

AWS Certified Solutions Architect Associate 2021 - SAA-C02

Course Duration: 2 months

Aws Training will be provided in: - English Language (with Real time scenarios)

Batch -Weekdays Batch (Mon to Fri)

AWS Table of Contents:

Section 1: Introduction to Cloud Computing

- Comparing On-premises Data Centers vs. Cloud
- Private, Public, and Hybrid Cloud
- Cloud Services (Offering) - IaaS, PaaS, SaaS
- AWS Global Infrastructure - Regions and Availability Zones
- AWS Free Tier - Know what you are getting for free with your new account
- Lab - AWS Billing Alerts and Cost Budgets

Section 2: VPC, SecGroup, NACL, Elastic IP,NAT,VPN,VPC Peering

- VPC introduction
- VPC Components
- Implied Router and Route Tables
- IP Addressing
- Internet Gateway
- VPC Overview Lab
- VPC Types and Introduction to Security Groups
- Creating A Custom VPC, Security Groups
- Network Access Control Lists (N ACLs) and Lab
- VPC - Network ACLs and Security Groups
- VPC - Network ACLs vs. Security Groups
- Applying Security Group and N ACLs
- VPC - Network Address Translation - NAT
- VPC Peering
- VPC Lab - Working with VPC Peering Across Accounts/Regions

- Transit Gateway
- VPC Virtual Private Networks (VPN)
- VPC Direct Connect
- Direct Connect Routing and Link Aggregation Groups (LAGs)
- Hybrid Connectivity Use Cases /Scenarios
- AWS Direct Connect Gateway
- AWS Direct Connect Limits
- VPC Endpoints - Gateway Endpoint
- Lab - VPC Gateway Endpoint
- VPC Interface Endpoint
- VPC Interface Endpoints
- Egress Only Internet Gateway (forIPv6)
- Egress-only Internet
- VPC Flow log and DHCP Option Sets

Section 3: Elastic Compute Cloud (EC2)

- Elastic Block Store Types
- EC2 LAB - Creating an EC2instance
- Encrypting the Root Volume of an EC2 instance
- EC2 Enhanced Networking and Placement Groups
- EC2 Placement Groups
- EC2 Status Checks and Monitoring
- EC2 Instance States
- EC2 Instance Termination and Termination Protection
- EC2 Instance Metadata and User Data
- Labs - EC2 Instance User Data
- Labs - EC2 instance metadata
- Migration to/from AWS EC2 & VM Import/Export
- Bastion Hosts
- EC2 Instance Launch Modes (Purchase Options) - Reserved & Scheduled Instances
- EC2 Instance Launch Modes
- VPC and EC2 Instance Tenancy Attribute
- Elastic Compute Cloud - Elastic
- Network Interfaces (ENIs)

- Elastic Network Interface (ENI) - IP Addressing
- NAT instance Source/Destination Check
- Public IPv4 address auto assignment
- DEMO - TCP/IP Packet Walkthrough -Deep Dive
- LAB - EC2 - VPC Combined Project Lab
- EC2 - NAT Instance Project
- EC2 Labs - NAT Instance
- Project & NAT Gateway

Section 4: Introduction to Encryption and AWS KMS

- Introduction to Encryption and Cloud HSM
- AWS Key Management Service (KMS) - Introduction
- AWS KMS - Customer Master Keys

Section 5: AWS's Elastic Block Store (EBS)

- EBS - Block Store Types and IOPS
- EBS Snapshots
- EBS Snapshots - 2
- Lab - EBS Volumes and Snapshots
- EBS Encryption
- EBS Encryption- Changing the Encryption state of an EBS volume
- Lab - Root EBS Volume Encryption
- EBS - Sharing EBS Snapshots
- EBS - Copying EBS snapshots
- Lab - EBS Encryption and Sharing Snapshots
- EBS - Creating and Registering AMIs from Block Store Volumes
- EBS - Creating AMIs from
- EBS-Backed EC2 Instances
- Labs - EBS - Creating and Sharing AMIs
- Labs - EBS - Creating and Sharing AMIs - Encryption Key permissions
- EBS Redundant Array of Independent Disks (RAID) and EBS volumes

Section -6 Elastic Load Balancer (ELB)

- Elastic Load Balancer - Introduction
- Elastic Load Balancer - How it works

- How ELB works
- ELB health checks
- ELB Cross Zone Load Balancing
- ELB Positioning -Internet-facing vs Internal ELB
- Refresher for TCP IP Packet flow
- ELB - Security Group
- ELB – Network ACLs
- ELB - Layer 4
- TCP/SSL Listeners
- ELB - Layer 7 HTTP/HTTPS Listeners
- ELB Service - Classical Load Balancer Overview and Lab Layout
- ELB & Sticky Sessions (Session Affinity)
- ELB Security policy for SSL/HTTPS sessions
- SSL/HTTPS authentication - Client and Server Certificates
- ELB Connection Draining
- ELB Monitoring
- ELB Pre-Warming & Scaling

Section 7: AWS Auto Scaling

- Auto Scaling Introduction
- Auto Scaling Components
- Auto Scaling Features
- Auto Scaling Availability Zone Rebalance feature
- Adding/Detaching EC2 instances to/from Auto Scaling Groups
- Auto Scaling and Elastic Load Balancing Service
- Auto Scaling health checks
- Auto Scaling Health Checks - SNS Notifications & Merging Auto Scaling groups
- Hands On Lab Auto Scaling
- Auto Scaling policies/plans -Scheduled Scaling, On-Demand Simple Scaling, On-Demand Step Scaling, Target Tracking Scaling
- Auto Scaling – Monitoring

Section 8: Introduction to Databases

- Introduction to Relational Databases

- Introduction to Non-Relational Databases (No-SQL)
- RDS - Types and Examples of Non-Relational Databases

Section 9: Relational Database Service (RDS)

- RDS - Introduction lecture to the AWS RDS Service
- RDS - Multi-AZ option
- RDS - Subnet Groups
- Hands on Lab - Creating an RDS instance
- RDS - Automatic Backups
- RDS - Manual Backups (Snapshots)
- RDS - Multi-AZ
- RDS instance security and encryption
- RDS - Read Replicas of RDS instances
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- Actions, Snapshots and Read Replicas
- RDS - Billing and Reserved DB instances
- RDS – Scaling

Section 10: Amazon Aurora

- Amazon Aurora - Introduction
- Aurora Cluster Architecture
- Amazon Aurora - End Points
- Amazon Aurora Features -
- Amazon Aurora Features - Autoscaling, Storage and Reliability, High Availability
- Amazon Aurora - Security,
- Amazon Aurora - Security, Encryption, Global DB, Aurora with other Services
- Hands On Labs - Create an Amazon Aurora DB Cluster
- Amazon Aurora Replication, Automated backup, and Snapshots, Backtrack feature
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Section 11: AWS Auditing

- AWS Auditing, Monitoring, and Notification Services
- AWS Simple Notification Service (SNS)
- AWS Simple Notification Service -Reliability & Security
- Hands On Labs - Simple Notification Service (SNS)
- Introduction to AWS CloudTrail
- CloudTrail Log File Integrity Validation
- Amazon CloudWatch - Introduction
- CloudWatch - How it works, Cloud Watch Concepts
- Amazon CloudWatch Alarms
- Hands On Labs - CloudWatch Alarms
- CloudWatch Logs - Introduction and Concepts
- CloudWatch Logs Insights, CW and
- EC2, CloudTrail, S3 and Elasticsearch
- Hands On Labs - CloudWatch Logs with VPC Flow Logs and CloudWatch Alarms
- AWS CloudWatch Logs - CW Agent, Real Time Processing, and Cross Account Logging
- CloudWatch Events
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Section 12:Simple Storage Service (S3)

- Amazon S3 - Introduction to Object Storage
- Amazon S3 - Data Consistency
- models in distributed storage systems
- Amazon S3 - AWS S3 Buckets
- Amazon S3 - Objects
- Hands On Labs - Creating a S3 bucket and uploading Objects
- Amazon S3 - Bucket Versioning and MFA Delete
- Hands On Labs - S3 Bucket Versioning
- S3 - Managing Access and Access Policies
- Amazon S3 Access Policy types
- Amazon S3 - Understanding Bucket and Object ACLs
- Amazon S3 - Copying / Uploading S3 Objects
- S3 Storage Classes
- Amazon Glacier - Archive Retrieval in Glacier

- Amazon S3 Bucket Lifecycle Policies
- Hands on Labs - S3 Lifecycle Policies/Rules
- Amazon S3 - Server-Side Encryption(SSE)
- Amazon S3 Server-Side Encryption -Detailed
- Hands on Labs - S3 Server Side Encryption
- Amazon S3 - When to use Access Control Lists with Buckets & Object
- Amazon S3 - When to use Bucket and User Policies
- Amazon S3 - Static Website Hosting in an S3 Bucket
- Hands On Labs - S3 Static Website Hosting
- Amazon S3 - Pre-Signed URLs
- Amazon S3 - Cross Region Replication (CRR)
- S3 Same Region Replication - SRR
- Hands On Labs - S3 - SRR and CRR
- Amazon S3 - Cross Origin Resource Sharing (CORS)
- S3 - Transfer Acceleration
- Amazon S3 Performance considerations and best practices
- Amazon S3 and Glacier SELECT
- Core Knowledge - S3 - Billing
- Core Knowledge - S3 - Notification and S3 Monitoring

Section 13: File System options - EFS and FSx

- AWS Elastic File System (EFS) - Introduction to the Service and Mount Targets
- AWS EFS - Use Cases , Use in On-premise Servers , Storage Classes, Pricing
- Hands On Labs - EFS
- AWS EFS - Data Encryption, EFS Data backup, EFS and AWS Data sync, Monitoring EFS
- AWS FSx for Windows File Server - Introduction, Deployment options & Encryption
- Amazon FSx - Data Protection, Backup/Restore, Access, Monitoring and Security
- Hands On Labs - Amazon FSx for Windows File Server
- Amazon FSx for Lustre
- Amazon EFS vs FSx for Windows vs FSx for Lustre
- Hands On Labs - Amazon FSx for Lustre

Section 14: Amazon Route 53 - AWS's Domain Name System (DNS) Service

- Amazon Route 53 - Introduction to DNS System and DNS Hierarchy
- Amazon Route 53 - Registering Domains with Route 53
- Amazon Route 53 - Steps to configure ROUTE 53
- Hands On Labs - Registering a Domain Name with Route 53
- Amazon Route 53 - Hosted Zones
- Amazon Route 53 - Working with Hosted Zones
- Hands On Labs - Creating/testing the Lab setup and Route53 Simple Routing
- Amazon Route 53 - Supported DNS Record Types
- Amazon Route 53 - Alias or No Alias- CNAME vs Alias records
- Hands On Labs - Route 53 Alias Records
- Amazon Route 53 - Health Checks
- Amazon Route 53 - Routing Policies- Failover & Geolocation Routing
- Hands On Labs - Route 53 Health Checks and Failover Routing
- Hands On Labs - Route 53 Geolocation (Geo) Routing
- Amazon Route 53 - Latency and Weighted Routing Policies
- Hands On Labs - Route 53 Latency Routing
- Hands On Labs - Route 53 Weighted Routing
- Hands On Lab - Amazon Route 53 MultiValue Answer
- Amazon Route 53 Resolver
- Hands on Labs - Route 53 Resolver
- Amazon Route 53 – Pricing

Section 15 : AWS CloudFront

- Content Delivery Networks (CDNs) introduction
- Amazon CloudFront - Static and Dynamic Content
- Amazon CloudFront - Introduction
- Amazon CloudFront Regional Edge Cache
- Amazon CloudFront Distributions
- Amazon CloudFront - Origin types
- Amazon CloudFront - Content Delivery
- Amazon CloudFront - Alternate Domain Names
- Amazon CloudFront - Supported HTTP Methods & Serving Private Content
- Amazon CloudFront - Viewer & Origin Protocol - & Object Invalidation

- Hands On Labs - Configuring a CloudFront Web Distribution with a S3 AWS Origin
- Amazon CloudFront - Field Level Encryption & WAF & GeoRestriction
- Amazon CloudFront - Video Streaming/ Access Logs & CloudTrail/ Pricing
- Global Accelerator
- Hands-On Lab : Global Accelerator

Section 16: Messaging and Integration

- AWS Simple Queue Service (SQS) - Introduction
- AWS SQS - Polling types and SQS Timers
- AWS SQS - Reliability, Security, and Encryption
- Hands On Labs - Simple Queue Service and Integration with SNS
- AWS SQS - Monitoring, SQS queue names, and Logging
- Amazon MQ

Section 17: Amazon Serverless Services

- Introduction to AWS Lambda
- AWS Serverless (lambda-based)
- Applications building blocks
- AWS Lambda Function Invocation types
- AWS Lambda Triggers - Event Sources that can Trigger a Lambda Function
- Hands On Labs - Lambda and S3 as a Trigger
- AWS Lambda Use Cases
- AWS Lambda Scaling, Versioning, and Service Limits
- AWS Lambda - Operations and Monitoring
- AWS Lambda Edge
- Introduction to AWS API Gateway
- API Gateway Architecture , API Methods and Resources
- API Gateway - Scaling - Throttling and Caching
- API Gateway CORS & API Operations and Monitoring
- Hands On Labs - API Gateway

Section 18: AWS DynamoDB

- AWS DynamoDB - Review of NoSQL and Data Types

- DynamoDB Introduction
- DynamoDB tables, components, Primary Key
- DynamoDB Table Throughput
- Hands On Labs - Creating a DynamoDB Simple Key table and Global Tables
- DynamoDB - Local and Global Secondary Indexes
- Hands on Labs - DynamoDB Local and Global Secondary Indexes
- DynamoDB Local, Backup/Restore,
- Point in Time Recovery, and TTL
- Hands On Labs - DynamoDB Point in Time Recovery, On Demand Backup and TTL
- DynamoDB Accelerator (DAX)
- DynamoDB Streams
- DynamoDB Transactions
- Amazon Neptune and DocumentDB
- (With MongoDB compatibility)
- DynamoDB Scalability, Throttling, and Limits

Section 19: AWS Caching, Big Data, Data Streaming, Analytics, and IoT Services

- Amazon Elastic Map Reduce - Introduction
- AWS EMR - Clusters, Nodes, and deployment in an AZ
- Amazon ElastiCache Introduction
- Amazon ElastiCache - Caching Strategies
- Amazon ElastiCache for Memcached
- Amazon ElastiCache for Redis

Section 20: AWS Kinesis - Introduction

- AWS Kinesis - Introduction
- AWS Kinesis Data Streams
- AWS Kinesis Data Firehose
- AWS Kinesis Analytics

Section 21: AWS Redshift - Introduction

- AWS Redshift - Introduction
- AWS Redshift Backup/Restore & Monitoring

- AWS Redshift - High Availability, Data Durability, Scaling and Billing
- DynamoDB integration with RedShift and AWS EMR plus Best Practices

Section 22: AWS Services and Strategies for Deployment Management

- Amazon CloudFormation
- Amazon CloudFormation Template Components
- Hands On Labs - Creating a CF Stack, Updating a Stack, and Stack Change Sets
- Section 23 :AWS OpsWorks
- AWS OpsWorks - Introduction
- AWS Opsworks Stacks and Layers
- AWS OpsWorks Components
- AWS Elastic BeanStalk - Introduction
- Elastic BeanStalk - Components and Concepts
- Section 24: Amazon Elastic ContainerServices (ECS)
- AWS EC2 (Elastic) Container Service [ECS] - Why we need it?
- AWS ECS - Introduction to Docker
- Introduction to AWS ECS
- AWS ECS Launch Types
- AWS ECS - Task Definitions andTasks
- AWS ECS and IAM Roles
- Elastic Kubernetes Service (EKS)

Section 25: Core Knowledge -Application Load Balancer

- Classic Load Balancer Refresher andWeaknesses
- Introduction to Application Load Balancer
- ALB Components explained
- Hands on Labs - Creating Route Targets and Application Load Balancer
- ALB Listener Rules
- ALB Content Routing (Host and Path based routing)
- ALB - Containers and Microservices Support
- ALB and ECS Dynamic Host Port Mapping
- Hands-On Lab : ECS and Application Load Balancer
- Monitoring the ALB

Section 26: Amazon Network Load Balancer (NLB)

- Amazon ELB - Network Load Balancing (NLB) - Agenda
- Quick Amazon ELB Recap
- Amazon NLB - L2.5 Features and How it Works
- Amazon NLB - Features and How it Works (Cont.)
- Amazon NLB - Supported Target Types
- Amazon NLB - Source IP Address Preservation
- Amazon NLB - Proxy Protocol - Health Checks - Monitoring
- Amazon NLB - Troubleshooting Some Common Problems

Section 27: AWS Identity and Access Management (IAM) and AWS Directory Services

- AWS Directory Services -Introduction
- AWS Services - AWS MicrosoftActive Directory
- AWS Directory Service - AWSMicrosoft AD
- AWS Directory Service - AWS Simple AD
- AWS Services - AWS Directory
- Services - AWS Connector
- AWS Identity and AccessManagement (IAM) - Introduction
- IAM - Features
- IAM Elements
- IAM Elements (Actions and
- IAM & Identity Federation
- IAM - Identities - Groups , Roles and Temporary Credentials
- IAM Identity-based and Resource-based policies
- IAM Users deep dive
- IAM User Credentials detailed
- IAM Roles
- IAM Service Roles
- IAM Role Delegation
- AWS Cross-Account Access
- Cross Account Access with External ID
- IAM Users and Roles - When to use what?
- IAM Logging using AWS CloudTrail
- IAM Best Practices
- Security Token Service (STS) -Introduction

- WebID Federation and STSCredentials
- Using STS Security Credentials -WebID Federation example
- Web Identity Federation using STS
- Identity Federation with SAML 2.0 -AWS API Access
- Identity Federation with SAML 2.0(Console Access)
- AWS Single Sign-On (SSO)
- AWS Web Application Firewall (WAF)
- Hands-On Lab : AWS WAF

Section 28: Amazon Data Migration Services and Hybrid Cloud

- AWS Snowball
- AWS Snowball, Snowball Edge, Snowmobile
- AWS Storage Gateway - Snowball -
- VM Import/Export
- AWS Database Migration Service(AWS DMS)
- AWS Database Migration Services - How it works and Schema Conversion Tool (SCT)
- AWS DMS Components - Replication Instance, Multi AZ, DMS and VPC
- AWS Server Migration Service (SMS)

Cloud Automation tool: Terraform

HashiCorp Certified: Terraform Associate

- 1 Understand infrastructure as code (IaC) concepts
 - 1a Explain what IaC is
 - 1b Describe advantages of IaC patterns

- 2 Understand Terraform's purpose (vs other IaC)
 - 2a Explain multi-cloud and provider-agnostic benefits
 - 2b Explain the benefits of state

- 3 Understand Terraform basics
 - 3a Handle Terraform and provider installation and versioning
 - 3b Describe plugin based architecture
 - 3c Demonstrate using multiple providers
 - 3d Describe how Terraform finds and fetches providers
 - 3e Explain when to use and not use provisioners and when to use local-exec or remote-exec

- 4 Use the Terraform CLI (outside of core workflow)
 - 4a Given a scenario: choose when to use terraform fmt to format code
 - 4b Given a scenario: choose when to use terraform taint to taint Terraform resources
 - 4c Given a scenario: choose when to use terraform import to import existing infrastructure into your Terraform state
 - 4d Given a scenario: choose when to use terraform workspace to create workspaces
 - 4e Given a scenario: choose when to use terraform state to view Terraform state
 - 4f Given a scenario: choose when to enable verbose logging and what the outcome/value is

- 5 Interact with Terraform modules
 - 5a Contrast module source options
 - 5b Interact with module inputs and outputs

- 5c Describe variable scope within modules/child modules
- 5d Discover modules from the public Terraform Module Registry
- 5e Defining module version

- 6 Navigate Terraform workflow
 - 6a Describe Terraform workflow (Write -> Plan -> Create)
 - 6b Initialize a Terraform working directory (terraform init)
 - 6c Validate a Terraform configuration (terraform validate)
 - 6d Generate and review an execution plan for Terraform (terraform plan)
 - 6e Execute changes to infrastructure with Terraform (terraform apply)
 - 6f Destroy Terraform managed infrastructure (terraform destroy)

- 7 Implement and maintain state
 - 7a Describe default local backend
 - 7b Outline state locking
 - 7c Handle backend authentication methods
 - 7d Describe remote state storage mechanisms and supported standard backends
 - 7e Describe effect of Terraform refresh on state
 - 7f Describe backend block in configuration and best practices for partial configurations
 - 7g Understand secret management in state files

- 8 Read, generate, and modify configuration
 - 8a Demonstrate use of variables and outputs
 - 8b Describe secure secret injection best practice
 - 8c Understand the use of collection and structural types

- 8d Create and differentiate resource and data configuration
- 8e Use resource addressing and resource parameters to connect resources together.
- 8f Use Terraform built-in functions to write configuration
- 8g Configure resource using a dynamic block
- 8h Describe built-in dependency management (order of execution based)

- 9 Understand Terraform Cloud and Enterprise capabilities
 - 9a Describe the benefits of Sentinel, registry, and workspaces
 - 9b Differentiate OSS and TFE workspaces
 - 9c Summarize features of Terraform Cloud

Automate AWS services using Terraform

Introduction to Terraform

Terraform Overview

Terraform Features

Automate AWS services using Terraform

VPC

EC2

ECS

ECR

Lambda

APIGateway

ALB

IAC

Fargate

