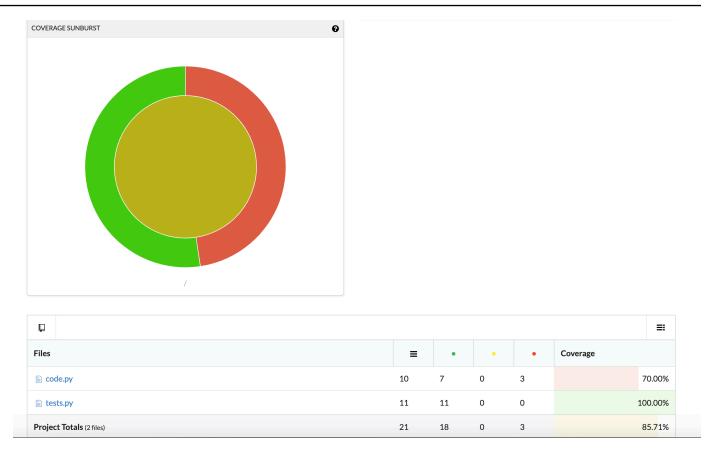
Enter the following commands in your buildspec file. For more information, see <u>Buildspec</u> syntax.

```
build:
    - pip install coverage
```

```
coverage run -m unittest discoverpostbuild:echo 'Connect to CodeCov'bash my_script.sh
```

7. Run a build of your build project. A link to Codecov reports generated for your project appears in your build logs. Use the link to view the Codecov reports. For more information, see Run AWS CodeBuild builds manually and Log AWS CodeBuild API calls with AWS CloudTrail. Codecov information in the build logs looks like the following:

The reports look like the following:



Use AWS CodeBuild with Jenkins

You can use the Jenkins plugin for AWS CodeBuild to integrate CodeBuild with your Jenkins build jobs. Instead of sending your build jobs to Jenkins build nodes, you use the plugin to send your build jobs to CodeBuild. This eliminates the need for you to provision, configure, and manage Jenkins build nodes.

Topics

- Set up Jenkins
- Install the plugin
- Use the plugin

Set up Jenkins

For information about setting up Jenkins with the AWS CodeBuild plugin, and to download the plugin source code, see https://github.com/awslabs/aws-codebuild-jenkins-plugin.

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Install the plugin

If you already have a Jenkins server set up and would like to only install the AWS CodeBuild plugin, on your Jenkins instance, in the Plugin Manager, search for **CodeBuild Plugin for Jenkins**.

Use the plugin

To use AWS CodeBuild with sources from outside of a VPC

- Create a project in the CodeBuild console. For more information, see <u>Create a build project</u> (console).
 - Choose the AWS Region where you want to run the build.
 - (Optional) Set the Amazon VPC configuration to allow the CodeBuild build container to access resources in your VPC.
 - Write down the name of your project. You need it in step 3.
 - (Optional) If your source repository is not natively supported by CodeBuild, you can set Amazon S3 as the input source type for your project.
- 2. In the IAMconsole, create an user to be used by the Jenkins plugin.
 - When you create credentials for the user, choose Programmatic Access.
 - Create a policy similar to the following and then attach the policy to your user.

```
{
  "Version": "2012-10-17",
  "Statement": 「
    {
      "Effect": "Allow",
      "Resource": ["arn:aws:logs:{{region}}:{{awsAccountId}}:log-group:/aws/
codebuild/{{projectName}}:*"],
      "Action": ["logs:GetLogEvents"]
    },
      "Effect": "Allow",
      "Resource": ["arn:aws:s3:::{{inputBucket}}}"],
      "Action": ["s3:GetBucketVersioning"]
   },
    {
      "Effect": "Allow",
      "Resource": ["arn:aws:s3:::{{inputBucket}}/{{inputObject}}"],
```

Install the plugin API Version 2016-10-06 910

```
"Action": ["s3:PutObject"]
    },
      "Effect": "Allow",
      "Resource": ["arn:aws:s3:::{{outputBucket}}/*"],
      "Action": ["s3:GetObject"]
    },
    {
      "Effect": "Allow",
      "Resource": ["arn:aws:codebuild:{{region}}:{{awsAccountId}}:project/
{{projectName}}"],
      "Action": ["codebuild:StartBuild",
        "codebuild:BatchGetBuilds",
        "codebuild:BatchGetProjects"]
    }
  ]
}
```

- 3. Create a freestyle project in Jenkins.
 - On the **Configure** page, choose **Add build step**, and then choose **Run build on CodeBuild**.
 - Configure your build step.
 - Provide values for Region, Credentials, and Project Name.
 - Choose **Use Project source**.
 - Save the configuration and run a build from Jenkins.
- 4. For **Source Code Management**, choose how you want to retrieve your source. You might need to install the GitHub plugin (or the Jenkins plugin for your source repository provider) on your Jenkins server.
 - On the Configure page, choose Add build step, and then choose Run build on AWS CodeBuild.
 - Configure your build step.
 - Provide values for **Region**, **Credentials**, and **Project Name**.
 - Choose Use Jenkins source.
 - Save the configuration and run a build from Jenkins.

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To use the AWS CodeBuild plugin with the Jenkins pipeline plugin

 On your Jenkins pipeline project page, use the snippet generator to generate a pipeline script that adds CodeBuild as a step in your pipeline. It should generate a script similar to this:

```
awsCodeBuild projectName: 'project', credentialsType: 'keys', region: 'us-west-2',
sourceControlType: 'jenkins'
```

Use AWS CodeBuild with serverless applications

The AWS Serverless Application Model (AWS SAM) is an open-source framework for building serverless applications. For more information, see the <u>AWS serverless application model</u> repository on GitHub.

You can use AWS CodeBuild to package and deploy serverless applications that follow the AWS SAM standard. For the deployment step, CodeBuild can use AWS CloudFormation. To automate the building and deployment of serverless applications with CodeBuild and AWS CloudFormation, you can use AWS CodePipeline.

For more information, see <u>Deploying Serverless Applications</u> in the AWS Serverless Application Model Developer Guide.

Related resources

- For information about getting started with AWS CodeBuild, see <u>Getting started with AWS</u>
 CodeBuild using the console.
- For information about troubleshooting issues in CodeBuild, see <u>Troubleshooting AWS CodeBuild</u>.
- For information about quotas in CodeBuild, see <u>Quotas for AWS CodeBuild</u>.

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Topics

- 1) base Docker image—windowsservercore
- 2) windows-base Docker image—choco
- 3) windows-base Docker image—git --version 2.16.2
- 4) windows-base Docker image—microsoft-build-tools --version 15.0.26320.2
- 5) windows-base Docker image—nuget.commandline --version 4.5.1
- 7) windows-base Docker image—netfx-4.6.2-devpack
- 8) windows-base Docker image—visualfsharptools, v 4.0
- 9) windows-base Docker image—netfx-pcl-reference-assemblies-4.6
- 10) windows-base Docker image—visualcppbuildtools v 14.0.25420.1
- 11) windows-base Docker image—microsoft-windows-netfx3-ondemand-package.cab
- 12) windows-base Docker image—dotnet-sdk

1) base Docker image—windowsservercore

(license terms available at: https://hub.docker.com/_/microsoft-windows-servercore)

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3) windows-base Docker image—git --version 2.16.2

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4) windows-base Docker image—microsoft-build-tools --version 15.0.26320.2

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5) windows-base Docker image—nuget.commandline --version 4.5.1

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7) windows-base Docker image—netfx-4.6.2-devpack

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9) windows-base Docker image—netfx-pcl-reference-assemblies-4.6

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10) windows-base Docker image—visualcppbuildtools v 14.0.25420.1

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11) windows-base Docker image—microsoft-windows-netfx3-ondemand-package.cab

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12) windows-base Docker image—dotnet-sdk

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Use CodeBuild condition keys as IAM service role variables to control build access

With the CodeBuild build ARN, you can restrict build resource access by using context keys to scope down resource access in your CodeBuild service role. For CodeBuild, the keys that can be used to

control build access behavior are codebuild:buildArn and codebuild:projectArn. With the build project ARN, you can verify whether a call to your resource came from a specific build project. To verify this, use the codebuild:buildArn or codebuild:projectArn condition keys in an IAM identity-based policy.

To use the codebuild:buildArn or codebuild:projectArn condition keys in your policy, include it as a condition with any of the ARN condition operators. The value of the key must be an IAM variable that resolves to a valid ARN. In the example policy below, the only access allowed will be to the build project with the project ARN for the \${codebuild:projectArn} IAM variable.

AWS CodeBuild condition keys

AWS CodeBuild provides a set of condition keys that you can use in IAM policies to enforce your organizational policies on CodeBuild resources such as projects and fleets. The condition keys cover most of the CodeBuild API request contexts, including network settings, credential configurations and compute restrictions.

Topics

- Enforce VPC connectivity settings on your projects and fleets
- Prevent unauthorized modifications to project buildspec
- Restrict compute types for your builds
- Control environment variable settings
- Use variables in condition key names
- Check the existence of attributes in API requests

Enforce VPC connectivity settings on your projects and fleets

This policy allows the caller to use the selected VPCs, subnets, and security groups when creating CodeBuild projects and fleets. For more information about multivalued context keys, see <u>Single-valued vs. multivalued context keys</u>.

```
{
    "Version": "2012-10-17",
    "Statement": [{
        "Effect": "Allow",
        "Action": [
            "codebuild:CreateProject",
            "codebuild:CreateFleet"
        ],
        "Resource": "*",
        "Condition": {
            "ForAnyValue:StringEquals": {
                 "codebuild:vpcConfig.vpcId": [
                     "vpc-01234567890abcdef",
                     "vpc-abcdef01234567890"
                ],
                 "codebuild:vpcConfig.subnets": [
                     "subnet-1234abcd",
                     "subnet-5678abcd"
                ],
                "codebuild:vpcConfig.securityGroupIds": [
                     "sq-12345678abcdefghij",
                     "sg-01234567abcdefghij"
                ]
            }
        }
    }]
}
```

Prevent unauthorized modifications to project buildspec

This policy does not allow the caller to override the buildspec in the buildspecOverride field.



Note

The codebuild: source.buildspec condition key supports only the Null operator to check the existence of the API field. It doesn't evaluate the content of the buildspec.

```
{
    "Version": "2012-10-17",
    "Statement": [{
        "Effect": "Allow",
        "Action": "codebuild:StartBuild",
        "Resource": "*"
    }, {
        "Effect": "Deny",
        "Action": "codebuild:StartBuild",
        "Resource": "*",
        "Condition": {
            "Null": {
                "codebuild:source.buildspec": "false"
            }
        }
    }]
}
```

Restrict compute types for your builds

This policy allows creating fleets that can build with only c5.large or m5.large compute instance type.

```
{
    "Version": "2012-10-17",
    "Statement": [{
        "Effect": "Allow",
        "Action": "codebuild:CreateFleet",
        "Resource": "*",
        "Condition": {
            "ForAnyValue:StringEquals": {
                "codebuild:computeConfiguration.instanceType": ["c5.large", "m5.large"]
            }
        }
    }]
```

}

Control environment variable settings

This policy allows the caller to override the STAGE environment variable to be either BETA or GAMMA. It also explicitly denies overriding STAGE to be PRODUCTION, and denies overriding the MY_APP_VERSION environment variable. For multiple value context keys, please see Single-valued vs. multivalued context keys.

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Effect": "Allow",
            "Action": [
                 "codebuild:StartBuild"
            ],
            "Resource": "*",
            "Condition": {
                "ForAnyValue:StringEquals": {
                     "codebuild:environment.environmentVariables/STAGE.value": [
                         "BETA",
                         "GAMMA"
                    ]
                }
            }
        },
            "Effect": "Deny",
            "Action": [
                "codebuild:StartBuild"
            ],
            "Resource": "*",
            "Condition": {
                "StringEquals": {
                     "codebuild:environment.environmentVariables/STAGE.value":
 "PRODUCTION"
                },
                "ForAnyValue:StringEquals": {
                     "codebuild:environment.environmentVariables.name": [
                         "MY_APP_VERSION"
                    1
                }
```

Use variables in condition key names

You can use variables in condition key names like secondarySources/
\${sourceIdentifier}.location and secondaryArtifacts/
\${artifactIdentifier}.location, where you can specify your secondary source or secondary artifact identifier in the IAM policy. The policy below allows the caller to create a project with a specific source location for the secondary source mySecondSource.

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Effect": "Allow",
            "Action": "codebuild:CreateProject",
            "Resource": "*",
            "Condition": {
                 "StringEquals": {
                     "codebuild:secondarySources/mySecondSource.location": "my-source-
location"
                }
            }
        }
    ]
}
```

Check the existence of attributes in API requests

CodeBuild supports condition keys to check the existence of some fields in the API request. The policy enforces the VPC requirement when creating or updating projects.

```
{
   "Version": "2012-10-17",
   "Statement": [{
        "Effect": "Allow",
        "Action": [
            "codebuild:CreateProject",
```

```
"codebuild:UpdateProject"
],
    "Resource": "*",
    "Condition": {
        "Null": {
            "codebuild:vpcConfig": "false"
        }
    }
}
```

Code examples for CodeBuild using AWS SDKs

The following code examples show how to use CodeBuild with an AWS software development kit (SDK).

Actions are code excerpts from larger programs and must be run in context. While actions show you how to call individual service functions, you can see actions in context in their related scenarios.

For a complete list of AWS SDK developer guides and code examples, see <u>Using this service with</u> <u>an AWS SDK</u>. This topic also includes information about getting started and details about previous SDK versions.

Code examples

- Basic examples for CodeBuild using AWS SDKs
 - Actions for CodeBuild using AWS SDKs
 - Use CreateProject with an AWS SDK or CLI
 - Use ListBuilds with an AWS SDK or CLI
 - Use ListProjects with an AWS SDK or CLI
 - Use StartBuild with an AWS SDK or CLI

Basic examples for CodeBuild using AWS SDKs

The following code examples show how to use the basics of AWS CodeBuild with AWS SDKs.

Examples

- Actions for CodeBuild using AWS SDKs
 - Use CreateProject with an AWS SDK or CLI
 - Use ListBuilds with an AWS SDK or CLI
 - Use ListProjects with an AWS SDK or CLI
 - Use StartBuild with an AWS SDK or CLI

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Actions for CodeBuild using AWS SDKs

The following code examples demonstrate how to perform individual CodeBuild actions with AWS SDKs. Each example includes a link to GitHub, where you can find instructions for setting up and running the code.

The following examples include only the most commonly used actions. For a complete list, see the AWS CodeBuild API Reference.

Examples

- Use CreateProject with an AWS SDK or CLI
- Use ListBuilds with an AWS SDK or CLI
- Use ListProjects with an AWS SDK or CLI
- Use StartBuild with an AWS SDK or CLI

Use CreateProject with an AWS SDK or CLI

The following code examples show how to use CreateProject.

CLI

AWS CLI

Example 1: To create an AWS CodeBuild build project

The following create-project example creates a CodeBuild build project using source files from an S3 bucket

```
aws codebuild create-project \
    --name "my-demo-project" \
    --source "{\"type\": \"S3\",\"location\": \"codebuild-us-west-2-123456789012-
input-bucket/my-source.zip\"}" \
    --artifacts {"\"type\": \"S3\",\"location\": \"codebuild-us-
west-2-123456789012-output-bucket\""} \
    --environment "{\"type\": \"LINUX_CONTAINER\",\"image\": \"aws/codebuild/
standard:1.0\",\"computeType\": \"BUILD_GENERAL1_SMALL\"}" \
    --service-role "arn:aws:iam::123456789012:role/service-role/my-codebuild-
service-role"
```

Output:

```
{
    "project": {
        "arn": "arn:aws:codebuild:us-west-2:123456789012:project/my-demo-
project",
        "name": "my-cli-demo-project",
        "encryptionKey": "arn:aws:kms:us-west-2:123456789012:alias/aws/s3",
        "serviceRole": "arn:aws:iam::123456789012:role/service-role/my-codebuild-
service-role",
        "lastModified": 1556839783.274,
        "badge": {
            "badgeEnabled": false
        },
        "queuedTimeoutInMinutes": 480,
        "environment": {
            "image": "aws/codebuild/standard:1.0",
            "computeType": "BUILD_GENERAL1_SMALL",
            "type": "LINUX_CONTAINER",
            "imagePullCredentialsType": "CODEBUILD",
            "privilegedMode": false,
            "environmentVariables": []
        },
        "artifacts": {
            "location": "codebuild-us-west-2-123456789012-output-bucket",
            "name": "my-cli-demo-project",
            "namespaceType": "NONE",
            "type": "S3",
            "packaging": "NONE",
            "encryptionDisabled": false
        },
        "source": {
            "type": "S3",
            "location": "codebuild-us-west-2-123456789012-input-bucket/my-
source.zip",
            "insecureSsl": false
        },
        "timeoutInMinutes": 60,
        "cache": {
            "type": "NO_CACHE"
        },
        "created": 1556839783.274
```

}

Example 2: To create an AWS CodeBuild build project using a JSON input file for the parameters

The following create-project example creates a CodeBuild build project by passing all of the required parameters in a JSON input file. Create the input file template by running the command with only the --generate-cli-skeleton parameter.

```
aws codebuild create-project --cli-input-json file://create-project.json
```

The input JSON file create-project. json contains the following content:

```
{
    "name": "codebuild-demo-project",
    "source": {
        "type": "S3",
        "location": "codebuild-region-ID-account-ID-input-bucket/MessageUtil.zip"
    },
    "artifacts": {
        "type": "S3",
        "location": "codebuild-region-ID-account-ID-output-bucket"
    },
    "environment": {
        "type": "LINUX_CONTAINER",
        "image": "aws/codebuild/standard:1.0",
        "computeType": "BUILD_GENERAL1_SMALL"
    },
    "serviceRole": "serviceIAMRole"
}
```

Output:

```
{
    "project": {
        "name": "codebuild-demo-project",
        "serviceRole": "serviceIAMRole",
        "tags": [],
        "artifacts": {
            "packaging": "NONE",
            "type": "S3",
            "location": "codebuild-region-ID-account-ID-output-bucket",
```

```
"name": "message-util.zip"
        },
        "lastModified": 1472661575.244,
        "timeoutInMinutes": 60,
        "created": 1472661575.244,
        "environment": {
            "computeType": "BUILD_GENERAL1_SMALL",
            "image": "aws/codebuild/standard:1.0",
            "type": "LINUX_CONTAINER",
            "environmentVariables": []
        },
        "source": {
            "type": "S3",
            "location": "codebuild-region-ID-account-ID-input-bucket/
MessageUtil.zip"
        },
        "encryptionKey": "arn:aws:kms:region-ID:account-ID:alias/aws/s3",
        "arn": "arn:aws:codebuild:region-ID:account-ID:project/codebuild-demo-
project"
    }
}
```

For more information, see Create a Build Project (AWS CLI) in the AWS CodeBuild User Guide.

• For API details, see CreateProject in AWS CLI Command Reference.

JavaScript

SDK for JavaScript (v3)



Note

There's more on GitHub. Find the complete example and learn how to set up and run in the AWS Code Examples Repository.

Create a project.

```
import {
 ArtifactsType,
 CodeBuildClient,
 ComputeType,
```

```
CreateProjectCommand,
  EnvironmentType,
  SourceType,
} from "@aws-sdk/client-codebuild";
// Create the AWS CodeBuild project.
export const createProject = async (
  projectName = "MyCodeBuilder",
 roleArn = "arn:aws:iam::xxxxxxxxxxxxrrole/CodeBuildAdmin",
 buildOutputBucket = "xxxx",
 githubUrl = "https://...",
) => {
  const codeBuildClient = new CodeBuildClient({});
 const response = await codeBuildClient.send(
    new CreateProjectCommand({
      artifacts: {
        // The destination of the build artifacts.
        type: ArtifactsType.S3,
        location: buildOutputBucket,
      },
      // Information about the build environment. The combination of
 "computeType" and "type" determines the
      // requirements for the environment such as CPU, memory, and disk space.
      environment: {
        // Build environment compute types.
        // https://docs.aws.amazon.com/codebuild/latest/userguide/build-env-ref-
compute-types.html
        computeType: ComputeType.BUILD_GENERAL1_SMALL,
        // Docker image identifier.
        // See https://docs.aws.amazon.com/codebuild/latest/userguide/build-env-
ref-available.html
        image: "aws/codebuild/standard:7.0",
        // Build environment type.
        type: EnvironmentType.LINUX_CONTAINER,
      },
      name: projectName,
      // A role ARN with permission to create a CodeBuild project, write to the
 artifact location, and write CloudWatch logs.
      serviceRole: roleArn,
      source: {
        // The type of repository that contains the source code to be built.
        type: SourceType.GITHUB,
```

```
// The location of the repository that contains the source code to be
built.
       location: githubUrl,
    },
  }),
 );
console.log(response);
//
     {
//
        '$metadata': {
//
          httpStatusCode: 200,
          requestId: 'b428b244-777b-49a6-a48d-5dffedced8e7',
//
//
          extendedRequestId: undefined,
//
          cfId: undefined,
//
          attempts: 1,
//
          totalRetryDelay: 0
//
        },
//
        project: {
//
          arn: 'arn:aws:codebuild:us-east-1:xxxxxxxxxxx:project/MyCodeBuilder',
          artifacts: {
//
//
            encryptionDisabled: false,
//
            location: 'xxxxxx-xxxxxxx-xxxxxx',
//
            name: 'MyCodeBuilder',
//
            namespaceType: 'NONE',
//
            packaging: 'NONE',
//
            type: 'S3'
//
          },
//
          badge: { badgeEnabled: false },
//
          cache: { type: 'NO_CACHE' },
//
          created: 2023-08-18T14:46:48.979Z,
          encryptionKey: 'arn:aws:kms:us-east-1:xxxxxxxxxxxxxxxxa:alias/aws/s3',
//
//
          environment: {
//
            computeType: 'BUILD_GENERAL1_SMALL',
//
            environmentVariables: [],
//
            image: 'aws/codebuild/standard:7.0',
//
            imagePullCredentialsType: 'CODEBUILD',
//
            privilegedMode: false,
//
            type: 'LINUX_CONTAINER'
//
          },
//
          lastModified: 2023-08-18T14:46:48.979Z,
//
          name: 'MyCodeBuilder',
//
          projectVisibility: 'PRIVATE',
//
          queuedTimeoutInMinutes: 480,
//
          serviceRole: 'arn:aws:iam::xxxxxxxxxxxrrole/CodeBuildAdmin',
//
          source: {
```

```
insecureSsl: false,
 //
             location: 'https://...',
 //
             reportBuildStatus: false,
 //
             type: 'GITHUB'
 //
           },
 //
           timeoutInMinutes: 60
 //
         }
 //
       }
  return response;
};
```

- For more information, see AWS SDK for JavaScript Developer Guide.
- For API details, see CreateProject in AWS SDK for JavaScript API Reference.

For a complete list of AWS SDK developer guides and code examples, see Using this service with an AWS SDK. This topic also includes information about getting started and details about previous SDK versions.

Use ListBuilds with an AWS SDK or CLI

The following code examples show how to use ListBuilds.

C++

SDK for C++



Note

There's more on GitHub. Find the complete example and learn how to set up and run in the AWS Code Examples Repository.

```
//! List the CodeBuild builds.
/*!
 \param sortType: 'SortOrderType' type.
 \param clientConfiguration: AWS client configuration.
 \return bool: Function succeeded.
bool AwsDoc::CodeBuild::listBuilds(Aws::CodeBuild::Model::SortOrderType sortType,
```

```
const Aws::Client::ClientConfiguration
&clientConfiguration) {
   Aws::CodeBuild::CodeBuildClient codeBuildClient(clientConfiguration);
   Aws::CodeBuild::Model::ListBuildsRequest listBuildsRequest;
   listBuildsRequest.SetSortOrder(sortType);
   Aws::String nextToken; // Used for pagination.
   do {
       if (!nextToken.empty()) {
           listBuildsRequest.SetNextToken(nextToken);
       }
       Aws::CodeBuild::Model::ListBuildsOutcome listBuildsOutcome =
codeBuildClient.ListBuilds(
               listBuildsRequest);
       if (listBuildsOutcome.IsSuccess()) {
           const Aws::Vector<Aws::String> &ids =
listBuildsOutcome.GetResult().GetIds();
           if (!ids.empty()) {
               std::cout << "Information about each build:" << std::endl;</pre>
               Aws::CodeBuild::Model::BatchGetBuildsRequest getBuildsRequest;
               getBuildsRequest.SetIds(listBuildsOutcome.GetResult().GetIds());
               Aws::CodeBuild::Model::BatchGetBuildsOutcome getBuildsOutcome =
codeBuildClient.BatchGetBuilds(
                        getBuildsRequest);
               if (getBuildsOutcome.IsSuccess()) {
                   const Aws::Vector<Aws::CodeBuild::Model::Build> &builds =
getBuildsOutcome.GetResult().GetBuilds();
                   std::cout << builds.size() << " build(s) found." <<</pre>
std::endl;
                   for (auto val: builds) {
                        std::cout << val.GetId() << std::endl;</pre>
                   }
               } else {
                   std::cerr << "Error getting builds"</pre>
                              << getBuildsOutcome.GetError().GetMessage() <<</pre>
std::endl;
                   return false;
               }
```

• For API details, see ListBuilds in AWS SDK for C++ API Reference.

CLI

AWS CLI

To get a list of AWS CodeBuild builds IDs.

The following list-builds example gets a list of CodeBuild IDs sorted in ascending order.

```
aws codebuild list-builds --sort-order ASCENDING
```

The output includes a nextToken value which indicates that there is more output available.

```
{
    "nextToken": "4AEA6u7J...The full token has been omitted for
brevity...MzY2OA==",
    "ids": [
```

Run this command again and provide the nextToken value in the previous response as a parameter to get the next part of the output. Repeat until you don't receive a nextToken value in the response.

```
aws codebuild list-builds --sort-order ASCENDING --next-
token 4AEA6u7J...The full token has been omitted for brevity...MzY20A==
```

Next part of the output:

```
"ids": [
    "codebuild-demo-project:49015049-21cf-4b50-9708-df115EXAMPLE",
    "codebuild-demo-project:543e7206-68a3-46d6-a4da-759abEXAMPLE",
    ... The full list of build IDs has been omitted for brevity ...
    "codebuild-demo-project:c282f198-4582-4b38-bdc0-26f96EXAMPLE"
]
}
```

For more information, see View a List of Build IDs (AWS CLI) in the AWS CodeBuild User Guide

For API details, see <u>ListBuilds</u> in AWS CLI Command Reference.

For a complete list of AWS SDK developer guides and code examples, see <u>Using this service with</u> <u>an AWS SDK</u>. This topic also includes information about getting started and details about previous SDK versions.

Use ListProjects with an AWS SDK or CLI

The following code examples show how to use ListProjects.

C++

SDK for C++



Note

There's more on GitHub. Find the complete example and learn how to set up and run in the AWS Code Examples Repository.

```
//! List the CodeBuild projects.
/*!
 \param sortType: 'SortOrderType' type.
 \param clientConfiguration: AWS client configuration.
 \return bool: Function succeeded.
 */
bool AwsDoc::CodeBuild::listProjects(Aws::CodeBuild::Model::SortOrderType
 sortType,
                                     const Aws::Client::ClientConfiguration
 &clientConfiguration) {
    Aws::CodeBuild::CodeBuildClient codeBuildClient(clientConfiguration);
    Aws::CodeBuild::Model::ListProjectsRequest listProjectsRequest;
    listProjectsRequest.SetSortOrder(sortType);
    Aws::String nextToken; // Next token for pagination.
    Aws::Vector<Aws::String> allProjects;
    do {
        if (!nextToken.empty()) {
            listProjectsRequest.SetNextToken(nextToken);
        }
        Aws::CodeBuild::Model::ListProjectsOutcome outcome =
 codeBuildClient.ListProjects(
                listProjectsRequest);
        if (outcome.IsSuccess()) {
            const Aws::Vector<Aws::String> &projects =
 outcome.GetResult().GetProjects();
            allProjects.insert(allProjects.end(), projects.begin(),
 projects.end());
```

• For API details, see ListProjects in AWS SDK for C++ API Reference.

CLI

AWS CLI

To get a list of AWS CodeBuild build project names.

The following list-projects example gets a list of CodeBuild build projects sorted by name in ascending order.

```
aws codebuild list-projects --sort-by NAME --sort-order ASCENDING
```

The output includes a nextToken value which indicates that there is more output available.

```
{
    "nextToken": "Ci33ACF6...The full token has been omitted for brevity...U
+AkMx8=",
    "projects": [
        "codebuild-demo-project",
        "codebuild-demo-project2",
```

```
... The full list of build project names has been omitted for
brevity ...
    "codebuild-demo-project99"
]
}
```

Run this command again and provide the nextToken value from the previous response as a parameter to get the next part of the output. Repeat until you don't receive a nextToken value in the response.

```
aws codebuild list-projects --sort-by NAME --sort-order ASCENDING --next-
token Ci33ACF6...The full token has been omitted for brevity...U+AkMx8=

{
    "projects": [
        "codebuild-demo-project100",
        "codebuild-demo-project101",

... The full list of build project names has been omitted for brevity ...
        "codebuild-demo-project122"

]
}
```

For more information, see <u>View a List of Build Project Names (AWS CLI)</u> in the *AWS CodeBuild User Guide*.

• For API details, see <u>ListProjects</u> in *AWS CLI Command Reference*.

For a complete list of AWS SDK developer guides and code examples, see <u>Using this service with</u> <u>an AWS SDK</u>. This topic also includes information about getting started and details about previous SDK versions.

Use StartBuild with an AWS SDK or CLI

The following code examples show how to use StartBuild.

C++

SDK for C++



Note

There's more on GitHub. Find the complete example and learn how to set up and run in the AWS Code Examples Repository.

```
//! Start an AWS CodeBuild project build.
/*!
 \param projectName: A CodeBuild project name.
 \param clientConfiguration: AWS client configuration.
 \return bool: Function succeeded.
 */
bool AwsDoc::CodeBuild::startBuild(const Aws::String &projectName,
                                    const Aws::Client::ClientConfiguration
&clientConfiguration) {
    Aws::CodeBuild::CodeBuildClient codeBuildClient(clientConfiguration);
    Aws::CodeBuild::Model::StartBuildRequest startBuildRequest;
    startBuildRequest.SetProjectName(projectName);
    Aws::CodeBuild::Model::StartBuildOutcome outcome =
 codeBuildClient.StartBuild(
            startBuildRequest);
    if (outcome.IsSuccess()) {
        std::cout << "Successfully started build" << std::endl;</pre>
        std::cout << "Build ID: " << outcome.GetResult().GetBuild().GetId()</pre>
                  << std::endl;
    }
    else {
        std::cerr << "Error starting build" << outcome.GetError().GetMessage()</pre>
                  << std::endl;
    }
    return outcome.IsSuccess();
}
```

• For API details, see StartBuild in AWS SDK for C++ API Reference.

CLI

AWS CLI

To start running a build of an AWS CodeBuild build project.

The following start-build example starts a build for the specified CodeBuild project. The build overrides both the project's setting for the number of minutes the build is allowed to be queued before it times out and the project's artifact settings.

```
aws codebuild start-build \
    --project-name "my-demo-project" \
    --queued-timeout-in-minutes-override 5 \
    --artifacts-override {"\"type\": \"S3\",\"location\":
    \"arn:aws:s3:::artifacts-override\",\"overrideArtifactName\":true"}
```

Output:

```
{
    "build": {
        "serviceRole": "arn:aws:iam::123456789012:role/service-role/my-codebuild-
service-role",
        "buildStatus": "IN_PROGRESS",
        "buildComplete": false,
        "projectName": "my-demo-project",
        "timeoutInMinutes": 60,
        "source": {
            "insecureSsl": false,
            "type": "S3",
            "location": "codebuild-us-west-2-123456789012-input-bucket/my-
source.zip"
        "queuedTimeoutInMinutes": 5,
        "encryptionKey": "arn:aws:kms:us-west-2:123456789012:alias/aws/s3",
        "currentPhase": "QUEUED",
        "startTime": 1556905683.568,
        "environment": {
            "computeType": "BUILD_GENERAL1_MEDIUM",
            "environmentVariables": [],
            "type": "LINUX_CONTAINER",
```

```
"privilegedMode": false,
            "image": "aws/codebuild/standard:1.0",
            "imagePullCredentialsType": "CODEBUILD"
        },
        "phases": [
            {
                "phaseStatus": "SUCCEEDED",
                "startTime": 1556905683.568,
                "phaseType": "SUBMITTED",
                "durationInSeconds": 0,
                "endTime": 1556905684.524
            },
            {
                "startTime": 1556905684.524,
                "phaseType": "QUEUED"
            }
        ],
        "logs": {
            "deepLink": "https://console.aws.amazon.com/cloudwatch/home?
region=us-west-2#logEvent:group=null;stream=null"
        },
        "artifacts": {
            "encryptionDisabled": false,
            "location": "arn:aws:s3:::artifacts-override/my-demo-project",
            "overrideArtifactName": true
        },
        "cache": {
            "type": "NO CACHE"
        },
        "id": "my-demo-project::12345678-a1b2-c3d4-e5f6-11111EXAMPLE",
        "initiator": "my-aws-account-name",
        "arn": "arn:aws:codebuild:us-west-2:123456789012:build/my-demo-
project::12345678-a1b2-c3d4-e5f6-11111EXAMPLE"
    }
}
```

For more information, see Run a Build (AWS CLI) in the AWS CodeBuild User Guide.

• For API details, see StartBuild in AWS CLI Command Reference.

For a complete list of AWS SDK developer guides and code examples, see <u>Using this service with</u> <u>an AWS SDK</u>. This topic also includes information about getting started and details about previous SDK versions.

Troubleshooting AWS CodeBuild

Use the information in this topic to help you identify, diagnose, and address issues. To learn how to log and monitor CodeBuild builds to troubleshoot issues, see <u>Logging and monitoring</u>.

Topics

- Apache Maven builds reference artifacts from the wrong repository
- Build commands run as root by default
- Builds might fail when file names have non-U.S. English characters
- Builds might fail when getting parameters from Amazon EC2 Parameter Store
- Cannot access branch filter in the CodeBuild console
- Cannot view build success or failure
- · Build status not reported to source provider
- Cannot find and select the base image of the Windows Server Core 2019 platform
- Earlier commands in buildspec files are not recognized by later commands
- Error: "Access denied" when attempting to download cache
- Error: "BUILD_CONTAINER_UNABLE_TO_PULL_IMAGE" when using a custom build image
- Error: "Build container found dead before completing the build. build container died because it was out of memory, or the Docker image is not supported. ErrorCode: 500"
- Error: "Cannot connect to the Docker daemon" when running a build
- Error: "CodeBuild is not authorized to perform: sts:AssumeRole" when creating or updating a build project
- Error: "Error calling GetBucketAcl: Either the bucket owner has changed or the service role no longer has permission to called s3:GetBucketAcl"
- Error: "Failed to upload artifacts: Invalid arn" when running a build
- Error: "Git clone failed: Unable to access 'your-repository-URL': SSL certificate problem: Self signed certificate"
- Error: "The bucket you are attempting to access must be addressed using the specified endpoint" when running a build
- Error: "This build image requires selecting at least one runtime version."

- Error: "QUEUED: INSUFFICIENT_SUBNET" when a build in a build queue fails
- Error: "Unable to download cache: RequestError: Send request failed caused by: x509: Failed to load system roots and no roots provided"
- Error: "Unable to download certificate from S3. AccessDenied"
- Error: "Unable to locate credentials"
- RequestError timeout error when running CodeBuild in a proxy server
- The bourne shell (sh) must exist in build images
- Warning: "Skipping install of runtimes. runtime version selection is not supported by this build image" when running a build
- Error: "Unable to verify JobWorker identity" when opening the CodeBuild console
- Build failed to start
- · Accessing GitHub metadata in locally cached builds
- AccessDenied: The bucket owner for the report group does not match the owner of the S3 bucket...
- Error: "Your credentials lack one or more required privilege scopes" when creating a CodeBuild project with CodeConnections
- Error: "Sorry, no terminal at all requested can't get input" when building with the Ubuntu install command

Apache Maven builds reference artifacts from the wrong repository

Issue: When you use Maven with an AWS CodeBuild-provided Java build environment, Maven pulls build and plugin dependencies from the secure central Maven repository at https://repo1.maven.org/maven2. This happens even if your build project's pom.xml file explicitly declares other locations to use instead.

Possible cause: CodeBuild-provided Java build environments include a file named settings.xml that is preinstalled in the build environment's /root/.m2 directory. This settings.xml file contains the following declarations, which instruct Maven to always pull build and plugin dependencies from the secure central Maven repository at https://repo1.maven.org/maven2.

<settings>

```
<activeProfiles>
    <activeProfile>securecentral</activeProfile>
 </activeProfiles>
 ofiles>
    cprofile>
      <id>securecentral</id>
      <repositories>
        <repository>
          <id>central</id>
          <url>https://repo1.maven.org/maven2</url>
          <releases>
            <enabled>true</enabled>
          </releases>
        </repository>
      </repositories>
      <plu><pluginRepositories>
        <plu><pluginRepository>
          <id>central</id>
          <url>https://repo1.maven.org/maven2</url>
          <releases>
            <enabled>true</enabled>
          </releases>
        </pluginRepository>
      </pluginRepositories>
    </profile>
 </profiles>
</settings>
```

Recommended solution: Do the following:

- 1. Add a settings.xml file to your source code.
- 2. In this settings.xml file, use the preceding settings.xml format as a guide to declare the repositories you want Maven to pull the build and plugin dependencies from instead.
- 3. In the install phase of your build project, instruct CodeBuild to copy your settings.xml file to the build environment's /root/.m2 directory. For example, consider the following snippet from a buildspec.yml file that demonstrates this behavior.

```
version 0.2

phases:
  install:
    commands:
```

- cp ./settings.xml /root/.m2/settings.xml

Build commands run as root by default

Issue: AWS CodeBuild runs your build commands as the root user. This happens even if your related build image's Dockerfile sets the USER instruction to a different user.

Cause: By default, CodeBuild runs all build commands as the root user.

Recommended solution: None.

Builds might fail when file names have non-U.S. English characters

Issue: When you run a build that uses files with file names that contain non-U.S. English characters (for example, Chinese characters), the build fails.

Possible cause: Build environments provided by AWS CodeBuild have their default locale set to POSIX. POSIX localization settings are less compatible with CodeBuild and file names that contain non-U.S. English characters and can cause related builds to fail.

Recommended solution: Add the following commands to the pre_build section of your buildspec file. These commands make the build environment use U.S. English UTF-8 for its localization settings, which is more compatible with CodeBuild and file names that contain non-U.S. English characters.

For build environments based on Ubuntu:

```
pre_build:
   commands:
        - export LC_ALL="en_US.UTF-8"
        - locale-gen en_US en_US.UTF-8
        - dpkg-reconfigure -f noninteractive locales
```

For build environments based on Amazon Linux:

```
pre_build:
  commands:
```

```
- export LC_ALL="en_US.utf8"
```

Builds might fail when getting parameters from Amazon EC2 Parameter Store

Issue: When a build tries to get the value of one or more parameters stored in Amazon EC2 Parameter Store, the build fails in the DOWNLOAD_SOURCE phase with the error Parameter does not exist.

Possible cause: The service role the build project relies on does not have permission to call the ssm:GetParameters action or the build project uses a service role that is generated by AWS CodeBuild and allows calling the ssm:GetParameters action, but the parameters have names that do not start with /CodeBuild/.

Recommended solutions:

• If the service role was not generated by CodeBuild, update its definition to allow CodeBuild to call the ssm: GetParameters action. For example, the following policy statement allows calling the ssm: GetParameters action to get parameters with names starting with /CodeBuild/:

```
{
  "Version": "2012-10-17",
  "Statement": [
     {
        "Action": "ssm:GetParameters",
        "Effect": "Allow",
        "Resource": "arn:aws:ssm:REGION_ID:ACCOUNT_ID:parameter/CodeBuild/*"
    }
]
}
```

If the service role was generated by CodeBuild, update its definition to allow CodeBuild to
access parameters in Amazon EC2 Parameter Store with names other than those starting
with /CodeBuild/. For example, the following policy statement allows calling the
ssm:GetParameters action to get parameters with the specified name:

```
"Action": "ssm:GetParameters",
    "Effect": "Allow",
    "Resource": "arn:aws:ssm:REGION_ID:ACCOUNT_ID:parameter/PARAMETER_NAME"
    }
]
]
```

Cannot access branch filter in the CodeBuild console

Issue: The branch filter option is not available in the console when you create or update an AWS CodeBuild project.

Possible cause: The branch filter option is deprecated. It has been replaced by webhook filter groups, which provide more control over the webhook events that trigger a new build in CodeBuild.

Recommended solution: To migrate a branch filter that you created before the introduction of webhook filters, create a webhook filter group with a HEAD_REF filter with the regular expression <code>^refs/heads/branchName</code>. For example, if your branch filter regular expression was <code>^branchName</code>, then the updated regular expression you put in the HEAD_REF filter is <code>^refs/heads/branchName</code>. For more information, see Bitbucket webhook events and Filter GitHub webhook events (console).

Cannot view build success or failure

Issue: You cannot see the success or failure of a retried build.

Possible cause: The option to report your build's status is not enabled.

Recommended solutions: Enable **Report build status** when you create or update a CodeBuild project. This option tells CodeBuild to report back the status when you trigger a build. For more information, see reportBuildStatus in the AWS CodeBuild API Reference.

Build status not reported to source provider

Issue: After allowing build status reporting to a source provider, such as GitHub or Bitbucket, the build status is not updated.

Possible cause: The user associated with the source provider does not have write access to the repo.

Recommended solutions: To be able to report the build status to the source provider, the user associated with the source provider must have write access to the repo. If the user does not have write access, the build status cannot be updated. For more information, see Source provider access.

Cannot find and select the base image of the Windows Server Core 2019 platform

Issue: You cannot find or select the base image of the Windows Server Core 2019 platform.

Possible cause: You are using an AWS Region that does not support this image.

Recommended solutions: Use one of the following AWS Regions where the base image of the Windows Server Core 2019 platform is supported:

- US East (N. Virginia)
- US East (Ohio)
- US West (Oregon)
- · Europe (Ireland)

Earlier commands in buildspec files are not recognized by later commands

Issue: The results of one or more commands in your buildspec file are not recognized by later commands in the same buildspec file. For example, a command might set a local environment variable, but a command run later might fail to get the value of that local environment variable.

Possible cause: In buildspec file version 0.1, AWS CodeBuild runs each command in a separate instance of the default shell in the build environment. This means that each command runs in isolation from all other commands. By default, then, you cannot run a single command that relies on the state of any previous commands.

Recommended solutions: We recommend that you use build spec version 0.2, which solves this issue. If you must use buildspec version 0.1, we recommend that you use the shell command chaining operator (for example, && in Linux) to combine multiple commands into a single command. Or include a shell script in your source code that contains multiple commands, and then call that shell script from a single command in the buildspec file. For more information, see Shells and commands in build environments and Environment variables in build environments.

Error: "Access denied" when attempting to download cache

Issue: When attempting to download the cache on a build project that has cache enabled, you receive an Access denied error.

Possible causes:

- You have just configured caching as part of your build project.
- The cache has recently been invalidated through the InvalidateProjectCache API.
- The service role being used by CodeBuild does not have s3:GetObject and s3:PutObject permissions to the S3 bucket that is holding the cache.

Recommended solution: For first time use, it's normal to see this immediately after updating the cache configuration. If this error persists, then you should check to see if your service role has s3:GetObject and s3:PutObject permissions to the S3 bucket that is holding the cache. For more information, see Specifying S3 permissions in the *Amazon S3 Developer Guide*.

Error: "BUILD_CONTAINER_UNABLE_TO_PULL_IMAGE" when using a custom build image

Issue: When you try to run a build that uses a custom build image, the build fails with the error BUILD_CONTAINER_UNABLE_TO_PULL_IMAGE.

Possible cause: The build image's overall uncompressed size is larger than the build environment compute type's available disk space. To check your build image's size, use Docker to run the docker images REPOSITORY: TAG command. For a list of available disk space by compute type, see <u>Build</u> environment compute modes and types.

Recommended solution: Use a larger compute type with more available disk space, or reduce the size of your custom build image.

Possible cause: AWS CodeBuild does not have permission to pull the build image from your Amazon Elastic Container Registry (Amazon ECR).

Recommended solution: Update the permissions in your repository in Amazon ECR so that CodeBuild can pull your custom build image into the build environment. For more information, see the Amazon ECR sample.

Possible cause: The Amazon ECR image you requested is not available in the AWS Region that your AWS account is using.

Recommended solution: Use an Amazon ECR image that is in the same AWS Region as the one your AWS account is using.

Possible cause: You are using a private registry in a VPC that does not have public internet access. CodeBuild cannot pull an image from a private IP address in a VPC. For more information, see <u>Private</u> registry with AWS Secrets Manager sample for CodeBuild.

Recommended solution: If you use a private registry in a VPC, make sure the VPC has public internet access.

Possible cause: If the error message contains "**toomanyrequests**", and the image is obtained from Docker Hub, this error means the Docker Hub pull limit has been reached.

Recommended solution: Use a Docker Hub private registry, or obtain your image from Amazon ECR. For more information about using a private registry, see Private registry with AWS Secrets Manager sample for CodeBuild. For more information about using Amazon ECR, see Amazon ECR sample for CodeBuild.

Error: "Build container found dead before completing the build. build container died because it was out of memory, or the Docker image is not supported. ErrorCode: 500"

Issue: When you try to use a Microsoft Windows or Linux container in AWS CodeBuild, this error occurs during the PROVISIONING phase.

Possible causes:

- The container OS version is not supported by CodeBuild.
- HTTP_PROXY, HTTPS_PROXY, or both are specified in the container.

Recommended solutions:

• For Microsoft Windows, use a Windows container with a container OS that is version microsoft/windowsservercore:10.0.x (for example, microsoft/windowsservercore:10.0.14393.2125).

• For Linux, clear the HTTP_PROXY and HTTPS_PROXY settings in your Docker image, or specify the VPC configuration in your build project.

Error: "Cannot connect to the Docker daemon" when running a build

Issue: Your build fails and you receive an error similar to Cannot connect to the Docker daemon at unix:/var/run/docker.sock. Is the docker daemon running? in the build log.

Possible cause: You are not running your build in privileged mode.

Recommended solution: To fix this error, you must enable privileged mode and update your buildspec using the following instructions.

To run your build in privileged mode, follow these steps:

- 1. Open the CodeBuild console at https://console.aws.amazon.com/codebuild/.
- 2. In the navigation pane, choose **Build projects**, then choose your build project.
- 3. From **Edit**, choose **Environment**.
- 4. Choose **Additional configuration**.
- 5. From Privileged, select Enable this flag if you want to build Docker images or want your builds to get elevated privileges.
- Choose Update environment.
- 7. Choose **Start build** to retry your build.

You'll also need to start the Docker daemon inside your container. The install phase of your buildspec might look similar to this.

```
phases:
   install:
    commands:
        - nohup /usr/local/bin/dockerd --host=unix:///var/run/docker.sock --
host=tcp://127.0.0.1:2375 --storage-driver=overlay2 &
        - timeout 15 sh -c "until docker info; do echo .; sleep 1; done"
```

For more information about the OverlayFS storage driver referenced in the buildspec file, see Use the OverlayFS storage driver on the Docker website.



Note

If the base operating system is Alpine Linux, in the buildspec.yml add the -t argument to timeout:

```
- timeout -t 15 sh -c "until docker info; do echo .; sleep 1; done"
```

To learn more about how to build and run a Docker image by using AWS CodeBuild, see Docker in custom image sample for CodeBuild.

Error: "CodeBuild is not authorized to perform: sts:AssumeRole" when creating or updating a build project

Issue: When you try to create or update a build project, you receive the error Code:InvalidInputException, Message:CodeBuild is not authorized to perform: sts:AssumeRole on arn:aws:iam::account-ID:role/service-role-name.

Possible causes:

- The AWS Security Token Service (AWS STS) has been deactivated for the AWS region where you are attempting to create or update the build project.
- The AWS CodeBuild service role associated with the build project does not exist or does not have sufficient permissions to trust CodeBuild.
- The AWS CodeBuild service role casing associated with the build project does not match with the actual IAM role.

Recommended solutions:

- Make sure AWS STS is activated for the AWS region where you are attempting to create or update the build project. For more information, see Activating and deactivating AWS STS in an AWS Region in the IAM User Guide.
- Make sure the target CodeBuild service role exists in your AWS account. If you are not using the console, make sure you did not misspell the Amazon Resource Name (ARN) of the service role

when you created or updated the build project. Note that IAM roles are case sensitive, so check that the casing of the IAM role is correct.

 Make sure the target CodeBuild service role has sufficient permissions to trust CodeBuild. For more information, see the trust relationship policy statement in <u>Allow CodeBuild to interact with</u> other AWS services.

Error: "Error calling GetBucketAcl: Either the bucket owner has changed or the service role no longer has permission to called s3:GetBucketAcl"

Issue: When you run a build, you receive an error about a change in ownership of an S3 bucket and GetBucketAcl permissions.

Possible cause: You added the s3:GetBucketAcl and s3:GetBucketLocation permissions to your IAM role. These permissions secure your project's S3 bucket and ensure that only you can access it. After you added these permissions, the owner of the S3 bucket changed.

Recommended solution: Verify you are an owner of the S3 bucket, and then add permissions to your IAM role again. For more information, see Secure access to S3 buckets.

Error: "Failed to upload artifacts: Invalid arn" when running a build

Issue: When you run a build, the UPLOAD_ARTIFACTS build phase fails with the error Failed to upload artifacts: Invalid arn.

Possible cause: Your S3 output bucket (the bucket where AWS CodeBuild stores its output from the build) is in an AWS Region different from the CodeBuild build project.

Recommended solution: Update the build project's settings to point to an output bucket that is in the same AWS Region as the build project.

Error: "Git clone failed: Unable to access 'your-repository-URL': SSL certificate problem: Self signed certificate"

Issue: When you try to run a build project, the build fails with this error.

Possible cause: Your source repository has a self-signed certificate, but you have not chosen to install the certificate from your S3 bucket as part of your build project.

Recommended solutions:

- Edit your project. For Certificate, choose Install certificate from S3. For Bucket of certificate, choose the S3 bucket where your SSL certificate is stored. For **Object key of certificate**, enter the name of your S3 object key.
- Edit your project. Select **Insecure SSL** to ignore SSL warnings while connecting to your GitHub Enterprise Server project repository.



Note

We recommend that you use **Insecure SSL** for testing only. It should not be used in a production environment.

Error: "The bucket you are attempting to access must be addressed using the specified endpoint" when running a build

Issue: When you run a build, the DOWNLOAD_SOURCE build phase fails with the error The bucket you are attempting to access must be addressed using the specified endpoint. Please send all future requests to this endpoint.

Possible cause: Your pre-built source code is stored in an S3 bucket, and that bucket is in an AWS Region different from the AWS CodeBuild build project.

Recommended solution: Update the build project's settings to point to a bucket that contains your pre-built source code. Make sure that bucket is in the same AWS Region as the build project.

Error: "This build image requires selecting at least one runtime version."

Issue: When you run a build, the DOWNLOAD SOURCE build phase fails with the error YAML_FILE_ERROR: This build image requires selecting at least one runtime version.

Possible cause: Your build uses version 1.0 or later of the Amazon Linux 2 (AL2) standard image, or version 2.0 or later of the Ubuntu standard image, and a runtime is not specified in the buildspec file.

Recommended solution: If you use the aws/codebuild/standard:2.0 CodeBuild managed image, you must specify a runtime version in the runtime-versions section of the buildspec file. For example, you might use the following buildspec file for a project that uses PHP:

```
version: 0.2

phases:
    install:
        runtime-versions:
            php: 7.3

build:
        commands:
            - php --version
artifacts:
    files:
            - README.md
```

Note

If you specify a runtime-versions section and use an image other than Ubuntu Standard Image 2.0 or later, or the Amazon Linux 2 (AL2) standard image 1.0 or later, the build issues the warning, "Skipping install of runtimes. Runtime version selection is not supported by this build image."

For more information, see Specify runtime versions in the buildspec file.

Error: "QUEUED: INSUFFICIENT_SUBNET" when a build in a build queue fails

Issue: A build in a build queue fails with an error similar to QUEUED: INSUFFICIENT_SUBNET.

Possible causes: The IPv4 CIDR block specified for your VPC uses a reserved IP address. The first four IP addresses and the last IP address in each subnet CIDR block are not available for you to use

and cannot be assigned to an instance. For example, in a subnet with CIDR block 10.0.0.0/24, the following five IP addresses are reserved:

- 10.0.0.0: Network address.
- 10.0.0.1: Reserved by AWS for the VPC router.
- 10.0.0.2: Reserved by AWS. The IP address of the DNS server is always the base of the VPC network range plus two; however, we also reserve the base of each subnet range plus two. For VPCs with multiple CIDR blocks, the IP address of the DNS server is located in the primary CIDR. For more information, see Amazon DNS server in the Amazon VPC User Guide.
- 10.0.0.3: Reserved by AWS for future use.
- 10.0.0.255: Network broadcast address. We do not support broadcast in a VPC. This address is reserved.

Recommended solutions: Check if your VPC uses a reserved IP address. Replace any reserved IP address with one that is not reserved. For more information, see <u>VPC and subnet sizing</u> in the *Amazon VPC User Guide*.

Error: "Unable to download cache: RequestError: Send request failed caused by: x509: Failed to load system roots and no roots provided"

Issue: When you try to run a build project, the build fails with this error.

Possible cause: You configured caching as part of your build project and are using an older Docker image that includes an expired root certificate.

Recommended solution: Update the Docker image that is being used in your AWS CodeBuild the project. For more information, see <u>Docker images provided by CodeBuild</u>.

Error: "Unable to download certificate from S3. AccessDenied"

Issue: When you try to run a build project, the build fails with this error.

Possible causes:

You have chosen the wrong S3 bucket for your certificate.

• You have entered the wrong object key for your certificate.

Recommended solutions:

 Edit your project. For Bucket of certificate, choose the S3 bucket where your SSL certificate is stored.

• Edit your project. For **Object key of certificate**, enter the name of your S3 object key.

Error: "Unable to locate credentials"

Issue: When you try to run the AWS CLI, use an AWS SDK, or call another similar component as part of a build, you get build errors that are directly related to the AWS CLI, AWS SDK, or component. For example, you might get a build error such as Unable to locate credentials.

Possible causes:

- The version of the AWS CLI, AWS SDK, or component in the build environment is incompatible with AWS CodeBuild.
- You are running a Docker container within a build environment that uses Docker, and the container does not have access to the AWS credentials by default.

Recommended solutions:

- Make sure your build environment has the following version or higher of the AWS CLI, AWS SDK, or component.
 - AWS CLI: 1.10.47
 - AWS SDK for C++: 0.2.19
 - AWS SDK for Go: 1.2.5
 - AWS SDK for Java: 1.11.16
 - AWS SDK for JavaScript: 2.4.7
 - AWS SDK for PHP: 3.18.28
 - AWS SDK for Python (Boto3): 1.4.0
 - AWS SDK for Ruby: 2.3.22
 - Botocore: 1.4.37

- CoreCLR: 3.2.6-beta
- Node.js: 2.4.7

If you need to run a Docker container in a build environment and the container requires AWS credentials, you must pass through the credentials from the build environment to the container.
 In your buildspec file, include a Docker run command such as the following. This example uses the aws s3 ls command to list your available S3 buckets. The -e option passes through the environment variables required for your container to access AWS credentials.

```
docker run -e AWS_DEFAULT_REGION -e AWS_CONTAINER_CREDENTIALS_RELATIVE_URI your-
image-tag aws s3 ls
```

- If you are building a Docker image and the build requires AWS credentials (for example, to download a file from Amazon S3), you must pass through the credentials from the build environment to the Docker build process as follows.
 - 1. In your source code's Dockerfile for the Docker image, specify the following ARG instructions.

```
ARG AWS_DEFAULT_REGION
ARG AWS_CONTAINER_CREDENTIALS_RELATIVE_URI
```

2. In your buildspec file, include a Docker build command such as the following. The --build-arg options sets the environment variables required for your Docker build process to access the AWS credentials.

```
docker build --build-arg AWS_DEFAULT_REGION=$AWS_DEFAULT_REGION --build-arg
AWS_CONTAINER_CREDENTIALS_RELATIVE_URI=$AWS_CONTAINER_CREDENTIALS_RELATIVE_URI -
t your-image-tag .
```

RequestError timeout error when running CodeBuild in a proxy server

Issue: You receive a RequestError error similar to one of the following:

RequestError: send request failed caused by: Post https://logs.<your-region>.amazonaws.com/: dial tcp 52.46.158.105:443: i/o timeout from CloudWatch Logs.

• Error uploading artifacts: RequestError: send request failed caused by: Put https://your-bucket.s3.your-aws-region.amazonaws.com/*: dial tcp 52.219.96.208:443: connect: connection refused from Amazon S3.

Possible causes:

- ssl-bump is not configured properly.
- Your organization's security policy does not allow you to use ssl_bump.
- Your buildspec file does not have proxy settings specified using a proxy element.

Recommended solutions:

- Make sure ssl-bump is configured properly. If you use Squid for your proxy server, see
 Configure Squid as an explicit proxy server.
- Follow these steps to use private endpoints for Amazon S3 and CloudWatch Logs:
 - 1. In your private subnet routing table, remove the rule you added that routes traffic destined for the internet to your proxy server. For information, see Creating a subnet in your VPC in the Amazon VPC User Guide.
 - 2. Create a private Amazon S3 endpoint and CloudWatch Logs endpoint and associate them with the private subnet of your Amazon VPC. For information, see VPC endpoint services in the Amazon VPC User Guide.
 - 3. Confirm **Enable Private DNS Name** in your Amazon VPC is selected. For more information, see Creating an interface endpoint in the *Amazon VPC User Guide*.
- If you do not use ssl-bump for an explicit proxy server, add a proxy configuration to your buildspec file using a proxy element. For more information, see Run CodeBuild in an explicit proxy server and Buildspec syntax.

```
version: 0.2
proxy:
  upload-artifacts: yes
  logs: yes
phases:
  build:
    commands:
```

The bourne shell (sh) must exist in build images

Issue: You are using a build image that is not provided by AWS CodeBuild, and your builds fail with the message Build container found dead before completing the build.

Possible cause: The Bourne shell (sh) is not included in your build image. CodeBuild needs sh to run build commands and scripts.

Recommended solution: If sh in not present in your build image, be sure to include it before you start any more builds that use your image. (CodeBuild already includes sh in its build images.)

Warning: "Skipping install of runtimes. runtime version selection is not supported by this build image" when running a build

Issue: When you run a build, the build log contains this warning.

Possible cause: Your build does not use version 1.0 or later of the Amazon Linux 2 (AL2) standard image, or version 2.0 or later of the Ubuntu standard image, and a runtime is specified in a runtime-versions section in your buildspec file.

Recommended solution: Be sure your buildspec file does not contain a runtime-versions section. The runtime-versions section is only required if you use the Amazon Linux 2 (AL2) standard image or later or the Ubuntu standard image version 2.0 or later.

Error: "Unable to verify JobWorker identity" when opening the CodeBuild console

Issue: When you open the CodeBuild console, an "Unable to verify JobWorker identity" error message is displayed.

Possible cause: The IAM role that is used for console access has a tag with jobId as the key. This tag key is reserved for CodeBuild and will cause this error if it is present.

Recommended solution: Change any custom IAM role tags that have the key jobId to have a different key, such as jobIdentifier.

Build failed to start

Issue: When starting a build, you receive a **Build failed to start** error message.

Possible cause: The number of concurrent builds has been reached.

Recommended solutions: Wait until other builds are complete, or increase the concurrent build limit for the project, and start the build again. For more information, see Project configuration.

Accessing GitHub metadata in locally cached builds

Issue: In some cases, the .git directory in a cached build is a text file and not a directory.

Possible causes: When local source caching is enabled for a build, CodeBuild creates a gitlink for the .git directory. This means that the .git directory is actually a text file containing the path to the directory.

Recommended solutions: In all cases, use the following command to obtain the Git metadata directory. This command will work no matter the format of .git:

git rev-parse --git-dir

AccessDenied: The bucket owner for the report group does not match the owner of the S3 bucket...

Issue: When uploading test data to an Amazon S3 bucket, CodeBuild is unable to write the test data to the bucket.

Possible causes:

- The account specified for the report group bucket owner does not match the owner of the Amazon S3 bucket.
- The service role does not have write access to the bucket.

Recommended solutions:

• Change the report group bucket owner to match the owner of the Amazon S3 bucket.

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• Modify the service role to allow write access to the Amazon S3 bucket.

Error: "Your credentials lack one or more required privilege scopes" when creating a CodeBuild project with CodeConnections

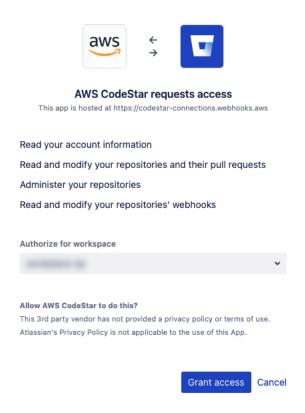
Issue: When creating a CodeBuild project with CodeConnections, you don't have permission to install a Bitbucket webbook.

Possible causes:

• The new permission scope may not have been accepted in your Bitbucket account.

Recommended solutions:

- To accept the new permission, you should have received any email with a subject titled Action required Scopes for AWS CodeStar have changed sent by Bitbucket, notifications noreply@bitbucket.org. The email contains a link to grant the webhook permissions to your existing CodeConnections Bitbucket app installation.
- If you cannot locate the email, you can grant the permission by navigating to https://bitbucket.org/site/addons/reauthorize?account=<workspace-name>&addon_key=aws-codestar, or https://bitbucket.org/site/addons/reauthorize?addon_key=aws-codestar and selecting the workspace you'd like to grant the webhook permission to.



Error: "Sorry, no terminal at all requested - can't get input" when building with the Ubuntu install command

Issue: If you're running GPU container privileged builds, you may be installing the NVIDIA Container Toolkit following this <u>procedure</u>. In the latest CodeBuild image release, CodeBuild preinstalls and configures docker with nvidia-container-toolkit in the latest amazonlinux and ubuntu curated image. Following this procedure will cause builds with the Ubuntu install command to fail with following error:

Running command curl -fsSL https://nvidia.github.io/libnvidia-container/gpgkey | gpg --dearmor --no-tty -o /usr/share/keyrings/nvidia-container-toolkit-keyring.gpg gpg: Sorry, no terminal at all requested - can't get input curl: (23) Failed writing body

Possible causes: The gpg key already exists at the same location.

Recommended solutions: The nvidia-container-toolkit is already installed in the image. If you see this error, you can skip the install and restart docker process in your buildspec.

Quotas for AWS CodeBuild

The following tables list the current quotas in AWS CodeBuild. These quotas are for each supported AWS Region for each AWS account, unless otherwise specified.

Service quotas

The following are the default quotas for the AWS CodeBuild service.

Name	Default	Adjus e	Description
Associated tags per project	Each supported Region: 50	No	Maximum number of tags you can associate with a build project
Build projects	Each supported Region: 5,000	Yes	Maximum number of build projects
Build timeout in minutes	Each supported Region: 2,160	No	Maximum build timeout in minutes
Concurrent request for information about builds	Each supported Region: 100	No	Maximum number of builds you can request information about at any one time using the AWS CLI or an AWS SDK.
Concurrent requests for information on build projects	Each supported Region: 100	No	Maximum number of build projects you can request information about at any one time using the AWS CLI or an AWS SDK.
Concurrently running builds for ARM Lambda/10GB environment	Each supported Region: 1	Yes	Maximum number of concurrently

Name	Default	Adjus e	Description
			running builds for ARM Lambda/10GB environment
Concurrently running builds for ARM Lambda/1GB environment	Each supported Region: 1	Yes	Maximum number of concurrently running builds for ARM Lambda/1GB environme nt
Concurrently running builds for ARM Lambda/2GB environment	Each supported Region: 1	Yes	Maximum number of concurrently running builds for ARM Lambda/2GB environme nt
Concurrently running builds for ARM Lambda/4GB environment	Each supported Region: 1	Yes	Maximum number of concurrently running builds for ARM Lambda/4GB environme nt
Concurrently running builds for ARM Lambda/8GB environment	Each supported Region: 1	Yes	Maximum number of concurrently running builds for ARM Lambda/8GB environme nt
Concurrently running builds for ARM/2XLarge environment	Each supported Region: 1	Yes	Maximum number of concurrently running builds for ARM/2XLarge environment

Name	Default	Adjus e	Description
Concurrently running builds for ARM/ Large environment	Each supported Region: 1	Yes	Maximum number of concurrently running builds for ARM/Large environment
Concurrently running builds for ARM/ Medium environment	Each supported Region: 1	Yes	Maximum number of concurrently running builds for ARM/Medium environment
Concurrently running builds for ARM/ Small environment	Each supported Region: 1	Yes	Maximum number of concurrently running builds for ARM/Small environment
Concurrently running builds for ARM/ XLarge environment	Each supported Region: 1	Yes	Maximum number of concurrently running builds for ARM/XLarge environment
Concurrently running builds for Linux GPU Large environment	Each supported Region: 0	Yes	Maximum number of concurrently running builds for Linux GPU/Large environment
Concurrently running builds for Linux GPU Small environment	Each supported Region: 0	Yes	Maximum number of concurrently running builds for Linux GPU/Small environment
Concurrently running builds for Linux Lambda/10GB environment	Each supported Region: 1	Yes	Maximum number of concurrently running builds for Linux Lambda/10GB environment

Name	Default	Adjus e	Description
Concurrently running builds for Linux Lambda/1GB environment	Each supported Region: 1	Yes	Maximum number of concurrently running builds for Linux Lambda/1GB environme nt
Concurrently running builds for Linux Lambda/2GB environment	Each supported Region: 1	Yes	Maximum number of concurrently running builds for Linux Lambda/2GB environme nt
Concurrently running builds for Linux Lambda/4GB environment	Each supported Region: 1	Yes	Maximum number of concurrently running builds for Linux Lambda/4GB environme nt
Concurrently running builds for Linux Lambda/8GB environment	Each supported Region: 1	Yes	Maximum number of concurrently running builds for Linux Lambda/8GB environme nt
Concurrently running builds for Linux/2XLarge environment	Each supported Region: 0	Yes	Maximum number of concurrently running builds for Linux/2XLarge environment
Concurrently running builds for Linux/ Large environment	Each supported Region: 1	Yes	Maximum number of concurrently running builds for Linux/Large environment

Name	Default	Adjus e	Description
Concurrently running builds for Linux/ Medium environment	Each supported Region: 1	Yes	Maximum number of concurrently running builds for Linux/Medium environment
Concurrently running builds for Linux/ Small environment	Each supported Region: 1	Yes	Maximum number of concurrently running builds for Linux/Small environment
Concurrently running builds for Linux/ XLarge environment	Each supported Region: 1	Yes	Maximum number of concurrently running builds for Linux/XLarge environment
Concurrently running builds for Windows Server 2019/Large environme nt	Each supported Region: 1	Yes	Maximum number of concurrently running builds for Windows Server 2019/Large environment
Concurrently running builds for Windows Server 2019/Medium environment	Each supported Region: 1	Yes	Maximum number of concurrently running builds for Windows Server 2019/Medium environment
Concurrently running builds for Windows Server 2022/2XLarge environment	Each supported Region: 1	Yes	Maximum number of concurrently running builds for Windows Server 2022/2XLarge environment

Name	Default	Adjus e	Description
Concurrently running builds for Windows Server 2022/Large environme nt	Each supported Region: 1	Yes	Maximum number of concurrently running builds for Windows Server 2022/Large environment
Concurrently running builds for Windows Server 2022/Medium environment	Each supported Region: 1	Yes	Maximum number of concurrently running builds for Windows Server 2022/Medium environment
Concurrently running builds for Windows Server 2022/XLarge environment	Each supported Region: 1	Yes	Maximum number of concurrently running builds for Windows Server 2022/XLarge environment
Concurrently running builds for Windows/Large environment	Each supported Region: 1	Yes	Maximum number of concurrently running builds for Windows/L arge environment
Concurrently running builds for Windows/Medium environment	Each supported Region: 1	Yes	Maximum number of concurrently running builds for Windows/M edium environment
Minimum period for build timeout in minutes	Each supported Region: 5	No	Minimum build timeout in minutes
Security groups under VPC configura tion	Each supported Region: 5	No	Security groups available for VPC configuration

Name	Default	Adjus e	Description
Subnets under VPC configuration	Each supported Region: 16	No	Subnets available for VPC configuration



Note

Internal metrics will determine the default quotas for concurrent running builds.

Quotas for the maximum number of concurrent running builds vary, depending on the compute type. For some platforms and compute types, the default is 20. To request a higher concurrent build quota, or if you get a "Cannot have more than X active builds for the account" error, use the link above to make the request. For more information on pricing, see AWS CodeBuild pricing.

Other limits

Build projects

Resource	Default
Allowed characters in a build project descripti on	Any
Allowed characters in a build project name	The letters A-Z and a-z, the numbers \emptyset -9, and the special characters - and _
Length of a build project name	2 to 150 characters, inclusive
Maximum length of a build project description	255 characters
Maximum number of reports you can add to a project	5

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Resource	Default
Number of minutes you can specify in a build project for the build timeout of all related builds	5 to 2160 (36 hours)

Builds

Resource	Default
Maximum time the history of a build is retained	1 year
Number of minutes you can specify for the build timeout of a single build	5 to 2160 (36 hours)

Compute fleets

Resource	Default
Concurrent number of compute fleets	10
Concurrently running instances for ARM/Small environment fleets	1
Concurrently running instances for ARM/Large environment fleets	1
Concurrently running instances for Linux/Sma Il environment fleets	1
Concurrently running instances for Linux/Med ium environment fleets	1
Concurrently running instances for Linux/Lar ge environment fleets	1

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Resource	Default
Concurrently running instances for Linux/XLa rge environment fleets	1
Concurrently running instances for Linux/2XL arge environment fleets	0
Concurrently running instances for Linux GPU/ Small environment fleets	0
Concurrently running instances for Linux GPU/ Large environment fleets	0
Concurrently running instances for Windows Server 2019/Medium environment fleets	1
Concurrently running instances for Windows Server 2019/Large environment fleets	1
Concurrently running instances for Windows Server 2022/Medium environment fleets	1
Concurrently running instances for Windows Server 2022/Large environment fleets	1
Concurrently running instances for Mac ARM/ Medium environment fleets	1
Concurrently running instances for Mac ARM/ Large environment fleets	1

Reports

Resource	Default
Maximum duration a test report is available after it is created	30 days

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Resource	Default
Maximum length of a test case message	5,000 characters
Maximum length of a test case name	1,000 characters
Maximum number of report groups per AWS account	5,000
Maximum number of test cases per report	500

Tags

Tag limits apply to tags on CodeBuild build projects and CodeBuild report group resources.

Resource	Default
Resource tag key names	Any combination of Unicode letters, numbers, spaces, and allowed characters in UTF-8 between 1 and 127 characters in length. Allowed characters are + - = : / @
	Tag key names must be unique, and each key can only have one value. A tag key name cannot:
	• begin with aws:
	consist only of spaces
	end with a space
	 contain emojis or any of the following characters: ? ^ * [\ ~ ! # \$ % & * () > < " ' ` [] { } ;
Resource tag values	Any combination of Unicode letters, numbers, spaces, and allowed characters in UTF-8 between 0 and 255 characters in length. Allowed characters are + - = : / @

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Resource	Default
	A key can only have one value, but many keys can have the same value. A tag key value cannot contain emojis or any of the following characters: ? ^ * [\ ~ ! # \$ % & * () > < " ' ` [] { } ;

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AWS CodeBuild User Guide document history

The following table describes the important changes to the documentation since the last release of AWS CodeBuild. For notification about updates to this documentation, you can subscribe to an RSS feed.

• Latest API version: 2016-10-06

Change	Description	Date
Updated content: AWS managed (predefined) policies for AWS CodeBuild	The AWSCodeBuildAdminA ccess, AWSCodeBuildDevelo perAccess, and AWSCodeBuildReadOnlyAccess policies have been updated. The original resource arn:aws:codeconnections:*:* :connection/* has been updated to arn:aws:codeconnections:*:* :* .	June 10, 2025
New reference for CodeBuild condition keys	Added a new reference page with examples for using CodeBuild condition keys. See AWS CodeBuild condition keys.	May 15, 2025
New content: Docker image build server sample for CodeBuild	CodeBuild now supports offloading your Docker builds to a managed image build server.	May 15, 2025
New compute type: CUSTOM_INSTANCE_TYPE	CodeBuild now allows you to create a reserved capacity fleet with a specific instance	April 23, 2025

	type by using CUSTOM_IN STANCE_TYPE .	
New support for CodeBuild sandbox	Added information about using the new CodeBuild sandbox. See <u>Debug builds</u> with CodeBuild sandbox.	April 7, 2025
New Windows environment types	CodeBuild now supports Windows XL and 2XL environment types. For more information, see <u>Build</u> environment compute types.	March 31, 2025
Updated Amazon S3 caching	CodeBuild now supports a new caching behavior for Amazon S3 caching.	March 28, 2025
New content: GitHub Actions runner configuration options	CodeBuild now supports CODEBUILD_CONFIG_G ITHUB_ACTIONS_ENTE RPRISE_REGISTRATIO N_NAME for registration at the enterprise level.	March 11, 2025
New content: Add new webhook filter type	Add support for a new webhook filter type (ORGANIZATION_NAME).	March 11, 2025
New content: Tutorial for Apple code signing with Fastlane with S3 certificate storage	Add new tutorial for Apple code signing with Fastlane in CodeBuild using S3 for certificate storage	February 5, 2025
New content: Tutorial for Apple code signing with Fastlane with GitHub certifica te storage	Add new tutorial for Apple code signing with Fastlane in CodeBuild using GitHub for certificate storage	February 5, 2025

New content: Buildkite runner	Add new content for the Buildkite runner	January 31, 2025
New content: Buildkite manual webhooks	Add support for Buildkite manual webhooks.	January 31, 2025
New content: Batch build buildspec reference	Add support for batch builds in reserved capacity fleets and Lambda environments.	January 8, 2025
New content: Execute parallel tests in batch builds	Add new content for parallel tests in batch builds.	January 2, 2025
New content: Retry builds automatically	CodeBuild now supports auto-retry for webhook builds.	December 18, 2024
New content: Configure a private registry credential for self-hosted runners	Add support for setting registry credentials when using custom images from non-private registries.	December 13, 2024
New content: GitHub Actions runner configuration options	CodeBuild GitHub Actions self-hosted runners now allow you to register your runners at the organization level and configure a specific runner group ID.	December 12, 2024
New content: Add on-failure attribute RETRY	CodeBuild now allows you to configure an on-failure attribute to RETRY in your buildspec.	December 12, 2024
New content: GitLab manual webhooks	Add support for GitLab manual webhooks.	December 11, 2024
Updated content: Updated aliases	Update aliases for Linux-bas ed standard runtime images.	November 22, 2024

Updated content: Label overrides supported with the CodeBuild-hosted GitLab runner	Add support for custom image label overrides for GitLab runners.	November 22, 2024
Updated content: Label overrides supported with the CodeBuild-hosted GitHub Actions runner	Add support for custom image label overrides for GitHub Actions runners.	November 22, 2024
Updated content: AWS managed (predefined) policies for AWS CodeBuild	The AWSCodeBuildAdminA ccess, AWSCodeBuildDevelo perAccess, and AWSCodeBuildReadOnlyAccess policies have been updated. The original resource arn:aws:c odebuild:* has been updated to arn:aws:c odebuild:*:*:proje ct/*.	November 15, 2024
Updated content: Reserved capacity	Reserved capacity fleets now support non-container builds: ARM EC2, Linux EC2, and Windows EC2.	November 12, 2024
Updated content: Reserved capacity	Reserved capacity fleets now support attribute-based compute.	November 6, 2024
New content: Retry builds automatically	CodeBuild now allows you to enable auto-retry for your builds.	October 25, 2024
New content: Run CodeBuild in a managed proxy server for reserved capacity fleets	Add proxy configurations support for reserved capacity fleets.	October 15, 2024

New content: Self-managed GitLab runners	Add new content for self- managed GitLab runners	September 17, 2024
New content: GitLab group webhooks	Add support for GitLab group webhooks.	September 17, 2024
New content: Run buildspec commands the INSTALL, PRE_BUILD, and POST_BUILD phases	Add support for -with-bui ldspec .	August 20, 2024
Updated content: Reserved capacity	Reserved capacity fleets now support macOS.	August 19, 2024
New content: GitHub App connections	Add support for GitHub App connections.	August 14, 2024
New content: Bitbucket App connections	Add support for Bitbucket App connections.	August 14, 2024
New content: Multiple access tokens in CodeBuild	Add support for sourcing access tokens to third party providers from secrets in AWS Secrets Manager or through AWS CodeConne ctions connections.	August 14, 2024
Updated content: Reserved capacity	Reserved capacity fleets now support ARM Medium, ARM XLarge, and ARM 2XLarge compute types.	August 5, 2024
Updated content: Reserved capacity	CodeBuild now supports VPC connectivity for reserved capacity fleets on Windows.	August 1, 2024

New ARM compute types	CodeBuild now supports ARM Medium, ARM XLarge, and ARM 2XLarge compute types. For more information, see Build environment compute types.	July 10, 2024
<u>Updated content: SHA</u> <u>signature</u>	Update the Secure Hash Algorithm (SHA) signature for the x86_64 and ARM.	June 19, 2024
New content: GitHub global and organization webhooks	Add support for GitHub global and organization webhooks.	June 17, 2024
New content: Add new webhook filter type	Add support for a new webhook filter type (REPOSITORY_NAME).	June 17, 2024
Updated disk space	The ARM Small and ARM Large compute types now have increased disk space.	June 4, 2024
New content: GitHub manual webhooks	Add support for GitHub manual webhooks.	May 23, 2024
<u>Updated content: Reserved</u> <u>capacity</u>	CodeBuild now supports VPC connectivity for reserved capacity fleets on Amazon Linux.	May 15, 2024
Updated content: Lambda compute images	Add Lambda support for .NET 8 (al-lambda/aarch64/dotnet8 and al-lambda/x86_64/dotnet8)	May 8, 2024

Updated quota: Build timeout	Update maximum build timeout quota to 2160 minutes (36 hours).	May 1, 2024
Updated content: AWS managed (predefined) policies for AWS CodeBuild	The AWSCodeBuildAdminA ccess, AWSCodeBuildDevelo perAccess, and AWSCodeBuildReadOnlyAccess policies have been updated to reflect the AWS CodeConnections rebranding.	April 30, 2024
New content: Bitbucket app password or access token	Add support for Bitbucket access tokens.	April 11, 2024
New content: Auto-discover reports in CodeBuild	CodeBuild now supports report auto-discover.	April 4, 2024
New content: Self-hosted GitHub Actions runners	Add new content for self-host ed GitHub Actions runners	April 2, 2024
New content: GitLab connections	Add support for GitLab and GitHub Self Managed connections.	March 25, 2024
New content: Add new webhook events and filter types	Add support for new webhook events (RELEASED and PRERELEASED) and filter types (TAG_NAME and RELEASE_NAME).	March 15, 2024
New content: Add a new webhook event: PULL_REQUEST_CLOSED	Add support for a new webhook event: PULL_REQU EST_CLOSED .	February 20, 2024
<u>Updated content: Docker</u> <u>images provided by CodeBuild</u>	Add support for Windows Server Core 2019 (windows-base: 2019-3.0)	February 7, 2024

Updated content: Docker images provided by CodeBuild	Add support for new runtimes for Amazon Linux 2023 (al2/aarch64/standard/3.0)	January 29, 2024
New content: Reserved capacity	CodeBuild now supports reserved capacity fleets in CodeBuild.	January 18, 2024
New compute type	CodeBuild now supports a Linux XLarge compute type. For more information, see Build environment compute types.	January 8, 2024
Updated content: Docker images provided by CodeBuild	Add support for new runtimes for Amazon Linux 2 (al2/standard/5.0) and Ubuntu (ubuntu/st andard/7.0)	December 14, 2023
<u>Updated content: Docker</u> <u>images provided by CodeBuild</u>	Add support for new Lambda compute images	December 8, 2023
New content: AWS Lambda compute	Add new content for the AWS Lambda compute	November 6, 2023
<u>Updated content: Docker</u> <u>images provided by CodeBuild</u>	Add support for Amazon Linux 2 (al2/stand ard/5.0)	May 17, 2023
Changes to managed policies for CodeBuild	Details about updates to AWS managed politices for CodeBuild are now available . For more information, see CodeBuild updates to AWS managed policies.	May 16, 2023

Updated content: Docker images provided by CodeBuild	Remove support for Amazon Linux 2 (al2/stand ard/3.0) and add support for Amazon Linux 2 (al2/ standard/corretto8) and Amazon Linux 2 (al2/ standard/corretto11)	May 9, 2023
Updated content: Docker images provided by CodeBuild	Add support for Ubuntu 22.04 (ubuntu/st andard/7.0)	April 13, 2023
<u>Updated content: Docker</u> <u>images provided by CodeBuild</u>	Remove support for Ubuntu 18.04 (ubuntu/st andard/4.0) and Amazon Linux 2 (al2/aarch64/ standard/1.0)	March 31, 2023
Updated content: Remove VPC limitation	Removing the following limitation: If you configure CodeBuild to work with a VPC, local caching is not supported. Starting 02/28/22, your VPC build will take longer since a new Amazon EC2 instance will be used for each build.	March 1, 2023
<u>Updated content: Docker</u> <u>images provided by CodeBuild</u>	Remove support for Ubuntu 18.04 (ubuntu/ standard/3.0) and Amazon Linux 2 (al2/stand ard/2.0)	June 30, 2022

When CodeBuild credentials

information, see Amazon ECR

Amazon ECR Sample: Restrict

are used to pull an Amazon image access ECR image, you can restrict image access to a specific CodeBuild project. For more March 10, 2022

March 10, 2022

sample.

Added region support The ARM CONTAINER

compute type is now

supported in the following additional regions: Asia Pacific (Seoul), Canada (Central), Europe (London), and Europe

(Paris). For more informati on, see Build environment

compute types.

New VPC limitation If you configure CodeBuild

to work with a VPC, local caching is not supported. Starting 02/28/22, your VPC build will take longer since a new Amazon EC2 instance will be used for each build.

February 25, 2022

Batch report mode

CodeBuild now allows you to select how batch build statuses are sent to the source provider for a project. For more information, see Batch report mode.

October 4, 2021

New compute type

CodeBuild now supports a small ARM compute type. For more information, see Build environment compute types.

September 13, 2021

Pul	bl	lic	bui	ld	pro	jects
			-	. ~	P1 0	1000

CodeBuild now allows you to make the build results for your build projects available to the public without requiring access to an AWS account. For more information, see Public build projects.

August 11, 2021

Session debugging for batch builds

CodeBuild now supports session debugging for batch builds. For more information, see build-graph and build-list.

March 3, 2021

Project level concurrent build limit

CodeBuild now allows you to limit the number of concurren t builds for a build project. For more information, see Project configuration and concurren tBuildLimit.

February 16, 2021

New buildspec property: s3-prefix

CodeBuild now provides the s3-prefix buildspec property for artifacts that allows you to specify a path prefix for artifacts that are uploaded to Amazon S3. For more information, see s3-prefix.

February 9, 2021

New buildspec property: on-failure

CodeBuild now provides the on-failure buildspec property for build phases that allows you to determine what happens when a build phase fails. For more information, see on-failure.

February 9, 2021

New buildspec property: exclude-paths	CodeBuild now provides the exclude-paths buildspec property for artifacts that allows you to exclude paths from your build artifacts. For more information, see exclude-paths.	February 9, 2021
New buildspec property: enable-symlinks	CodeBuild now provides the enable-symlinks buildspec property for artifacts that allows you to preserve symbolic links in a ZIP artifact. For more information, see enable-sy mlinks.	February 9, 2021
Buildspec artifact name enhancement	CodeBuild now allows the artifacts/name property to contain path information. For more information, see name .	February 9, 2021
Code coverage reporting	CodeBuild now provides code coverage reports. For more information, see <u>Code coverage reports</u> .	July 30, 2020
Batch builds	CodeBuild now supports running concurrent and coordinated builds of a project. For more information,	July 30, 2020

see Batch builds in CodeBuild.

Windows Server 2019 image	CodeBuild now provides	July 20, 2020

a Windows Server Core
2019 build image. For more
information, see <u>Docker</u>
images provided by CodeBuild

lages provided by CodeB

Session Manager CodeBuild now allows you

to pause a running build and then use AWS Systems Manager Session Manager to connect to the build container and view the state of the container. For more informati on, see Session Manager. July 20, 2020

Updated topic CodeBuild now supports

specifying a shell to use in their build environments in the buildspec file. For more information, see <u>Build specification reference</u>.

June 25, 2020

Test reporting with test frameworks

Added several topics the describe how to generate CodeBuild test reports with several test frameworks. For more information, see <u>Test reporting with test framework</u> s.

May 29, 2020

Updated topics

CodeBuild now supports adding tags to report groups. For more information, see

ReportGroup.

May 21, 2020

Support for test reporting

CodeBuild support for test reporting is now generally

available.

May 21, 2020

Updated topics

CodeBuild now supports creating create webhook filters for Github and Bitbucket that trigger builds only when the head commit message matches the specified expression. For more information, see GitHub pull request and webhook filter sample and Bitbucket pull request and webhook filter sample.

May 6, 2020

New topics

CodeBuild now supports sharing build project and report group resources. For more information, see Working with shared projects and Working with shared report groups.

December 13, 2019

New and updated topics

CodeBuild now supports test reporting during the run of a build project. For more information, see Working with test reporting, Create a test report, and Create a test report using the AWS CLI sample.

November 25, 2019

Updated topic

CodeBuild now supports Linux
GPU and Arm environme
nt types, and the 2xlarge
compute type. For more
information, see <u>Build</u>
environment compute types.

November 19, 2019

Updated topics

CodeBuild now supports build numbers on all builds, exporting environment variables, and AWS Secrets Manager integration. For more information, see Exported variables and Secrets Manager in Buildspec syntax.

November 6, 2019

New topic

CodeBuild now supports notification rules. You can use notification rules to notify users of important changes in build projects. For more information, see Create a notification rule.

November 5, 2019

Updated topics

CodeBuild now supports the Android version 29 and Go version 1.13 runtimes. For more information, see <u>Docker images provided by CodeBuild</u> and <u>Buildspec syntax</u>.

September 10, 2019

Updated topics

When you create a project, you can now choose the Amazon Linux 2 (AL2) managed image. For more information, see Docker images provided by CodeBuild and Runtime versions in buildspec file sample for CodeBuild.

August 16, 2019

Updated topic

When you create a project, you can now choose to disable encryption of S3 logs and, if you use a Git-based source repository, include Git submodules. For more information, see Create a build project in CodeBuild.

March 8, 2019

New topic

CodeBuild now supports local caching. You can specify local caching in one or more of four modes when you create a build. For more informati on, see <u>Build caching in</u>
CodeBuild.

February 21, 2019

New topics

CodeBuild now supports webhook filter groups to specify events that trigger a build. For more information, see <u>Filter GitHub webhook</u> events and <u>Filter Bitbucket</u> webhook events.

February 8, 2019

New topic

The CodeBuild User Guide now shows how to use CodeBuild with a proxy server. For more information, see <u>Use</u> CodeBuild with a proxy server.

February 4, 2019

Updated topics

CodeBuild now supports using an Amazon ECR image that is in another AWS account. Several topics have been updated to reflect this change, including Amazon ECR sample for CodeBuild, Create a build project, and Create a CodeBuild service role.

January 24, 2019

Support for private Docker registries

CodeBuild now supports using a Docker image that is stored in a private registry as your runtime environme nt. For more information, see Private registry with AWS
Secrets Manager sample.

January 24, 2019

Updated topic

CodeBuild now supports using an access token to connect to GitHub (with a personal access token) and Bitbucket (with an app password) repositories. For more information, see Create a build project (console) and <a href="Use access tokens with your source provider.

December 6, 2018

Updated topic	CodeBuild now supports new build metrics that measure the duration of each phase in a build. For more information, see CodeBuild CloudWatch metrics.	November 15, 2018
VPC endpoint policy topic	Amazon VPC endpoints for CodeBuild now support policies. For more informati on, see <u>Create a VPC</u> endpoint policy for CodeBuild .	November 9, 2018
<u>Updated content</u>	Topics have been updated to reflect the new console experience.	October 30, 2018
Amazon EFS sample	CodeBuild can mount an Amazon EFS file system during a build using commands in a project's buildspec file. For more information, see Amazon EFS sample for CodeBuild.	October 26, 2018
Bitbucket webhooks	CodeBuild now supports webhooks when you use Bitbucket for your repositor y. For more information, see Bitbucket pull request sample for CodeBuild.	October 2, 2018

S3 logs

CodeBuild now supports build logs in an S3 bucket. Previousl y, you could only build logs using CloudWatch Logs. For more information, see Create project.

September 17, 2018

Multiple inpout sources and multiple output artifacts

CodeBuild now supports projects that use more than one input source and publish more than one set of artifacts . For more information, see Multiple input sources and input artifacts sample and CodePipeline integration with CodeBuild and multiple input sources and output artifacts sample.

August 30, 2018

Semantic versioning sample

The CodeBuild User Guide now has a use case-base d sample that demonstra tes how to use semantic versioning to create artifact names at build time. For more information, see <u>Use semantic versioning to name build artifacts sample</u>.

August 14, 2018

New static website sample

The CodeBuild User Guide now has a use case-based sample that demonstrates how to host build output in an S3 bucket. The sample takes advantage of the recent support of unencrypted build artifacts. For more informati on, see Create a static website with build output hosted in an S3 bucket.

August 14, 2018

Support for overriding an artifact name with semantic versioning

You can now use semantic versioning to specify a format that CodeBuild uses to name build artifacts. This is useful because a build artifact with a hard-coded name overwrite s previous build artifacts that use the same hard-code d name. For example, if a build is triggered multiple times a day, you can now add a timestamp to its artifact name. Each build artifact name is unique and does not overwrite the artifacts of previous builds.

August 7, 2018

Support of unencrypted build artifacts

CodeBuild now supports builds with unencrypted build artifacts. For more informati on, see Create a build project (console).

July 26, 2018

Support for Amazon
CloudWatch metrics and
alarms

CodeBuild now provides integration with CloudWatch metrics and alarms. You can use the CodeBuild or CloudWatch console to monitor builds at the project and account level. For more information, see Monitoring builds.

July 19, 2018

Support for reporting a build's status

CodeBuild can now report the status of a build's start and completion to your source provider. For more informati on, see <u>Create a build project in CodeBuild</u>.

July 10, 2018

Environment variables added to CodeBuild documentation

The Environment variables in build environments page was updated with the CODEBUILD _BUILD_ID, CODEBUILD _LOG_PATH, and CODEBUILD _START_TIME environment variables.

July 9, 2018

Support for a finally block in the buildspec file

The CodeBuild documenta tion was updated with details about the optional finally block in a buildspec file. Commands in the finally block always run after the commands in its corresponding commands block. For more information, see Buildspec syntax.

June 20, 2018

CodeBuild agent update	The CodeBuild documenta
notifications	tion was updated with details
	about how you can use
	Amazon SNS to be notified
	when new versions of the
	CodeBuild agent are released.
	For more information, see
	Receive notifications for
	new AWS CodeBuild agent

versions.

June 15, 2018

Earlier updates

The following table describes important changes in each release of the AWS CodeBuild User Guide before June 2018.

Change	Description	Date
Support for Windows builds	CodeBuild now supports builds for the Microsoft Windows Server platform, including a prepackaged build environment for the .NET Core 2.0 on Windows. For more information, see Run Microsoft Windows samples for CodeBuild .	May 25, 2018
Support for build idempoten cy	When you run the start- build command with the AWS Command Line Interface (AWS CLI), you can specify that the build is idempoten t. For more information, see Run a build (AWS CLI).	May 15, 2018

Change	Description	Date
Support for overriding more build project settings	You can now override more build project settings when you create a build. The overrides are only for that build. For more informati on, see Run AWS CodeBuild builds manually.	May 15, 2018
VPC Endpoint support	You can now use VPC endpoints to improve the security of your builds. For more information, see <u>Use VPC endpoints</u> .	March 18, 2018
Support of triggers	You can now create triggers to schedule builds at regular frequencies. For more information, see <u>Create AWS</u> <u>CodeBuild triggers</u> .	March 28, 2018
FIPS endpoints documenta tion	You can now learn about how to use the AWS Command Line Interface (AWS CLI) or an AWS SDK to tell CodeBuild to use one of four Federal Information Processing Standards (FIPS) endpoints . For more information, see Specify the AWS CodeBuild endpoint .	March 28, 2018

Change	Description	Date
AWS CodeBuild available in Asia Pacific (Mumbai), Europe (Paris), and South America (São Paulo)	AWS CodeBuild is now available in the Asia Pacific (Mumbai), Europe (Paris), and South America (São Paulo) regions. For more informati on, see AWS CodeBuild in the Amazon Web Services General Reference.	March 28, 2018
GitHub Enterprise Server support	CodeBuild can now build from source code stored in a GitHub Enterprise Server repository. For more informati on, see Run the GitHub Enterprise Server sample.	January, 25, 2018
Git clone depth support	CodeBuild now supports the creation of a shallow clone with a history truncated to the specified number of commits. For more informati on, see Create a build project .	January, 25, 2018
VPC support	VPC-enabled builds are now able to access resources inside your VPC. For more informati on, see VPC support .	November, 27, 2017
Dependency caching support	CodeBuild now supports the dependency caching. This allows CodeBuild to save certain reusable pieces of the build environment in the cache and use this across builds.	November, 27, 2017

Change	Description	Date
Build badges support	CodeBuild now supports the use of build badges, which provide an embeddable, dynamically generated image (badge) that displays the status of the latest build for a project. For more information, see <u>Build badges sample</u> .	November 27, 2017
AWS Config integration	AWS Config now supports CodeBuild as an AWS resource, which means the service can track your CodeBuild projects. For more information about AWS Config, see <u>AWS Config</u> sample.	October 20, 2017
Automatically rebuild updated source code in GitHub repositories	If your source code is stored in a GitHub repository, you can enable AWS CodeBuild to rebuild your source code whenever a code change is pushed to the repository. For more information, see Run the GitHub pull request and webhook filter sample.	September 21, 2017

Change	Description	Date
New ways for storing and retrieving sensitive or large environment variables in Amazon EC2 Systems Manager Parameter Store	You can now use the AWS CodeBuild console or the AWS CLI to retrieve sensitive or large environment variables stored in Amazon EC2 Systems Manager Parameter Store. You can also now use the AWS CodeBuild console to store these types of environment variables in Amazon EC2 Systems Manager Parameter Store. Previously, you could only retrieve these types of environment variables by including them in a buildspec or by running build commands to automate the AWS CLI. You could only store these types of environme nt variables by using the Amazon EC2 Systems Manager Parameter Store console. For more informati on, see Create a build project, Change build project settings , and Run builds manually.	September 14, 2017
Build deletion support	You can now delete builds in AWS CodeBuild. For more information, see <u>Delete builds</u> .	August 31, 2017

Change	Description	Date
Updated way to retrieve sensitive or large environme nt variables stored in Amazon EC2 Systems Manager Parameter Store by using a buildspec	AWS CodeBuild now makes it easier to use a buildspec to retrieve sensitive or large environment variables stored in Amazon EC2 Systems Manager Parameter Store. Previously, you could only retrieve these types of environment variables by running build commands to automate the AWS CLI. For more information, see the parameter-store mapping in Buildspec syntax.	August 10, 2017
AWS CodeBuild supports Bitbucket	CodeBuild can now build from source code stored in a Bitbucket repository. For more information, see Create a build project and Run builds manually.	August 10, 2017
AWS CodeBuild available in US West (N. California), Europe (London), and Canada (Central)	AWS CodeBuild is now available in the US West (N. California), Europe (London), and Canada (Central) regions. For more information, see AWS CodeBuild in the Amazon Web Services General Reference.	June 29, 2017

Change	Description	Date
Alternate buildspec file names and locations supported	You can now specify an alternate file name or location of a buildspec file to use for a build project, instead of a default buildspec file named buildspec.yml at the root of the source code. For more information, see Buildspec file name and storage location.	June 27, 2017
Updated build notifications sample	CodeBuild now provides built-in support for build notifications through Amazon CloudWatch Events and Amazon Simple Notification Service (Amazon SNS). The previous Build notifications sample has been updated to demonstrate this new behavior.	June 22, 2017
Docker in custom image sample added	A sample showing how to use CodeBuild and a custom Docker build image to build and run a Docker image has been added. For more information, see the <u>Docker in custom image sample</u> .	June 7, 2017

Change	Description	Date
Fetch source code for GitHub pull requests	When you run a build with CodeBuild that relies on source code stored in a GitHub repository, you can now specify a GitHub pull request ID to build. You can also specify a commit ID, a branch name, or a tag name instead. For more informati on, see the Source version value in Run a build (console) or the sourceVersion value in Run a build (AWS CLI).	June 6, 2017
Build specification version updated	A new version of the buildspec format has been released. Version 0.2 addresses the issue of CodeBuild running each build command in a separate instance of the default shell. Also in version 0.2, environment_variab les is renamed to env, and plaintext is renamed to variables . For more information, see <u>Build</u> specification reference for CodeBuild .	May 9, 2017

Change	Description	Date
Dockerfiles for build images available in GitHub	Definitions for many of the build images provided by AWS CodeBuild are available as Dockerfiles in GitHub. For more information, see the Definition column of the table in Docker images provided by CodeBuild .	May 2, 2017
AWS CodeBuild available in Europe (Frankfurt), Asia Pacific (Singapore), Asia Pacific (Sydney), and Asia Pacific (Tokyo)	AWS CodeBuild is now available in the Europe (Frankfurt), Asia Pacific (Singapore), Asia Pacific (Sydney), and Asia Pacific (Tokyo) regions. For more information, see <u>AWS</u> <u>CodeBuild</u> in the Amazon Web Services General Reference.	March 21, 2017
CodePipeline test action support for CodeBuild	You can now add to a pipeline in CodePipeline a test action that uses CodeBuild. For more information, see Add a CodeBuild test action to a pipeline (CodePipeline console).	March 8, 2017

Change	Description	Date
Buildspec files support fetching build output from within selected top-level directories	Buildspec files now enable you to specify individual top-level directories whose contents you can instruct CodeBuild to include in build output artifacts. You do this by using the base-dire ctory mapping. For more information, see Buildspec Syntax .	February 8, 2017
Built-in environment variables	AWS CodeBuild provides additional built-in environme nt variables for your builds to use. These include environme nt variables describing the entity that started the build, the URL to the source code repository, the source code's version ID, and more. For more information, see Environment variables in build environments.	January 30, 2017
AWS CodeBuild available in US East (Ohio)	AWS CodeBuild is now available in the US East (Ohio) region. For more informati on, see <u>AWS CodeBuild</u> in the <i>Amazon Web Services General Reference</i> .	January 19, 2017

Change	Description	Date
Shell and command behaviors information	CodeBuild runs each command you specify in a separate instance of a build environment's default shell. This default behavior can produce some unexpecte d side effects for your commands. We recommend some approaches to work around this default behavior if needed. For more informati on, see Shells and commands in build environments.	December 9, 2016
Environment variables information	CodeBuild provides several environment variables that you can use in your build commands. You can also define your own environment variables. For more informati on, see Environment variables in build environments .	December 7, 2016
Troubleshooting topic	Troubleshooting informati on is now available. For more information, see <u>Troublesh</u> ooting AWS CodeBuild.	December 5, 2016
Jenkins plugin initial release	This is the initial release of the CodeBuild Jenkins plugin. For more information, see <u>Use AWS CodeBuild with Jenkins</u> .	December 5, 2016
User Guide initial release	This is the initial release of the CodeBuild User Guide.	December 1, 2016