Course Name: Azure DevOps Engineer Expert Professional Certification Course

Course Overview

The "Azure DevOps Engineer Training" course offers a hands-on learning experience to master DevOps practices using Azure DevOps tools. Through a blend of theoretical concepts, practical labs, and a final project, learners will gain proficiency in Continuous Integration (CI), Continuous Deployment (CD), Infrastructure as Code (IaC), and monitoring. The course also covers Agile development with Azure Boards and application scaling with Kubernetes. By the end, participants will be able to design, implement, and manage efficient DevOps workflows for Azure environments.

Course Type

Intermediate

Course Objectives

1. Understand core DevOps principles and Azure DevOps services.

2. Automate build, integration, and deployment pipelines using CI/CD practices.

3. Implement Infrastructure as Code (IaC) using Bicep and Terraform.

4. Monitor applications and infrastructure performance using Azure Monitor and Log Analytics.

5. Manage Agile workflows with Azure Boards and scale applications using Azure Kubernetes Service (AKS).

6. Apply the learned skills in a real-world project to build and deploy an end-to-end DevOps solution.

What You'll Learn

- Core DevOps practices and their implementation with Azure DevOps tools.

- Setting up and managing CI/CD pipelines for automated builds and deployments.

- Using Bicep and Terraform for Infrastructure as Code (IaC) to provision Azure resources.

- Monitoring and troubleshooting applications with Azure Monitor and Application Insights.

- Scaling and managing containerized applications with Kubernetes and Azure AKS.

- Agile development workflows using Azure Boards for sprint and backlog management.

- Designing and deploying a fully automated, monitored, and scalable application.

Duration

43 hours (including lectures, hands-on labs, and final project).

Requirements

- Access to a Microsoft Azure account for hands-on labs.

- A computer with a stable internet connection.

Prerequisites

- Basic knowledge of Azure cloud services.

- Familiarity with software development and version control (Git).

- Some understanding of containerization and Agile development principles is recommended but not mandatory.

Target Audience

- Software developers and IT professionals interested in mastering DevOps practices on Azure.

- Cloud engineers and system administrators aiming to enhance their skills in CI/CD and IaC.

- Teams managing Agile workflows and large-scale deployments.

- Learners preparing for certifications like AZ-400: Designing and Implementing Microsoft DevOps Solutions.

- Organizations looking to adopt or improve DevOps practices using Azure DevOps tools.

Curriculum

Module 1: Introduction to DevOps and Azure DevOps

- What is DevOps?
- Key DevOps practices and culture
- Overview of Azure DevOps services
- Azure Repos
- Azure Pipelines
- Azure Artifacts
- Azure Boards
- Setting up an Azure DevOps organization and projects
- Introduction to version control with Git and Azure Repos

Handson Lab:

- Create an Azure DevOps organization and a project
- Initialize a Git repository and push code to Azure Repos

Module 2: Implementing Continuous Integration (CI) with Azure DevOps

- What is Continuous Integration (CI)?
- Setting up build pipelines in Azure DevOps
- Integrating version control with build pipelines
- Using YAML for pipeline configuration
- Managing build triggers and artifact creation
- Integrating unit tests and code quality checks

Handson Lab:

- Create a simple CI pipeline to build and test code
- Configure build triggers and version control integration

Module 3: Implementing Continuous Deployment (CD) with Azure DevOps

- What is Continuous Deployment (CD)?
- Deploying to Azure App Service, Virtual Machines, and Azure Kubernetes Service (AKS)
- Release pipelines and stages in Azure DevOps
- Configuring approval gates and environment variables
- Integrating deployment validation and automated testing
- Implementing rollback and failure recovery strategies

Handson Lab:

- Create and deploy a release pipeline to Azure App Service
- Implement approval gates and validation tests in the pipeline

Module 4: Infrastructure as Code (IaC) with Bicep and Terraform

- Introduction to Infrastructure as Code (IaC)
- Overview of Bicep and Terraform for Azure
- Writing Bicep templates to deploy resources
- Using Terraform to manage Azure infrastructure
- Managing state and backends in Terraform
- Creating and maintaining reusable IaC templates
- Implementing CI/CD for IaC pipelines

Handson Lab:

- Create and deploy an Azure resource using Bicep
- Implement a Terraform script to provision an Azure Virtual Machine

Module 5: Monitoring and Incident Management

- Introduction to Azure Monitor and Log Analytics
- Setting up monitoring for applications and infrastructure
- Configuring Application Insights for monitoring applications

- Implementing alerts and notifications for incident management

- Analyzing logs and metrics to troubleshoot issues

- Integrating monitoring with Azure DevOps for proactive alerting

Handson Lab:

- Set up monitoring for an application using Application Insights

- Create custom alerts for resource performance metrics

Module 6: Agile Development with Azure Boards and Scaling Applications

- Introduction to Azure Boards for Agile development

- Creating and managing work items (User Stories, Tasks, Bugs)

- Managing sprints and backlogs

- Kanban boards and Scrum boards

- Scaling applications with Azure Kubernetes Service (AKS)

- Introduction to Kubernetes and AKS

- Deploying containerized applications to AKS

- Managing scalability and high availability in AKS

- Configuring horizontal scaling in Kubernetes

Handson Lab:

- Create a Kanban board for an Agile project in Azure Boards

- Deploy a containerized application to Azure Kubernetes Service and scale it

Final Project

- Create a CI/CD pipeline to automate the deployment of an application to an Azure App Service

- Use Infrastructure as Code (Bicep or Terraform) to provision necessary resources

- Implement monitoring for the deployed application and infrastructure

- Manage work items and track the progress using Azure Boards

- Deploy and scale a containerized application on AKS

Assessment

- Final Quiz: A quiz to assess knowledge on the covered topics.

- Handson Project Evaluation: Evaluation of the final project based on the implementation and best practices.