DevOps CourseContent

INTRODUCTION TO DEVOPS

- What is DevOps?
- History of DevOps
- Different Teams Involved
- DevOps definitions
- DevOps and Software Development Life Cycle
  - Waterfall Model
  - Agile Model
- DevOps mainobjectives
- Prerequisites for DevOps
- Continuous Testing and Integration
- Continuous Release and Deployment
- Continuous Application Monitoring
- Configuration Management
- What is Cloud?
- History and evolution of cloud
- Cloud ComputingConcepts
- Public, Private, Hybrid Clouds
- IAAS, SAAS, PAAS Cloud Models
- Public Clouds
  - Amazon Web Services, Azure, Oracle Cloud, IBM Cloud
- DevOps withCloud

BEFORE DEVOPS:

LINUX: BASICS & ADMIN

- Linux OS Introduction
- Importance of Linux in DevOps
- Fetching OS and Hardware information
- Linux Basic Command Utilities
- File and Directory Management.
- Linux File Editors (VIM)
- Utilities to download software into Linux from Internet
- User Administration
- File permissionmanagement
- Package Management
- Service Management

LINUX: NETWORKING

- Introduction to network.
- Introduction to network in Cloud.
- Firewall
- Load Balancer
- Port
- Protocol
- IP Address
- DNS
- DHCP
- Static IP

WEB APPLICATION ARCHITECTURE

- Enterprise 3-tier Application layout
- Apache Web Server
- Apache Tomcat Server
- MariaDB Server
- MOD_JK Module
- Integration of Web Server with Application Server.
- Integration of Application Server with DB Server.
- Haproxy Load balancer.

DEVOPS TOOLS:

VERSION CONTROL – GIT

- Version Control System
- Centralized & Distributed Version Control System
- Advantages of Git
- **GIT**
  - Anatomy of GIT

- GIT Features
- 3-Tree Architecture
- GITHUB Projects
- GITHUB Management
- GIT Clone / Commit / Push / Merge
- GITLAB Installation & Configuration
- GITLAB Management
- Introduction to GITLAB-CI

BUILD TOOLS –MAVEN

- Java Compiler
- Maven LifeCycle
- Maven Installation
- Maven build requirements
- Maven POM XML File
- Maven **G A V** explained
- Add a custom life cycle in Maven
- Integrate Artifact manager to Maven

REPOSITORY TOOLS – SONATYPE NEXUS

- What is Aritifact manager
- Artifact manager tools
- Sonatype Nexus Installation
- Nexus with Maven Integration
- Using default repositories
- Create Roles in Nexus
- Create Users to Nexus
- Assign Roles to Nexus Users

CONTINUOUS INTEGRATION – JENKINS

- INTRODUCTION TO JENKINS-CI
  - Continuous Integration with Jenkins Overview
  - Installation of Jenkins Master and Jenkins Slave.
  - Configure Jenkins
  - Jenkins management
  - Support for the Git version control systems
  - Different types of Jenkins Jobs
  - Setting up a Jenkins job
  - Scheduling build Jobs
  - Maven Build Scripts

- Securing Jenkins
  - Authentication
  - Authorization
  - Confidentiality
  - Creating users
- Jenkins Plugin
  - Installing Jenkins Plugins
  - SCM plugin
  - Build and test
  - Analyzers
- Distributed builds with Jenkins
- Best Practices for Jenkins
- **Jenkins Pipeline Projects.**
- **Groovy Scripting Basics.**
- **Jenkins Blue Ocean Projects.**

CONFIGURATION MANAGEMENT - ANSIBLE

- Introduction
- Ansible and Infrastructure Management
- Ansible Inventory
  - Ungrouped Hosts
  - Grouped Hosts
  - Groups of Groups
- Ansible Server Installation.
  - Ansible Server Configuration file
    - Update Username
    - Update Keys
    - Update SSH Parameters
    - Update Roles
    - Update Inventory
    - Update MISC parameters
  - How Ansible picks the configuration
- Setting up SSH KEYS to and checking connection to remote nodes.
- Ansible Facts.
  - Default facts from nodes
  - Create custom facts on nodes.
  - How to print facts
- Ansible Playbooks
  - Define and use of 'hosts' parameter
  - Define and use of 'become' parameter
  - Define and use of 'gather_facts' parameter
  - Define and use of 'tasks' parameter
  - Define and use of 'vars' parameter
  - Define and use of 'vars_files' parameter
  - Define and use of 'vars_prompt' parameter

- o Define and use of 'handlers' parameter
- o Define and use of 'roles'
- o List of Modules to be discussed:
  - setup, ping, yum, yum_repository, service, copy, get_url, shell, command, set_fact, authorized_key, user, debug, file, find, fetch, hostname, include, include_vars, mail, package, stat, unarchive, gce, ec2, wait_for, wait_for_connection

- o Conditions
  - when
- o Loops
  - with_items
- o How to store output of one task and use it in another task.
- o Variables From:
  - vars
  - vars_files
  - vars_prompt
  - vars from inventory hosts
  - vars from inventory groups
  - Roles

- ➢ Roles
  - Create Role
  - Define Role
  - Write roles
  - Role Dependencies
  - Variables from Roles
  - Variable Precedence.

- ➢ MISC
  - Ansible Vault
  - Ansible Pull
  - Ansible Galaxy

- ➢ Ansible in Real Time

- ➢ Ansible Tower
  - Role-based access control
  - Job scheduling
  - Portal mode
  - Fully documented REST API
  - Tower Dashboard
  - Cloud integration

CONTAINERS –DOCKERS

- o What are containers.
- o Difference between VM’s and Containers
- o Hypervisor Vs Docker Engine
- o Docker Introduction
- o Docker Installation
- o Docker Images

- Docker Commands and different options
- Creating own Docker images using commit.
- Creating own images using Dockerfile
- Automating Image creation with DockerHub and Jenkins
- Docker UCP
    - Docker UCP Installation
    - Docker UCP Configuration
    - Creating a Service in UCP
- Docker Compose.
    - Usage of Docker Compose.
    - Create Stack with Docker Compose.
    - Setup a stack service in Docker Compose.

ADDITIONAL OVERVIEW

- Shell Scripting
- SonarQube
    - Installation and Configuration of SonarQube.
    - Integration of SonarQube with Jenkins
- VAGRANT
- Google Cloud
- GitLab-CI
- JIRA
- Nagios

Real Time Projects