Advance DevOps Tools - Git, Ansible, Kubernetes on baremetal and Azure, CI/CD with Jenkins

(Koenig Crafted)

Git and GitHub

Module 1 – Git
Introduction to Version Control System
History of Git
Git Basics
States in Git
Installing Git
Configuration of Git
Working with Repositories
Basic Git Commands
Working with Remotes
Tagging
Git Branching

Automation with Ansible

Module 1 – Introduction Configuration Management with Ansible
Ansible: An Introduction
Current IT Automation State
Configuration Management
Ansible History
Introducing Ansible
How Ansible Works?

Module 2 – Ansible Deployment
Pre-requisites for Controller Node
Installation and Configuration
Ansible Configuration File
Pre-requisites for Managed Hosts
Ansible Inventory
Ansible Architecture

Module 3 – Ad-Hoc Execution with Ansible
Introduction to Ad-Hoc Commands
Ad-Hoc Remote Executions
Ansible Commands
Connections and Privilege Escalations

Module 4 – Ansible Playbooks
YAML Structure
Ansible Playbooks
Playbooks Structure
Playbooks Syntax Checks
Playbooks Smoke Test
Playbooks Real Time Run
Playbook Examples

Module 5 – Variables in Ansible
Introduction to Variables
Defining Variables in Ansible Code
Use Cases
Ansible Facts
Facts in Playbooks
Disabling Facts

Module 6 – Conditionals, Loops and Handlers
Conditionals in Ansible
Loops in Ansible
Handlers in Ansible

Module 7 – Jinja2 Templates
Introduction to Jinja 2 Templates
Writing Jinja2 Templates
Use Jinja2 Templates

Module 8 – Ansible Roles
Introduction to Ansible Role
Directory Structure
Role Creation
Pre-Tasks and Post-Tasks

Module 9 – Ansible Vault
Introduction
Encrypt Playbooks with Password
Encrypt Playbooks with Password File

Module 10 – Ansible Galaxy
Overview of Ansible Galaxy
How to use Community Roles

Certified Kubernetes Administrator

Module 1 – Core Concepts
Overview of Container Orchestration
Introduction to Kubernetes
Kubernetes Architecture

Module 2 – Installation, Configuration & Validation
Design a Kubernetes Cluster
Installation of Kubernetes Master and Nodes
Choose a Network Solution
Verify Installation

Module 3 – Managing Resources
Managing Pods
Managing Labels & Selector
Managing Replication Controller & Replica Set
Managing Service

Module 4 – Scheduling Manual Scheduling
Taint and Tolerations
Node Selector
Node Affinity

Module 5 – Application Lifecycle Management
Overview of Deployment
Deployment Strategies
Managing Deployment
Canary Deployment
Blue-Green Deployment

Module 6 – Environment Variable
Plain Key
Config Map
Secret
Mount Variable as Volume

Module 7 – Storage
Volumes
Persistent Volumes
Persistent Volume Claim

Module 8 – Security
Kubernetes Authentication
Managing Users in Kubernetes
Service Account
Managing Roles and Role Binding
Managing Cluster Role and Cluster Role Binding
Security Context

Module 9 – Cluster Maintenance
OS Upgrade
Upgrade Cluster Version
Static Pod
ETCD Backup
Cron Job

Module 10 – Logging and Monitoring
Understand how to Monitor all Cluster Components
Understand how to Monitor Applications
Manage Cluster Components Logs
Manage Application Logs
Prometheus Tool

Module 11 – Networking in Kubernetes
Kubernetes Networking
Understand CNI
Understand Pod Networking Concepts
Configure DNS
Configure and Manage Ingress Rule
Namespace
Metal Load Balancer

Module 12 – Managing Helm Chart
Introduction to Helm
Helm Installation
Use community Helm Chart
Create Helm Chart
Upgrade Helm Chart
Downgrade Helm Chart

Module 13 – Troubleshooting
Troubleshoot ETCD Failure
Troubleshoot Kubelet Failure
Troubleshoot Container Runtime Failure
Troubleshoot Scheduler Failure

Azure Kubernetes Service (AKS)

Module 1 – Core Concepts
Overview of Container Orchestration
Introduction to Kubernetes
Kubernetes Architecture

Module 2 – Create Azure AKS Cluster
Introduction to Azure AKS Cluster
Create AKS Cluster
Explore AKS Cluster using kubectl
Setup Azure CLI on Local Desktop

Module 3 – Storage
Volumes
Persistent Volumes
Persistent Volume Claim
Azure Disks for AKS Storage
Create Storage Class
Managing Persistent Volumes
Managing Persistent Volume Claims
Use AKS Provisioned Storage Class instead of Custom Storage Class

Module 4 – Security
Introduction to Active Directory Authentication for AKS admins
Create AD Group and User and Enable AD for AKS
Access Azure AKS Cluster Resources using Azure AD User

Manage Roles and Rolebindings
Manage ClusterRole and ClusterRoleBindings

Module 5 – Autoscaling
Introduction to Cluster Autoscaler
Create AKS Cluster with Autoscaling enabled using Azure AKS
Introduction to Horizontal Pod Autoscaler
Create Horizontal Pod Autoscaler

Module 6 – Logging and Monitoring
Understand how to Monitor all Cluster Components on Azure
Understand how to Monitor Applications on Azure
Manage Cluster Components Logs on Azure
Manage Application Logs on Azure

CI/CD Tool - Jenkins

Module 1 – Introduction to Jenkins
Introduction to Jenkins Jenkins Installation Introduction to Jenkins UI Create First Job
Add Parameters to your Job

Module 2 – Add SSH Node Credentials in Jenkins
Install SSH Plugin in Jenkins
Add Credentials of Node
Integrate Node SSH Server with Jenkins

Module 3 – Build Job on Remote Machine
Deploy Web Server Automatically through Jenkins

Module 4 – Git Webhooks
Introduction to Git Webhooks
Use of GitHub Webhooks
How GitHub Webhooks Works
Configure GitHub Webhooks
Configure Jenkins to use GitHub Webhooks

Module 5 – Jenkins Security
Enable/Disable Login in Jenkins Allow Users to Sign up
Create Users Manually in the Jenkins DB Create and Manage Roles for Jenkins Users

Module 6 – Jenkins Email Integration
Install a Mail Plugin
Integration Jenkins and G-mail
Add notifications to your jobs

Module 7 – Jenkins Ansible Integration
Store Playbooks, Inventory and Configuration Files on GitHub
Configure Git Webhooks
Automatically Pull Code from GitHub then Run on Ansible Server

Module 8 – Projects
Automate Everything: Store everything in GitHub then Jenkins will automatically pull the code and configure the application