

## Amazon Web Services

### Solution Architect - Associate

#### Course Objective

- This course will introduce to the cloud computing basics and the services offered by Amazon in cloud to host the applications. At the end of the course you will be able to configure the applications on AWS by using different resource like EC2, RDS, S3, ELB, IAM, VPC , Security etc.,.

#### Duration

- 30 Hrs + 5 Hours would be extra for doubts and extra sessions.

#### Intended audience

- Linux or Windows administrators
- Database, storage or network administrators
- Developers who wants to develop applications for AWS

#### Prerequisites

Basic knowledge on the following is mandatory

- Using PUTTY to login to Linux servers
- Using WINSCP to upload files to remote server
- Creating user, groups on Linux and installing packages
- Setting up simple website using apache webserver
- Installing database and creating schema
- Connecting to database using client tools
- Should have exposure to XML, YAML and JSON formats
- Network troubleshooting using ping, nslookup and telnet commands

- Exposure to any of the programming languages Java, Python, Ruby or Shell scripting

## Lab or workstation requirements

- All candidates should have admin privileges on their laptops/desktops or they should have the following software installed.
  - Putty ( For windows download from [here](#) )
  - WinSCP ( For windows download from [here](#) )
  - MySQL WorkBench ( For windows download from [here](#) )
- All candidates should have AWS accounts created and have admin privileges.
- Candidates attending online sessions should make sure their audio drives are installed on their workstations. We would recommend to use a headphone with MIC which is tested.

## Training mode

- Classroom or Online

## Course Content

### Introduction to Cloud Computing

Introduction to cloud computing world  
History  
Cloud business models  
Public, Private and Hybrid cloud models  
Advantages of cloud computing

## AWS

### Introduction

#### AWS Regions & Availability zones

Tools to access services  
Low level building blocks  
High level building blocks  
Overview of the console

## Elastic Compute Cloud (EC2)

Introduction to EC2  
Pricing models On-demand vs Reserved vs Spot instances  
Using Amazon Machine Images (AMIs) to create the instances  
Public vs Private Images  
Sharing Images to other accounts  
Logging into instances using key pairs  
Converting pem files to ppk  
Volumes and types  
Using snapshots for backup  
Increasing the size of the volumes  
Backup and restore process of the EC2 instances  
Adding network interfaces  
Assigning static IPs using Elastic IPs  
Control access to instances using Security Groups

## Relational Database Service (RDS)

Introduction to Managed database  
Creating RDS instances using AWS console  
Choosing an RDS engine and version  
Public vs Private database instances  
Multi-AZ setup  
Backup using snapshots and point in restore  
Parameter Group  
Options Group  
Control access to instances using Security Groups

## Elastic Load Balancer (ELB)

Introduction to Elastic Load Balancing  
Creating ELB from Console  
Attaching instances to ELB  
Configuring Ports, Protocols and health checks  
Enabling sticky session  
Connection draining

Enabling SSL Certificates for https transactions

## Auto-Scaling

- Overview
- Creating launch configuration
- Creating auto-scaling group
- Auto-scaling policies

## Storage (Simple Storage Service S3)

- Introduction to Simple Storage Server (S3)
- Storage options (default vs reduced redundancy vs Glacier)
- Creating buckets using Console
- Uploading and downloading data to S3
- Building static websites using S3
- Enable version control on S3
- S3 access policies

## Storage (Glacier)

- Introduction to Glacier
- Moving data from S3 to Glacier
- Setting archiving policies on S3

## CloudFront (Content Delivery Network Service)

- Introduction to CloudFront
- Configure S3 backend for CloudFront
- Configure ELB backend from CloudFront

## CloudWatch

- Introduction to CloudWatch monitoring service
- Monitoring CPU, Memory and network utilization of different resources
- Creating notifications

## Simple Notification Services (SNS)

- Introduction to SNS
- Subscribing to receive notifications
- Sending alerts using SNS

## Simple Email Services (SES)

- Introduction to SES

## Identity Access Management (IAM)

- Introduction to IAM
- Access controls using IAM
- Creating users, groups and roles
- Assigning policies
- Inline vs Managed policies

## Others

- Tagging
- Installing CLI tools
- Using CLI

## Virtual Private Cloud (VPC)

- Introduction
- Choosing a network design and CIDR
- Design a simple network
- Creating Subnets and setup routing as per the design
- Using IGW to enable internet access
- Access controls using Network ACLs
- Network ACLs vs Security Groups
- Creating Private connections from data center to AWS
- Enabling VPC peering between VPCs

## CloudFormation

- Introduction
- Understanding the template format
- Cloudformation designer
- Create a simple cloudformation template
- Managing dependencies
- Updating the existing stacks
- Intrinsic functions
- Pseudo parameters
- Updating cloudformation stacks
- Understanding events
- Cloudformer

Advance Level Solution Architecting.

## Cloud Computing with AWS Course Outline

### Fundamentals of Amazon Web Services (AWS)

- ☐ Regions
- ☐ Availability Zones and Data centers
- ☐ AWS Credentials
- ☐ Review of All AWS Services

### Amazon S3

- ☐ Fundamental APIs: PUT, GET, LIST, DELETE
- ☐ Consistency model
  - o Types of consistency model for distributed storage
  - o S3's consistency model
  - o Really understanding eventual consistency
- ☐ S3 Namespace
- ☐ Access Control List
- ☐ Bucket Policy
- ☐ Pre-signed URL
- ☐ Multipart upload
- ☐ Understanding Pricing for S3

### Hands-on: S3 Lab; Creating Buckets, objects, and managing access control

- ☐ Data encryption with S3
- ☐ Multipart upload
- ☐ Understanding Pricing for S3
- ☐ Data encryption with S3
- ☐ AWS Import/Export Service
- ☐ Server side logging
- ☐ Versioning of data in S3
- ☐ Architecture case study of common Use Cases of S3

## Amazon EC2

- ☐ EC2 Architecture
- ☐ EC2 Instance types
  - o Hardware differences
  - o On-Demand Instances
  - o Reserved Instances
  - o Spot Instances
- ☐ Data Persistence Models
- ☐ Amazon Elastic Block Storage (EBS)
- ☐ Amazon Machine Image (AMI)
  - o S3 AMI
  - o EBS AMI
- ☐ EC2 Security Model
  - o Security Credentials
    - ☐ Signon Credentials
    - ☐ Key pairs
    - ☐ X.509 certificate
    - ☐ Access keys
  - o EC2 Security Groups
- ☐ Instance addressing
- ☐ Generating Custom AMIs
- ☐ Working with EC2 Console
- ☐ Monitoring Instances with Amazon CloudWatch
- ☐ Amazon Elastic IP

## Hands-on: Hosting an Application on EC2

### Amazon Relational Database Services (RDS)

- ☐ Core advantages of EBS
- ☐ Starting an EBS database instance
- ☐ Starting read-replica of database
- ☐ High fault tolerant multi AZ deployment

## Amazon Elastic Load Balancer (ELB)

- ☐ Fundamentals of a Load Balancer
- ☐ starting a load balancer instance
- ☐ Sticky sessions
- ☐ SSL termination on ELB

## Amazon CloudWatch

- ☐ Architecture of CloudWatch
- ☐ APIs and Use Cases
- ☐ Canned metrics
- ☐ Custom metrics

## Auto-Scaling

- ☐ Understanding auto-scaling
- ☐ Auto-scaling Fundamentals
- ☐ Setting up auto-scaling rules

Use Case Study and Lab: Deploying an auto-scaling app on the cloud using auto-scaling, EC2, RDS, ELB

## Amazon VPC

- ☐ Deep Dive into AWS networking infrastructure
- ☐ VPC Networking Fundamentals
  - o Private and Public Subnets
  - o Allocation of IP Addresses
  - o CIDR Notation
- ☐ Elastic Network Interface (ENI)
- ☐ Routing inside VPC
  - o Network Address Translation (NAT)
  - o Internet Gateways
  - o Configuring Routes
- ☐ VPN tunnels to VPC

Hands-on: Hosting secure applications using public and private subnets



## Identity and Access Management (IAM)

- ☐ Understanding IAM
- ☐ Groups and Users
- ☐ Application “Roles” in IAM
- ☐ Access Policies
- ☐ Federated Authentication on IAM

## Hands-on: Generating groups, users, access policies and Route 53

- ☐ Deep Dive on DNS Architecture
- ☐ Using Route53 for your Domain Name
- ☐ Creating Name Server Entries
- ☐ Setting up Health Checks
- ☐ Configuring for Multi-Location application
  - o Master – Slave Configuration
  - o Master – Master Configuration
  - o Weighted Round Robin
  - o Geo-location Aware Routing

## Hands-on: Moving an existing domain name to Route53 and configuring multi-location Routing

## Cloud Formation

- ☐ Infrastructure as Code
- ☐ Understanding the Cloud Formation template sub-sections
- ☐ Generating template for our Infrastructure
- ☐ Deploying using Cloud Formation

## Hands-on: Generating and Deploying Cloud Formation Templates

## CloudFront

- ☐ CDN Fundamentals
- ☐ Using CloudFront for Public Data
- ☐ Using CloudFront for Access Controlled Data

## Hands-on: Setup CloudFront CDN for an Application

## AWS Frequently Used Design Patterns

- ☐ Architecting on AWS
- ☐ For Batch Processing
- ☐ For Online Applications
- ☐ For Disaster Recovery
- ☐ Data Security

## Common Customer Issues/Request

- Hands-on: Enabling 2way Authentication based login
- Hands-on: EC2 Windows password Recovery
- Hands-on: EBS Resizing/Shrinking
- Hands-on: Elastic Load Balancer on Webserver.