

# Amazon Web Services (AWS)

## Introduction to Cloud Computing

- A Short history
- Client Server Computing Concepts
- Challenges with Distributed Computing
- Introduction to Cloud Computing
- Why Cloud Computing?
- Benefits of Cloud Computing

## Cloud Computing Deployment Models

- Private Cloud
- Public Cloud
- Hybrid Cloud

## Cloud Delivery/Service Models

- Software as a Service (SaaS)
- Platform as a Service(PaaS)
- Infrastructure as a Service (IaaS)

## Linux Basics

- Linux basic Commands
- Linux basic Administration

## Introduction to AWS

- Subscription to AWS
- Introduction to the AWS Management Console

## Introduction to AWS Services

- Amazon Elastic Compute Cloud(EC2)
- Amazon Simple Storage Service (S3)
- Elastic Block Storage (EBS)
- Elastic Load Balancing (ELB)
- Amazon Relational Database Service (RDS)
- Amazon DynamoDB Introduction
- Auto Scaling
- Amazon ElastiCache
- Identity and Access Management (IAM)
- Virtual Private Cloud (VPC)
- Cloud Formation
- Simple Email Services (SES)

- Simple Queue Services (SQS)
- Simple Notification Services (SNS)
- Server less computing (Lambda)
- Cloud Trail
- Elastic Beanstalk
- Cloud Front
- Route-53
- Glacier
- Key Management Service (KMS)

## Elastic Compute Cloud (EC2) Essentials

- Regions and Availability Zones – Choose the right Region
- Amazon Machine Images (AMI)
- Working with AMIs
- Choosing the right AMI
- Deciding what goes into an AMI
- Finding the right AMI
- Pricing model in EC2 instances
- On-demand, Reserved, Scheduled, Spot instances, Dedicated Hosts
- EC2 Reserved Instance Marketplace
- Importing and Exporting Instances
- Bastion Host
- Sending/Receiving traffic from private instances using Bastion Host.

## EC2 Instances

- Building an EC2 Windows instance & Linux Instance
- Boot strapping with user-data
- Setting up security
- Security with Key Pairs
- Working with the Security Group
- Different IPs assigned to an EC2 instance
- Assigning Elastic IPs
- Login/Access to the instance
- Creating your own custom AMI, Registering & Granting access to the AMI
- Placement groups
- EC2 instance protection
- Instance Roles
- Importing and Exporting Instances
- Elastic Network Interfaces(ENIs)
- Resources and Tags
- Accessing Meta-Data & use cases.

## Elastic Block Store (EBS)

- EBS Volume Types
- EBS Encryption
- EBS Performance
- Instance Store volumes
- Instance Stores Available on Instance Types
- Instance Store Usage Scenarios
- Adding Instance Store Volumes to an AMI
- Optimizing Disk Performance
- Creating and deleting volumes
- Attaching and detaching volumes
- Mounting and Unmounting the attached volume
- Increasing the volume size
- Creating snapshots
- Creating Volumes & AMIs from Snapshots.
- Cross-Region snapshot copy & use cases.

## Elastic Load Balancer (ELB)

- What Is Elastic Load Balancing
- How Elastic Load Balancing Works
- Classic & App ELB types.
- Creating load balancer
- Internal & External Load balancers
- Load balancing protocols
- Listener Configurations
- Attach & Detach Subnets
- Security groups for the load balancer
- Configure health check for the load balancer
- Adding multiple instance to the load balancer
- Custom Domain Names
- Cross-Zone Load Balancing
- DNS Failover
- Monitoring and Logging
- Connection Draining
- ELB traffic logging

## Auto Scaling

- What is auto scaling
- Auto scaling components
- Benefits of auto scaling
- Creating launch configuration, and its prerequisites.

- Creating Auto Scaling Groups (ASG)
- Attach & Detach EC2 Instances in ASG
- Configuration of auto scaling policies based on the Load on EC2 instances.
- Using Auto scaling with Elastic Load balancer (ELB).
- Temporarily Removing Instances
- Suspend and Resume Process
- Shut Down Your Auto Scaling Process
- Monitoring Your Auto Scaling Instances
- Health Checks
- Getting Notifications When Your Auto Scaling Group Changes

### Simple Storage Service (S3)

- Creating and deleting buckets
- Adding objects to buckets
- Getting objects
- Deleting objects
- Notifications
- Uses of S3 storage
- Working with Permissions of S3, Access Control, Bucket policy
- S3 Data encryption types
- Enable Versioning, Logging for S3 objects
- Lifecycle rules in s3
- Accessing S3 storage with Tools
- Hosting a Static Website
- Cross-region replication
- Audit Logging with AWS CloudTrail

### Glacier Storage

- Creating Vaults
- Working with Archives
- Accessing the Glacier vault using tools
- Using Glacier for backups
- Job Operations
- Data Retrieval Policy Operations

### Identity and Access management (IAM)

- Creation of user accounts
- Setting up multi factor Authentication (MFA)
- Roles in IAM
- Groups in IAM
- Delegation of permissions for users

- Creation of custom policies for delegation
- Using Identity Providers
- Cross-Account Access
- Account settings
- Credential Report
- Encryption - Key Management Service (KMS)

## Virtual Private Cloud (VPC)

- Different types of networks that can be setup in AWS
- Creating a custom VPC
- NACLs & Security Groups
- Creation of Internet Gateway(IGW)
- Connecting to instances in the gateway
- Subnets, Route Tables & Association
- NAT Instances & NAT-Gateways
- VPC Peering
- VPN overview & components

## Route 53

- Configuring Amazon Route 53 as Your DNS Service
- Registering a Domain Name and Configuring Amazon Route 53 as the DNS Service
- Working with Public Hosted Zones
- Working with Private Hosted Zones
- Working with Resource Record Sets
- Health Checks and DNS Failover
- Creating, Updating, and Deleting Health Checks
- Using IAM to Control Access to Amazon Route 53 Resources

## Cloud watch

- Monitoring the AWS Service Health Dashboard
- Monitoring with Cloud watch
- Getting statistics for a specific EC2 instance
- Getting aggregated statistics
- Metrics for other AWS Services and related namespaces
- Setting up notifications

## Simple Notification Services (SNS)

- Creation of a topic
- Subscribing to topic via Email
- Setting notification for EC2 instance changes

## Simple Queue Service (SQS)

- Creation of a queue
- Sending messages to the queue
- Sending SNS to SQS
- Retrieving messages from SQS

## Elastic Beanstalk

- Creation of Web-App using Elastic Beanstalk
- Building a sample application using Beanstalk
- Modifying the properties of the deployment.

## Relational Database Service (RDS)

- DB Instances
- Selecting the DB-Engine
- Configuring the Database Server
- Creating your Database
- Setting up automatic backups, snapshots & restores
- Authorizing access to the DB with RDS Security Groups
- DB Instance Replication
- Security: Using IAM to Manage Access to Amazon RDS Resources
- RDS Limits
- Managing MySQL Database server
- DB Instance Life Cycle: Renaming a DB Instance
- Deleting or Rebooting a DB Instance
- Working with Storage Types
- Upgrading a DB Instance
- Working with Option Groups & DB Parameter Groups
- Working with Reserved DB Instances
- Monitoring
- Database Log Files

## Cloud Front

- How CloudFront Delivers Content
- Working with Distributions
- Working with Web Distributions
- Working with Objects
- Request and Response Behavior
- Serving Private Content through CloudFront
- Using an HTTPS Connection to Access Your Objects
- Using IAM to Control Access to CloudFront Resources
- Monitoring CloudFront Activity Using CloudWatch

## ElastiCache

- ElastiCache Terminology and Concepts
- Backup and Restore
- Clusters Explanation ( Memcached and Redis )
- CloudWatch Metrics with ElastiCache
- Managing ElastiCache
- Managing Replication Groups
- DNS Names and Underlying IP

## Cloud Formation

- Building AWS infrastructure as a code
- Utilization of Sample templates

- Introduction to YAML

## Use Cases

- Cloud Architecture Best Practices
- Cost Optimization
- Security Considerations
- Cost Calculation
- AWS CLI & use case to check instance, ELB, EBS states
- Building a simple web application in the AWS cloud
- Certification Track & guidance