**Batch Date:** July 25th @7:00AM  
  
Faculty: Mr. Maha (15+ Yrs of Exp,..)

**Duration:** 4 Months

**Location:** **Maitrivanam, Hyderabad**

**Venue :**  
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**Syllabus:**

**DEVOPS**

**Model 1: Continues Integration and Continues Delivery**

• Git  
• Jenkins  
• Maven  
• Jfrog  
• SonarQube

**Model 2: Configuration management**

• Vagrant  
• Chef

**Model 3: Configuration Management**

• Ansible

**Model 4: Containerization**

• Docker  
• Kubernetes

**Model 5: Infrastructure Automation**

• Terraform

**Model 6: Monitoring**

• Elastic search  
• Kibana  
• Log stash  
• Nagios

**Why DevOps:**

• Business Perspective  
• IT Perspective  
• Developer Perspective  
• Tester Perspective  
• Operations Perspective

**What is DevOps:**

• Definition   
• Stakeholders of DevOps

**What is SDLC:**

• Phases of SDLC  
• Role of Dev in SDLC  
• Role of Ops in SDLC

**Introduction to DevOps Automation:**

• Introduction  
• Tools  
• DevOps Technology Categories  
• Collaboration  
• Planning  
• Issue Tracking  
• Configuration Management  
• Source Control  
• Dev Environments  
• Continuous Integration  
• Continuous Testing  
• Continuous Deployment  
• Monitoring

**Linux Essentials:**

• History  
• Types of OS  
• Flavours  
• OS Structure  
• File system  
• All Linux basic commands  
• File & directorys persmisions  
• User & groups administration  
• Accessing Servers with ssh  
• How multi user works in Linux  
• How make normal user as sudo user.

**Shell Script:**

• Introduction  
• Type of shells  
• Variables  
• Types of variables  
• Operators  
• Input arguments  
• String comparison  
• Athematic comparison  
• File conditions  
• If, loops, case, functions  
• Examples

**Virtualization:**

• Introduction  
• What is Virtualization  
• Server Virtualization  
• Desktop Virtualization  
• Application Virtualization

**Apache Webserver:**

• Installations  
• Configuration

**Tomcat Application Server:**

• Installation, configuration  
• Tomcat Manager  
• Application Management  
• Application Deployment

**DevOps Tools**

**Model 1: Continues Integration and Continues Delivery**

**Source Code Management:**

What is Version Control System?

**Git:**

• Source Code Management  
• SCM Tools  
• What is Git  
• Installation  
• Work space/ work dir/ work tree  
• Configuration  
• Commit/check-in  
• Version/version-ID/commit-ID,  
• Work space, staging area, buffer area  
• Local Repo/remote repo  
• Customer Branching  
• Release Branching  
• Merge, stash, fast-forwarding, rebase  
• Chery-pick, cat-file and hocks  
• Repositories and Tracking  
• **Git Commands:** add, commit, log, push, status, ignore, branch, checkout merge, confict, stash, reset, revert  
• Git GUI

**Automate Build Process:**

**Maven:**

• Introduction, Maven Structure  
• Maven Dependenciess  
• Maven Repositories  
• Maven Plugins and goals  
• Integrated Maven Build  
• Maven project

**Jenkins:**

**What is Jenkins?**

**Installation and configuration**

• Prerequisitesd  
• Download and installation  
• Configuration.

**Managing Jenkins**

• Securing Jenkins, Managing Credentials, Plugin Management  
• Jenkins Backup, Create a Build Slave

**Creating Application Builds**

• Manual compilation with Maven  
• Manually Testing, Packaging and Running the App  
• Creating a Jenkins Job and configuring a Git Repo  
• Compiling in Jenkins  
• App Packaging in Jenkins  
• Archiving artifacts  
• Cleaning up Past Builds  
• Build time trend  
• The jenkins Dashboard  
• Troubleshooting build failures  
• Build linking upstream and downstream

**Plugins**

• Introduction  
• Plugin Architecture  
• Extension Points  
• Getting Plugins  
• Useful Plugins Overview  
• Build Tool Plugins  
• Installing a plugin  
• Plugin configuration  
• Security Overview

**Continuous Testing and Continuous Integration and Testing**

• Adding steps to Freestyle Project  
• Creating a Pipeline job to execute Maven  
• Archiving in a Pipeline  
• Checking out git repository in pipeline  
• The Master Agent Model  
• Allocating a node and workspace in Pipeline  
• Triggering Automated Builds  
• Configuring an Email Server  
• Notifications when a build fails  
• Executing unit tests

**Finding and Managing Plugins**

• The need for plugins  
• Integrated Code Coverage  
• Assessing a plugin  
• Testing Plugins and Plugin Types

**Building Continuous Delivery Pipeline**

• Continuous Delivery  
• Backup and Restore  
• A Second Node Allocation  
• Adding an Agent Node  
• Setup parallel integration testing in a pipeline  
• Executing and Monitoring Parallel pipelines  
• Setup Deployment to staging  
• Executing a Deployment pipeline  
• Checkin pipeline script to Git

**Master and Slave Configuration**  
  
**Integrating Jenkins with jfrog and sonarqube**

**Model 2: Configuration / Provisioning**

**CHEF:**

**Introduction to Chef**

• What is Chef  
• Common Chef Terminology  
• Chef Serverand Workstation  
• Chef-Client  
• Server and Nodes  
• Chef Configuration Concepts  
• Run\_list

**Setting up the Environment**

• Intro to ChefDK  
• Chef Workstation Setup

**Chef Server**

• Installing Chef Server  
• Chef-Repo, Setting Up the Work Station, and Bootstrapping A Node  
• Configuring Git  
• Chef Client, Nodes and Run Lists  
• Building A Quick Apache Cookbook  
• Managing Node Run\_Lists  
• Chef-Client Configuration

**Resources**

• Understanding Chef and Chef Convergence  
• Common Chef Resources  
• Default Resource Actions  
• Working with not\_if and only\_if Guards

**Recipes and Cookbooks**

• Understanding Chef Recipes and Run Lists  
• Understanding Chef Cookbooks  
• Generating a Cookbook  
• Cookbook Pro-Tips

**Local Cookbook Development Basics**

• Test Kitchen Configuration  
• Using Test Kitchen  
• Static Code Analysis  
• Troubleshooting

**Building Web & application server Cookbook**

• Getting Setup  
• Starting the Apache Recipe  
• Adding Platform Support to the Cookbook  
• Adding Local Chef-Repo to Github  
• Install and configure Chef Reporting  
• Node Object and Search  
• What is Node Object  
• Writing cookbook & recipes for webserver  
• Writing cookbook & recipes for tomcat application server

**Attributes:**

• Node Attributes  
• Type of Attributes  
• Attributes presidency

**Environments**

• Chef Environments  
• What are Environments and why do they matter  
• Creating and Configuring Environments  
• Deploying to Different Environments  
• Viewing and Environments with Knife

**Roles**

• What are Roles  
• Creating A web server Role  
• Creating Db Server Role  
• Creating a Base Role

**Chef Supermarket**

• Chef Supermarket

**Vagrant:**

**Introduction**

• What is Vagrant  
• Virtualization Overview

**Setting Up Vagrant**

• Virtual Box Installation  
• Vagrant Installation

**Using Vagrant**

• Vagrant Machine  
• Vagrant Files  
• Boxes  
• Running Vagrant Machines  
• SSH to Vagrant Machine  
• Synced Folders  
• Environment Management

**Automated Provisioning**

• Provisioning  
• Installing Apache /Shell Script  
• Installing Apache /Chef

**Networking**

• Private Networking  
• Public Networking

**Model 3: Configuration / Provisioning**

**Ansible:**

**Introduction**

• What is Ansible  
• Change Management  
• Provisioning  
• Automation  
• Orchestration  
• Why use Ansible  
• YAML  
• Built in Security  
• Extendable  
• Conclusion

**Architecture and Process Flow**

• Architecture Introduction  
• System Requirement  
• Components Overview  
• Process of Execution  
• Conclusion

**Setup and Configuration**

• Test Environment Setup  
• Download and Installation  
• Ansible Configuration File  
• The HOSTS File  
• Overriding the Default HOSTS File  
• Overriding the Default System Ansible.Cfg File  
• Overriding the Default Roles Path  
• Understanding the core components of Ansible  
• Ad-hoc commands in Ansible

**Ansible Inventory and Configuration**

• Introduction to Inventory &Configuration  
• Inventory Fundamentals  
• Scaling out with Multiple Files  
• Ansible Configuration Basics

**Ansible Playbooks**

• Ansible Command Line  
• Our First Playbook  
• Variables: Inclusion Types  
• Target Section  
• Variable Section  
• Task Section  
• Handler Section  
• Outlining Playbook  
• Create a Playbook from Outline  
• Optimizing Playbook  
• Taking Playbook for a Dry Run  
• Simple Variable Substitution  
• Loops  
• Conditionals  
• Vault  
• Basic Include Statements  
• Tags  
• Basic Error Handling  
• Includes - Breaking Your Playbook Into Discrete Plays  
• Starting At Task or Stepping Through All Tasks  
• Passing Variables Into Playbooks at the Command Line  
• Using Jinja2 Templates  
• Use a playbook to copy a program and customize it for the target host.  
• Wiring Play books for java, webservers and applications server

**Ansible Modules**

• Introduction  
• Ansible Modules Fundamentals  
• Module Docs  
• Yum Module  
• Setup Module  
• Other modules

**Create and use templates to create customized configuration files**

• Introduction  
• Templates

**Working with Ansible facts and variables.**

• Let see how we get ansible facts and how we use facts  
• Using Ansible facts  
• Using variables to gather server info

**Roles**

• Introduction to Roles  
• Role Basics  
• Creating Role  
• Ansible Galaxy  
• Roles - The Directory Structure  
• Role Based Tasks  
• Task Order - Pre and Post Tasks  
• Roles - Conditional Execution  
• Roles - Variable Substitution  
• Roles - Handlers  
• Roles - Configuring Alternate Roles Paths  
• Roles - Conditional Include Statements  
• Roles - Waiting For Events  
• Roles - Executing a Task Until  
• Roles - Using Tags  
• Roles - Breaking a Playbook Into a Role  
• Roles - Passing Variables from Command Line  
• Roles - Using Jinja2 Templates  
• Roles - LocalAction  
• Roles - Lets create a role to install apache.  
• Lets use the previous role and add a new one.  
• Lets build on the previous role  
• Create Role for installing tomcat on multiple nodes  
• Create Role for deployapplication on multiple nodes

**Model 4: Containerization**

**Docker:**

• Introduction  
• What is Docker  
• Docker Life Cycle  
• How Docker Containers working

**Installing Docker**

• Installing Docker on Linux

**Working with Containers**

• How to create the containers  
• Docker commands  
• Theory of pulling and Running Containers  
• Working with images  
• Container Life cycle  
• Dockerfile  
• Build Docker images  
• Docker push  
• Docker compose  
• Docker volumes  
• Docker cpu  
• Docker memory  
• Docker Networking

**Kubernetes**

• What is kubernets  
• Purpose of Kubernets  
• How kubernets works  
• Master components, how works  
• Node Compenents, how works  
• How pods works  
• Installations and configuration kubernets cluster  
• Pod lifecycle  
• Work with pods  
• Work with Services  
• Work with Replica controller  
• Work with Deployment  
• How to Releases java application by using RC and Deploy  
• KOPS

**Model 5: Terraform**

**Infrastructure Automation**

• What is Infrastructure as Code and why is it needed?  
• Declarative vs Procedural tools for Infrastructure as Code  
• Infrastructure as Code in the Cloud  
• Requirements for infrastructure provisioner  
• Deploying First Server  
• Preparing work environment  
• Terraform providers  
• Configuring AWS provider e. Creating EC2 instance with Terraform  
• Working with state  
• Handling resource updates

**Resource Dependencies and Modules**

• Creating AWS Virtual Private Cloud  
• Controlling dependencies with depends\_on and ignore\_changes  
• Making sense of our template  
• Removing duplication with modules  
• Configuring modules  
• Retrieving module data with outputs  
• Using root module outputs

**Storing and Supplying Configuration**

• Understanding variables  
• Configuring data sources  
• Exploring Terraform configuration resources  
• Taking a quick look at Consul

**Model 6: Monitoring**

**System Monitoring: Nagios**

• Installation of Nagios  
• Configuring Nagios  
• Monitoring with Nagios

**Application Monitoring: ELK**

• Installation of Elasticsearch, logstash, Kiban stack  
• Configuring the ELK Stack  
• Monitoring logs with ELK

**Amazon Web Services**

**Model 7: Elastic Cloud Computing (EC2)**

• EC2  
• EBS (Elastic Block Storage)  
• CLB (Classic Load Balancer)  
• ALB (Application Load Balancer)  
• Cloud Watch  
• SNS (Simple Notification Service)  
• Auto Scale  
• Route53  
• EFS (Elastic File Storage)  
• EC2 CLI  
• EC2 Cloud Formation  
• Price optimization

**Model 8: Networking (VPC)**

• Basic Networking  
• VPC (Virtual Private Cloud)  
• Subnet  
• Rout table  
• NAT  
• SG (Security groups)  
• NACL (Network Access Control Lists)  
• Peering connection  
• Transit Gateway  
• VPN (virtual private network)  
• Cloud Formation  
• VPC CLI  
• VPC Cloud Formation  
• Price optimization

**Model 9: Storage and Permissions (S3, IAM)**

• S3  
• Storage Classes  
• Version  
• Object Lifecycle  
• Statistic webhost  
• Glacier  
• IAM users  
• IAM groups  
• IAM roles  
• IAM Policies  
• S3 CLI  
• Price optimization

**Model 10: Database (RDS)**

• RDS (Relation Database Services)  
• Replica  
• MAZ (Multi Available Zone)  
• Private RDS  
• Dynamo DB  
• RDS CLI  
• DMS (Data Migration Services)  
• Elastic Cache  
• Price optimization

**AWS Introduction**

**Model 7: Elastic Compute Cloud (EC2)**

* EC2 Basics
* Amazon Machine Images (AMIs)
* Instance types
* Elastic Block Store (EBS)
* Security Groups
* IP Addressing
* Launching and using an EC2 instance
* EC2 Essentials
* Understanding Reserved Instances
* Selecting and Building EC2 Instances
* Working with public and private IP Addresses
* Cloud-init User data and Metadata
* Cloud Watch and EC2
* EC2 Placement Groups o Serving Traffic to Private Web Servers

**EBS (Elastic Block Storage)**

* Hard disk Basics
* EBS Types
* EBS vs Instance Storage

**EBS Volumes And Snapshots:**

* Working with Elastic Block Storage
* Understanding AWS Storage Types
* Increasing IOPS Performance
* Configuring Optimized Instances
* EBS Snapshots and Replication
* EBS Snapshots Characteristics
* Working with Snapshots in the AWS Management Console
* AWS Command Line Interface
* Working with EC2 using CLI
* EC2 Troubleshooting Scenarios

**Elastic File Storage**

* Demonstrate ability to create backups for different services
* Overview of Backup Services on AWS and Services that Include Backups
* Creating and Scripting Automation for EC2 Snapshots

**Load Balancing Basics**

* OSI Network Layer
* Load Balancing
* Classic Load Balancer
* Application Load Balancer
* Auto Scaling Groups
* Target Groups
* Health Checks

**Simple Notification Service (SNS)**

* Introduction
* SNS Topics
* SNS Subscriptions and SNS Subscription Protocols
* SNS Push Notifications

**Cloudwatch**

* Creating Cloud Watch Alarms for EC2 Monitoring
* Creating custom cloudwatch metrics
* Configuring Alarms

**Monitoring and Metrics**

* Understanding AWS Instance types, Utilization and Performance
* EC2 Instance and System Status Checks
* Creating Cloud Watch Alarms
* Installing and Configuring Monitoring Scripts for EC2 Instances
* Dedicating an instance to monitoring
* Monitoring EBS for performance and availability

**CloudTrail**

* CloudTrail Workflow
* Concepts
* CloudTrail Log Files

**Auto Scaling:**

* Basics
* Using Auto Scaling
* Auto Scaling Troubleshooting scenarios
* Auto Scaling Features
* How Auto Scaling Works
* Configuring Auto Scaling

**Route 53:**

* Route 53 Basics
* Using Route 53
* Route 53 and DNS Failover
* Weighted Routing Policies In Route 53
* Configuring DNS with Route 53
* Where we are in the reference architecture
* The role of DNS in a distributed cloud system
* Using Route 53 with ELB, CloudFront, S3
* Configuring Route 53
* Route 53 Best Practices

**Billing:**

* AWS Billing and linking AWS Accounts
* AWS Billing Dimensions and metrics for Cloud Watch
* Cost Optimizing
* Using the AWS Price List API and Cost Explorer

**AWS EC2 CLI:**

* Creation and management of EC2 resources using CLI

**Model 8: Virtual Private Cloud (VPC)**

* AWS Global Infrastructure
* VPC Basics
* Internet Gateways (IGW)
* Route Tables (RTs)
* Network Access Control Lists (NACLs)
* Subnets o Availability Zones
* Introduction to VPC and AWS Networking o Building A VPC From Scratch
* VPC Networking
* VPC Security
* Configuring a NAT Instance
* DB Subnet Groups
* Elastic IP Addresses and Elastic Network Interfaces
* Configure a Web Application In VPC
* Extending the VPC to On-Premise Networks
* VPC Peering o Troubleshooting scenarios
* Network and Data Security o Network Monitoring with Flow Logs

**Extending On-Premise Networks with VPN:**

* Using Directory Service to Connect Hybrid Architectures
* Security Zones
* Understanding AWS IP Subnet Reservations
* Hybrid Cloud AWS
* Overview
* AWS Hybrid Cloud Scenario
* Network Integration in to AWS VPC
* Best Practices
* AWS VPC Wizard Creation
* Creating an OpenVPN Instance for Client Connections

**Cloud Formation:**

* Cloud Formation Essentials
* Creation and deployment of VPC Using Cloud Formation

**Billing:**

* Cost Optimizing

**AWS VPC CLI:**

* Creation and management of VPC resources using CLI

**Model 9: S3, IAM**

**Simple Storage Service (S3)**

* S3 Basics
* Buckets and objects
* Storage Classes
* Object Lifecycles
* Permissions
* Object Versioning
* S3 Essentials
* S3 Bucket/Object Versioning and Policies
* Website Hosting with S3
* AWS Command Line Interface
* Working with S3 using CLI
* Introduction To S3 Developer Requirements
* Creating a static hosting Website with S3
* S3 IAM & Bucket Policies

**Glacier:**

* Overview
* Introduction to Glacier
* Creating a Glacier Vault
* Storing Archives in Glacier
* Understanding Glacier's Retrieval Pricing
* Restoring Archives from Glacier

**Billing:**

* Cost Optimizing

**AWS S3 CLI:**

* Creation and management of s3 resources using CLI

**Identity Access Management (IAM)**

* What is IAM
* Create User
* Create Groups
* Roles
* Polices
* Custom polices
* Create/Set an IAM Policy for an IAM User

**Model 10: Relational Database Service (RDS) Dynamo DB**

**RDS:**

* Overview
* Essentials
* Working with RDS
* Subnet Groups
* Security Options
* RDS Security Groups and Connecting to RDS from EC2
* Monitoring RDS for performance and availability
* MySQL and Maria DB on RDS
* Replica & MAZ
* Private RDS

**Amazon Dynamo DB:**

* Getting Started with Dynamo DB
* Local and Global Secondary Indexes
* Dynamo DB overview and Limits
* Dynamo DB Multi-Region Replication

**Database Migration Service**

* How AWS DMS Works
* Security Setup
* Replication Instance
* Endpoints
* Tasks
* Migrating Mysql
* Migrating Microsoft SQL Server

**Elastic Cache**

* Caching Overview
* Memcached
* Redis
* Clusters
* Backups

**Billing:**

* AWS Billing and linking AWS Accounts
* AWS Billing Dimensions and metrics for Cloud Watch
* Cost Optimizing o Using the AWS Price List API and Cost Explorer

**AWS CLI**

* Creation & Managing EBS & EFS using CLI
* Creation and Management of DB Services using CLI