aws

Hands-on tutorials

Migrate an ASP.NET Web Application to Elastic Beanstalk

Migrate an ASP.NET Web Application to Elastic Beanstalk: Hands-on tutorials

Table of Contents

Migrate an ASP.NET Web Application to Elastic Beanstalk

AWS experience	Intermediate
Time to complete	15 minutes
Cost to complete	Running this tutorial for an hour with two t3.medium instances in the US East (N. Virginia) Region (us-east-1) will cost $0.12 total (on demand). One day will cost $2.88; one month will cost about $84.40.
Requires	AWS account with IAM permissions to create an EC2 instance, key pair, security group, IAM user, and an Elastic Beanstalk environment. **Note** Accounts created within the past 24 hours might not yet have access to the services required for this tutorial.
Last updated	March 30, 2023

Overview

The purpose of this tutorial is to migrate a sample ASP.NET web application to a fully managed AWS Elastic Beanstalk environment using the interactive Windows Web Application Migration Assistant (WWAMA). Additional information about the Windows Web Application Migration Assistant is available here.

What you'll accomplish

- In this tutorial, you will migrate a sample ASP.NET web application to a fully managed AWS Elastic Beanstalk environment.

Prerequisites

You will need an AWS account and IAM permissions to create an EC2 instance, key pair, security group, IAM user, and an Elastic Beanstalk environment. This tutorial will deploy an AWS CloudFormation template that automatically provisions the sample website on an EC2 instance that will be the source web application for the migration.

Implementation

Step 1: Sign up for AWS

- The CloudFormation template used in this tutorial launches a t3.medium EC2 instance, which is **not** included in the Free Tier. You can estimate EC2 costs on the EC2 pricing page.

  Already have an account? Sign in.

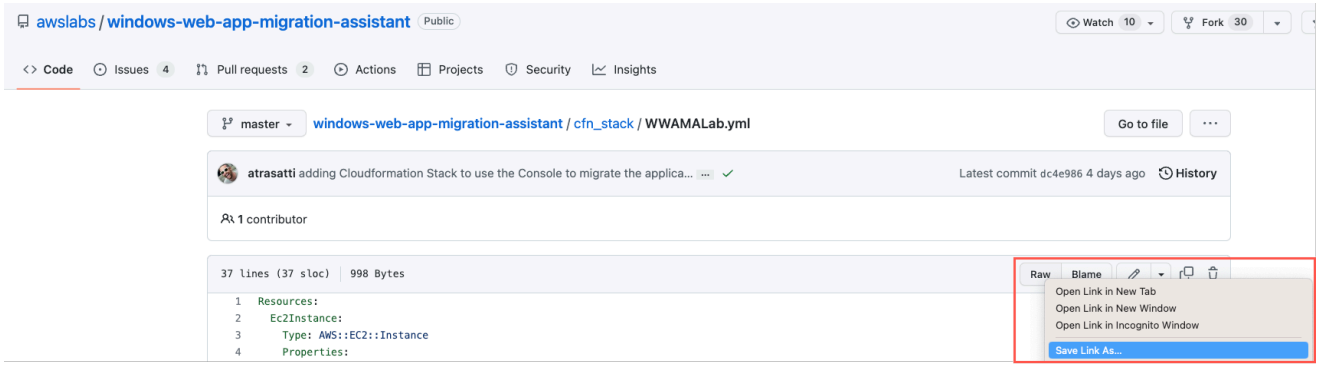
Step 2: Set up and configure the stack

- Use CloudFormation to launch the EC2 instance that will host the sample website. Then, set up the required IAM permissions.

  a. Launch an EC2 instance

  Use CloudFormation to launch an EC2 instance in the US-East-1 Region.

  First, you will need to download the YAML file we will use for the CloudFormation template from GitHub. In GitHub, open the context (right-click) menu of the **Raw** button at the top of the file, select **Save Link As**. Choose the location on your computer where you want to save the file, and select **Save**.

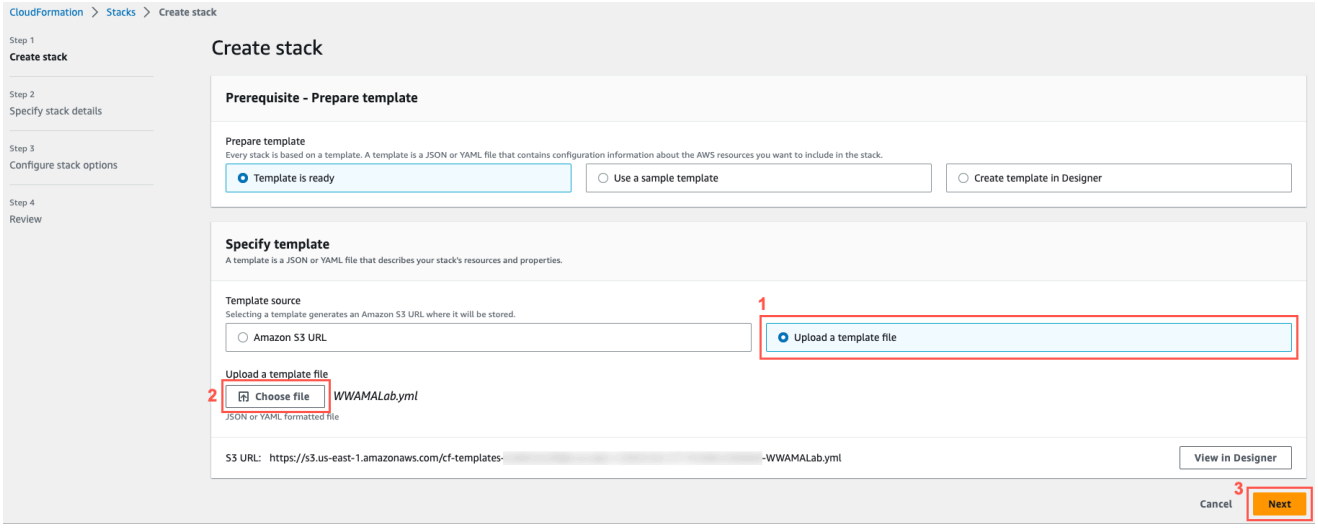


  b. Create the stack

Once you have saved the file locally, open the Create stack page within the AWS CloudFormation console. In the **Specify template** section, select **Upload a template file**.

Choose the **Choose file** button and navigate to the YAML file on your local machine and select **Open**.

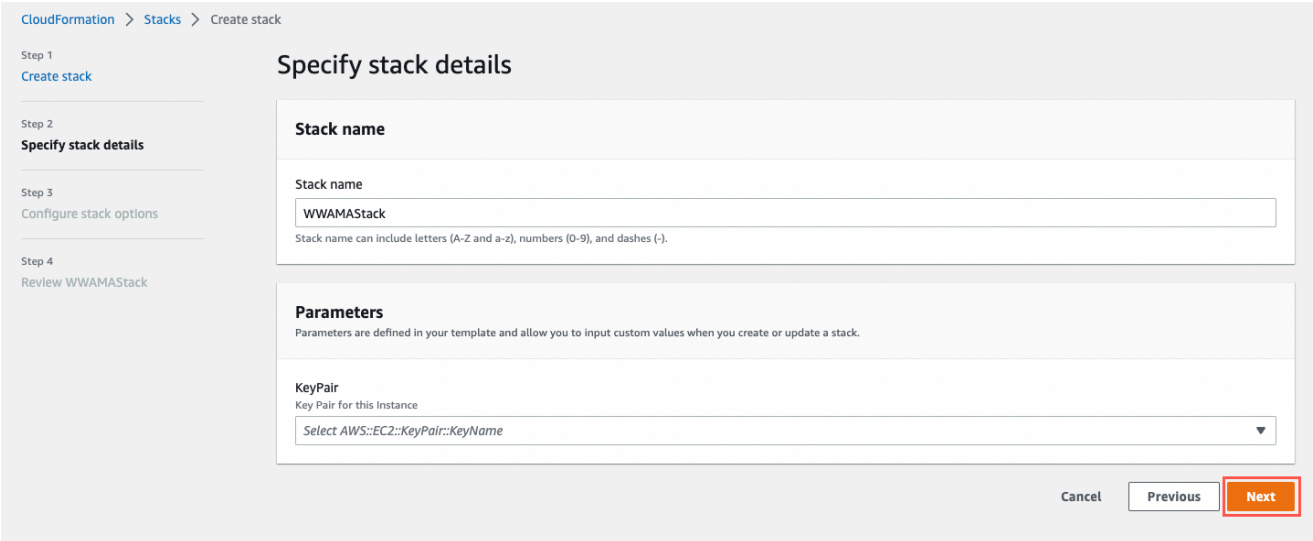
Then choose **Next**.



c. Add a key pair

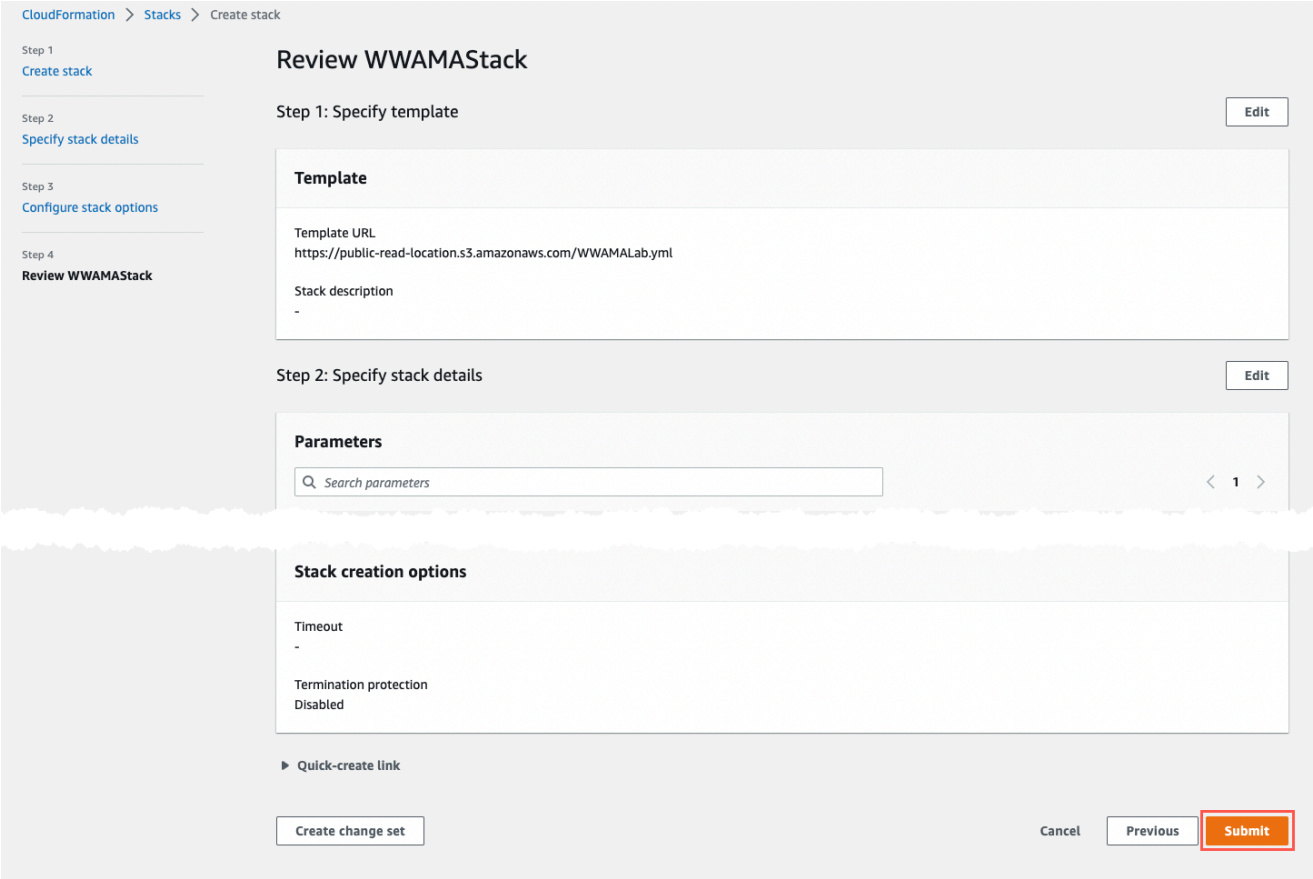
Select an existing key pair or create a key pair if you do not have one.

Then choose **Next**.



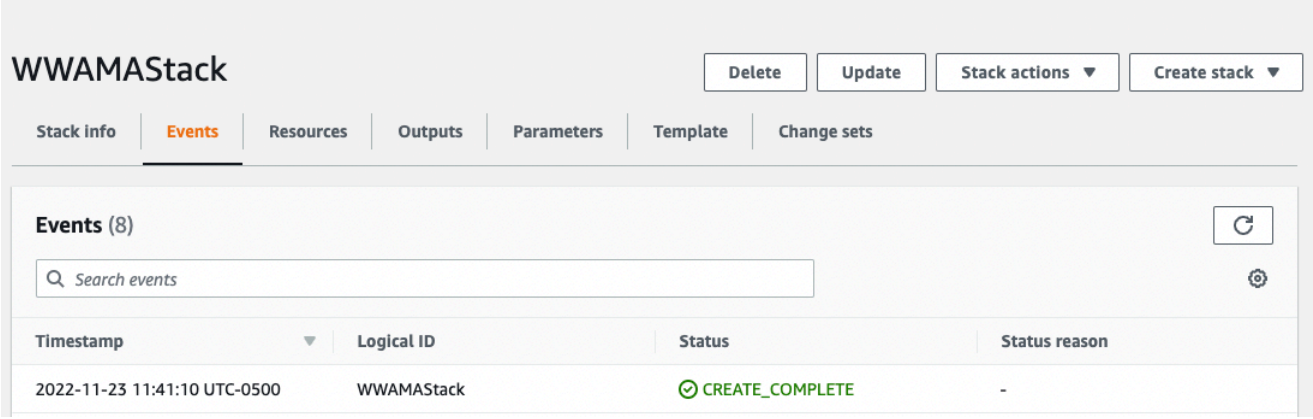
d. Review the configuration

On the **Configure stack** options screen, choose **Next**. At the bottom of the **Review** screen, choose **Submit**.



e. Verify completion

Once the stack has been created, you will see its status change to **CREATE_COMPLETE**.



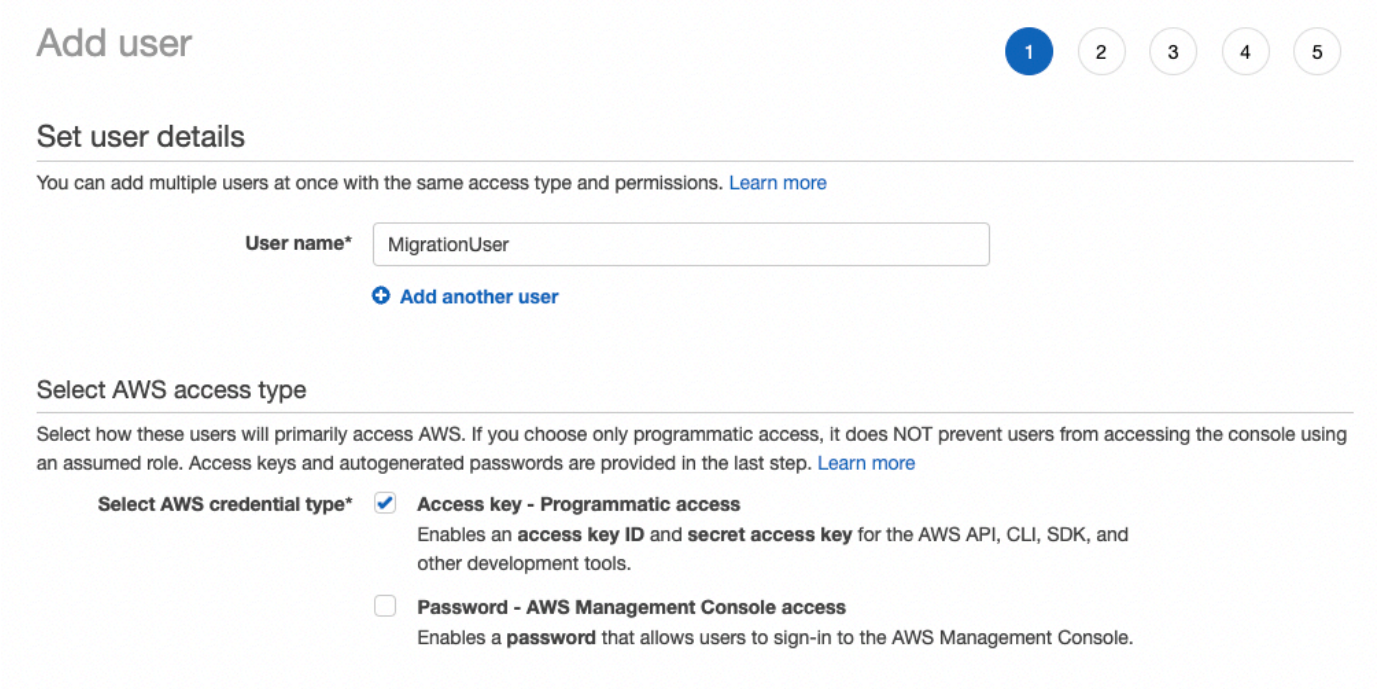
Step 3: Create the IAM user

1. Log into the console and add a user

   Log in to the IAM console.

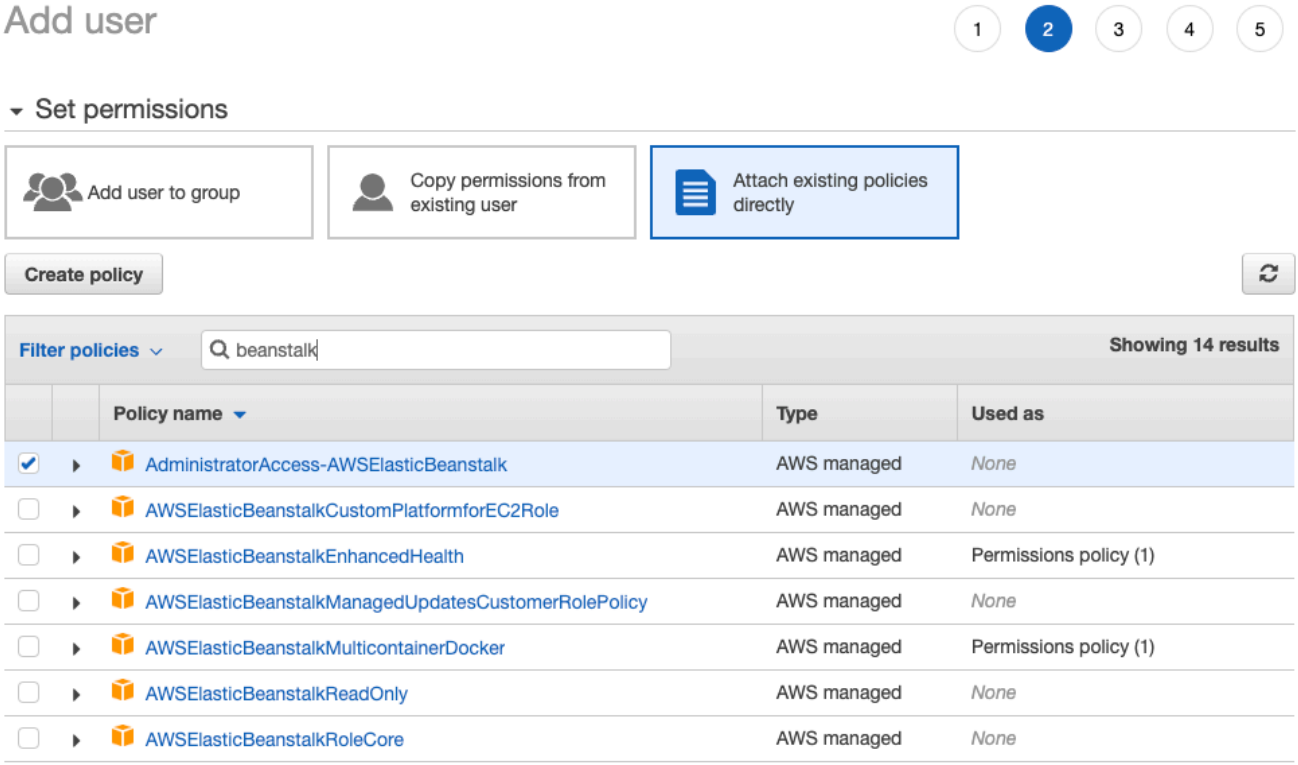
   In the left navigation pane, select **Users**, then choose **Add users**.

   Enter the **User name MigrationUser**, check the box for **Programmatic access**, then choose **Next:Permissions**.



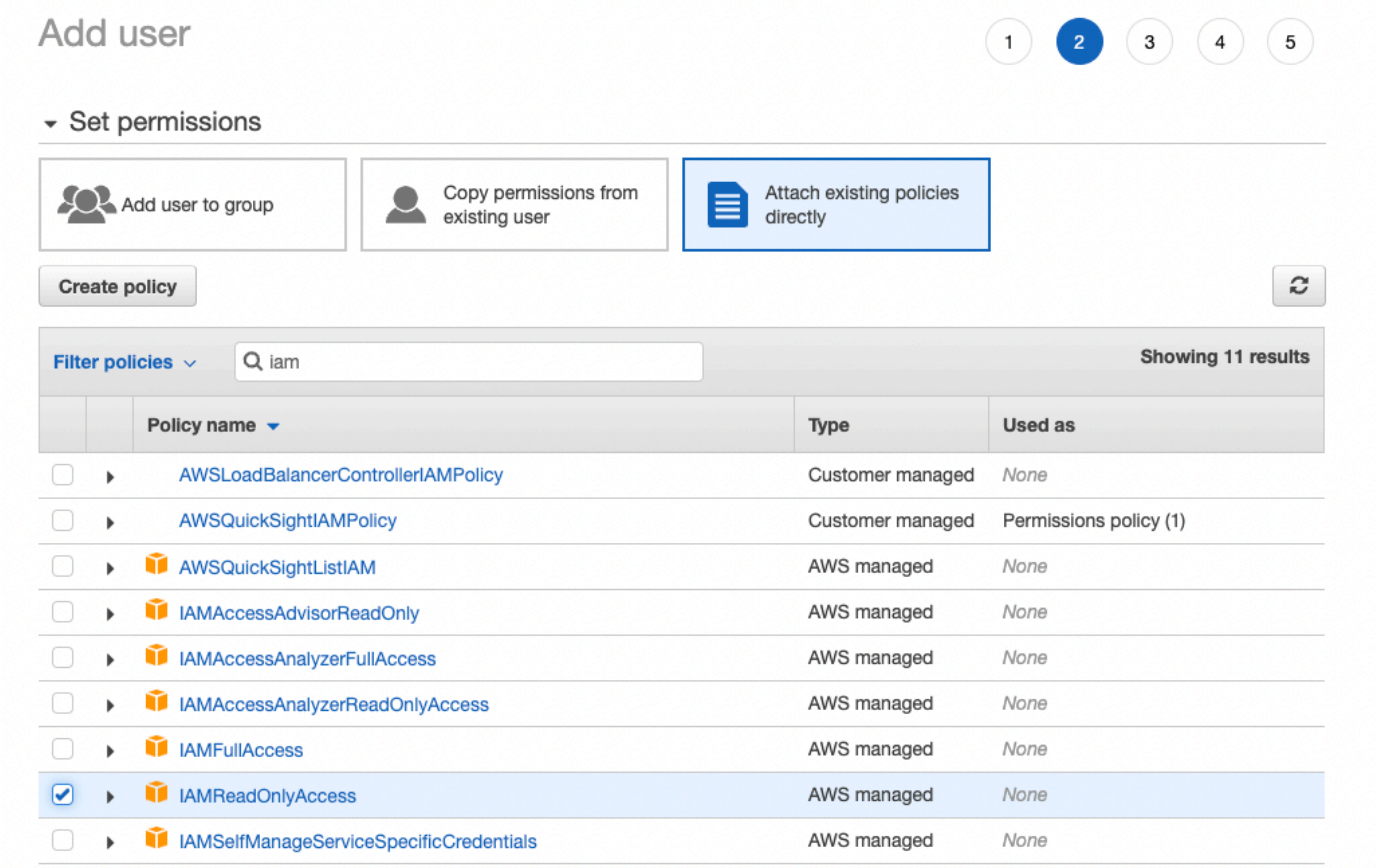
2. Attach Elastic Beanstalk policy

   Select **Attach existing policies directly**, and enter **beanstalk** in the search bar to filter the policies. Select the **checkbox** next to **AdministratorAccess-AWSElasticBeanstalk**.



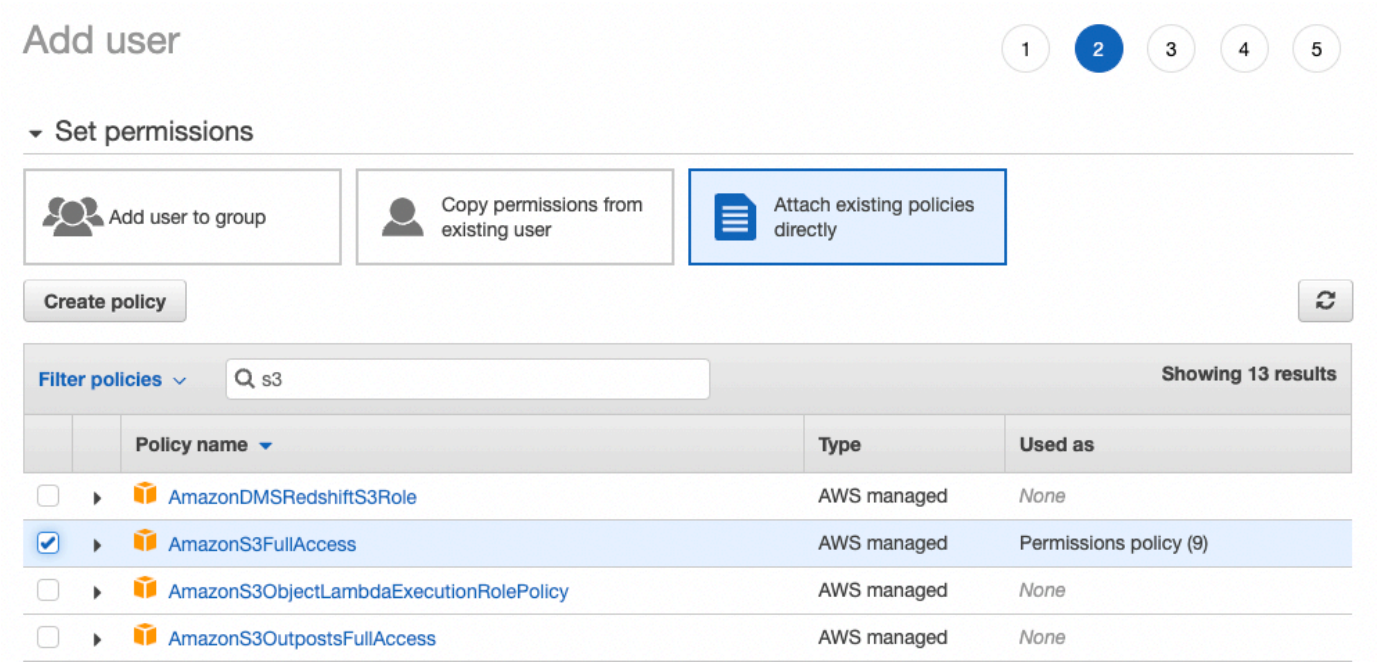
3. Attach IAM policy

   Enter **iam** in the search bar and select the **checkbox** next to **IAMReadOnlyAccess**.



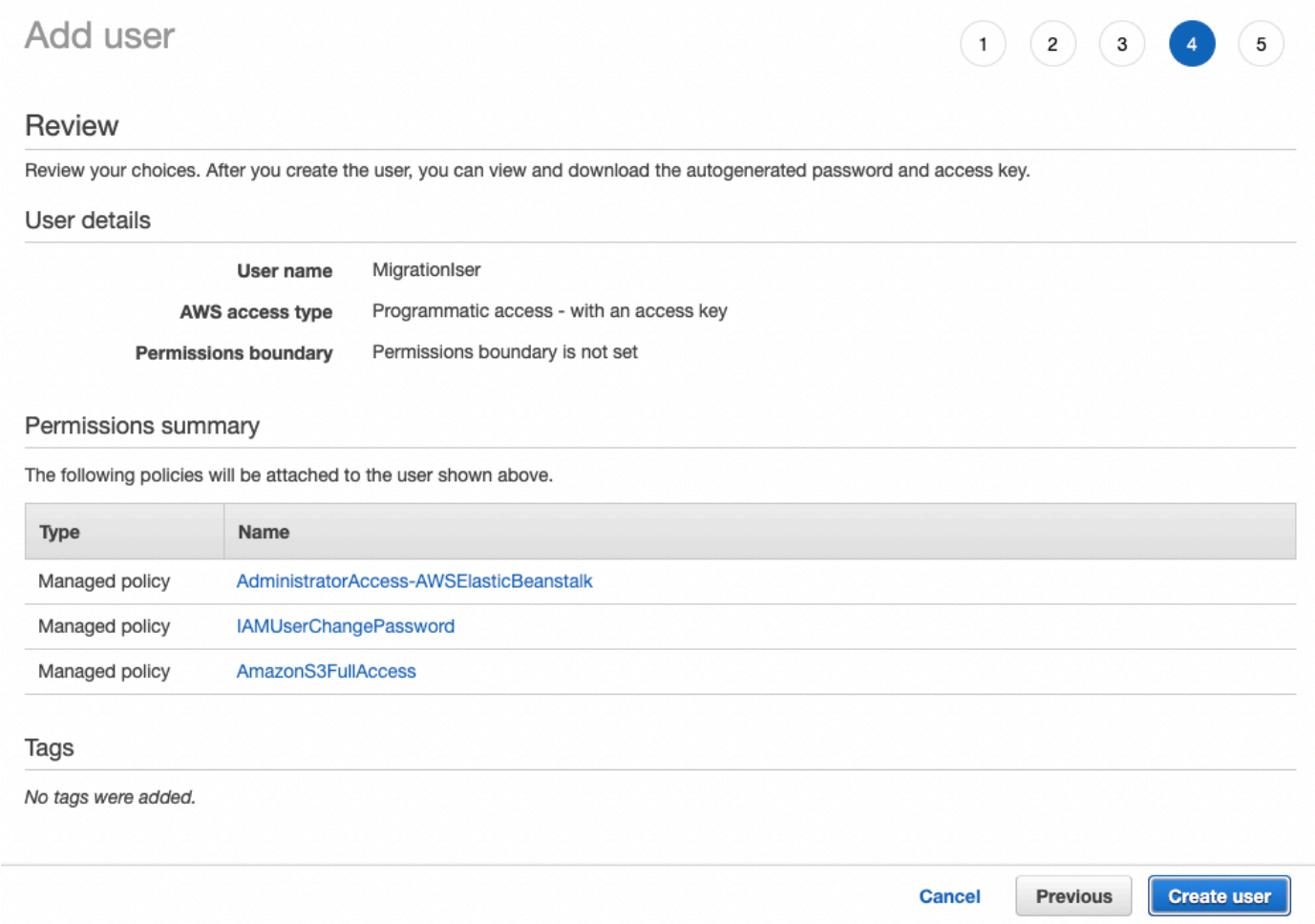
4. Attach S3 policy

   Enter **s3** in the search bar and select the **checkbox** next to **AmazonS3FullAccess**.



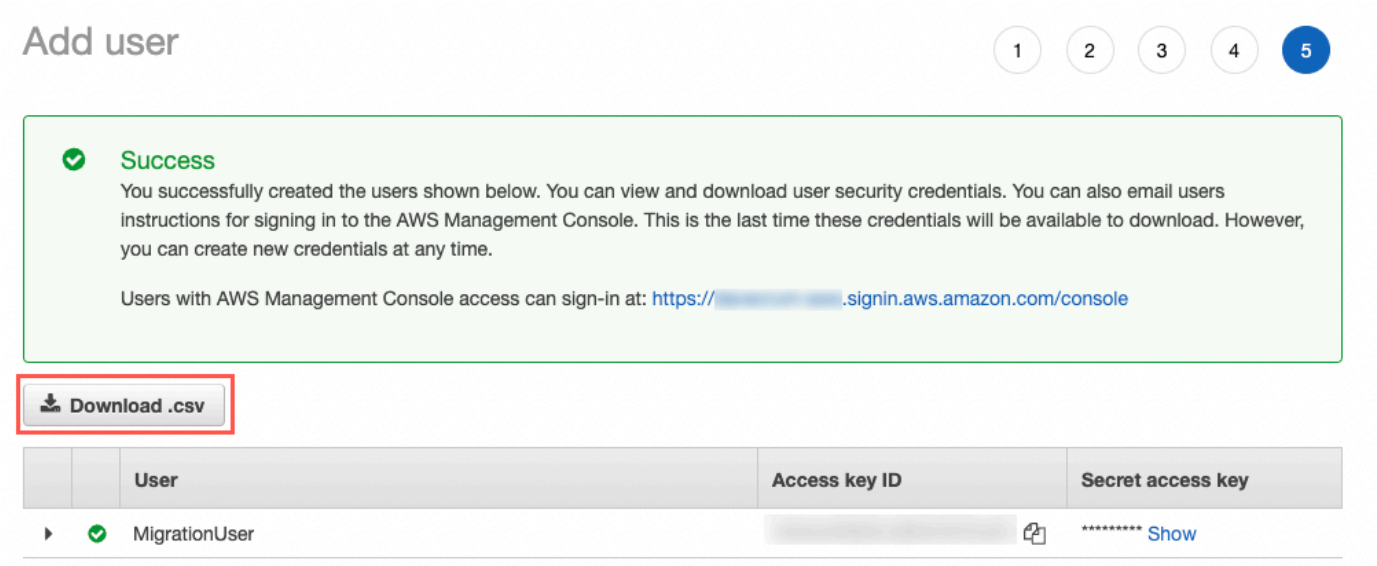
5. Review configuration and create user

   Choose **Next:Tags**, then **Next:Review**, and then **Create user**.



6. Download credentials

   After the user is created, choose the **Download .csv** button when the prompt appears.

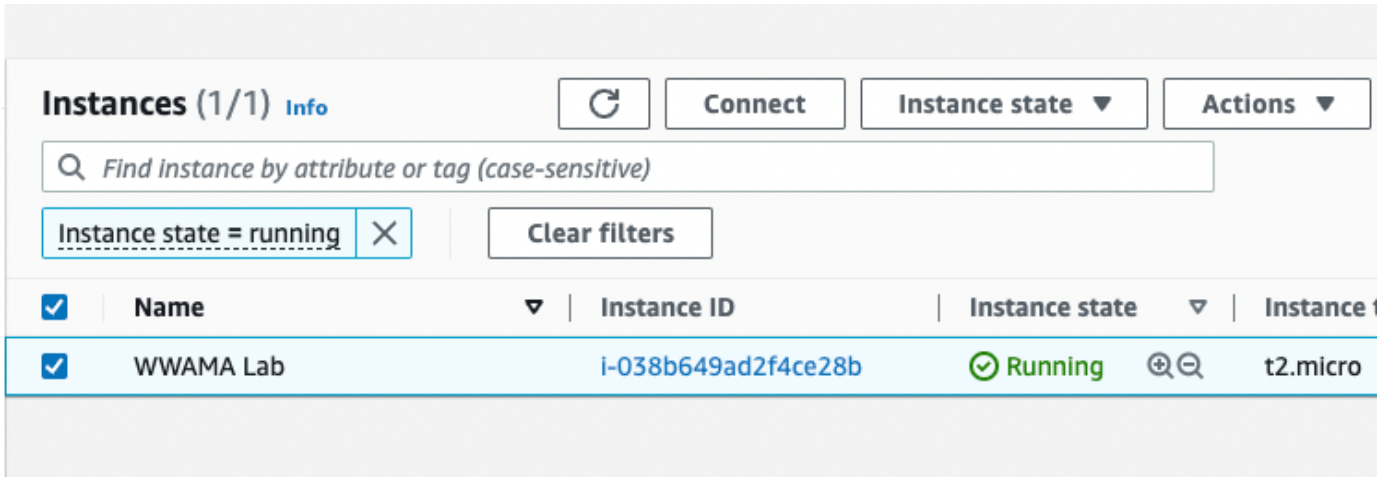


Step 4: Log in to the EC2 console and set up to run the WWAMA tool

1. Log into the EC2 console

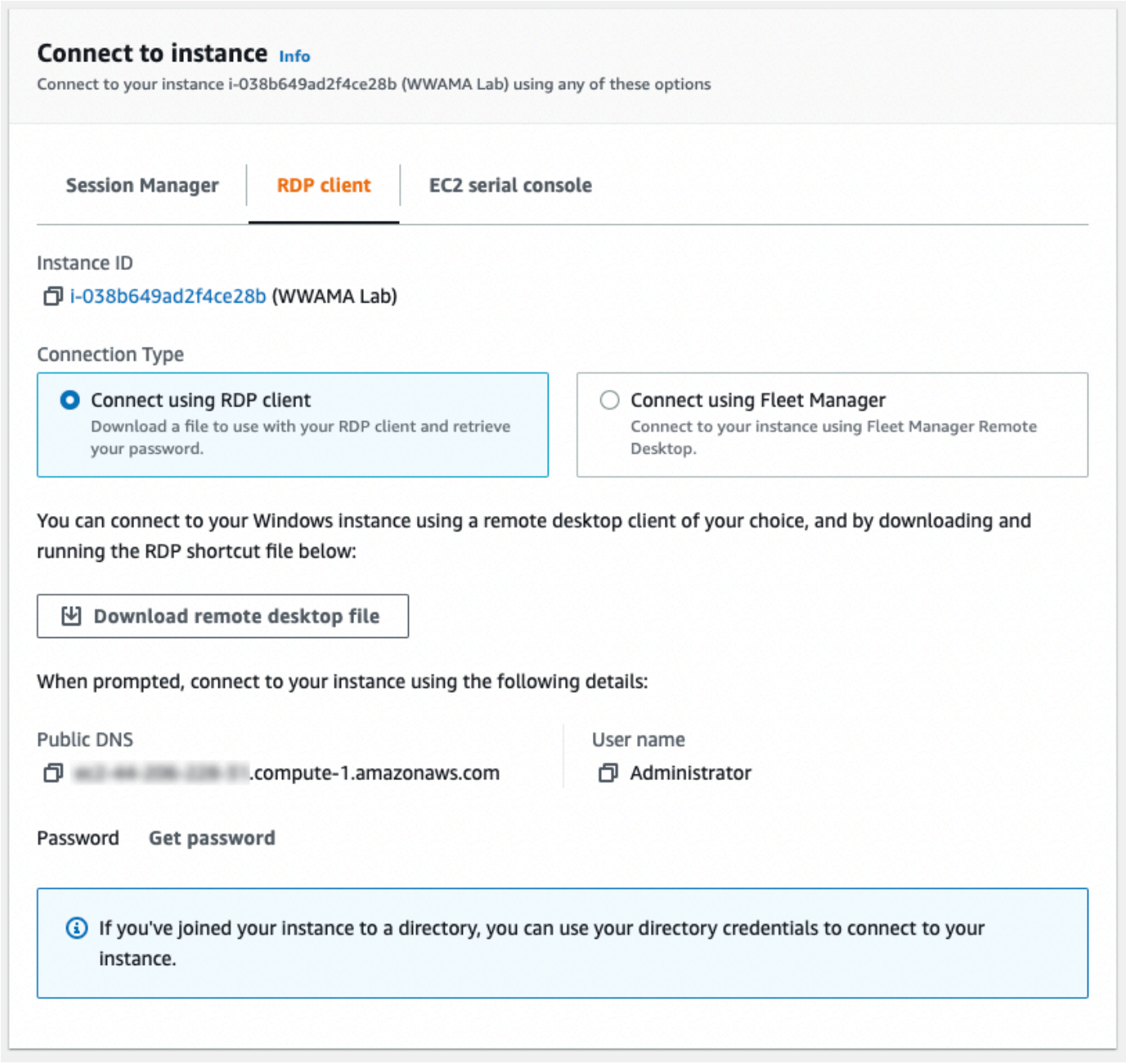
   Log in to EC2 console.

   Select the WWAMA instance and choose **Connect**.



2. Connect to the instance

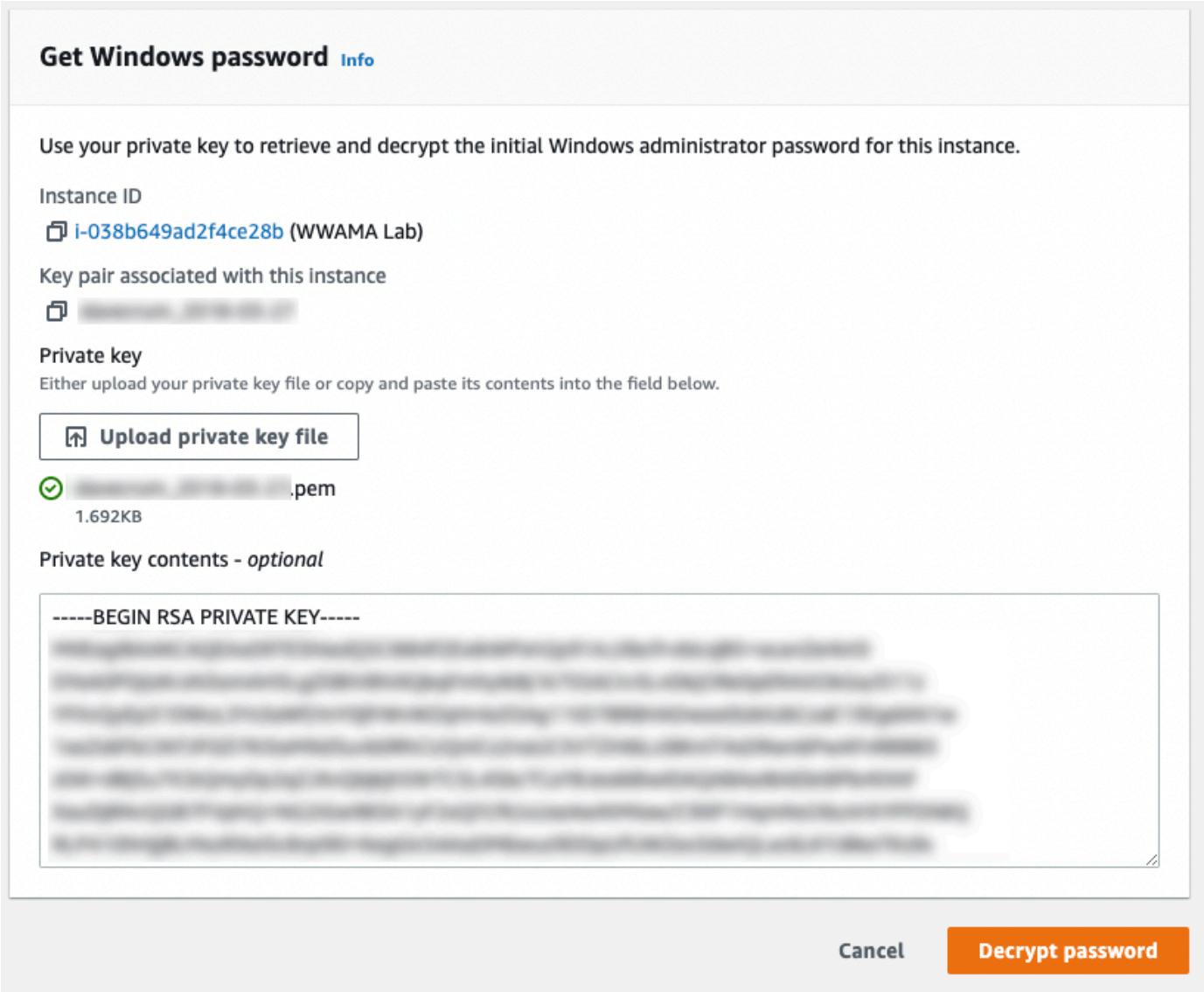
   Select the **RDP client** tab, then choose the **Download remote desktop file** button and save the RDP file. Then choose **Get password**.



3. Upload private key

   Choose **Upload private key file** to upload your private key, then choose **Decrypt password** to get your Windows Server password. You will see the password in plain text.

   Copy it because you will need it in the next step.

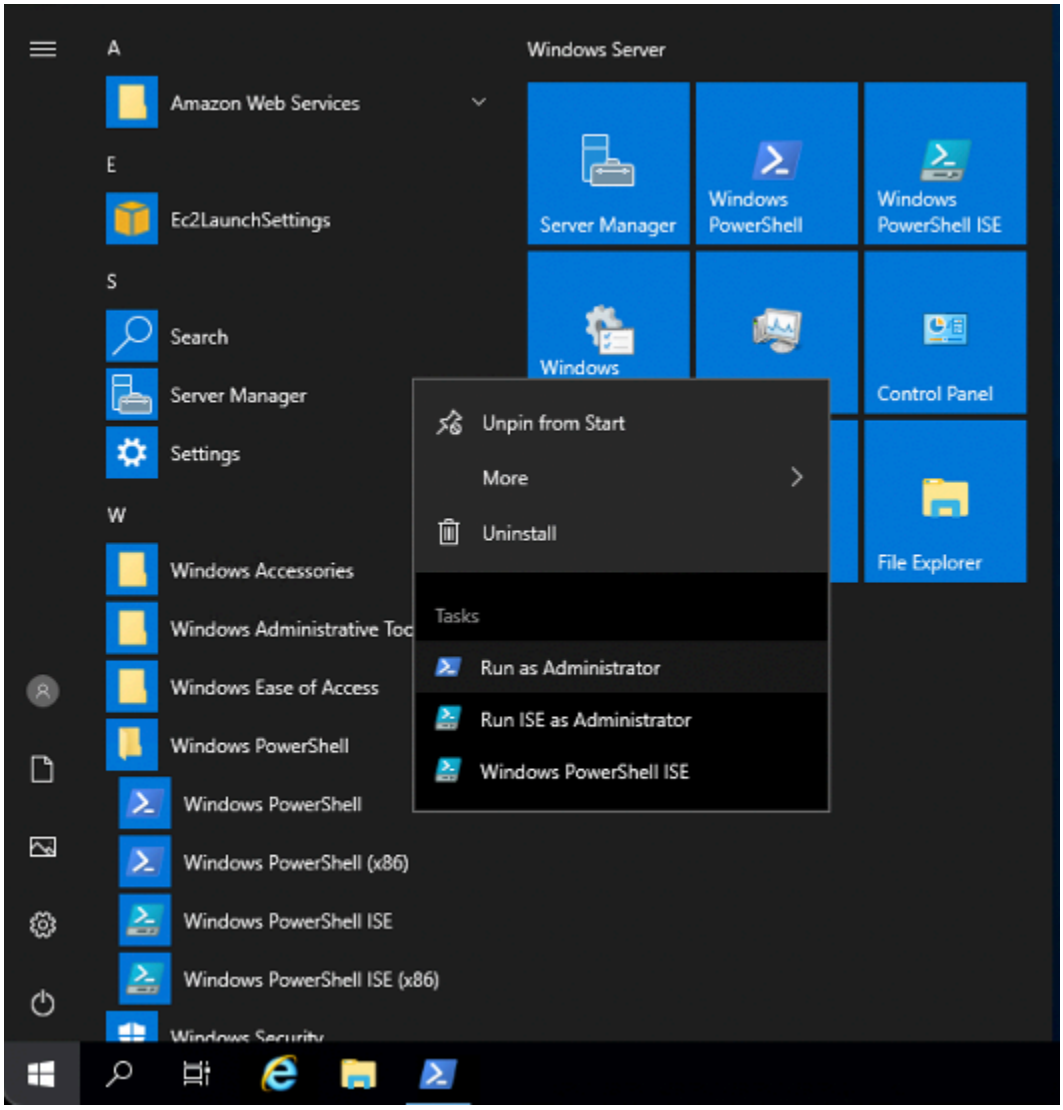


4. Log into the instance

   Log in to the EC2 instance using the RDP file you saved earlier and provide your password.

5. Open a PowerShell terminal

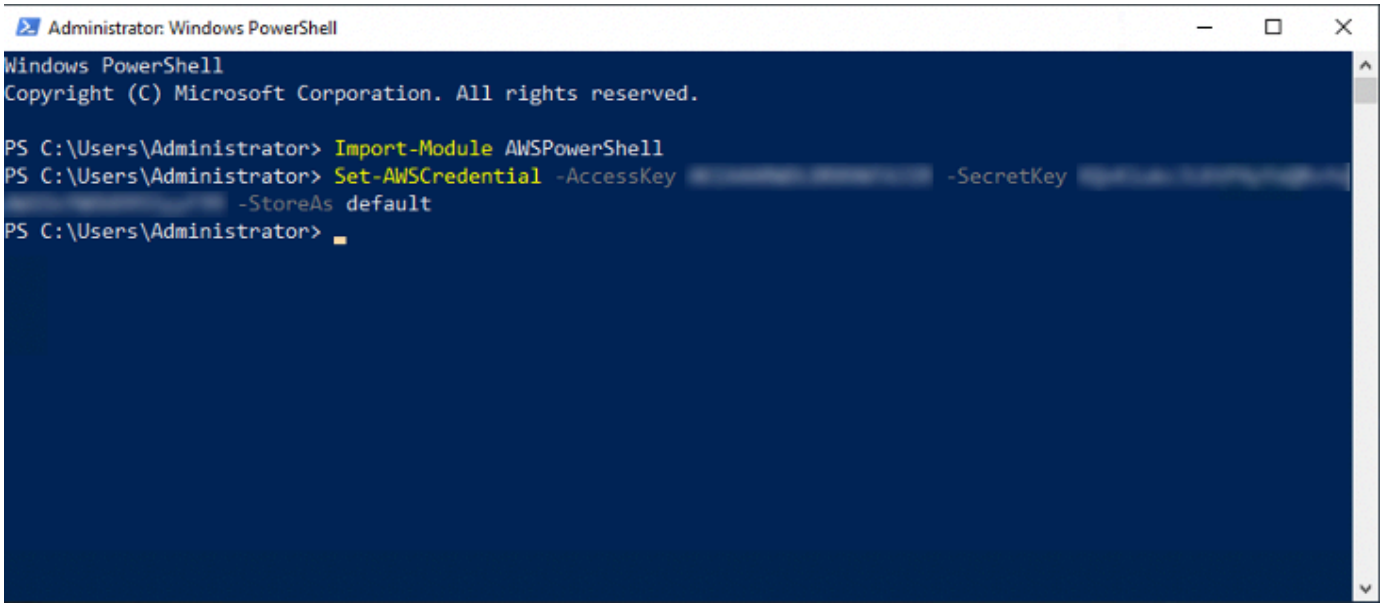
   Open a PowerShell terminal as an Administrator by choosing the Windows icon in the lower left corner of the screen, open the **Windows PowerShell** folder, open the context (right-click) menu for **Windows PowerShell**, and then choose **Run as Administrator**.



6. Configure credentials

   In the PowerShell window, run the commands provided in the PowerShell sample to configure the AWS credentials. Replace **ACCESS_KEY** and **SECRET_ACCESS_KEY** with the values in the CSV file you downloaded earlier during the creation of the **MigrationUser**.

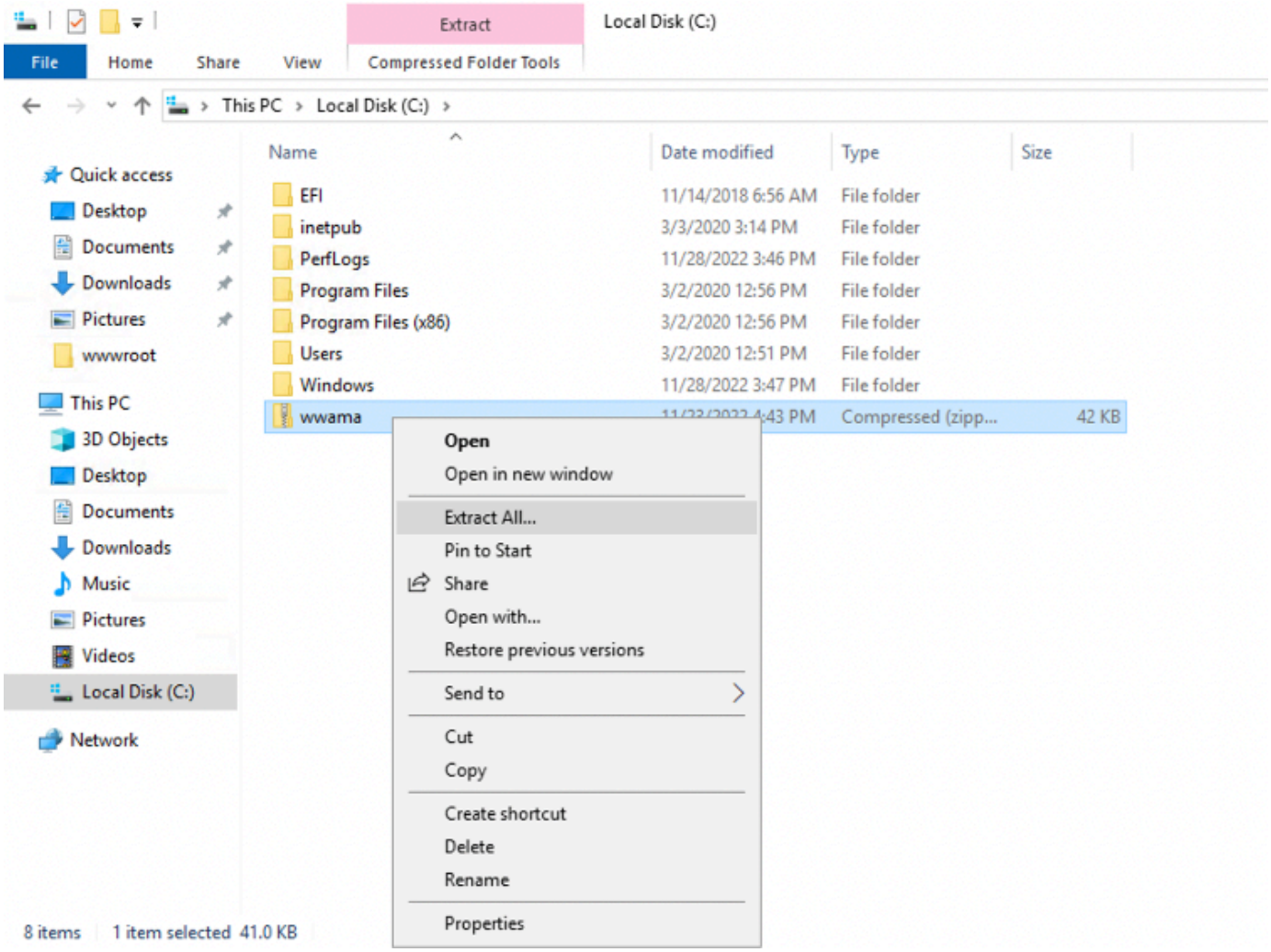
```
PS C:\> Import-Module AWSPowerShell
PS C:\> Set-AWSCredential -AccessKey ACCESS_KEY -SecretKey SECRET_ACCESS_KEY -
StoreAs default
```



7. Extract Migration Assistant files

   The migration assistant has been pre-downloaded on the C:\ drive by the CloudFormation template. The file is **wwama.zip**.

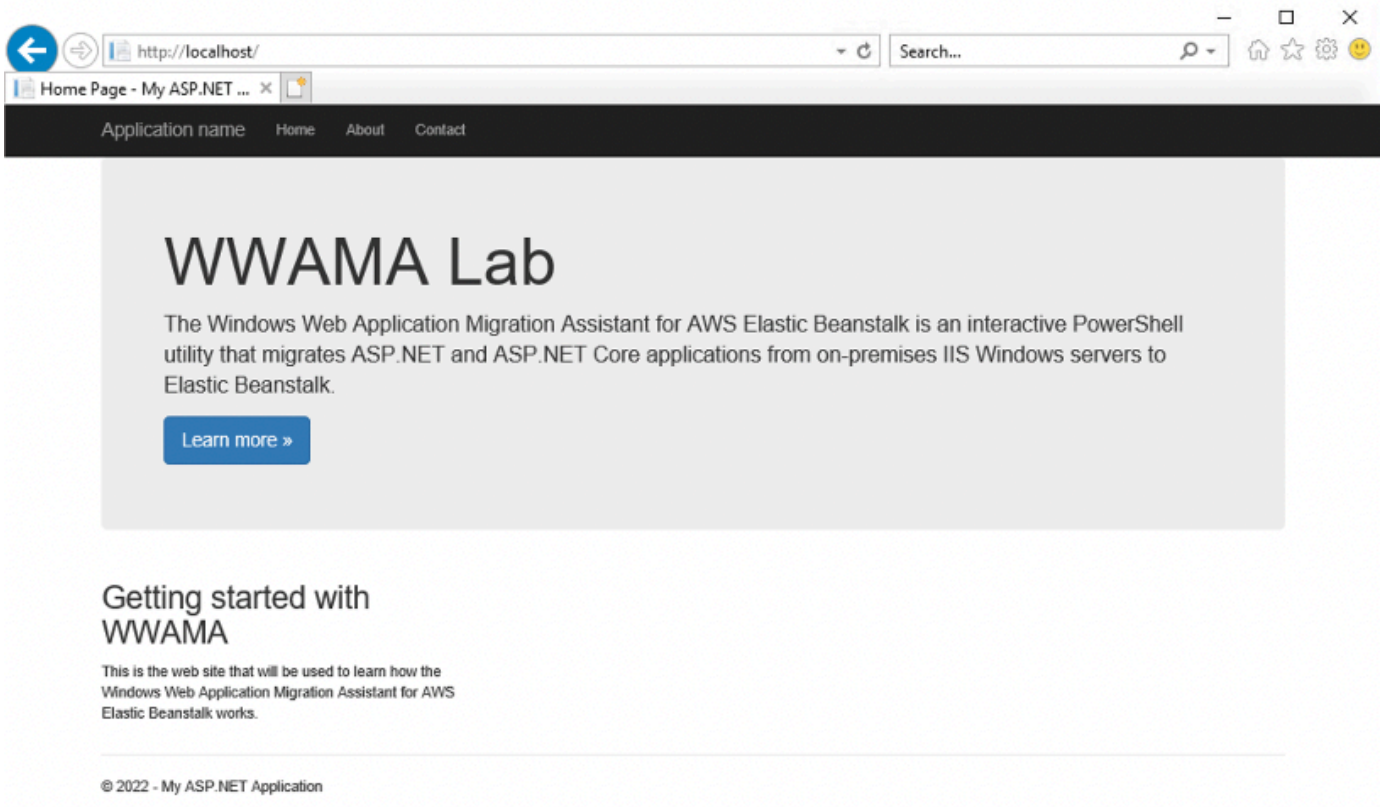
   Open the context (right-click) menu for the wwama.zip file and extract the archive.



8. View the sample website

   Open a web browser on the EC2 Windows Server instance and navigate to **http://localhost/**.

   You will see the sample website that the migration assistant will migrate.



Step 5: Run the Migration Assistant

1. Launch the script

   In the PowerShell terminal you opened earlier, change to the migration assistant directory and launch the migration script.

   ```
   PS C:\> cd \wwama\windows-web-app-migration-assistant-master
   PS C:\wwama\windows-web-app-migration-assistant-master> .
   \MigrateIISWebsiteToElasticBeanstalk.ps1
   ```

   The assistant prompts you for the location of your credentials file. Press **Enter** to skip.

   When prompted for AWS Profile Name, enter **default**.

2. Select a Region

   Enter the AWS Region where you'd like your Elastic Beanstalk environment to run.

For example: us-east-1. For a list of AWS Regions where Elastic Beanstalk is available, see AWS Elastic Beanstalk endpoints and quotas.

3. Select the web application you want to migrate

   The assistant then discovers any websites running on your IIS server and lists them, as in the example.

   Enter the number **2** to migrate the sample site.

```
[AWS Migration]  ----------------------------------------
[AWS Migration] |                                        |
[AWS Migration] | AWS Web Application Migration Assistant |
[AWS Migration] |                                   v0.2 |
[AWS Migration]  ----------------------------------------

[AWS Migration] Starting new migration run: run-20221206182200
[AWS Migration] Logs for this migration run can be found at
[AWS Migration]     C:\wwama\windows-web-app-migration-assistant-master\runs\run-20221206182200\logs
[AWS Migration] Checking for dependencies...
[AWS Migration] ------------------------------------------------------------------------------------------
[AWS Migration] Provide an AWS profile that the migrated application should use.
[AWS Migration] Enter file location, for example 'c:\aws\credentials', or press ENTER:
[AWS Migration] Enter the AWS profile name: default
[AWS Migration]
[AWS Migration] Enter the AWS Region for your migrated application. For example: us-east-2.
[AWS Migration] For a list of available AWS Regions, see:
[AWS Migration]     https://docs.aws.amazon.com/general/latest/gr/rande.html
[AWS Migration] Enter the AWS Region [us-east-1]:
[AWS Migration] ------------------------------------------------------------------------------------------
[AWS Migration] The migration assistant found website(s) on the local server 'EC2AMAZ-AEE0RST'.
[AWS Migration] [1] - Default Web Site
[AWS Migration] [2] - WWAMAsite
[AWS Migration] Enter the number of the website to migrate: [1]: 2
[AWS Migration] Selected the website 'WWAMAsite' to migrate from the server 'EC2AMAZ-AEE0RST'.
[AWS Migration] ------------------------------------------------------------------------------------------
```

4. Update connection strings

   The assistant then prompts you to update any connection strings selected above. Press **Enter** as there aren't any connection strings in this application.

   This message will appear: **The migration assistant didn't find any connection strings.**

5. Set up your Elastic Beanstalk application

   Next, name your new Elastic Beanstalk application.

   When prompted to select the Windows Server version, enter **6** and press **Enter.**

```
[AWS Migration] Taking a snapshot of the website... This might take a few minutes.
[AWS Migration]
[AWS Migration] Automatically discovering possible connection strings... This might take a few minutes.
[AWS Migration] ------------------------------------------------------------------------------------
[AWS Migration]
[AWS Migration] The migration assistant didn't find any connection strings.
[AWS Migration] ------------------------------------------------------------------------------------
[AWS Migration] Enter the number of the connection string you would like to update, or press ENTER:
[AWS Migration]
[AWS Migration] Done. Collected 0 connection strings to update.
[AWS Migration] ------------------------------------------------------------------------------------
[AWS Migration] Your application doesn't have a database that needs to be migrated.
[AWS Migration] Finished updating the connection string.
[AWS Migration] ------------------------------------------------------------------------------------
[AWS Migration] Converting the website to an Elastic Beanstalk deployment bundle... This might take a few minutes.
[AWS Migration] An application bundle was successfully generated.
[AWS Migration] ------------------------------------------------------------------------------------
[AWS Migration] AWS Elastic Beanstalk Deployment
[AWS Migration] ------------------------------------------------------------------------------------
[AWS Migration] Enter a unique name for your new Elastic Beanstalk application: MigratedApp
[AWS Migration] Creating a new Elastic Beanstalk application...


ApplicationArn          : arn:aws:elasticbeanstalk:us-east-1:[redacted]:application/MigratedApp
ApplicationName         : MigratedApp
ConfigurationTemplates  : {}
DateCreated             : 12/6/2022 6:23:25 PM
DateUpdated             : 12/6/2022 6:23:25 PM
Description             :
ResourceLifecycleConfig : Amazon.ElasticBeanstalk.Model.ApplicationResourceLifecycleConfig
Versions                : {}

[AWS Migration] Elastic Beanstalk supports the following Windows Server versions:
[AWS Migration] [1] : Windows Server 2012
[AWS Migration] [2] : Windows Server 2012 R2
[AWS Migration] [3] : Windows Server Core 2012 R2
[AWS Migration] [4] : Windows Server 2016
[AWS Migration] [5] : Windows Server Core 2016
[AWS Migration] [6] : Windows Server 2019
[AWS Migration] [7] : Windows Server Core 2019
[AWS Migration] Enter the number of the Windows version for your Elastic Beanstalk environment [1]: 6
```

6. Configure application

   For instance type that the application will run on, press **Enter** to select the default (t3.medium).

   ```
   Enter the instance type (default t3.medium) :
   ```

   For **environment type**, enter 1 for single instance.

   ```
   Enter the environment type [1]:
   ```

   The migration assistant then migrates your application to Elastic Beanstalk.

```
[AWS Migration] Taking a snapshot of the website... This might take a few minutes.
[AWS Migration]
[AWS Migration] Automatically discovering possible connection strings... This might take a few minutes.
[AWS Migration] ------------------------------------------------------------------------------------
[AWS Migration]
[AWS Migration] The migration assistant didn't find any connection strings.
[AWS Migration] ------------------------------------------------------------------------------------
[AWS Migration] Enter the number of the connection string you would like to update, or press ENTER:
[AWS Migration]
[AWS Migration] Done. Collected 0 connection strings to update.
[AWS Migration] ------------------------------------------------------------------------------------
[AWS Migration] Your application doesn't have a database that needs to be migrated.
[AWS Migration] Finished updating the connection string.
[AWS Migration] ------------------------------------------------------------------------------------
[AWS Migration] Converting the website to an Elastic Beanstalk deployment bundle... This might take a few minutes.
[AWS Migration] An application bundle was successfully generated.
[AWS Migration] ------------------------------------------------------------------------------------
[AWS Migration] AWS Elastic Beanstalk Deployment
[AWS Migration] ------------------------------------------------------------------------------------
[AWS Migration] Enter a unique name for your new Elastic Beanstalk application: MigratedApp
[AWS Migration] Creating a new Elastic Beanstalk application...


ApplicationArn          : arn:aws:elasticbeanstalk:us-east-1:[redacted]:application/MigratedApp
ApplicationName         : MigratedApp
ConfigurationTemplates  : {}
DateCreated             : 12/6/2022 6:23:25 PM
DateUpdated             : 12/6/2022 6:23:25 PM
Description             :
ResourceLifecycleConfig : Amazon.ElasticBeanstalk.Model.ApplicationResourceLifecycleConfig
Versions                : {}

[AWS Migration] Elastic Beanstalk supports the following Windows Server versions:
[AWS Migration] [1] : Windows Server 2012
[AWS Migration] [2] : Windows Server 2012 R2
[AWS Migration] [3] : Windows Server Core 2012 R2
[AWS Migration] [4] : Windows Server 2016
[AWS Migration] [5] : Windows Server Core 2016
[AWS Migration] [6] : Windows Server 2019
[AWS Migration] [7] : Windows Server Core 2019
[AWS Migration] Enter the number of the Windows version for your Elastic Beanstalk environment [1]: 6
```

7. Verify completion

   When the migration completes, you will see a success message in the CLI.

```
[AWS Migration] Updating the Elastic Beanstalk environment... This might take a few minutes.
.............
LoggedAt                    : 12/6/2022 6:30:42 PM
AbortableOperationInProgress : True
ApplicationName             : MigratedApp
CNAME                       : MigratedApp-env.eba-eqgwqiqh.us-east-1.elasticbeanstalk.com
DateCreated                 : 12/6/2022 6:23:35 PM
DateUpdated                 : 12/6/2022 6:30:41 PM
Description                 :
EndpointURL                 : 3.231.48.118
EnvironmentArn              : arn:aws:elasticbeanstalk:us-east-1:[redacted]:environment/MigratedApp/MigratedApp-env
EnvironmentId               : e-8caujwcefr
EnvironmentLinks            : {}
EnvironmentName             : MigratedApp-env
Health                      : Grey
HealthStatus                :
PlatformArn                 : arn:aws:elasticbeanstalk:us-east-1::platform/IIS 10.0 running on 64bit Windows Server
                              2019/2.10.6
Resources                   :
SolutionStackName           : 64bit Windows Server 2019 v2.10.6 running IIS 10.0
Status                      : Updating
TemplateName                :
Tier                        : Amazon.ElasticBeanstalk.Model.EnvironmentTier
VersionLabel                : run-20221206182200-v1
ResponseMetadata            : Amazon.Runtime.ResponseMetadata
ContentLength               : 1325
HttpStatusCode              : OK

[AWS Migration] Waiting for the Elastic Beanstalk application to launch... This might take a few minutes.
.
[AWS Migration] Note that it might take a few minutes for the application to be ready.
[AWS Migration] Application URL:
[AWS Migration]     MigratedApp-env.eba-eqgwqiqh.us-east-1.elasticbeanstalk.com
[AWS Migration]
[AWS Migration] The Elastic Beanstalk deployment succeeded. Your web application is now hosted in AWS at 'MigratedApp-env.eba-eqgwqiqh.
us-east-1.elasticbeanstalk.com'

PS C:\wwama\windows-web-app-migration-assistant-master>
```

Step 6: Navigate to your web application hosted on Elastic Beanstalk

Now that the site is successfully migrated, verify that the website is up and running.

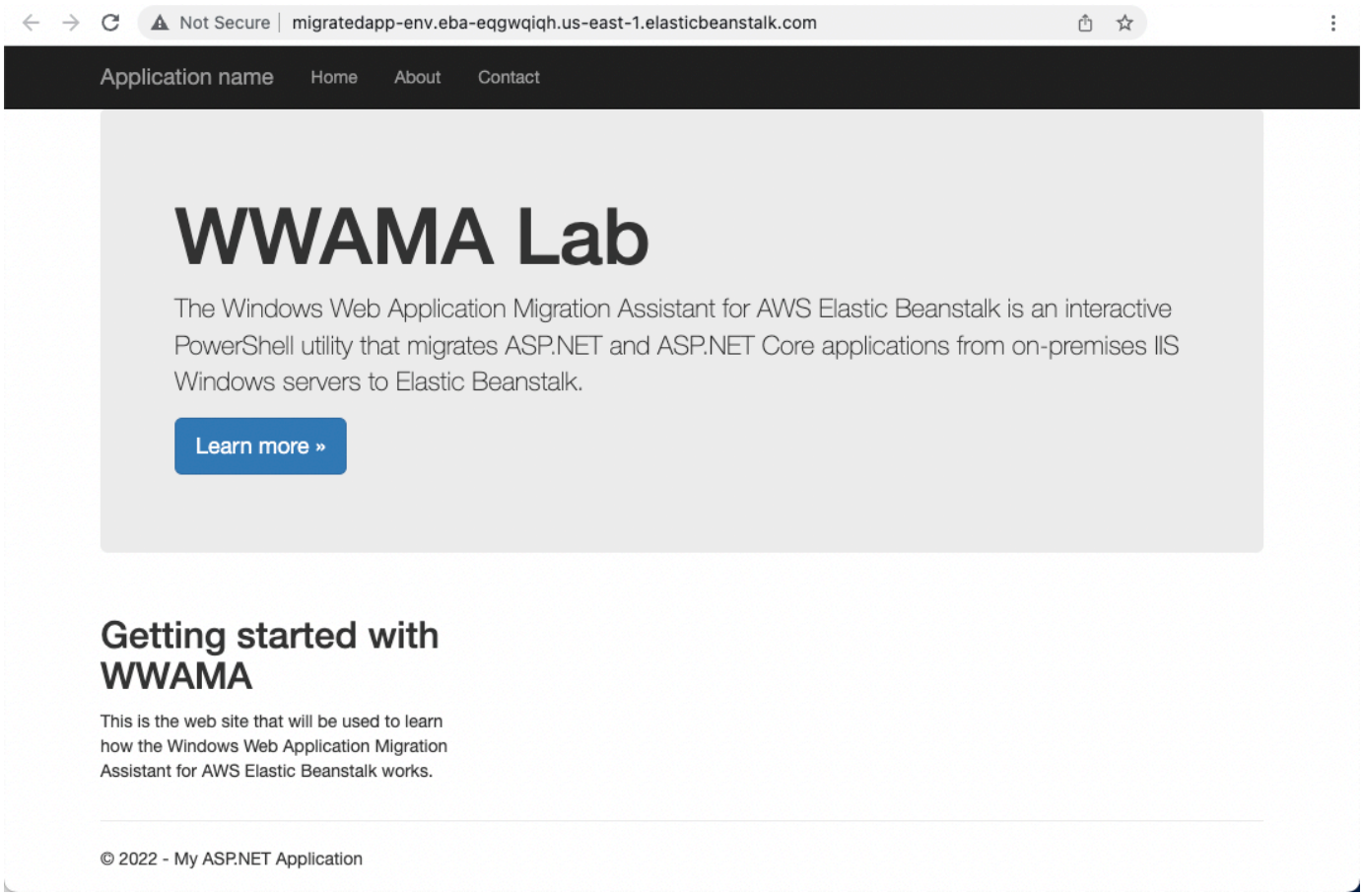
1. Locate the application URL

   Get the URL from the output of the PowerShell script.

```
[AWS Migration] Note that it might take a few minutes for the application to be ready.
[AWS Migration] Application URL:
[AWS Migration]     MigratedApp-env.eba-eqgwqiqh.us-east-1.elasticbeanstalk.com
[AWS Migration]
[AWS Migration] The Elastic Beanstalk deployment succeeded. Your web application is now hosted in AWS at 'MigratedApp-env.eba-eqgwqiqh.
us-east-1.elasticbeanstalk.com'
```

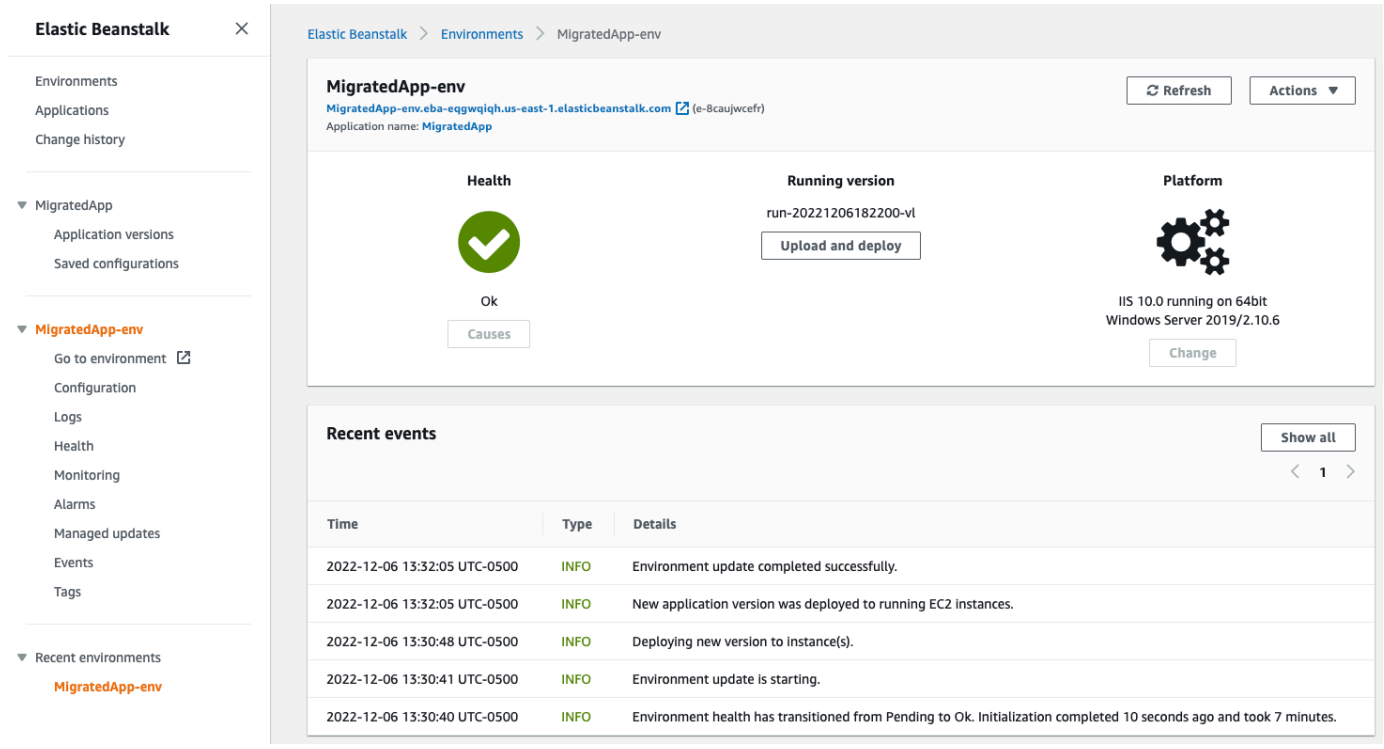
2. View the page

   Input the URL into your web browser, and you should see your web application, now running on Elastic Beanstalk.



3. Access the app in Beanstalk

   You can also view the Elastic Beanstalk environment from the AWS console. Make sure you're seeing the console for the same Region you deployed your application to. Feel free to explore what you can do with your application by using the menu on the left side.

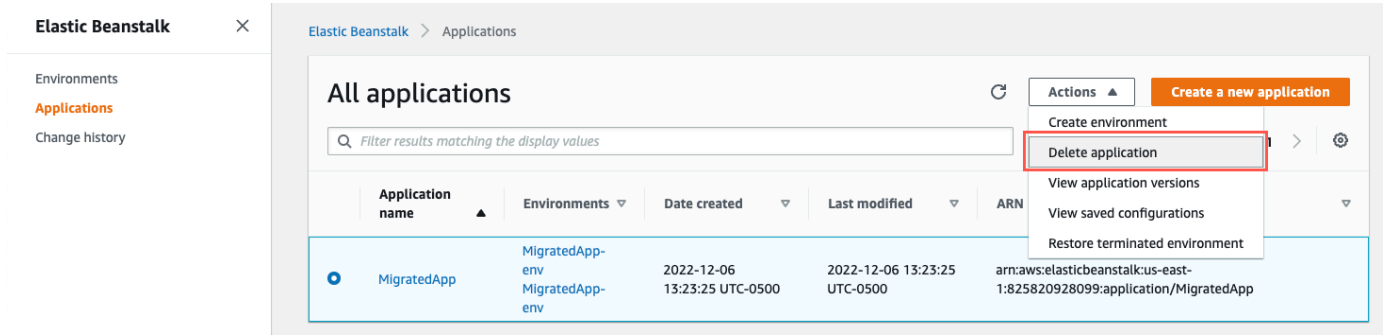


Clean up resources

1. Delete the Elastic Beanstalk application

   Go to the Elastic Beanstalk console.

   In the **Applications** view, select the radio button next to your application, choose the **Actions** menu, then select **Delete application**. In the confirmation dialog, enter the name of your application and choose **Delete**. This will delete both your application and the Elastic Beanstalk environment.

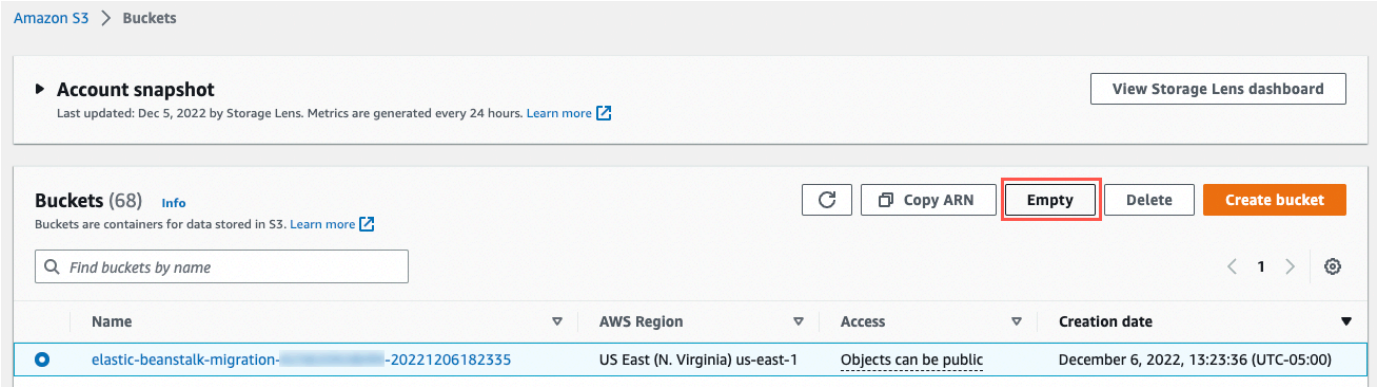


2. Delete temporary files from Amazon S3

Go to the Amazon S3 console, select the radio button next to the bucket named **elastic-beanstalk-migration-ACCOUNT_ID-TIMESTAmazon Managed Service for Prometheus**, where **ACCOUNT_ID** is your AWS account ID and **TIMESTAmazon Managed Service for Prometheus** is the time that your application was deployed.

Then choose **Empty** to first empty the contents of the bucket. You will need to confirm this action by entering **permanently delete** in a text box and choose **Empty**. Choose **Exit** to go back to the S3 buckets view.

Now that the S3 bucket is empty, select the radio button next to the bucket again and choose **Delete**. You will need to confirm this action by entering the name of the bucket in the text box and choose **Delete bucket**.



3. Delete the CloudFormation stack

   Go to the CloudFormation console and delete the CloudFormation stack **WWAMAStack** created at the start of the lab.

Conclusion

Congratulations! You have successfully migrated a sample ASP.NET web application to a fully managed Elastic Beanstalk environment using the Windows Web Application Migration Assistant (WWAMA). AWS Elastic Beanstalk is an easy-to-use service for deploying and scaling web applications and services developed with Java, .NET, PHP, Node.js, Python, Ruby, Go, and Docker on familiar servers such as Apache, Nginx, Passenger, and IIS. You can simply upload your code, and Elastic Beanstalk automatically handles the deployment, from capacity provisioning, load balancing, auto scaling, to application health monitoring. At the same time, you retain full control over the AWS resources powering your application and can access the underlying resources at any time. Visit AWS Elastic Beanstalk to learn more.