AWS Course Syllabus

Module 1: Linux Fundamentals

- Overview of all basic commands
- Vim editor modes
- Filesystem hierarchy – Basic topics
- File and directories creation
- Grep
- Filter commands (head, tail, more, less)
- Creating users and groups
- Important files related
- Modifying, deleting users and group
- Linux permissions
- Basic permissions overview
- Software management
- Yellowdog update modifier(yum)
- Yum commands
- Different runlevels
- Services and daemons

Module 2: Why Cloud ?

- Why Cloud and What is Cloud Computing?
- Identify the features and benefits of cloud computing
- Different types of Cloud Computing deployment model
- Public Cloud, Private Cloud, Hybrid Cloud
- Virtualization – An essential in cloud
- Virtualization in Cloud model
- Different types of virtualization

- Hypervisor – Benefits

- Different types of services and its difference in Cloud computing

- IaaS, PaaS, SaaS

- Importance of scaling in cloud computing

- Different types of scaling and its applications

- Issues we overcome using cloud and applications

- Cost model that we use in cloud computing

Module 3: AWS – An overview

- Describe the features of AWS

- The features of AWS marketplace

- Describe the features of Amazon Compute Services

- Describe the features of Amazon Storage Services

- Describe the features of Amazon Network Services

- Describe the features of Amazon Database services

- Describe about various services in AWS

- Global Infrastruture – Regions and Availability Zones

- Create a free tier account in AWS and onboarding

- Introduction AWS management console

Module 4: Understand Identity Access Management of AWS

- Protect your AWS by different authentication system

- Password policies set for users

- AWS User Account and Groups in detail

- Creating custom policies in AWS

- Introduction about Roles and its use

- Creating Roles and associating policies

- Creating programmatic access and management console access for users

- Associating policies to the user and groups

Module 5: EC2 Instance

- Describe AMI and AWS Marketplace templates

- Launch a basic EC2 instance

- Different types of Instances Reserved, On-demand, Spot, Dedicated

- Security groups and tags for EC2 instance

- Public key – Private key introduction and protecting EC2 with keys

- Attaching and detaching EBS volumes

- Launch an ec2 instance from an AMI

- Create custom AMI and working with different region

- Make use of amazon EBS volume and create snapshots

- Manage the configuration of your application

- Deploying a new instance from the created AMI

Module 6: Auto-scaling

- Get Started with Auto Scaling Using the Console

- Creating Launch configurations and make use of it for autoscaling groups

- Maintain a Fixed Number of Running EC2 Instances

- Dynamic Scaling

- The lifecycle of autoscaling

- Policies of autoscaling

Module 7: Load Balancing

- Introduction to Loadbalancer (ELB)

- Different types of Loadbalancer in AWS

- Application Load balancer

- Network Load balancer

- Classic Load balancer

- Migrating classic load balancer to new load balancer

- Components and types of load balancing

Module 8: EBS (Elastic Block Storage)

- Create EBS volumes
- Delete EBS Volumes
- Attach and detach EBS volumes with EC2 instance
- Creating and deleting snapshots

Module 9: Object Storage in Cloud

- Understanding S3 durability and redundancy
- Introduction about S3 Buckets
- How S3 Uploading works and how to Download
- How to S3 Permissions
- How to implement S3 Object Versioning S3 Lifecycle Policies
- Storage Gateway
- Import Export
- S3 Transfer Acceleration
- Glacier storage

Module 10: Cloud Front

- Describing cloud front
- Creating a cloud front distribution
- Hosting a website of cloud front distribution
- Implementing global restrictions
- Configuring origins and behaviors

Module 11: Route53

- Describe Hosted zones and Domain name understanding
- How to create hosted zones
- Hosting a website with custom domain name
- Understanding routing policies

Module 12: AWS Security Management

- Describing Security Practices for Cloud Deployment

- AWS Shared Responsibilities and Securities

- Importance of Cloud Trail

- Describing Trust advisor

Module 13: Amazon Virtual Private Cloud (VPC)

- Introduction to Amazon Virtual Private Cloud (VPC).

- VPC Advantages and understanding IP addressing CIDR

- Default and Non-default VPC

- Different Components in VPC

- Describe, create, and manage Amazon Virtual Private Cloud

- Amazon VPC, Private Subnet, and Public Subnet

- AWS Networking, Security Groups, and Network ACLs

- Configuration and management of VPN connectivity

- Subnet and Subnet Mask

Module 14: Relational Database Service (RDS)

- Introduction to RDS

- Different database services of AWS: Amazon RDS, Dynamo DB, Redshift etc.

- Create MYSQL RDS Instance, Oracle RDS Instance, MS SQL RDS Instance

- Configuring the database

- Configuring backups

- Configuring the maintenance windows

- Connecting to the database

Module 15: NDynamo DB

- Creating a dynamo dB

- Adding data manually

- Learn about strong and eventual consistency

- Calculating Read write consistency
- Configuring alarms

Module 16: Monitoring Services

- Knowledge on Cloud watch – A monitoring service
- Create and Configuring Monitoring services
- How to perform Setting thresholds and Configuring actions
- Creating a cloud watch alarm
- Getting statistics for ec2 instances
- Monitoring other AWS services
- Configuring Notifications
- Integrating cloud watch with Auto scaling

Module 17: Application Services – An Overview

- What is SNS
- Creating a topic
- Create subscription
- Subscribed to the subscription
- SQS & SES
- Lambda and Elastic Beanstalk

Module 18: AWS Troubleshooting

- Troubleshooting EC2 instance
- Troubleshooting using Cloud watch
- Troubleshooting using ELB
- Troubleshooting by using Cloud front

Module 19: AWS Architecture and Design

- Backup and Disaster Recovery
- How to manage Disaster Recovery and Backups

- Best Practice for DR and Backups

- AWS High Availability Design

Module 20: DevOps Fundamentals

- An understanding of DevOps and the modern DevOps toolsets

Devops concepts:

Introduction to DevOps

Learning Objective:

This session will help you understand the purpose and the scope of DevOps in the current market, tools and the skills the market is looking for and how the culture is applied in the industries

Topics:

- DevOps Principles in detail
- DevOps Engineer Skills in the market
- Knowing DevOps Delivery Pipeline
- The market trend of DevOps
- DevOps Technical Challenges
- Tools we use in DevOps

Hands-On:

A brainstorming session on the trends in current IT industries

DevOps on Cloud

Learning Objective:

This session will help you understand how DevOps is currently being used on cloud infrastructure by automating entire setup. Learn cloud setup helps faster releases, fewer software failures and how trendy it is.

Topics:

- Essentials of Cloud computing?
- Cloud and virtualization architecture
- Cloud deployment architecture
- Cloud providers – An overview
- Why we need DevOps on Cloud?

- Introducing to Amazon web services

  Hands-on:

- How to setup AWS account

- Various AWS services for Devops – An overview

- DevOps using AWS – Demo

  GIT – A version control tool

  Learning Objective:

  This session will help you understand why version control system streamlines the development of

  working with different people and makes very easy to collaborate on projects.

  Topics:

- Knowing about Version control

- Git – A CLI

- Essentials of GIT in industry

- How to setup GIT

- Working with various commands in GIT

o Recording Changes to the Repository

▪ How to check the Status of Your Files

▪ How to track New Files

▪ Staging our modified files

▪ Ignoring Files from GIT

▪ Viewing Your Unstaged and Staged Changes

▪ How to commit Your Changes

▪ Skipping the Staging Area and commit

▪ Removing Files from GIT

o Viewing the Commit History

▪ Limiting Log Output

▪ Using a GUI to Visualize History

o Undoing Things

▪ Changing Your Last Commit

▪ Unstaging a Staged File

▪ Unmodifying a Modified File

o Working with Remotes

- Showing Your Remotes
- Adding Remote Repositories
- Fetching and Pulling from Your Remotes
- Pushing to Your Remotes
- Inspecting a Remote
- Removing and Renaming Remotes
o Branching and Merging in Git
- What a Branch Is
- Basic in Branching and Merging
- Branch Management in GIT
- Branching Workflows and its usage
- Remote Branches – create and delete
- Rebasing
o Git workflows
o Git cheat sheet

Hands-on exercises:
- Installing Git
- First-Time Git Setup
- Getting a Git Repository
- Working with various git commands
- Working with Local repository vs remote repository
- Managing remote repository
- Stashing operations and various local repository operations
- Branching and merging operations
- Resolving conflicts during merges
- Managing access on repository managements

Jenkins – Continuous integration

Learning Objective:

This session will help you understand why Jenkins is evolving as a must tool in the current DevOps practices. Understanding how Jenkins allowing current industries to set up their build pipelines with a more quickly and sophisticated build process by drastically reducing the risks in the software development lifecycles.

Topics:

- Essentials of Continuous Integration
- An example scenario where CI is used
- Know about Jenkins and its architecture in detail
- Jenkins tool Management in detail
- Know about User management in Jenkins
  - Authentication
    - Jenkins own database user creation
    - Options to enable integration with LDAP
  - Authorization
    - Matrix-based authorization
    - Project-based authorization
  - Overview of Maven
    - Maven project structure
    - Maven plugins
    - Project Object Model (POM) – the fundamental unit of work in Maven project
    - Maven build lifecycle
    - Adding external dependencies to maven pom.xml
    - Maven build and test project
  - Creating jobs and automatic build settings
    - What is Jenkins Pipeline?
    - Why Pipeline?
    - Integration with GIT
    - How to enable project-based authorization for a job
    - Source code management while creating jobs
    - Triggering automated build
    - Maven job setup
    - Know about post-build options for jobs like notifications, trigger another build, publishing reports, etc.
  - Adding a slave node to Jenkins
  - Building Delivery Pipeline
  - Notification settings in Jenkins
  - Plugin management in Jenkins

Hands-on Lab:

- Installing Jenkins
- Post-installation setup wizard
o Unlocking Jenkins
o Customizing Jenkins with plugins
o Creating the first administrator user
- Administration of Jenkins
- User management – Authentication and Authorization
- Master-slave set up on Jenkins
- Creating basic jobs to pull code from GitHub
- Jobs to perform individual operations
- Setup build pipeline
- Understanding build triggers, build and post-build operations
- Deploying an application to a container using Jenkins

Docker – A containerization technology

Learning Objective:

This session will help you understand why Docker knowledge is required in order to master DevOps cultures in the current IT industry Understanding containerizing the application is also isolating that into a completely separated environment.

Topics:

- Introduction
o Real-world Shipping Transportation Challenges
o Introducing Docker and its technology
o Understanding of Docker images and containers
- Working with container
o How to Share and copy a container
o Container Life Cycle
o How to use Base Image and customize
o Creation of Docker File
o How to Publish Image on Docker Hub
- Introduction to Docker Networking
o Network Types in docker technology

- o Docker Container Networking
- o Docker Compose – An introduction
- • Docker Swarm – An introduction
- o Use Docker Compose to create PHP, WordPress, MySQL
- o How to Start Containers on a Cluster with Docker Swarm
- o Creating and Scaling an application in Docker swarm

Hands-on:

- • How to setup docker-engine
- • How to run docker container from pulling image from public repo
- • How do we create a docker file
- • Creating different docker files for different application
- • Creating a docker-compose file to deploy multi-container
- • Creating docker custom bridge networks
- • Creating docker swarm cluster
- • Orchestration of container using swarm cluster

Kubernetes

Learning Objective:

This session will help you understand how Kubernetes helps to orchestrate the Docker containers. How the opensource system helps to automate the deployment, scaling and managing the containers.

Topics:

- • Introduction to Kubernetes
- • Kubernetes Cluster Architecture – An overview
- • Understanding concepts of Pods, Replica sets, deployments and namespaces
- • Understanding the concepts of services and networking
- • Persistent volumes and persistent volume claims – an overview
- • Design of Pods
- • Understanding labels, selectors, jobs, and schedulers

Hands-on:

- • Setting up the Kubernetes Cluster
- • Deploying an app through Kubernetes Dashboard
- • Accessing the application through service
- • Rolling updates in Kubernetes

- Creating and adding volumes

Ansible – A configuration Management

Learning Objective:

This session will help you understand how significantly Ansible reduces your coding hours with the configuration management tool. Understanding most popular configuration management tool to set up easily, configure easily and deploy IT infrastructure easily.

Topics:

- Introducing Ansible – A configuration management tool
  - Basics / What Will Be Installed
  - Understanding Ansible architecture
  - Control Machine Requirements
  - Managed Node Requirements
- Inventory
  - Hosts and Groups
  - Host Variables
  - Group Variables
- Learn various Ansible Modules
- How to use Adhoc commands
  - Parallelism and Shell Commands
  - File Transfer
  - Managing Packages
  - Users and Groups
  - Deploying From Source Control
  - Managing Services
- Introduction to YAML script
- Playbook
  - About Playbooks
  - Playbook Language Example – YAML
  - How to Write Playbooks
  - Tasks in Playbooks
  - Understanding about various tasks in the playbook
  - Introduction to Handlers and variables

- o   Learn about using handlers, variables in the playbook
- o   Become (Privilege Escalation)
- •   Roles
- o   Role of Directory Structure
- o   Using Roles
- o   Role Duplication and Execution
- o   Role Default Variables
- o   Role Dependencies
- o   Role Search Path
- o   Ansible Galaxy
- •   Including and Importing
- o   Includes vs. Imports
- o   Importing Playbooks
- o   Including and Importing Task Files
- o   Including and Importing Roles

Hands-on:

- •   How to setup Ansible server and target servers.
- •   Writing Adhoc commands to install and configure the servers
- •   Writing a playbook to install and configure webservers and deplo0y an application
- •   How to create Ansible Role and use it
- •   Using an ansible role in a playbook
- •   How to use Ansible Galaxy to download roles.
- •   Example – Install and use Jenkins roles from ansible-galaxy