CURRICULUM OF DevOps

Duration
3 Months

DevOps Course Syllabus:|

Pre-requisition:|

* Must knowledge, AWS Cloud.
* [EC2, S3, IAM, SNS, SQS, DynamoDB, Route53, VPC, CloudWatch]
* [Kinesis, Lambda, RDS, EBS, EFS, Redshift, Auto Scaling, Load Balancing, Migration]

Topics:|

Session-01:| Introduction to DevOps:|

* What Is DevOps
* History of DevOps
* DevOps definition
* DevOps Main Objectives

* DevOps and Software Development Life Cycle
  * Waterfall Model
  * Agile Model
* Continuous Integration & Deployment
  * Jenkins
* Containers and Virtual Development
  * Docker
* Configuration Management Tools.
  * Ansible
  * Kubernetes
*Continuous Monitoring- Nagios
  * Nagios
* Infrastructure as code tool- IAC
  * Terraform
* Version Controlling Tool.
  * GIT
  * GitHub
  * GitLab
* Build Management Tool.
  * Maven

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Session-02| Cloud Computing.

* What is Cloud?
* Evolution of Cloud Computing
* IAAS (Infrastructure as a Service)
* SAAS (Software as a Service)
* PAAS (Platform as a Service)
* Private, Public and Hybrid Cloud
* Public Clouds
* Amazon Web Services

Session-03:| LINUX Basic and Admin

* Linux OS Introduction.
* Importance of Linux in DevOps.
* Linux Basic Command Utilities
* Linux Administration
* Environment Variables
* Networking
* Linux Server Installation
* RPM and YUM Installation

Session-04:| Shell Scripting

* Introduction
* Variables
* Flow Controls
* Loops
* Functions
* Lists
* Manipulating Strings
* Reading and Writing Files
* Positional Parameters

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Session-05:| Version Control-GIT, GitHub, GitLab

* GIT Features
* 3-Tree Architecture
* GIT – Clone /Commit / Push
* GIT Hub Projects
* GIT Hub Management
* GIT Rebase & Merge
* GIT Stash, Reset, Checkout
* GIT Clone, Fetch, Pull

Session-06:| Build tool- Maven

* Maven Installation
* Maven Build requirements
* Maven POM Builds (pom.xml)
* Maven Build Life Cycle
* Maven Local Repository (.m2)
* Maven Global Repository
* Group ID, Artifact ID, Snapshot
* Maven Dependencies
* Maven Plugins

Session-07:| Continuous Integration – Jenkins

* Introduction to Jenkins
* Continuous Integration with Jenkins
* Configure Jenkins
* Jenkins Management
* Scheduling build Jobs
* POLL SCM
* Build Periodically
* Maven Build Scripts
* Support for the GIT version control System
* Different types of Jenkins Jobs

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* Jenkins Build Pipe Line
  * Parent and Child Builds
  * Sequential Builds
  * Jenkins Master & Slave Node Configuration
  * Jenkins Workspace Management
  * Securing Jenkins
  * Authentication
  * Authorization
  * Confidentiality
  * Creating Users
  * Jenkins Plugins
  * Installing Jenkins Plugins
  * SCM plugin
  * Build and test

Session-08:| ANSIBLE
  * Introduction to Ansible
  * Ansible Server Configuration
  * Infrastructure Management
  * SSH Connection in Ansible Master
  * YAML Scripts
  * Host Inventory
  * Hosts and Groups
  * Host Variables
  * Group Variables
  * Host and Group Specific Data
  * Ad-hoc Commands
  * Playbooks
  * Variables
  * Conditionals
  * Loops
  * Blocks

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* Handlers
* Templates
* Modules
* Core Modules
* Extra Modules
* Ansible Roles

Session-09:| Docker
* How to get Docker Image?
* What is Docker Image
* Docker Installation
* Working with Docker Containers
* What is Container
* Docker Engine
* Crating Containers with an Image
* Working with Images
* Docker Command Line Interphase
* Docker Compose
* Docker Hub
* Docker Trusted Registry
* Docker swarm
* Docker attach
* Docker File & Commands

Session-10:| Kubernetes
Module-1:| Kubernetes Core Concepts and Networking
* Kubernetes Overview
* Kubernetes Overview
* Architecture of Kubernetes
* Kubernetes - Master Machine Components
* Setting Up a Cluster

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* Configure Kubernetes Network Using Calico
  * Kubectl Commands
  * Understanding the Concepts of Pods and their Networking
  * Use Init Containers to Pre-Set an Environment

Module 2: Kubernetes Services and Scheduling
  * Kubernetes Services and Controllers
  * Understand How Resource Limits Can Affect Pod Scheduling

Module 3: Kubernetes Controllers
  * Replica Set and Replication Controller
  * Daemon Sets
  * Deployments
  * Ingress
  * Using HPA

Module 4: Persistent Storage in Kubernetes
  * Persistent Volume and PersistentVolumeClaim
  * Access Modes for Volumes
  * Secrets and ConfigMaps in Pods
  * Storage Classes
  * Headless Services
  * Stateful Sets

Module 5: Securing the Cluster
  * Authentication
  * Authorization
  * Kubernetes Security Primitives
  * Security Contexts
  * Create and Use Roles and Role Bindings
  * Use Probes and Configure a Restart Policy for Pods

Module 6: Logging and Monitoring the Cluster
  * Monitoring the Cluster Using Prometheus
  * Visualizing Cluster Logs Using EFK Stack
  * Jobs

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* Helm Charts

Module 7: Troubleshooting the Cluster

* Debugging Pods
* Debugging Services
* Listing Cluster

Session-11:| Continuous Monitoring- Nagios

* What is Continuous Monitoring?
* What is Nagios?
* How Nagios Works?
* What is the Purpose of Nagios?
* Nagios Structure?
* Nagios Installation on Linux
  * Installing Nagios on Master
  * Installing NRPE on slave
  * Installing Check NRPE Plugin on Master

Session-12:| Terraform

* Install Terraform
* Learn the Terraform CLI
* Build and configure Infrastructure as Code
* Packaging IaC in Terraform Modules
* Manage Terraform State

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