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DevOps with AWS

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

SDLC (Software Development Lifecycle)

- What is SDLC?
- SDLC Methodologies
- Waterfall Model
- Advantages of Waterfall
- Dis-Advantages of Waterfall

What is Agile and Scrum

- Agile Development Process
- Agile Manifesto
- Agile Scrum Work Flow
- Agile Analysis Estimation Techniques

- Types of Roles and Responsibilities
- Problem That DevOps Solves
- Making a DevOps Transition
- Introduction to DevOps Automation

DevOps Life Cycle

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

Linux

- Linux Overview
- What is Operating system
- What is Unix, Linux
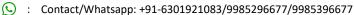- Unix vs Linux
- Linux vs Windows
- Linux market trends

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- Linux flavors
- Linux Architecture
- What is shell kernel command line utilities
- Linux Boot process
- Linux commands
- Linux admin level commands
- Reading files
- Redirection operators
- User management
- Group management
- File system management
- Linux volume manager hands on
- Linux installation using iso
- Directory structure
- Editors
- VMware overview

Shell Scripting

- Shell history and introduction
- Types of shells
- Shebang line in shell
- Command line arguments
- Variables
- Types of Operators
- Loops
- Case statement
- Functions
- grep
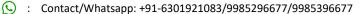- Awk
- Sed
- Adv. Script Programs

GIT (Source Code Management)

- Introduction
- What is a Version Control System (VCS)? Distributed Vs Non-distributed VCS
- What is Git and where did it come from?`
- Alternatives to Git
- Installation and Configuration
- Obtaining Git Installing Git
- Common configuration options GUI tools
- Key Terminology
- Clone Working Tree Checkout Staging area Add
- Commit Push Pull Stash
- Git - Local Repository Actions Creating a repository (git init) Checking status (git status)
- Adding files to a repository (git add) Committing files (git commit) Removing staged files (git reset) Removing committed files (git rm) Checking logs (git log)
- Git - Remote Repository Actions Creating a remote repository (git init) Cloning repositories (git clone)
- Updating the remote repository from the local (git push) Updating the local repository from the remote (git pull)
- Tagging in Git What are Git Tags? Listing tags Lightweight tags
- Displaying tag details (tag show) Annotated tags

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- Checking out tags Pushing tags Pulling tags
- Branching in Git
- What is a branch
- A note about <HEAD> Listing branches Create new branch Checkout branch Pushing branches Pulling branches Merging in Git
- Fetching Changes (git fetch) Rebasing (git rebase)
- Git Pull
- Git Workflows Different ways of using Git Centralized
- Feature Branch Gitflow Workflow Forking Workflow
- Creating a branch from a Stash Advanced Repository Actions Removing untracked files (git clean) Remove staged changes (git reset) Revert a commit (git revert)
- Checkout a previous commit (git checkout)
- Advanced Branching & Merging
- Deleting a Branch Fast forward merge Three way merge

MAVEN (Build Tool)

- Issues before in manual process of build process
- Automated build process
- Introduction
- Maven Structure and Installation

- Maven Dependencies
- Maven Repositories
- Maven Plug-ins
- Maven Configuration
- Integration with SCM tools
- Maven Project

Continuous Integration Tool (Jenkins)

- Introduction
- How to install and configure Jenkins
- How to achieve Continuous Integration with Jenkins
- Jenkins Jobs
- How to schedule jobs in Jenkins
- How to integrate Jenkins with Ant
- How to integrate Jenkins with Maven
- How to integrate Jenkins with Slack
- How to integrate Jenkins with Shell scripts
- How to integrate Jenkins with Python scripts
- Jenkins dashboard
- Jenkins authentication
- Jenkins plugins – how to download and use
- Parameterizing the build
- One click regression
- Overview of Continuous Integration (CI)
- What it means Continuous Integration? Fundamental of CI

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- How CI helps to Agile Development History of Jenkins
- Where Jenkins Fit in Organization Overview of Jenkins community
- Setup and Running Jenkins
- Prerequisites
- Preparing Environment Installing Git
- Setup Account
- Install Jenkins on Ubuntu / Windows Configuring a Node
- Running Jenkins as Stand-Alone/ Apache Server Backup Jenkins data
- Configuring Jenkins server
- Configure Dashboard Configure System Environment Global Properties
- Configure Build Tools Configure Proxy
- Working with Jenkins Build Job
- Create and Configure a job Run a job manually Triggering a Build Scheduled Build job Manual Build job
- Polling SCM
- Maven and ANT Build Step Execute a Shell
- Post-Build Actions Archiving Build Results Notifications
- Working with Automate Testing
- Advanced Jenkins
- Working with Maven Build Monitoring External jobs Distributed builds
- File fingerprint tracking Parameterized Build Job Parameterized Trigger

- Automated Deployment and Continuous Delivery
- Jenkins Plugins
- Change reporting Code coverage Static Analysis
- Performance reporting Style checking
- Secure and Notification in Jenkins
- Overview of Notification Email Notification
- Other Notification
- Best Practices on Jenkins

Configuration Management (ANSIBLE)

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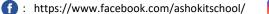- Extendable
- Conclusion

Architecture and Process Flow
- Architecture Introduction
- System Requirement
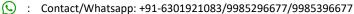- Components Overview
- Process of Execution &flow
- Conclusion

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Creating Environment

- Introduction
- Installing Ansible
- Testing with First Ansible Commands

Ansible Inventory and Configuration

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

Ansible Modules

- Introduction
- Ansible Modules Fundamentals
- Module Docs
- Yum Module
- Setup Module

Plays and PlayBooks

- Introduction
- Plays &Play Books basics
- Basic Play book
- Playbook Logic & More
- Advance Playbook usage

Roles

- Introduction to Roles
- Role Basics
- Creating Role
- Ansible Galaxy

<u>Vagrant</u>

Introduction

- What is Vagrant
- Virtualization Overview

Setting Up Vagrant

- Virtual Box Installation
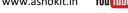- Vagrant Installation
- Vagrant without Virtual Box

Using Vagrant

- Vagrant Machine
- Vagrant Files
- Boxes
- Running Vagrant Machines
- SSH to Vagrant Machine
- Synced Folders
- Networking Basics
- Environment Management

Boxes

- Vagrant Boxes
- Basic Box Management
- Creating Boxes from existing environment
- Creating custom boxes

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DOCKER (Containerization Tool)

Introduction

- What is Docker
- Life without Docker
- Life with Docker
- Who will use Docker
- Installing Docker on Windows
- Installing Docker on Linux

Working with Containers

- What is container
- Docker run command
- Theory of pulling and Running Containers
- Working with images
- Container Life cycle
- Docker File
- Spring Boot App with Docker
- Python App with Docker
- MySql with Docker

Docker Swarm Mode

- Swarm Mode Theory
- Configuring Swarm Mode
- Services
- Scaling Services
- Rolling Updates

KUBERNETES

- What is Kubernetes
- How Kubernetes works
- Kubernetes Cluster
- Kubernetes Architecture
- Master components, how works
- Node Components, how works
- How pods works
- Installations and configuration Kubernetes cluster
- Pod lifecycle
- Working with pods
- Working with Services
- Deployments with Services

Monitoring Tools

- Log Monitoring with ELK
- NAGIOS

INFRASTRUCTURE AS CODE (IAC)

TERRAFORM

- Introduction to Terraform
- Terraform installation in windows environment
- Steps to create VPC and subnets
- Steps to create VPC using interpolation
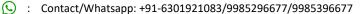- Terraform installation in Linux

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AWS (AMAZON WEB SERVICES)

Introduction to Cloud Computing

- What is Cloud Computing?
- Why Cloud?
- Types of Cloud Deployment Models
- Types of Cloud Services
- IaaS Vs. SaaS Vs. PaaS
- Future of Cloud Technologies
- Advantages and Disadvantages of Cloud
- Cloud Providers

Introduction to Amazon Web Services (AWS)

- What is AWS?
- How to Subscribe for AWS account
- What is the AWS Free Usage Tier
- AWS Certification
- Introduction to the AWS management Console
- List of services given by AWS

VM Creation in AWS

- Creating Windows VM
- Connecting to Windows VM using RDP
- Creating Linux VM
- Pem file & Ppk File
- Putty & Putty Gen
- Connecting to Linux VM using Putty
- Linux Introduction
- Linux Commands

Shell Scripting

- Overview of Shell Scripting
- Variables
- System Variables
- Command line arguments
- User Input
- Decision making
- Monitoring Script
- Loops, while Loops
- Remote Command Execution
- SSH Key Exchange

Elastic Compute Cloud (EC2)

- What is Amazon EC2?
- Features of Amazon EC2
- Managing the EC2 infrastructure
- EC2 Dashboard
- Pricing for Amazon EC2

AWS Regions and Availability Zones

- Describing Regions
- Availability Zones, and Endpoints
- Managing instances in an Availability Zone

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Amazon Machine Images (AMI)

- Managing AMIs
- Working with Windows, Linux AMIs
- Shared and Paid AMI
- Making an AMI Public

EC2 Instances

- Instance Type
- Instance life cycle
- Differences between reboot, stop, and terminate
- Building an EC2 windows and linux instances
- To install instance in public and private subnet
- Security via Key Pairs
- EC2 Class and VPC Security Groups
- Managing Elastic IP's
- Pricing model in EC2 instances
- EC2 with Amazon command line interface

Amazon Elastic Block Store (EBS)

- Features of Amazon EBS
- Amazon EBS volumes
- Managing EBS volumes
- Increasing the volume size
- Amazon EBS snapshots

Load Balancing (ELB)

- Creating a load balancer
- Internal and external load balancer
- Load balancing protocols
- Security groups for the load balancer
- Health check for the load balancer
- Cross-zone load balancing
- Connection Draining

Auto Scaling

- What is auto scaling?
- Auto scaling components

Advantages of auto scaling

- Creation of launch configuration
- Configuration of auto scaling policies
- Advantages of using auto scaling with ELB

Network & Security

- Security Groups
- Elastic IPs
- Placement Groups
- Key Pairs
- Network Interfaces

Networking Services

Amazon Virtual Private Cloud (VPC)

- What is Amazon VPC?
- VPC Essentials
- Default and Non Default VPC

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- VPC Networking and ACL
- Security Groups
- DNS and DHCP Options Sets
- VPC Peering and Endpoints
- Subnet Routing
- VPC Internet Gateway
- Elastic IP addresses and network interfaces
- VPC integration with many other AWS services
- Creating a NAT instance in a VPC
- Configuring a Web application in VPC
- Pricing for Amazon VPC

Amazon Route 53

- Route 53 as your DNS service
- Using Traffic Flow
- Route 53 Health Checks
- Configuring DNS Failover
- Latency Based Routing
- Weighted Routing Policies
- Hosting web portal using Route53
- Bucket Policies

Security & Identity Services
Identity Access Management (IAM)

- IAM Features
- Getting Started With IAM
- Creation of user, groups, roles
- Managing & Writing policies
- Credential Report
- IAM Console and the Sign-in Page

Storage & Content Delivery Services
Amazon S3

- What is object Storage?
- Data as objects
- Lifecycles of S3
- Managing Buckets
- Accessing S3 storage via tools
- Creation of a static website using S3 storage

Database Services
Relational Database Service (RDS)

- RDS Essentials
- Launching RDS instance
- Selecting the Engine
- Configuring the Database Engine
- Managing RDS Database
- Setting up automatic backups
- Authorizing access to the DB

Amazon Cloud Watch

- Amazon CloudWatch Architecture
- List of services monitored by CloudWatch
- Collect and track metrics
- Monitoring memory and disk Metrics
- Monitoring logs, Graphs
- Set Alarms

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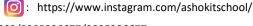
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Cloud Formation

- Building AWS infrastructure as a code
- Design a template
- Create a Stack
- Create a Template from your Existing Resources
- Introduction to JSON

Application Services
Amazon Simple Email Service (SES)

- Simple email service overview
- Configuring Amazon email service
- Amazon SES and Deliverability
- Amazon SES Email-Sending Process
- Email format and Limits of SES

Amazon Simple Queue Service (SQS)

- Simple Queue service overview
- SQS for background work task
- Creating a Queue
- Confirming the Queue exists
- Add a permission to the Queue

Amazon Simple Notification Service (SNS)

- Simple Notification Service overview
- SNS architecture
- Publishers and subscribers
- Creation of a topic
- Subscribing to topic via Email
- Setting notification for EC2 instance changes.

Real-time Applications Deployments

- Deploying Java Spring Boot Application
- Deploying Python Application
- Deploying Angular Application
- Deploying React JS Application
- Deploying Node JS Application
- Deploying Docker Containers in AWS
- Deploying Fullstack (Spring Boot + Angular) Crud Operations Application

Interview Guide
- Resume Preparation
- Frequently Asked Interview Questions
- Interview Tips & Tricks
- Mock Interviews