

## **DEVOPS WITH AWS**

Linux, Shell Script, Git, GitHub, AWS, Jenkins, Terraform, Ansible, Docker, Kubernetes, Maven, JFrog, SonarQube Prometheus and Grafana.

## **LINUX BASICS**

- Understanding the Linux file system hierarchy.
- Command line basics (navigation (pwd, cd, ls), file manipulation (mkdir, touch, cp, mv, etc.)).
- Text processing tools like grep, sed, awk, etc.
- Permissions and ownership management (chmod, chown).
- Processes and job control (ps, top, kill, etc.).
- vi Editor & Package management (apt, yum, rpm).
- User and group management.
- Troubleshooting Commands & Terminal Shortcuts.

## **SHELL SCRIPTING**

- Introduction of Bash Scripting
- Writing and executing shell scripts (Bash, sh).

- Variable usage, control structures (if, for, while loops).
- Understanding grep, regex, cut, sort, tail, head and exit codes
- Functions and scripting best practices.
- Understanding standard input, output, and error streams.
- Redirecting input and output in Bash scripts.
- Error handling and logging in scripts.
- Adopting best practices for writing efficient and maintainable scripts.
- Exploring the role of shell scripting in DevOps practices.

## **SOURCE CODE MANAGEMENT(GIT & GITHUB)**

- Difference between CVCS and DVCS
- Introduction of Git & Installation of Git
- Git three-stage Architecture & Detail explanation of Repository and Branching Strategy
- Git Commit, head, checkout, Diff, Tags, Fetch, Push, Pull
- Working with Git stash and Git pop
- Git Revert and Reset & Git rebase
- Resolve Merge conflicts in Git & Git Cherry-pick

- Working with git Squash & What is Git fork?

## **AWS CLOUD SERVICES**

- AWS Global Infrastructure
- Differences between On-premises and Cloud architecture.
- AWS Data Centers, AZs, Regions, Local Zones, EdgeLocations
- AWS Network (VPC, Subnet, IGW, NATGW,  
Routing, NACLs, SGs)
- VPC Peering and VPC Endpoints
- Overview of Elastic Compute Cloud (EC2) &  
EC2 instance options
- Amazon Machine Images (AMIs), EC2 Key Pairs,  
EC2 Metadata and User Data
- EC2 Launch Templates, Spot Instances & Reservations.
- Elastic Block Storage (EBS) and Instance Store
- EBS backup using Snapshots and Life Cycle Manager
- Introduction of Route53
- Route53 basics and feature
- Elastic Load balancing
- Introduction to Network, Application and Gateway

## Load Balancer.

- Load balancer integration with Route53
- EC2 Auto Scaling and Features
- Launch Configuration and Auto Scaling Groups
- S3 Simple Storage Service
- S3 buckets, versioning, static hosting and bucket policies
- S3 bucket replication and Life Cycle Policies
- IAM User & Groups, IAM Polices & Permissions
- Identity-based, Resource-based and Session-based Policies

## TERRAFORM

- Understanding the concept of (IAC) & Installation of Terraform
- Terraform Basics, Variables, Resources, Attributes and Dependencies
- Terraform files, Terraform State file
- Terraform modules and Terraform workspace
- Terraform each and module
- Terraform Project

## ANSIBLE

- Understanding the concept of (IAC) & Installation of Terraform
- Introduction to Ansible & Ansible Architecture
- Installation of Ansible and Understanding

### Required Components

- Setup of Ansible on the Control Node and Managed Nodes
- Configuring Inventory and Ansible cfg
- Ansible Ad-hoc Commands, Playbooks and Modules
- Ansible Roles, Ansible Galaxy for Roles
- Ansible Project

## **DOCKER**

- What is Virtualization before deep dive into the Containerization
- Docker vs Virtual Machine
- What is Docker & Docker Architecture

(Docker Daemon, Docker Client, Docker Host)

- Docker Image, Docker lifecycle
- Start and delete a container & Exploring exec command
- Docker file creation using Dockerfile & Custom Docker image
- EntryPoint Vs CMD

- Container Image Security Scanning with Trivy Scanner.
- Docker Hub and push our image to the Docker Hub
- Docker port Mapping & Docker port exposes
- Difference between Docker attach and Docker exec
- Docker volumes, Mapping volumes  
(Container to Container, Host to container)
- Docker Network & Docker Compose

## **KUBERNETES**

- What are Monolithic and Microservices Architecture
- Introduction to Kubernetes & Kubernetes architecture
- Overview about POD, Deployment, ReplicaSet,  
Service & Namespaces and quotas.
- Installing Kubernetes on AWS & Command with  
example (kubectl)
- Role of Master Node & Components of Control Plane  
and explanation
- Installing kubectl and minikube & Kubernetes  
YAML Configuration

- Fundamentals of Pods and their Lifecycle
- Kubernetes Pods, K8s Sidecar and init containers
- Replication, Auto healing and working with deployment in K8s
- Kubernetes Resource Limitations, K8s Deployments
- Kubernetes Deployment Strategy (Recreate, Rollout, Blue-Green and Canary)
- Kubernetes Services (ClusterIp, NodePort, Load Balancer and Ingress)
- Labels and Selectors in K8s
- Kubernetes ConfigMap and Secret in k8s
- Deploying Microservices app to K8s cluster
- Kubernetes Networking, Services and Nodeport
- Kubernetes storage (PV & PVC) and Kubernetes Probes
- K8s Taint, Tolerations and Troubleshooting Steps

## **MAVEN, JFROG & SONARQUBE**

- Understanding and Using Build Tools & Overview of Various Build Tool
- Introduction maven& Maven life cycle
- Integration with JFrog for Maven build Deploy.

- Introduction to Static Code Analysis.
- Installation of Sonar qube and performing analysis.

## **PROMETHEUS & GRAFANA**

- Prometheus, Grafana setup and configuring Linux  
Server no de-exporter.
- Introduction to Prometheus Query Language(PromQL).
- Writing basic PromQL queries. Alerts in Prometheus  
Setting up alerting rules
- Connecting to EC2 for Logs and monitoring &  
Prometheus Alerting
- Grafana setup & Configuring Prometheus as  
data source in Grafana.
- Monitor our applications for Prometheus  
dashboard visualiSation using Grafana

## **JENKINS CI/CD**

- What is CI/CD pipeline & Jenkins History
- Getting started with Jenkins & Jenkins installation on Cloud



- Master-Slave Architecture of Jenkins.
- User Management in Jenkins
- Jenkins-Linked Projects
- Integration with AWS, Github, Maven & JFrog.
- Integration with Sonar Qube for Code Quality, Code Coverage and Bugs.

## **AGILE AND DEVOPS PRINCIPLES**

- Understanding Agile methodologies and DevOps culture.
- Embracing principles such as collaboration, automation, and continuous improvement.
- Agile practices like Scrum (Scrum Phases, roles, events, values) & Jira board Overview.

## **REALTIME PROJECT**



# SHREE VEDA I TECHNOLOGIES

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