

**Advanced Architecting on AWS**

**Course Number:** AWS-115  
**Duration:** 3 days

**Overview**

This Advanced Architecting on AWS training builds on concepts introduced in the introductory [Architecting on AWS](file:////training/aws-architecture) course. Attendees learn how to manage multiple AWS accounts and manage hybrid connectivity, devices, networking, container services, automation tools for continuous integration/continuous delivery (CI/CD), security and distributed denial of service (DDoS) protection, data lakes, data stores, edge services, migration options, and costs.

Accelebrate is an AWS Training Partner (ATP) and this hands-on official AWS Classroom Training course is taught by an accredited Amazon Authorized Instructor (AAI).

**Prerequisites**

All students must have:

* Knowledge and experience with core AWS services from the Compute, Storage, Networking, and AWS Identity and Access Management (IAM) categories
* Attended the [Architecting on AWS classroom training](file:////training/aws-architecture) OR
* Achieved the [AWS Certified Solutions Architect - Associate](https://aws.amazon.com/certification/certified-solutions-architect-associate/) certification OR
* At least one year of experience operating AWS workloads

**Materials**

All AWS students will receive comprehensive courseware.

**Software Needed on Each Student PC**

A modern web browser and an Internet connection free of restrictive firewalls, so that the student can connect by SSH or Remote Desktop (RDP) into AWS virtual machines.

**Objectives**

* Review the AWS Well-Architected Framework to ensure understanding of best cloud design practices by responding to poll questions while following a graphic presentation
* Demonstrate the ability to secure Amazon Simple Storage Service (Amazon S3) virtual private cloud (VPC) endpoint connections in a lab environment
* Identify how to implement centralized permissions management and reduce risk using AWS organizational units (OUs) and service control policies (SCPs) with AWS Single SignOn
* Compare the permissions management capabilities of OUs, SCPs, and AWS SSO with and without AWS Control Tower to determine best practices based on use cases
* Discuss AWS hybrid network designs to address traffic increases and streamline remote work while ensuring FIPS 140-2 Level 2, or Level 3 security compliance
* Explore the solutions and products available to design a hybrid infrastructure, including access to 5G networks, to optimize service and reduce latency while maintaining high security for critical on-premises applications
* Explore ways to simplify the connection configurations between applications and high-performance workloads across global networks
* Demonstrate the ability to configure a transit gateway in a lab environment
* Identify and discuss container solutions and define container management options
* Build and test a container in a lab environment
* Examine how the AWS developer tools optimize the CI/CD pipeline with updates based on nearreal-time data
* Identify the anomaly detection and protection services that AWS offers to defend against DDoS attacks
* Identify ways to secure data in transit, at rest, and in use with AWS Key Management Service (AWS KMS) and AWS Secrets Manager
* Determine the best data management solution based on frequency of access, and data query and analysis needs
* Set up a data lake and examine the advantages of this type of storage configuration to crawl and query data in a lab environment
* Identify solutions to optimize edge services to eliminate latency, reduce inefficiencies, and mitigate risks
* Identify the components used to automate the scaling of global applications using geolocation and traffic control
* Deploy and activate an AWS Storage Gateway file gateway and AWS DataSync in a lab environment
* Review AWS cost management tools to optimize costs while ensuring speed and performance
* Review migration tools, services, and processes that AWS provides to implement effective cloud operation models based on use cases and business needs
* Provide evidence of your ability to apply the technical knowledge and experience gained in the course to improve business practices by completing a Capstone Project

**Outline**

* Reviewing Architecting Concepts
  + Review Architecting on AWS core best practices
  + Securing Amazon S3 VPC Endpoint Communications
* Single to Multiple Accounts
  + AWS Organizations for multi-account access and permissions
  + AWS SSO to simplify access and authentication across AWS accounts and third-party services
  + AWS Control Tower
  + Permissions, access, and authentication
* Hybrid Connectivity
  + AWS Client VPN authentication and control
  + AWS Site-to-Site VPN
  + AWS Direct Connect for hybrid public and private connections
  + Increasing bandwidth and reducing cost
  + Basic, high, and maximum resiliency
  + Amazon Route 53 Resolver DNS resolution
* Specialized Infrastructure
  + AWS Storage Gateway solutions
  + On-demand VMware Cloud on AWS
  + Extending cloud infrastructure services with AWS Outposts
  + AWS Local Zones for latency-sensitive workloads
  + Your 5G network with and without AWS Wavelength
* Connecting Networks
  + Simplifying private subnet connections
  + VPC isolation with shared services VPC
  + Transit Gateway Network Manager and VPC Reachability Analyzer
  + AWS Resource Access Manager
  + AWS PrivateLink and endpoint services
  + Configuring Transit Gateways
  + Advanced Architecting on AWS
  + AWS Classroom Training
* Containers
  + Container solutions compared to virtual machines
  + Docker benefits, components, solutions architecture, and versioning
  + Container hosting on AWS to reduce cost
  + Managed container services: Amazon Elastic Container Service (Amazon ECS) and Amazon
  + Elastic Kubernetes Service (Amazon EKS)
  + AWS Fargate
  + Deploying an Application with Amazon EKS on Fargate
* Continuous Integration/Continuous Delivery (CI/CD)
  + CI/CD solutions and impact
  + CI/CD automation with AWS CodePipeline
  + Deployment models
  + AWS CloudFormation StackSets to improve deployment management
* High Availability and DDoS Protection
  + Common DDoS attacks layers
  + AWS WAF
  + AWS WAF web access control lists (ACLs), real-time metrics, logs, and security automation
  + AWS Shield Advanced services and AWS DDoS Response Team (DRT) services
  + AWS Network Firewall and AWS Firewall Manager to protect accounts at scale
* Securing Data
  + What cryptography is, why you would use it, and how to use it
  + AWS KMS
  + AWS CloudHSM architecture
  + FIPS 140-2 Level 2 and Level 3 encryption
  + Secrets Manager
* Large-Scale Data Stores
  + Amazon S3 data storage management, including storage class, inventory, metrics, and policies
  + Data lake vs. data warehouse: Differences, benefits, and examples
  + AWS Lake Formation solutions, security, and control
  + Setting Up a Data Lake with Lake Formation
* Large-Scale Applications
  + What are edge services, and why would you use them?
  + Improve performance and mitigate risk with Amazon CloudFront
  + Lambda@Edge
  + AWS Global Accelerator: IP addresses, intelligent traffic distribution, and health checks
  + Migrating an On-Premises NFS Share Using AWS DataSync and Storage Gateway
* Optimizing Cost
  + On-premises and cloud acquisition/deprecation cycles
  + Cloud cost management tools, including reporting, control, and tagging
  + Examples and analysis of the five pillars of cost optimization
* Migrating Workloads
  + Business drivers and the process for migration
  + Successful customer practices
  + The 7 Rs to migrate and modernize
  + Migration tools and services from AWS
  + Migrating databases and large data stores
  + AWS Schema Conversion Tool (AWS SCT)
* Capstone Project
  + Use the Online Course Supplement (OCS) to review use cases, investigate data, and answer architecting design questions about Transit Gateway, hybrid connectivity, migration, and cost optimization