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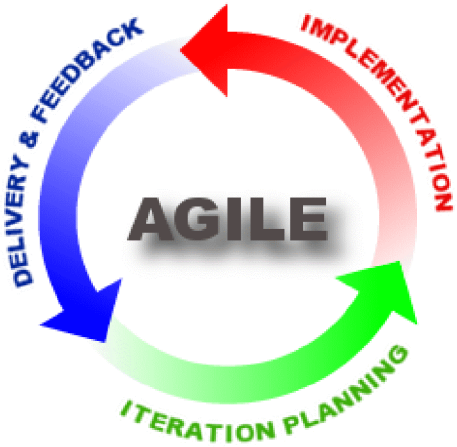
DevOps with AWS & LINUX

DevOps is the union of people, process and products to enable the continuous delivery of value to end users. It aims to create a culture and environment where building, testing, and releasing software can happen rapidly, frequently, and more reliably, so you can innovate like a startup and scale for the enterprise.

1. Introduction to DevOps

- What is Devops ?
- History of Devops
- Devops definition
- DevOps Main Objectives
- DevOps and Software Development Life Cycle
  - **Waterfall Model**
  - **Agail Model**
- Continuous Integration & Deployment
  - **Jenkins**
- Containers and Virtual Development
  - **Docker**
  - **Vagrant**
- Configuration Management Tools
  - **Ansible**
  - **Puppet**
  - **Chef**



2. CLOUD COMPUTING

- What is Cloud ?
- Evolution of Cloud Computing
- IAAS (Infrastructure as a Service)
- SAAS (Software as a Service)
- PAAS (Platform as a Service)
- Private, Public and Hybrid Cloud
- Public Clouds
  - **Amazon Web Services**
  - **Microsoft Azure**
  - **Google Cloud Services**

amazon web services™

Google Cloud Platform

3. LINUX: Basic and ADMIN

- Linux OS Introduction
- Importance of Linux in DevOps
- Linux Basic Command Utilities
- Linux Administration
- Environment Variables
- Networking
- Linux Server Installation
- RPM and YUM Installation

Linux™

4. WEB SERVER & APPLICATION SERVER

- Apache Web Server
- Web Server Installation & Configuration
- Apache Tomcat Server
- Tomcat Server Installation & Configuration
- Manual and Automated Application deployment

5. HA Proxy (High Availability Proxy)

- HA Proxy Installation
- HA Proxy Configuration(haproxy.cfg)
- Backend Servers & Ports
- Load Balancing Algorithm
  - roundrobin
  - leastconn
- Multiple HA Proxy Configuration

6. VERSION CONTROL - SVN & GIT

- Version Control System
- Centralized and Distributed Systems
- **SVN**
  - SVN Features
  - SVN Server Installation
  - Configure SVN with Web server
  - Create and Configure Users
  - SVN Trunk / Branch / Tag
- **GIT**
  - GIT Features
  - 3-Tree Architecture
  - GIT - Clone /Commit / Push
  - GIT Hub Projects
  - GIT Hub Management
  - GIT Rebase & Merge
  - GIT Stash, Reset , Checkout
  - GIT Clone, Fetch , Pull
- Differences between SVN & GIT

7. BUILD TOOLS - ANT & MAVEN

- Java Compiler
- **ANT**
  - ANT Installation
  - ANT build pre-requisites
  - Creating JAR and WAR files
  - Make and Build (**build.xml**)
  - Target and Tasks

- **MAVEN**
  - Maven Installation
  - Maven Build requirements
  - Maven POM Builds (**pom.xml**)
  - Maven Build Life Cycle
  - Maven Local Repository (.m2)
  - Maven Global Repository
  - Group ID, Artifact ID, Snapshot
  - Maven Dependencies
  - Maven Plugins

8. GIT Lab

- GIT Lab Installation
- GIT Lab Configuration
- Managing Projects in GIT Lab
- Creating Private Repository
- Repository Maintenance
- Set up key for Repository
- Deleting Repository

9. NEXUS

- Sonatype nexus download
- Nexus Configuration
- Configure settings.xml & pom.xml files
- Managing Nexus Releases and Snapshots
- Repository Maintenance
- Nexus user management
- Nexus roles management

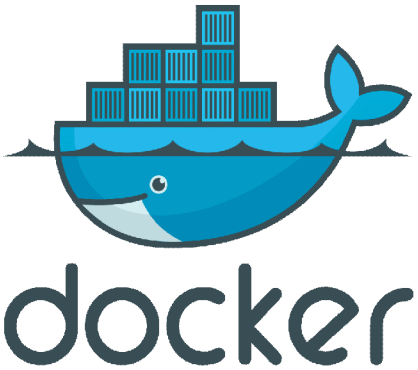
10. CONTINUOUS INTEGRATION- JENKINS

- Introduction to Jenkins
- Continuous Integration with Jenkins
- Configure Jenkins
- Jenkins Management
- **Scheduling build Jobs**
  - **POLL SCM**
  - **Build Periodically**
- Maven Build Scripts
- Support for the GIT version control System
- Different types of Jenkins Jobs
- **Jenkins Build Pipe Line**
  - Parent and Child Builds
  - Sequential Builds
- **Jenkins Master & Slave Node Configuration**
- Jenkins Workspace Management
- **Securing Jenkins**
  - Authentication
  - Authorization
  - Confidentiality
  - Creating Users
- **Jenkins Plugins**
  - Installing Jenkins Plugins
  - SCM plugin
  - Build and test

11. VAGRANT

- Introduction to Vagrant
- **Setting Up Vagrant**
  - Virtual Box Installation
  - Vagrant Installation
  - Vagrant Machines
  - Vagrant File
  - Vagrant Boxes
  - Environment Management
- **Networking Basics**
  - Private Network
  - Public Network
  - Network Adopters

12. DOCKER



- How to get Docker Image ?
- What is Docker Image
- Docker Installation
- **Working with Docker Containers**
  - What is Container
  - Docker Engine
  - Crating Containers with an Image
  - Working with Images
- Docker Command Line Interphase
- **Docker Compose**
- Docker Hub
- Docker Trusted Registry
- **Docker swarm**
- Docker attach
- Docker File & Commands

13. ANSIBLE

- Introduction to Ansible
- Ansible Server Configuration
- Infrastructure Management
- SSH Connection in Ansible Master
- YAML Scripts
- **Host Inventory**
  - Hosts and Groups
  - Host Variables
  - Group Variables
  - Host and Group Specific Data
- **Ad-hoc Commands**
- **Playbooks**
  - Variables
  - Conditionals
  - Loops
  - Blocks
  - Handlers
  - **Templates**
- **Modules**
  - Core Modules
  - Extra Modules
- **Ansible Roles**

14. PUPPET

- Introduction to Puppet
- Installation of Puppet Master
- Installation of Puppet Agent
- Configuration of Puppet Master and Agent
- Parameters in Puppet.conf
- Facter
- **Managing Manifests**
  - Creating Manifests
  - Node Definitions
  - Managing Files
- **Puppet DSL**
  - Adding Class to the Node definition
  - Variables
  - Inheritance
  - Templates (.erb)

- **Puppet Node Definition**
- **Resource Chain**
- **Puppet Forge Modules**
- **Creating and Managing Modules**
  - Module Structure
  - Defining First Class
  - Creating Node Definitions
  - Installing Web Servers
  - Installing App Servers
  - Installing DB Server
- **Roles and Profiles**

15. CHEF

- Introduction to Chef
- Installation of Chef Master
- Installation of Chef DK and Nodes
- Configuration of Chef Master
- Configuration of Chef DK and Master
- Knife utility
- Chef Repository
- **Workstation setup**
  - How to configure knife
  - Workstation Installation
  - Connection between knife and Master
- **Organization Setup**
  - Create an Organization
  - Add User & Node to an Organization
- **Node Setup**
  - Create a Server & add to Organization
  - Cookbooks creation
  - Check node details using knife
- **Node Objects**
  - How to add Run list to Nodes
  - Check node details
  - Managing Multiple Nodes
- **Roles and Environments**
- **Chef Data Bags**
- **Chef Market Place**

16. NAGIOS

Nagios®

- Introduction to **Nagios Core**
- Installation of Nagios Server
- Configuration of Nagios Server & Agent
- **NRPE** (Nagios Remote Plugin Executer)
- Configuration of **Nagios.cfg** and **Contacts.cfg**
- Monitoring Hosts
- Monitoring Services
- Monitoring Server Infrastructure

17. GCS (Google Cloud Services)

- Google Instance Creation
- Internal and External IPs
- Virtual Private Cloud
- Firewall Rules
- Google Compute Engine
- Putty Configuration

18. AWS (Amazon Web Services)

- Subscription to AWS
- Introduction to the AWS Management Console
- Why AWS Cloud
- **EC2** Essentials & Build EC2 Instances
- Security Groups
  Key Pairs (Public Key, Private Keys)

19. Elastic Compute Cloud(EC2) Instances

- Regions and Availability Zones
- Amazon Machine Images(AMI)
- Working with AMIs
- EC2 Reserved Instance Market Place
- **EC2 Instance Creation**
  - Building an Instance
  - Different types of Instances
  - Security with Key pair
  - Different IPs assign to EC2 Instance
  - Elastic IP Address
  - Login access to the Instance

20. Identity and Access Management (IAM)

- Creation of Users Accounts
- Roles in IAM
- Groups in IAM
- Account Settings
- Creating Permissions for Users
- Deleting Permissions for Users
- Accounting Settings

21. Virtual Private Cloud (VPC)

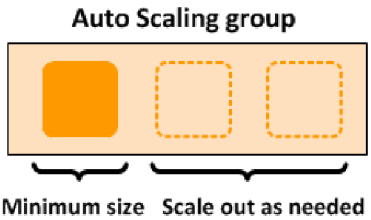
- Creating a Custom VPC
- Security Groups
- Creating Identity Gate Way (IGW)
- Connecting Instances in the Gateway
- Subnets
- Route Tables
- VPN Components

22. Elastic Load Balancer (ELB)

- What is Elastic Load Balancing
- How Elastic Load Balancing Works
- Creating Load Balancer
- Load Balancing Protocols
- Attach & Detach Subnets
- Adding Instances to Load Balancer
- Monitoring and Logging

23. Auto Scaling

- What is Auto Scaling
- Auto Scaling Components
- Advantages of Auto Scaling
- Auto Scaling Groups (ASG)
- Attach and Detach EC2 Instances in ASG
- Monitoring Auto Scaling Instances
- Health Checks



24. Simple Storage Services (S3)

- Creating and Deleting Buckets
- Adding Objects to Buckets
- Deleting Objects
- Uses of S3 storage
- Notifications
- Uses of S3 storage

S3

25. Route 53

- Configuring Amazon Route 53
- Public Hosted Zones
- Private Hosted Zones
- Resource Record Sets
- Managing Health Checks
- Working with Public and Private Hosted Zones

Amazon Route 53

26. Elastic Block Store(EBS)

- EBS Volume Types
- EBS Performances
- Instance Store Volumes
- Optimizing Disk Performance
- Creating and Deleting Volumes
- Attach and Detach Volumes
- Mount and Un-mounting Volumes

Amazon EBS

27. Relational Database Services (RDS)

- Data Base Instances
- Data Base Engine
- Creating Data Base
- RDS Limits
- Working with Storage Types

AWS RDS

28. Linux Admin Commands

- **Redhat/Ubuntu Linux Installation**
- Hierarchical File System
- Basic Commands
- Create Files and Directories
- File Management
- **File Links**
  - Hard Link
  - Soft Link
- **User Administration**
- Group Administration
- File Permissions (chmod)
- **File Search**
  - find
  - which
  - what is
- Basic and Advanced File Permissions
- File Ownership (chown, chgrp)
- **Access Control List(ACLs)**
  - setfacl
  - getfacl
- Sudo Permissions (suders)
- **Job Scheduling (Crontab)**

redhat.

- Memory Management (df,free,du)
- Process Management (ps ,top ,kill ,pkill)
- **Linux Package Installation**
  - rpm
  - yum
  - apt
  - apt-get

- Install and Configure Web Server(Apache)
- Install and Configure App Server(Tomcat)
- Install and Configure DB (MySQL / MariaDB)

- **File Compression and Extraction**
  - tar
  - GunZip
  - BunZip
  - unzip
- **Server Connections**
  - password method
  - SSH Keys (Secure Shell)
  - SSL (Secure Socket Layer)
- Secure Copy (scp)
- **Linux Filters**
  - grep
  - sed (Stream Editor)
  - awk (Field Processor)

- Linux Head, Tail, More commands
- **Service Management**
  - service
  - systemctl
- Linux Editors (Vi/Vim)
- **Linux User Communications**
  - write
  - wall
  - mail (send/receive mails)

29. SCRIPTING

- **Shell Scripting**
- **DSL (Declarative Domain Specific Language)**
- **Python Scripting**
- **Ruby Scripting**
  - Introduction
  - Variables
  - Flow Controls
  - Loops
  - Functions
  - Lists
  - Manipulating Strings
  - Reading and Writing Files
  - Positional Parameters

30. REAL TIME PROJECT