aws

Architecture Diagrams

Decoupled Serverless Scheduler

Decoupled Serverless Scheduler: Architecture Diagrams

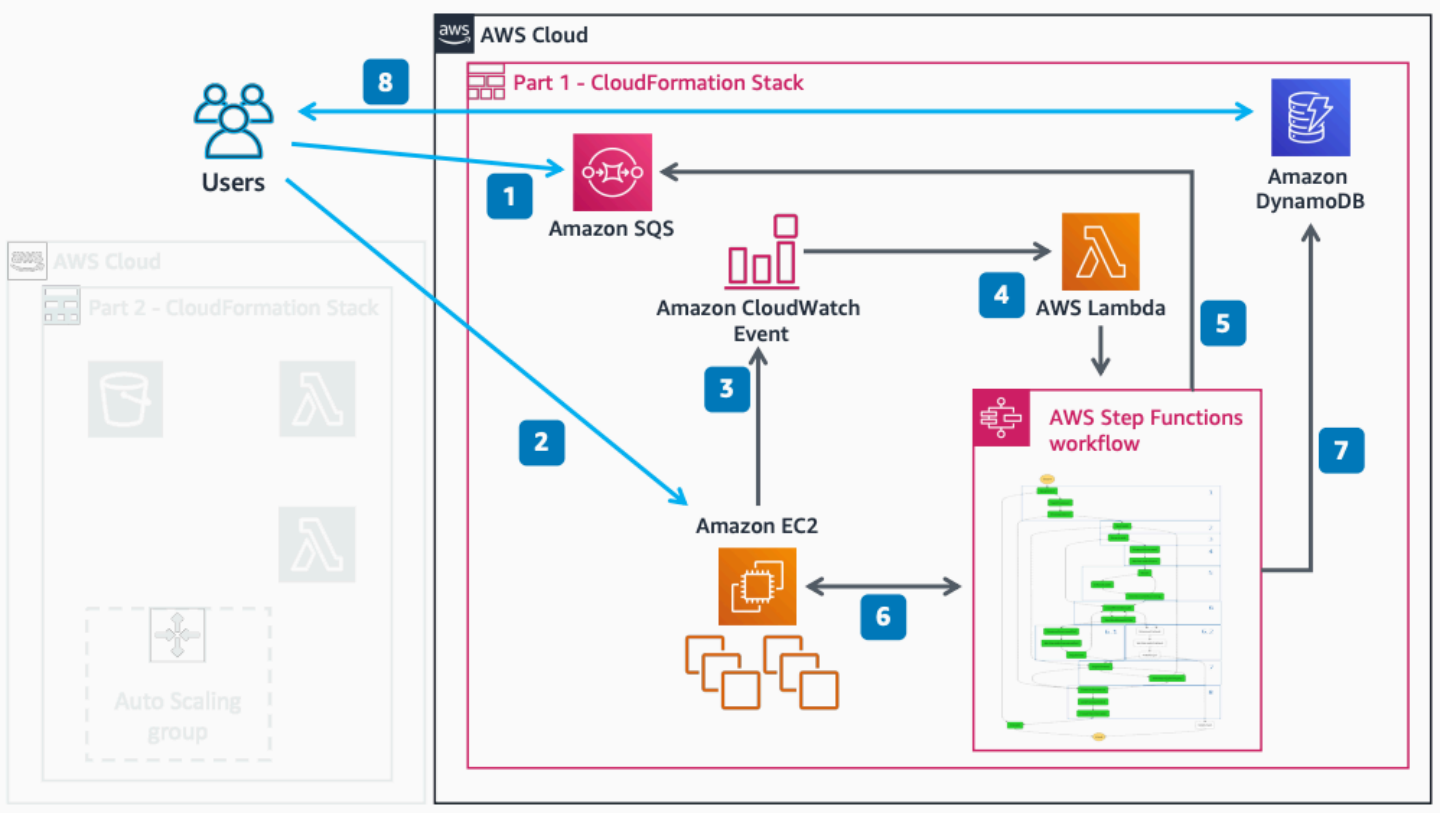
Table of Contents

Decoupled Serverless Scheduler, Part 1

Publication date: **February 18, 2021 (Diagram history)**

This architecture shows how to deploy a decoupled serverless scheduler to run any HPC application at scale. You submit jobs to Amazon Simple Queue Service using AWS Systems Manager Run Command, and AWS Step Functions orchestrates the job execution on Amazon Elastic Compute Cloud instances.

Decoupled Serverless Scheduler, Part 1



The following steps describe the architecture:

1. Jobs submitted to Amazon SQS use AWS Systems Manager Run Command such as bash or Windows PowerShell.
2. You launch an Amazon EC2 instance or cluster of Amazon EC2 instances with the tag key `scheduler-queue`.
3. On Amazon EC2 launch, an Amazon CloudWatch Event triggers an AWS Lambda function.

4. The Lambda function looks for the tag key `scheduler-queue` and triggers a new Step Functions state machine, passing the instance ID and tag value (SQS job queue name).
5. The workflow polls Amazon SQS for a new job, and continues to poll until there are no more jobs.
6. The workflow runs the job on previously launched Amazon EC2 instances or cluster of Amazon EC2 instances.
7. The workflow continuously writes job status to a Amazon DynamoDB table.
8. You monitor job status through the AWS Management Console or AWS Command Line Interface (AWS CLI).

Further reading

For additional information, refer to the following resources:

- AWS Architecture Icons
- AWS Architecture Center
- AWS Well-Architected
- AWS Decoupled Serverless Scheduler on GitHub

Diagram history

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Initial publication	Reference architecture diagram first published.	February 18, 2021
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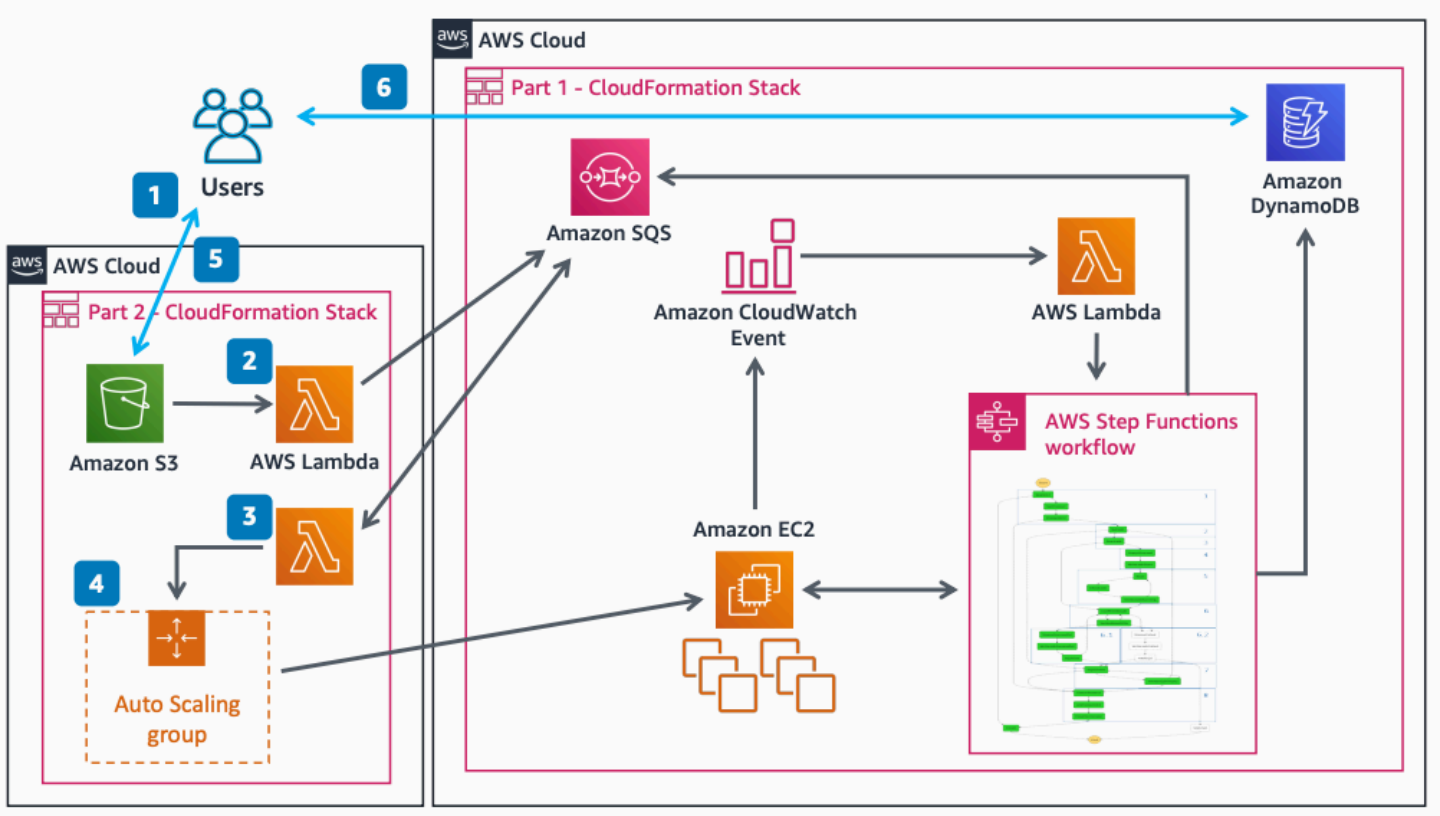
Decoupled Serverless Scheduler, Part 2

This architecture shows how to extend the decoupled serverless scheduler by using Amazon Simple Storage Service event triggers and Amazon EC2 Auto Scaling Groups for automatic worker management. You upload input files and executables to Amazon S3 instead of Amazon SQS, eliminating the need for JSON job definitions.

Decoupled Serverless Scheduler, Part 2



The following steps describe the architecture:

1. You upload input files and executables for jobs to Amazon S3.
2. The Amazon S3 event triggers an AWS Lambda function to create and submit new jobs.
3. Lambda monitors the job queue and updates the Amazon EC2 Auto Scaling Group with the desired instance count (customizable).
4. The Amazon EC2 Auto Scaling Group scales the number of workers from 0 to a defined maximum.
5. You download results from Amazon S3.

6. You monitor job status through the AWS Management Console or AWS CLI.

Further reading

For additional information, refer to the following resources:

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