

## DevOps Course Content

### INTRODUCTION TO DEVOPS

- What is DevOps?
- History of DevOps
- Dev and Ops
- DevOps definitions
- DevOps and Software Development Life Cycle
- DevOps main objectives
- Infrastructure As A Code
  - o IaaS Overview
  - o PaaS Overview
- DevOps on the Cloud
- Prerequisites for DevOps
- Introduction to Linux
  - o Basics of UNIX and Linux Operating Systems
  - o Linux System administration introduction
- Tools (Jenkins, Chef, Docker, Vagrant and so on.)
- Continuous Testing and Integration
- Continuous Release and Deployment
- Continuous Application Monitoring

### CLOUD COMPUTING and VIRTUALIZATION

- History and evolution of cloud
- Cloud computing concepts
- Grid Computing vs. Cloud Computing
- Characteristics and Benefits of Cloud
- Cloud service models (NIST)
- IaaS, PaaS and SaaS
- Cloud service model implementations
- Cloud Deployment Models (NIST)
- Virtualization
- Virtual Machines
- Virtual bootable OS Images
- Cloud Storage
- SOA and Cloud
- Virtual Private Cloud (VPC)
- Risk in Cloud and DevOps security concerns
- Introduction to AWS and AZURE

## DEVOPS ADOPTION

### • CRITERIA

- o Things to Look For and Avoid
- o IT Assets Ownership
- o Viewing Applications As Products, not Projects
- o DevOps in the Enterprise
- o IT Governance
- o Governance and Risk Mitigation
- o DevOps Adoption Steps
- o Select DevOps Techniques and Practices
- o Service Quality Metrics

### • TOOLS

- o The Choice of Cloud Platform
- o IaaS for DevOps
- o PaaS for DevOps
- o Containerization Tools
- o System Configuration Automation and Management
- o Continuous Integration (CI) systems
- o Build and Dependency Management Systems
- o Select DevOps Tools
- o Collaborative Lifecycle Management Solutions from IBM
- o Rational Team Concert (RTC)
- o Rational Quality Manager (RQM)
- o Rational DOORS Next Generation (DNG)

## DEVOPS TOOLS: CHEF

- Overview of Chef
  - o Common Chef Terminology (Server, Workstation, Client, Repository etc.)
  - o Servers and Nodes
  - o Chef Configuration Concepts
- Workstation Setup
  - o How to configure knife
  - o Execute some commands to test connection between knife and workstation
- Organization Setup
  - o Create organization
  - o Add yourself and node to organization
- Test Node Setup
  - o Create a server and add to organization
  - o Check node details using knife
- Databags
  - o How to create Databags
  - o Add Databags to organization
- Node Objects and Search

- o How to Add Run list to Node
- o Check node Details
  - Environments
- o How to create Environments
- o Add servers to environments
  - Roles
- o Create roles
- o Add Roles to organization
  - Advanced Chef
- o What is foodcritic and TestKitchen
- o Improve and expand on the existing recipes
- o One-click system launching

#### DEVOPS TOOLS: PUPPET

- Introduction to Puppet
- Installation and Configuration of Master server and agents
- Managing Manifests
- Creating and Managing modules
- Version control with Puppet

#### DEVOPS TOOLS: VAGRANT

- Introduction
- o What is Vagrant
- o Uses of Vagrant in an environment
- Installation and Configuration
- o How to install Vagrant in Windows and Linux
- o Configure Vagrant
- Provisioning with Vagrant
- o How to use Vagrant to create small virtual
- o Add required Images to Vagrant
- Using Vagrant
- o Using Vagrant in Chef for Testing

#### DEVOPS: SOURCE CODE MANAGEMENT

##### • GIT REPOSITORY

- o What is a version control system?
- o What is a distributed version control system?
- o Installation
- o Different levels of Git configuration
- o The process of staging and committing
- o The details of the commit objects
- NEXUS
- o Nexus prerequisites
- o Installing and Running Nexus

- o Using the Nexus User Interface

## CONTINUOUS INTEGRATION

- INTRODUCTION TO JENKINS-CI

- o Continuous Integration with Jenkins Overview
- o Installation
- o Configure Jenkins as stand-alone application
- o Configure Jenkins on an Application Server
- o Jenkins management
- o Support for the Git version control systems
- o Different types of Jenkins Jobs
- o Setting up a Jenkins job
- o Scheduling build Jobs
- o Maven Build Scripts
- o Securing Jenkins
  - Authentication
  - Authorization
  - Confidentiality
  - Creating users
- o Jenkins Plugin
  - Installing Jenkins Plugins
  - SCM plugin
  - Build and test
  - Analyzers
- o Distributed builds with Jenkins
- o Best Practices for Jenkins

## DEVOPS: MONITORING

- NAGIOS

- o How to monitor the Servers in Nagios
- o Trigger Alerts in Nagios
- o How to apply blackouts and remove blackouts

- ZENOSS

- o How to monitor the Servers in Zenoss
- o Trigger Alerts in Zenoss
- o How to apply blackouts and remove blackouts
- o How to check events; CPU, Memory and RAM Graphs for servers

## DEVOPS: APPLICATION ARCHITECTURE

- Web Forms
- User Controls
- Shared UI Code
- Business Logic

## CONFIGURATION MANAGEMENT

- Configuration Management Activity
- Configuration Control
- Incident Management
- Change Management
- Problem Management

## GENERAL ENVIRONMENT SETUP STEPS IN AWS and NTTA

- Creating Servers and Networks in Cloud
- Setting up rules and Application
- Difficult Scenarios in environments.
- Scaling
  - o Environment testing
  - o Monitoring logs

## MISCELLANEOUS

- Other Tools used in DevOps.
- Docker

