DevOps Training Syllabus

(Total Duration: 50Hrs)

Introduction to DevOps – 1Hr

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

Linux Fundamentals – 2Hrs

- 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

GIT - Version Control Tool – 5Hrs

- Knowing about Version control
- Git – A CLI
- Essentials of GIT in industry
- **How to setup GIT**
  - o Installing Git
  - o First-Time Git Setup
  - o Getting a Git Repository
- **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

- Git workflows
- Git cheat sheet

Jenkins - Continuous integration – 8Hrs

- Essentials of Continuous Integration
- An example scenario where CI is used
- Know about Jenkins and its architecture in detail
- **Jenkins tool Management in detail**
  o Installing Jenkins
  o Post-installation setup wizard
    - Unlocking Jenkins
    - Customizing Jenkins with plugins
    - Creating the first administrator user
- **Know about User management in Jenkins**
  o **Authentication**
    - Jenkins own database user creation

- Options to enable integration with LDAP
  - **Authorization**
    - Matrix based authorization
    - Project based authorization

- ## Maven - Build Tool
  - Maven project structure
  - Maven plugins
  - Project Object Model (POM) – 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

Ansible - Configuration Management Tool – 8Hrs

- **Introducing Ansible – A configuration management tool**
  - Basics / What Will Be Installed

- o Understanding Ansible architecture
- o Control Machine Requirements
- o Managed Node Requirements
- **Inventory**
  - o Hosts and Groups
  - o Host Variables
  - o Group Variables
- Learn various ansible Modules
- **How to use adhoc commands**
  - o Parallelism and Shell Commands
  - o File Transfer
  - o Managing Packages
  - o Users and Groups
  - o Deploying From Source Control
  - o Managing Services
- Introduction to YAML script
- **Playbook**
  - o About Playbooks
  - o Playbook Language Example - YAML
  - o How to Write Playbooks
  - o Tasks in Playbooks
  - o Understanding about various tasks in playbook
  - o Introduction to Handlers and variables
  - o Learn about using handlers, variables in the playbook
  - o Become (Privilege Escalation)
- **Roles**
  - o Role 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
- 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 playbook
- How to use Ansible Galaxy to download roles.
- Example – Install and use Jenkins roles from ansible galaxy

Docker - Container Tool – 8Hrs

Introduction

- Introduction to Containers
- Introduction to Docker
- Comparing Containers with Virtual machines
- Understanding the Docker architecture
- Understanding the components in Docker
- Installation of Docker on various machines.

Introduction To Docker Commands

- Working with basic Docker commands
- Working with Docker images commands
- Working with Docker container commands

Docker File

- Understanding Docker file
- Working with the various command sin Docker file
    - FROM
    - LABEL
    - RUN
    - CMD
    - EXPOSE
    - ENV
    - ARG
    - WORKDIR
    - VOLUME
    - ADD
    - COPY
    - ONBUILD
    - USER
    - HEALTHCHECK
    - ENTRYPOINT
- Writing a Docker file
- Creating custom image Docker file
- Running containers from the custom image
- Using all the above commands to create a custom image.

Docker-Compose

- Installing Docker-compose
- Creating a Docker-compose file
- Creating multi-tier containers from the Docker-compose file
- Working with the various Docker-compose commands to manage the containers

Docker-Networking

- Types of network in Docker
- Creating custom networks
- Running containers in custom networks
- Creating overlay networks and running container
- Creating macvlan networks and running container
- Working with bridge networks
- Working with host networks

Docker-Swarm

- Swarm Intro and Creating a 3-Node Swarm Cluster
- Swarm Mode A Built-In Orchestration
- Running containers in the swarm Cluster
- Creating Your First Service and Scale It Locally
- Swarm Basic Features and How to Use Them In Your Workflow
- Making containers highly available.
- Scaling Out with Overlay Networking
- Running swarm cluster using the overlay networks
- Scaling the containers
- Create A Multi-Service Multi-Node Web App
- Service Placement Preference
- Node Availability
- Working with various docker swarm commands.

Docker Events And Pushing Images

- Understanding events in Docker
- Checking the events in Docker
- Pushing the images to Docker hub
- Pulling the custom images from Docker hub.

Kubernetes Essentials – 2Hrs

- Why Kubernetes is important?
- What is Kubernetes?
- Where Kubernetes is useful?
- How to use Kubernetes?

Prometheus & Grafana - Monitoring & Visualization Tool – 7Hrs

Introduction

- Why is Monitoring important?
- What should I be monitoring?
- Which tools will suit my needs best?
- Prometheus overview
- Grafana overview

Getting started with Prometheus

- Pre-requisites
- Installing & configuring Prometheus

Monitoring Fundamentals

- What to monitor?
- Node Exporter
- StatsD Exporter
- Graphite Exporter

Setting up your Metrics

- Instrumenting an application
- Endpoints

- Label Naming
- Working with Time Series data
- Querying with PromQL

Alerts

- Defining Alerting rules
- Templating
- Alert notifications
- Setting up and configure

Visualization with Grafana

- Installing and configuring Grafana to work with Prometheus
- Create a Dashboard
- Adding a metrics endpoint as a data source
- Securing user permissions and authentication
- Publishing dashboards / snapshots

ELK – Log Monitoring Tool – 3Hrs

- what is ELK stack?
- ELK stack architecture
- what is elasticserach?
- what is Logstash?
- what is Kibana?
- installation and configuration of ELK
- ELK vs Splunk
- advantages of ELK stack

DevOps on Cloud – 2Hrs

- 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

- Various AWS services for DevOps - An overview

- DevOps using AWS – Demo

Project explanation – 3Hrs

Resume Preparation, Interview Questions and Documents Sharing – 1Hr

Thanks & Regards

Murali P N | Branch Manager | Bangalore

Mobile   : **+91 7871590386 | +91 7337894676**

LinkedIn: linkedin.com/in/murali-p-n

Mail   : murali.paramasivam@besanttechnologies.com | murali.besant@gmail.com

Web   : www.besanttechnologies.com | www.trainingbangalore.in

1 Lakh + happy learners
Facebook | LinkedIn | Twitter | YouTube