

Azure DevOps

1. About DevOps

- Introduction to DevOps
- Benefits of working in a DevOps environment Preview
- DevOps Lifecycle
- DevOps Stages
- Get an overview of different DevOps Tools
- DevOps Delivery Pipeline

2. Microsoft Azure

- Introduction to Cloud Computing
- Introduction to Azure
- Explore Azure Portal
- Exploring Microsoft Azure Fundamentals
- Regions and Availability Zones
- Azure Virtual Machines or Azure Compute
- Azure Storage
- Azure Databases
- Azure App services
- Networking in Azure
- Azure SQL Server
- Azure Security Introduction to Azure
- Azure Identity and Access Management
- Azure Key-Vault
- Azure Monitoring
- Azure Container registry
- Azure Kubernetes Services

3. Containerization using Docker

- Understand Containerization
- Learn the evolution of virtualization to containers
- Understand the Docker Architecture
- Container Lifecycle
- Docker CLI
- Port Binding
- Detached and Foreground Mode
- Dockerfile
- Dockerfile Instructions
- Docker Image

- Docker Registry - Docker Hub to store custom Images
- Container Storage
- Docker Volumes - Store data in Container Volumes for persistent storage
- Deploy a multi - Container application using Docker Compose
- Docker Swarm

4. Kubernetes (CKA) - Introduction to Container Orchestration

- Kubernetes Architecture
- Kubernetes Core Concepts
- Install Kubernetes - Manual Cluster Creation
- Install Kubernetes - Managed Cluster Creation
- Install Kubernetes – Minikube Cluster Creation
- Components of Kubernetes Cluster
- Api-resources
- Shedular
- Controller Manager
- Etc
- Kubelet
- Kube-proxy
- Understanding Pods
- Understanding YAML
- Multi Container pods
- Static Pods
- Init containers
- Name spaces
- Lables
- Limits
- Probs

5. Kubernetes - Controllers:

- ReplicaSet and Replication Controller
- Deployments Preview
- DaemonSets
- Rolling Updates and Rollbacks
- Scaling Application
- Ingress service
- Services (Cluster IP, Nodeport, Load Balancer)
- Ingress Service

6. Kubernetes - Scheduling :

- Node Selector
- Labels
- Affinity
- Taints and Tollerations
- Namespaces-limits
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7. Kubernetes - Storage:

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- Persistence Volume (PV)
- Persistence Volume Claims (PVC)
- Configmaps
- Secrets
- Statefullset
- Headless service
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8. Kubernetes - Security

- Authentication and Authorization
- Certificates
- Roles
- Cluster roles
- Configfiles
- Service Account
- Security Context
- Networking

9. Provisioning using Terraform

- Introduction to Terraform
- Terraform Architecture
- Terraform Configuration
- IaC with Terraform – Azure Cloud
- Terraform basics
- Terraform variables
- Terraform building blocks
- Terraform Common Commands
- Managing Terraform Resources

10. Continuous Integration with Jenkins

- Introduction & Installation
- Jenkins Architecture
- Plugin Management in Jenkins Preview
- Jenkins Security Management
- Notification in Jenkins
- Jenkins Master-slave architecture
- Jenkins Delivery Pipeline
- Jenkins Declarative pipeline

11. Introduction - Azure DevOps portal

- Azure DevOps Boards
- Getting started with Azure DevOps Demo generator
- Azure DevOps with Boards and backlogs
- Exploring Azure DevOps Boards - Epics, Features and User Stories
- Azure DevOps - Boards View vs Backlogs View
- Understanding Sprints in Azure DevOps
- Creating Azure DevOps Queries

12. Azure DevOps - Repos

- Exploring Files
- Commits
- pushes
- Branches
- Tags
- Pull Requests

13. Azure DevOps – Continuous Integration CI – Pipelines

- Introduction to Azure DevOps build pipelines
- Azure Container Registry
- Create a Local Repository, Check-In Files and Push to Remote Github Rep
- Create ACR, Azure DevOps Organization and Project and Discuss
- Create a Build Pipeline to Build and Push Docker Image to ACR
- Make changes to html file - commit and push changes and review
- Understand Namespaces in Azure Container Registry using Azure DevOps
- Review Docker Build and Push Pipeline code on a high level

14. Azure DevOps - Build Docker Image, Push to ACR and Deploy to Azure AKS

- Deploy to AKS Introduction
- Create Pre-built pipeline named Deploy to AKS
- Review Build and Deploy Stage Logs, Kubernetes Pods Access Application
- Deploy New Version of Application and review Pipeline stages Build, Deployment
- Review Pipeline code for Build and Deploy Stages

15. Azure DevOps – Create pipelines from scratch using Starter pipeline

- Introduction to Azure starter pipeline
- Create Semi customized Pipeline for Build, Push Docker Image to ACR
- Create using Starter Pipeline for Build, Push Docker Image to ACR

16. Azure DevOps – Release Pipelines – Continuous Delivery

- Release Pipelines Introduction
- Create k8s Namespaces and Service Connections to those k8s Namespaces
- Create Release Pipeline with Dev Stage and Map Artifacts from CI Build
- Verify Image name in k8s manifest and Check-In new code and review
- Change the Docker Image tag to Build.Source Version and test
- Create QA, Staging and Prod Stages in Release Pipelines with email app
- Check-In new code, review entire Build and Release Pipelines

17. Helm

- Introduction to Helm
- Helm fundamentals
- Helm advanced commands
- Creating Helm charts
- More into templates creation
- Advanced helm charts creation
- More about repositories
- Helm chart security

18. Argo CD (GitOps)

- Introduction and Core Concepts of Argo CD
- Setting-up Argo CD
- Applications
- Projects
- Repositories

- Tracking strategies
- Remote Kubernetes Clusters
- Application setup
- Automation by CI pipelines

19. Prometheus and Grafana (Monitoring and Logging)

- Introduction to Prometheus and Grafana
- Prometheus and Grafana Setup
- Monitoring using Prometheus
- Dashboard Visualization using Grafana
- Creating a Dashboard to monitor the Pipeline
- Azure with Prometheus
- Azure Monitor
- Additional learning's more into Prometheus and Grafana