



VIVEK IT SOLUTION



with

aws

AWS-DevOps Course Syllabus

Modules of the course

- Module 01: Aws Cloud Computing Overview
- Module 02: What is virtualization
- Module 03: Linux Introduction
- Module 04: Elastic Compute Cloud (ec2)
- Module 05: Virtual Private Cloud (VPC)
- Module 06: Amazon Simple Storage Service (S3)
- Module 07: Identity and Access Management
- Module 08: Amazon Relational Database and DynamoDB
- Module 09: Security Services
- Module 10: Serverless service lambda
- Module 11: Amazon Route 53
- Module 12: Migration strategies On-premises to Cloud
- Module 13: Overview Of Devops
- Module 14: Shell scripting
- Module 15: Web App Servers Configurations
- Module 16: Version Control with Git
- Module 17: Build tool Maven
- Module 18: SonarQube Overview
- Module 19: Continuous Integration – Jenkins
- Module 20: Docker
- Module 21: orchestration using Kubernetes
- Module 22: Overview of Argo CD
- Module 23: Continuous Monitoring with Grafana
- Module 24: Ansible
- Module 25: Terraform
- Module 26: Python Boto3
- Module 27: Project to cover all Tools
- Module 28: Resume Preparation

1. AWS Cloud Concepts

Cloud Computing

- Introduction to Cloud Computing
- Why Cloud Computing?
- Benefits of Cloud Computing
- Types of Cloud Computing
- Public Cloud
- Private Cloud
- Hybrid Cloud
- Community Cloud
- Software as a Service
- Platform as a Service
- Horizontal vs vertical scaling
- Cloud Computing Issues
- Security
- Costing Model

AWS Platform

- Introduction to AWS Elastic computing
- Introduction to the AWS products
- Regions and Availability Zones
- Signing up for AWS
- AWS Free usage tier
- Introduction AWS management console

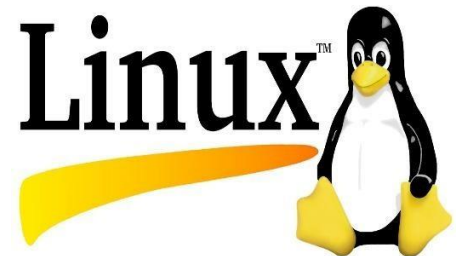
2. What is virtualization?

- Virtualization and cloud computing
- Types of virtualization
- Virtualization terminologies
- Hypervisor

- Benefits
- Vendors

3. Linux

- All-important Linux commands.
- The Linux filesystem.
- File permissions.
- Process management.
- User account management.
- Software management.
- Networking in Linux.



EC2 Instance

- EC2 Instance Launch Wizard with Windows and Linux OS
- EC2 Instance Types
- Generating custom Public Key and Private keys for EC2 instances
- Security groups
- Volumes and Snapshots
- Amazon Data lifecycle manager (DLM)
- Creating customized Amazon Machine Images
- User Data and Metadata
- Elastic Load Balancers and different types
- Creating Billing Alarm and EC2 instance alarms.
- Auto Scaling Groups
- Scaling Types and policies
- Different Type of Auto scaling Policies
- AWS CLI and IAM Roles



Load Balancing

- Introduction to Scaling
- ELB(Elastic Load Balancer)
- Components and types of load balancing
- Target group configure with ELB

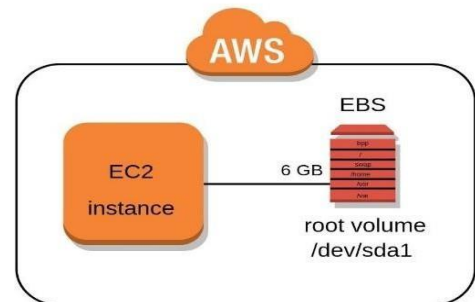
Auto-scaling

- Get Started with Auto Scaling Using the Console

- Maintain a Fixed Number of Running EC2 Instances
- Dynamic Scaling
- The lifecycle of autoscaling
- Policies of autoscaling

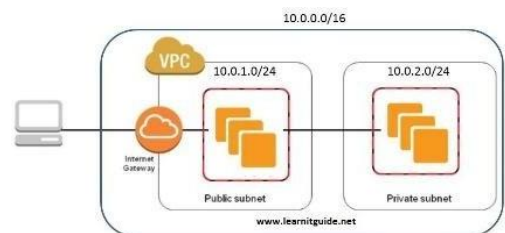
EBS (Elastic Block Storage)

- Create EBS volumes
- Delete EBS Volumes
- Attach and detach EBS volumes
- Mounting and unmounting EBS volume
- Creating and deleting snapshots
- Creating volumes from snapshots



VPC

- Networking Basics
- Public IPs & Private IPs
- CIDR Range
- Subnet Calculations
- Creating custom VPCs and custom Subnets
- Network ACL's
- Route Tables & IGW
- VPC Peering



S3(Simple Storage Service) Storage in Cloud

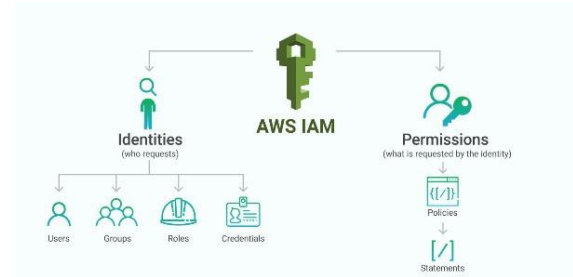
- What is Simple Storage Service (S3)
- Storage Classes
- Versioning
- S3 querying data
- S3 bucket ACL and bucket permission
- S3 data partition
- Data copying and moving
- Cross-region replication / Same Region replication
- Life Cycle Management
- Security & Encryption



- Static Webhosting with S3 bucket
- Events configuration on S3 buckets
- Enabling cross account access for S3
- S3 Data management and backup

IAM:(Identity Access Management)

- Root Account Vs IAM user
- Multi Factor Authentication for Users
- IAM Password Policies
- Keys Configure and different access approaches
- User, groups and Role concepts
- Creating Customer Managed Policies.
- Auditing User Activity



RDS Databases

- Launching a RDS Instances (MySQL, MSSQL & Aurora)
- Multi-AZ & Read Replicas for RDS instances.
- High Availability concept in RDS
- Difference between DB on Ec2 and managed RDS •RDS Proxy configure process
- Connection process from RDS to Ec2
- Connection process from RDS to local machine by using Work Bench process
- Creating DB and tables run the queries
- Configure Read replica with masters and access the tables from read replica.
- DynamoDB overview

Security Options:

- Security group Services
- AWS Certificate Manager

AWS Lambda:

- Overview of the Lambda
- Configuration with different services
- Creation and automate the service by using lambda boto3
- General configuration environment setup In lambda

- Lambda layers and importance
- Limitations

ROUTE 53

- DNS Records overview
- Routing Policies
- Hosting sample Website and configuring Policies.
- Simple RP
- Weighted RP
- Failover RP
- Geo Location RP
- Latency based routing
- Cross region high availability
- Configure records A type, C type
- Alias configure to ELB, Static website hosting and Cloud Front

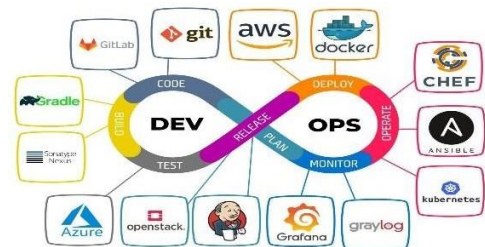


Migration Services

- SMS - Server Migration Service (Migrating server from onpremises to cloud)

4. Overview of DevOps

- What is DevOps?
- DevOps Market Trends
- DevOps Engineer Skills
- DevOps Delivery Pipeline
- DevOps Ecosystem



5. Shell Script

- Introduction
- Type of shells
- Variables
- Types of variables
- Operators
- Input arguments
- String comparison



- Arithmetic comparison
- File conditions
- If, loops, case, functions
- Examples

6. Web App Servers Configurations

Apache webserver:

- Installations
- Configuration



Tomcat application server:

- Installation, configuration
- Tomcat manager
- Application management



7. Version Control with Git – DevOps Syllabus

Git Introductions

- o What is Git
- o How it will work
- o Features

Git Workflow

- o Working Directory
- o Staging
- o Local Repository
- o Remote Repository

How to setup GIT

- o Installing Git
- o First-Time Git Setup
- o Getting a Git Repository



Working with various commands in GIT

- o Git Cheat sheet

Recording Changes to the Repository

- o How to check the Status of Your Files
- o How to track New Files
- o Staging our modified files
- o Ignoring Files from GIT
- o Viewing Your Un-staged and Staged Changes
- o How to commit Your Changes
 - Skipping the Staging Area and commit
 - o Removing Files from GIT

Viewing the Commit History

- o Limiting Log Output
- o Using a GUI to Visualize History

Undoing Things

- o Changing Your Last Commit
- o Unstaging a Staged File
- o Unmodifying a Modified File

Git Forking

- o Repository forking

Working with Remotes

- o Showing Your Remotes
- o Adding Remote Repositories
- o Fetching and Pulling from Your Remotes o Pushing to Your Remotes
- o Inspecting a Remote
- o Removing and Renaming Remotes

Branching and Merging in Git

- o What a Branch Is
- o Basic in Branching and Merging

- o Branch Management in GIT
- o Branching Workflows and its usage
- o Remote Branches – create and delete o Rebasing

8. 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 Plugin



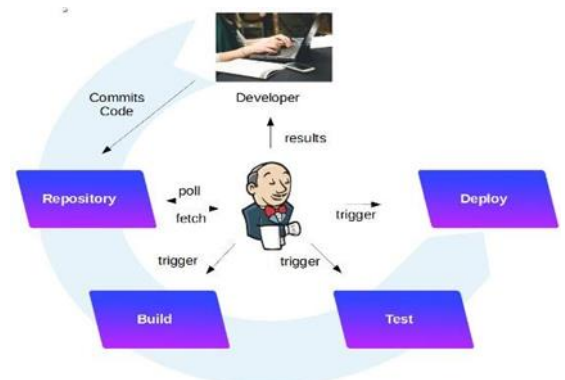
9. SonarQube Overview:

- Installation & Configuration of SonarQube
- Initiate code-scan with SonarQube server
- SonarQube dashboard
- Sample project to check code scan
- Maven integration with SonarQube
- Real-time use cases on SonarQube



10. Continuous Integration – Jenkins

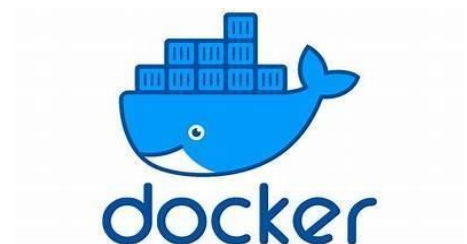
- Introduction to Jenkins
- Continuous Integration with Jenkins
- Configure Jenkins
- Jenkins Management
- Scheduling build Jobs



- o POLL SCM
 - o Build Periodically
- Jenkins Master & Slave Node Configuration
- Jenkins Workspace Management
 - Securing Jenkins
 - o Authentication
 - o Authorization
 - o Confidentiality
 - o Creating Users
- Jenkins Plugins
 - o Installing Jenkins Plugins
 - o SCM plugin
 - o Build and test
- Jenkins configure with below services tools
 - o Ec2
 - o Lambda
 - o S3
 - o GitHub
 - o Docker
 - o Jfrog
 - o SonarQube
 - o Kubernetes
 - o Trivy
 - o ArgoCD

11. Docker

- Docker Introduction
- What is Docker Image
- How to get Docker Image



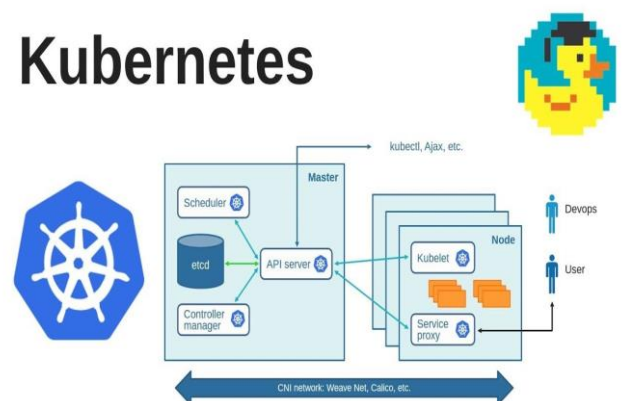
- Docker Installation
- Working with Docker Containers
 - o What is Container
 - o Docker Engine
 - o Creating Containers with an Image
 - o Working with Images
- Docker Command Line Interface
- Docker Compose
- Docker Hub
- Docker Trusted Registry
- Docker swarm
- Docker attaches
- Docker File & Command
- Docker networks
- Docker volumes

12. Orchestration using Kubernetes

- Revisiting Kubernetes
- Cluster Architecture
- Spinning up a Kubernetes Cluster on EC2 VMs
- Exploring your Cluster
- Kubernetes worker node components
- Understanding YAML
- Creating a Deployment in Kubernetes using YAML
- Creating a Service in Kubernetes
- Horizontal pod autoscaling
- Understanding the namespace concept



Kubernetes



- Importance of ingress controller
- Installing Kubernetes Dashboard
- Deploying an App using Dashboard
- Using Rolling Updates in Kubernetes
- Importance of headless service
- Working on headless service communication
- Containers and Container Orchestration
- Helm Charts
- Schedulers
- Metric Server deployment
- monitoring
- Kubernetes volume
- RBAC process

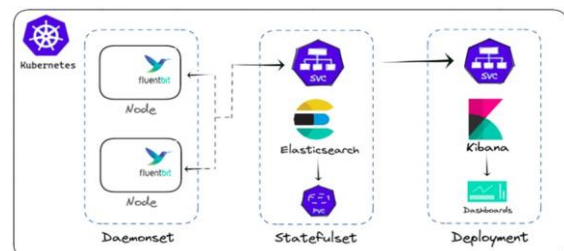
HELM

- Helm installation
- Helm configuration
- Helm deployment



EFK STACK

- Configuration
- K8s logs



13. Argo CD

- Installation
- Configurations
- CD



14. Continuous Monitoring with Grafana

- Introduction to Continuous Monitoring



- Introduction to Grafana
- Installing Grafana
- Grafana Prometheus and Objects
- Grafana Prometheus configure to Kubernetes.

15. Ansible

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



16. Terraform

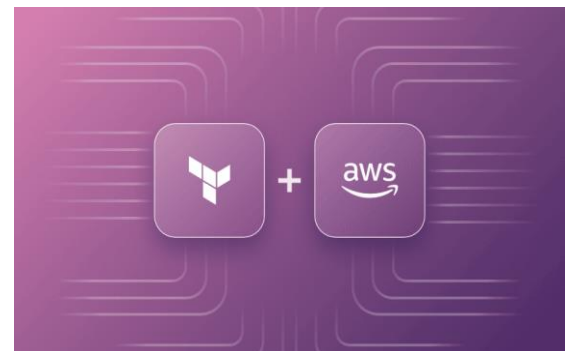
Introduction to terraform

- o Infrastructure Automation
- o Install Terraform
- o Providers
- o Resources
- o Basic Syntax
- o Exercise: Your First Script main.tf



Getting started with Terraform

- o Terraform Plan, show, Apply, Destroy
- o Exploring Terraform Registry
- o Interpolation
- o Tainting and Updating Resources
- o Terraform Console and Output
- o Terraform Variables
- o Breaking Out Our Variables and Outputs
- o Lab exercises: Breaking down main.tf into variables.tf, output.tf



Terraform Modules

- o Introduction to Modules
- o Module repositories
- o First Basic Module
- o The Module codes
- o Main Terraform Code
- o Lab exercises: Modules – The Root Module

Terraform: Writing in a more organized way

- o Maps and Lookups

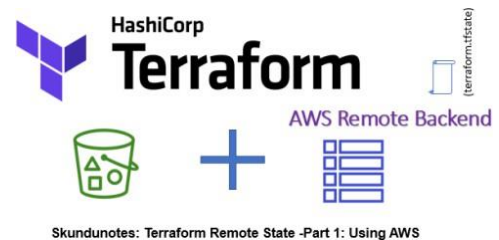
- o Terraform Workspaces
- o Breaking Out Our Variable Definitions o File, Remote - Exec and Local-Exec

Terraform with AWS: lab

- o Setting up the system for AWS
- o AWS Storage: The S3 Bucket and Random ID
- o AWS Storage: The Root Module
- o AWS Compute: AMI Data, Key Pair, and the File Function
- o AWS Compute: The EC2 Instance
- o AWS Compute: User Data and Template Files
- o AWS Compute: The Root Module

Terraform state

- o Remote state
- o Data Sources
- o Templates
- o Conditionals
- o Built-in Functions
- o Working with state files
- o Outputs, count and Join Function



Terraform with AWS: Lab Part

- o AWS Networking: VPC, IGW, and Route Tables
- o AWS Networking: Subnets, Security, and the Count Attribute
- o AWS Networking: The Root Module

Terraform Troubleshooting and Testing

- o Terraform Plan revisited
- o Debugging the script
- o Terraform Testing o Lab: Writing test scripts for Terraform.

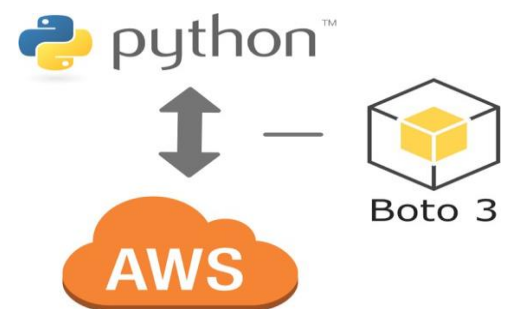
o Lab: Testing with Docker

Terraform Best Practices

- o Best practices in writing terraform scripts
- o Terraform Workflow
- o Terraform projects
- o Other Hashi Corp tools
- o New features of Terraform Introduction to Terraform

15. Python Boto3

- Introduction to Python
- List, Ranges & Tuples in Python
- Input and Output in Python
- Python Object Oriented
- Python Regular Expressions
- Python Necessity DevOps



Practice:

- Project to cover all Tools o Material
For all Tools
- Resume Preparation
- Tasks List Tool wise
- Mock Interview