



DevOps Engineering on AWS

Course ID #: 7000-725-ZZ-Z

Hours: 21

Course Content

Course Description:

In this course, you will cover how to use the combination of DevOps cultural philosophies, practices, and tools to increase your organization's ability to develop, deliver, and maintain applications and services at high velocity on AWS. This course covers Continuous Integration (CI), Continuous Delivery (CD), infrastructure as code, microservices, monitoring and logging, and communication and collaboration. Hands-on labs give you experience building and deploying AWS CloudFormation templates and CI/CD pipelines that build and deploy applications on Amazon Elastic Compute Cloud (Amazon EC2), serverless applications, and container-based applications. Labs for multi-pipeline workflows and pipelines that deploy to multiple environments are also included.

Course Objectives:

In this course, you will:

- Use DevOps best practices to develop, deliver, and maintain applications and services at high velocity on AWS
- List the advantages, roles and responsibilities of small autonomous DevOps teams
- Design and implement an infrastructure on AWS that supports DevOps development projects
- Leverage AWS Cloud9 to write, run and debug your code
- Deploy various environments with AWS CloudFormation
- Host secure, highly scalable, and private Git repositories with AWS CodeCommit
- Integrate Git repositories into CI/CD pipelines
- Automate build, test, and packaging code with AWS CodeBuild
- Securely store and leverage Docker images and integrate them into your CI/CD pipelines
- Build CI/CD pipelines to deploy applications on Amazon EC2, serverless applications, and container-based applications
- Implement common deployment strategies such as "all at once," "rolling," and "blue/green"
- Integrate testing and security into CI/CD pipelines
- Monitor applications and environments using AWS tools and technologies

Prerequisites:

Systems Operations on AWS

Developing on AWS



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Target Audience:

- DevOps engineers
- DevOps architects
- Operations engineers
- System administrators
- Developers

Topics:

Lesson 1: Course Overview

- Course objective
- Suggested prerequisites
- Course overview breakdown

Lesson 2: Introduction to DevOps

- What is DevOps?
- The Amazon journey to DevOps
- Foundations for DevOps

Lesson 3: Infrastructure Automation

- Introduction to Infrastructure Automation
- Diving into the AWS CloudFormation template
- Modifying an AWS CloudFormation template

Demonstration: AWS CloudFormation template structure, parameters, stacks, updates, importing resources, and drift detection

Lesson 4: AWS Toolkits

- Configuring the AWS CLI
- AWS Software Development Kits (AWS SDKs)
- AWS SAM CLI
- AWS Cloud Development Kit (AWS CDK)
- AWS Cloud9

Demonstration: AWS CLI and AWS CDK

Lab: Using AWS CloudFormation to provision and manage a basic infrastructure

Lesson 5: Continuous integration and continuous delivery (CI/CD) with development tools

- CI/CD Pipeline and Dev Tools

Demonstration: CI/CD pipeline displaying some actions from AWS CodeCommit, AWS CodeBuild, AWS CodeDeploy and AWS CodePipeline

Lab: Deploying an application to an EC2 fleet using AWS CodeDeploy

- AWS CodePipeline

Demonstration: AWS integration with Jenkins

Lab: Automating code deployments using AWS CodePipeline



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Lesson 6: Introduction to Microservices

- Introduction to Microservices

Lesson 7: DevOps and containers

- Deploying applications with Docker
- Amazon Elastic Container Service and AWS Fargate
- Amazon Elastic Container Registry and Amazon Elastic Kubernetes service

Demonstration: CI/CD pipeline deployment in a containerized application

Lesson 8: DevOps and serverless computing

- AWS Lambda and AWS Fargate
- AWS Serverless Application Repository and AWS SAM
- AWS Step Functions

Demonstration: AWS Lambda and characteristics

Demonstration: AWS SAM quick start in AWS Cloud9

Lab: Deploying a serverless application using AWS Serverless Application Model (AWS SAM) and a CI/CD Pipeline

Lesson 9: Deployment strategies

- Continuous Deployment
- Deployments with AWS Services

Lesson 10: Automated testing

- Introduction to testing
- Tests: Unit, integration, fault tolerance, load, and synthetic
- Product and service integrations

Lesson 11: Security automation

- Introduction to DevSecOps
- Security of the Pipeline
- Security in the Pipeline
- Threat Detection Tools

Demonstration: AWS Security Hub, Amazon GuardDuty, AWS Config, and Amazon Inspector

Lesson 12: Configuration management

- Introduction to the configuration management process
- AWS services and tooling for configuration management

Lab: Performing blue/green deployments with CI/CD pipelines and Amazon Elastic Container Service (Amazon ECS)

Lesson 13: Observability

- Introduction to observability
- AWS tools to assist with observability

Lab: Using AWS DevOps tools for CI/CD pipeline automations

Lesson 14: Reference architecture (Optional Lesson)

- Reference architectures

Lesson 15: Course Summary

- Components of DevOps practice
- CI/CD pipeline review
- AWS Certification

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