

DevOps Course Content

1. Introduction:

- Understanding Development
- Development SDLC using WaterFall & Agile
- Understanding Operations
- DevOps to the rescue
- What is DevOps
- DevOps SDLC
- Continuous Delivery model
- DevOps tools for DevOps SDLC
- DevOps Roles & Responsibilities

2. OS, Virtualization:

- Linux Introduction
- Command line utilities
- Basic commands
- Linux File system
- Text Editors (VIM)
- Filters & I/O Redirections
- Users & Group administration
- File permissions & Ownerships
- Sudo
- Software Management: Redhat & Ubuntu
- Tools such as ssh, telnet, scp, rsync, disk utils, backups etc
- Service & Process management
- Systems and HW stats

3. Basic Networking:

- Components of computer networks
- Classification: LAN, WAN, Peer to Peer network, Server based
- Switches
- Routers
- Network Architecture
- Protocols
- Port numbers
- DNS
- DHCP
- IP Addresses

4. Vprofile Web Application Architecture

- Infrastructure
- Network layout
- Services & Components
- Data bases
- Data stores
- Architecture from a DevOps perspective

5. Virtualization

- Introduction & Real time use cases
- Hypervisors
- Virtualbox
- Vagrant
- Vagrant on windows
- Vagrant on Linux
- Vagrant Cloud
- Automating virtual machines
- Vagrant & Virtualbox for Lab setup
- Create & Manage your own Lab on any computer

6. Implementing Vprofile on VM's

- Setup all Vprofile services in Single VM
- Create multiple vm's through Vagrant
- Setup Vprofile Multistack in multiple vm's
- Validate and test Multistack Vprofile App

7. Cloud computing

- Introduction to cloud computing
- DevOps & Cloud
- Public, Private & Hybrid cloud
- IAAS, PAAS & SAAS
- Cloud computing & DevOps

8. AWS

- Introduction to Public cloud with AWS
- Setup your own account and Manage it
- IAM: Manage users, groups, roles & policies
- Secure your AWS account
- Ec2 services: Instances, AMI, EIP, Security groups, key pairs
- EBS: Manage Volumes for ec2, backups & restores
- ELB: Load balance your own website
- S3: Use S3 to host websites & as a centralised storage
- RDS: Setup & Manage your own Highly available Database

9. Vprofile on AWS cloud

- Create multiple Ec2 instances for setting up Nginx and Tomcat
- Setup and use Elasticache, Elasticsearch, SQS, RDS, S3 for Vprofile backend services
- Setup AWS Elastic Load Balancer in front of Nginx or Tomcat for High Availability
- Monitor everything with AWS Cloudwatch

10. Automation, Orchestration & Version control system

- What is VCS & why it is needed
- DevOps use cases
- Setup your own repo with git
- Manage your code base/source code with GIT & GITHUB

11. Continuous Integration with Jenkins

- Introduction to Continuous Integration
- Build & Release and relation with DevOps
- Understanding development and developers

- Why continuous integration
- Jenkins introduction and setup
- Jenkins projects/jobs
- Jenkins plugins
- Jenkins administration:
 - a. Users
 - b. Nodes/slaves
 - c. Managing plugins
 - d. Managing software versions
 - e. Introduction
 - f. Phases
 - g. Java builds
- Build and Release job/project setup
- Nexus:
 - a. Intro & Setup
 - b. Software versioning & Hosted repository
 - c. Integration with Jenkins
- Continuous integration job/project setup
- Complete Jenkins project:
 - a. Packing Artifacts
 - b. Static Code Analysis
 - c. Tomcat setup Staging & productions
 - d. Artifacts deployments to web servers from Jenkins
 - e. Build Pipeline
- Jenkins not just CI tool anymore
- More DevOps use cases of Jenkins

12. Continuous Integration for Vprofile Application

- Setup Jenkins, Maven and Git for building Vprofile source code
- Sonarqube for Code Analysis
- Version vprofile softwares and upload it in Nexus repository
- Deploy Vprofile software to tomcat server
- Continuous Software Testing for Vprofile after deployment
- Vulnerability testing for Vprofile with security tools
- Alerting Developers for any build issues
- Complete Continuous Delivery Build Pipeline for Vprofile on Dev, QA, UAT and Production

13. Ansible

- Configuration Management & Automation
- What is Ansible & its features
- Ansible setup on local & cloud
- Understanding Ansible architecture & Execution
- Inventory
- Ad-hoc commands: Automating change Management with Ad Hoc commands
- Playbook Introduction
- Ansible configuration with ansible.cfg
- Ansible Documentation
- Modules, modules & lots of modules
- Writing playbook for web server & DB server deployments
 - a. Tasks
 - b. Variables
 - c. Templates
 - d. Loops
 - e. Handlers

- f. Conditions
 - g. Register
 - h. Debugging
- Ansible Roles
 - a. Identify server roles
 - b. Roles structure
 - c. Creating, Managing and executing roles
- Ansible Galaxy
 - a. Exploring Roles from Galaxy
 - b. Download Galaxy roles and integrate with your code
- Ansible Advanced Execution
 - a. Improving execution time
 - b. Limiting and selecting tasks
 - c. Troubleshooting and Testing

14. Puppet

- Config Management with Puppet
- Difference between Puppet & Ansible
- Puppet server & agent setup
- Writing puppet manifests
- Managing multi OS(RedHat & Ubuntu) with puppet
- Setup LAMP Stack with Puppet
 - a. Resources
 - b. Variables
 - c. Selectors
 - d. Classes
 - e. Variables
 - f. Conditions
 - g. Modules
- Puppet Forge modules:
 - h. Apache
 - i. VCS
 - j. Firewall
 - k. Mysql
- Templates
- Hiera

15. Vprofile Continuous Delivery project

- What is Continuous delivery & why its needed
- Continuous delivery vs continuous deployments
- Overview of the project
- Infrastructure setup for the project
- Integrating, AWS, Git, Jenkins, Nexus, Ansible, Webservers, Backends & DBservers
- Project execution step by step
- Build triggers
- Build Pipeline
- Deploy latest/old/any version of artifacts on Dev, QA, UAT & Production Environment

16. Continuous Delivery project

- What is continuous delivery & why its needed
- Continuous delivery vs Continuous deployments
- Overview of the project
- Infrastructure setup for the project
- Integrating, AWS, Git, Jenkins, Nexus, Ansible, Web servers & DBservers
- Project execution step by step
- Build triggers

- Build Pipeline
- Deploy latest/old/any version of artifacts

17. Dockers & Containers

- What are containers
- Difference between VM's & Containers
- Hypervisor Vs Docker Engine
- Docker Introduction
- Docker installation
- Images & containers basics
- Images
 - a. Docker Images Deep Dive
 - b. Docker Hub
 - c. Pull & Push images
 - d. Building your own Image with Docker file
 - e. Docker & Jenkins integration
 - f. Hosting & Managing Images
- Containers
 - g. Deep Dive
 - h. Running, Stopping, Deleting, Inspecting & Managing containers
 - i. Docker networking
 - j. Web server examples
 - k. Local Development workflow
 - l. Docker Compose
- Automated WorkFlow/ Continuous delivery of Dockers
- Docker Orchestration with Kubernetes
 - m. Microservice Architecture
 - n. Why Containers for microservices
 - o. Kubernetes Intro & Architecture
 - p. Kubernetes setup
 - q. Running Docker containers on kubernetes
 - r. Kubectl
 - s. Pod
 - t. Service
 - u. Replication controller & Set
 - v. Deployment
- What Next in container world

18. Containerizing Vprofile Applications

- Learn to containerize Vprofile all the services with Docker file and Build
- Continuous Integration of docker images from Jenkins
- Docker compose to run multistack vprofile app on Docker Engine
- Kubernetes Definitions for Vprofile all the containers and services

19. Automation, Orchestration & Version control system

- What is VCS & why it is needed
- DevOps use cases
- Setup your own repo with git
- Manage your code base/source code with GIT & GITHUB

20. Advanced Networking

- Ip Addresses & Subnet Masks
- IP Address Ranges
- Subnetting
- Private Vs Public networks

- High Availability

21. Advance AWS

- Ip Addresses & Subnet Masks
- VPC: Setup Highly Available & Secure network on AWS
- CloudWatch: Monitor you AWS setup
- Autoscaling with ELB
- Beanstalk: Setup and automated deployments

22. DevOps > DevSecOps

- Information Security Overview
- Security Threats and Attack vectors
- Hacking concepts
- Hacking Phases
- Attack Types
- Penetration Testing
- DevOps & PenTest
- PenTest tools
- Kali Linux OS
- Vulnerability Assessment tools
- Metasploit
- Nmap
- Nessus

23. More DevOps tools

- Chef
- Monit
- SonarQube integration with Jenkins
- Troubleshooting issues in DevOps implementations
- AWS automation with Ansible
- AWS cli, S3fs & S3cmd
- Terraform
- DevOps job profiling, Interview questions.
- How to keep up with DevOps latest tools