

DevOps chain of tools

Docker

Oral presentation:

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Concept of virtualization

What is Docker?

Architecture, Docker Engine, Docker Images, Registries, Docker Containers

Hands-On:

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Installing VirtualBox on windows Laptop

Installing Vagrant on Windows Laptop

Spinning up an Ubuntu Virtual Machine in VirtualBox

Installing Docker on Ubuntu

Configuring Docker Service Startup on Boot

Basic Docker Commands

Running containers from DockerHub

Creating Dockerfile

Creating Docker Image from Dockerfile

Running and Testing the created image

How to log in to container and execute commands

How to execute commands without logging in to container

How to stop a running container

How to remove a stopped container

How to remove an image

How to run multiple containers

Setting up network between containers

Creating Docker compose

Running compose to run dependent containers

Creating 4 Docker machines using DockerMachine tool.

Setting up Docker Swarm on one of the Docker Machines

Joining the other 3 docker machines to swarm

Running containers in swarm

Scaling containers up and down

Removing a node from the swarm

Adding the removed node back to swarm
Removing Swarm and Docker Machines
How to Tag an Image before uploading to DockerHub
How to upload images to DockerHub

Kubernetes

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Overview
Architecture

Hands-On

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Installation
Pods
Volumes
Services
Deployments
Network
Labels
Selectors
Secrets
Volumes
Namespaces
Replication Controllers
Images

Terraform

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Introduction

Hands-On

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Build Infrastructure

Configuration

Initialization

Applying Changes

Provisioning

Change Infrastructure

Configuration

Applying Changes

Destroy Infrastructure

Provisioning Resources

Assigning an elastic IP address

Applying Changes

Implicit / Explicit Dependencies

Non-Dependent Resources

Provisioners

Defining provisioners

Running Provisioners

Destroying Provisioners

Input Variables

Defining Variables

Assigning Variables

Using Variables

Lists

Maps

Assigning Maps

Output Variables

Defining Outputs

Viewing Outputs

Modules

- Using modules
- Applying Changes
- Module outputs
- Destroy modules

GIT

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1. What is VCS?
2. Detailed Git Architecture
3. Git Installation
4. Github Account creation.
5. Setting up remote repository

Hands-On

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6. Git initial Configurations.
7. Create Central/remote Repository locally
8. Deep dive – History of verifications of commits
9. Git Basic Commands.
10. Branching model/Strategy
11. Git advanced Commands
12. Git diff
13. Git show
14. Git push
15. Git checkout
16. Git reset -And its types
17. Git rebase
18. Git revert
19. Git stash
20. Ignoring files
21. Git clean
22. Git log
23. Git tag
24. Merging
25. Resolving merge Conflict
26. Hooks
27. Git Pull
28. Git Cherrypick
29. Git Fetch

30. Differences between GIT and SVN

Maven: Build Tool

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1. What is Build Management ?
2. What is Maven?
3. Why build tool is required ?
4. Maven Architecture?
5. Maven Repositories?
6. Maven Installations

Hands-On

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1. Project Name(GAV) and why they are important?
 2. Generate sample project structure
 3. Maven Build Life cycle
 4. Examples on Maven goals
 5. Verify Built artifacts
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1. What is POM?
 2. Maven Plugin management
 3. Different ways of invoking plugins
 4. Different command line options
 5. What is the importance of Settings.xml?
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1. Deployment Automation, Dependency declaration,
 2. Multi Module Projects
 3. Maven update version – for release
 4. Documentation – Building own site
 5. Software quality
 6. Build Types
 7. Real-time project deployment
 8. Code Coverage
 9. Sonarqube – Code quality tool

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What is CI and its benefits ?
Why Jenkins?
Crontab Syntax
Jenkins Architecture

Hands-On

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Jenkins Installation
Configure Systems
Configure Global Security
Global Tool Configuration
Reload Configurations from disk
Manage Plugins
System Information
System log
Load Statistics
Manage Nodes
Manage Users
Prepare to Shutdown
How to change port of Jenkins
How to change home directory of Jenkins
How to migrate Jenkins from one server to another
Real-time scenarios
Jenkins folder structure

Why Job Configuration is required?
Job Creation in Jenkins
CI setup – Exercise
Downstream dependency
CI and CD
Alter/create View – Project specific
Real-time scenarios
Build Pipeline

Jfrog –Artifactory
Sonarqube – Static code quality analyzer
Jacoco – Code coverage
Real time project - Integrate Jfrog, Sonarqube, JaCoCo and Docker in Jenkins.
Maintenance of Jenkins
Jenkins Best Practices
Popular Plugins
Code Review – An Agile process
Defect Tracking

Chef: Configuration management tool

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Why Chef is required?
What are Chef features?
Chef Architecture
Chef environment – terminologies
Hosted Chef server setup
AWS Instances – To setup node and WS – Points to Note

Hands-On

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Workstation Setup - ChefDK Installation
Connect WS to Server
Setup Node And connect to Hosted chef
Chef Recipe Syntax
Simplest form of Chef recipe code
What are Resources
How to do roll back in Chef

Commonly used Chef resources
Commands to generate cookbook and Recipe
Test your recipe locally before applying to PROD
Real-time Exercise – Write a recipe and upload to server to configure node
Chef Recipe – File resource
Chef Recipe – Array
Setting up Firewall -Multiple ports
Chef Recipe – User resource
Chef Recipe – Directory resource
Chef Recipe – Remote file resource
Chef Recipe – Execute resource
Chef Recipe – Template resource
Real-time –requirement to install apache service
Ruby has hash
Login to chef server – to check the hash of node
Adding the recipe to run_list to execute on nodes

Optimize chef recipe – using attributes
Real-time scenario – tomcat install
Optimize chef recipe – using attributes
Attributes precedence - Chart

How does chef-client works
How to stop executing the recipe in other platforms
Chef Sample project – In Github
Chef – Best practices
Community cookbooks - Supermarket

ROLES

Creating Roles
Exercise – on roles
CLEANUP
Chef - Environment
Databag - concept