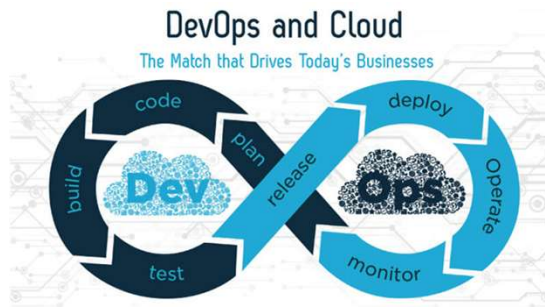# Welcome to Cloud DevOps Course

Bridging Development and Operations

Duration: 10 hours (5 sessions, 2 hours each)

Schedule: Wednesdays (8 PM - 10 PM), Q&A Sundays (8 PM - 9 PM)

Audience: IT Professionals

Presented By:

Meet Your Instructors

Talhal Jilal

- **Background:** 20+ year of experience in IT and Cloud Computing (AWS/Azure/GCP), DevOps and Infrastructure Automation

- **Certifications:** Master of Science in Information System, Graduate Certificate in Information Security

- **Speciality Area:** Microservices Architecture, Containerization, DevOps, and Cloud Operations

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Arif Faheem Khan

- **Background:** 10+ year of experience in IT and Cloud Technologies

- **Certifications:** AWS/Azure Certified Solutions Architect, AWS DevOps Professional, Terraform Associate.

- **Speciality Area:** Automation, CI/CD, Infrastructure as Code and Site Reliability Engineering

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Let's Get to Know Each Other

Name

Background : Professional / Academic

Goals

Hobbies

Agenda

1. What is DevOps?

2. What is Cloud Computing?

3. Importance of DevOps and Cloud in the modern IT ecosystem

4. Key Tools and Technologies Overview

- Git
- Jenkins
- Ansible
- Terraform
- Containers and Orchestration (Docker, Docker Compose)

5. Career Opportunities in Cloud and DevOps

What is DevOps

Definition:

- A set of practices that combines software development (Dev) and IT operations (Ops) to shorten the systems development lifecycle and provide continuous delivery with high software quality.

Key Principles:

- **Collaboration:** Breaking down silos between Development and Operations teams.
- **Automation:** Automating repetitive tasks and processes.
- **Continuous Integration (CI) and Continuous Delivery (CD):** Ensuring rapid deployment of code changes.
- **Monitoring:** Constant feedback loops for improvements.

What is Cloud Computing?

Definition:

- The delivery of computing services (servers, storage, databases, networking, software, etc.) over the internet (the cloud).

Key Characteristics:

- **On-Demand Access:** Pay-as-you-go pricing for resources.
- **Scalability:** Resources can be scaled up or down as needed.
- **Elasticity:** Automated scaling based on usage.
- **Global Reach:** Cloud services can be accessed from anywhere.

Importance of DevOps and Cloud in the Modern IT Ecosystem

DevOps in the IT Ecosystem:

- **Faster Development Cycles:** Enables rapid software delivery through CI/CD pipelines.
- **Improved Collaboration:** Teams work together across the entire development lifecycle.
- **Efficiency Gains:** Automation of tasks reduces manual effort and errors.

Cloud Computing in the IT Ecosystem:

- **Cost-Effective:** Reduces the need for large infrastructure investments.
- **Flexibility & Agility:** Businesses can quickly adapt to changing demands.
- **Global Availability:** Services and apps can be deployed worldwide.

Key Tools and Technologies Overview (Git)

Git:

- **Version Control System:** Allows tracking changes in source code.
- **Key Features:**
  - Distributed version control.
  - Branching and merging.
  - Collaborate efficiently on code.
- **Usage:** Widely used in DevOps for version control of code and configuration files.
- **Popular Platforms:** GitHub, GitLab, Bitbucket.

Key Tools and Technologies Overview (Jenkins)

Jenkins:

- **Automation Server:** Primarily used for automating the build and deployment process in CI/CD pipelines.

- **Key Features:**
  - Continuous Integration and Delivery.
  - Plugin support for integration with various DevOps tools.
  - Easy configuration through web interface.

- **Usage:** Jenkins helps teams automate repetitive tasks and ensure faster software delivery.

Key Tools and Technologies Overview (Ansible)

Ansible:

- **Automation Tool:** Used for configuration management, application deployment, and task automation.
- **Key Features:**
  - Agentless (no need to install software on managed nodes).
  - YAML-based configuration files.
  - Infrastructure as Code (IaC).
- **Usage:** Automates infrastructure management and deployment tasks, ensuring consistency and reliability.

Key Tools and Technologies Overview (Terraform)

Terraform:

- **Infrastructure as Code (IaC) Tool:** Allows the provisioning and management of cloud infrastructure using code.

- **Key Features:**
  - Declarative configuration.
  - Supports multiple cloud providers (AWS, Azure, Google Cloud).
  - Version-controlled infrastructure changes.

- **Usage:** Provision cloud resources and automate infrastructure management with code.

Key Tools and Technologies Overview (Containers & Orchestration - Docker & Docker Compose)

Docker:

- **Containerization Tool:** Allows packaging applications and their dependencies into containers.
- **Key Features:**
  - Lightweight and portable.
  - Environment consistency across different stages (dev, test, prod).
  - Easy to deploy and scale.

Docker Compose:

- **Tool for Defining and Running Multi-Container Docker Applications:**
  - Allows defining multi-container setups using a simple YAML file.
  - Facilitates easy scaling and management of microservices architectures.
- **Usage:** Containers are used to package and isolate software, while Docker Compose is used to manage complex multi-container setups.

Practical Activities

1. AWS Free Tier Account Setup

- **Navigating to AWS Free Tier sign-up**
- **Verifying account creation**

2. Configuring Root Users and Access Policies

- **Root account setup best practices**
- **Defining and assigning IAM access policies**

3. Enabling Multi-Factor Authentication (MFA)

- **Adding security to accounts**
- **Steps to enable MFA using mobile apps or hardware devices**

4. Setting Up IAM Roles

- **Understanding IAM roles and policies**
- **Creating and assigning IAM roles to services**

Practical Activities

5. Launching a Linux Virtual Machine and Executing Basic Linux Commands

https://github.com/zaftechnologies/ki-devops/blob/main/4.Lab_1.md

- Choosing an AMI and configuring instance details
- SSH into the instance
- Running essential commands: `ls`, `pwd`, `cat`, `cd`

Q&A Session