Advanced Architecting on AWS

Duration: 3 Days Course Code: GK1980

Overview:

In this course, each module presents a scenario with an architectural challenge to be solved. You will examine available AWS services and features as solutions to the problem. You will gain insights by participating in problem-based discussions and learning about the AWS services that you could apply to meet the challenges. Over 3 days, the course goes beyond the basics of a cloud infrastructure and covers topics to meet a variety of needs for AWS customers. Course modules focus on managing multiple AWS accounts, hybrid connectivity and devices, networking with a focus on AWS Transit Gateway connectivity, container services, automation tools for continuous integration/continuous delivery (CI/CD), security and distributed denial of service (DDoS) protection, data lakes and data stores, edge services, migration options, and managing costs. The course concludes by presenting you with scenarios and challenging you to identify the best solutions.
Course level: Advanced
Duration: 3 days
Activities
This course includes presentations, group discussions, use cases, videos, assessments, and hands-on labs.

Target Audience:

This course is intended for:
- Cloud architects
- Solutions architects
- Anyone who designs solutions for cloud infrastructures

Objectives:

- In this course, you will learn to:
- 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 Organizations organizational units (OUs) and service control policies (SCPs) with AWS Single Sign[1]On
- 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[1]premises applications
- Explore ways to simplify the connection configurations between applications and high[1]performance workloads across global networks
- Demonstrate the ability to configure a transit gateway in a lab
- Examine how the AWS developer tools optimize the CI/CD pipeline with updates based on near[1]real-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

environment

- Identify and discuss container solutions and define container management options
- Build and test a container in a lab environment

by completing a Capstone Project

Prerequisites:

We recommend that attendees of this course 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 OR
- Achieved the AWS Certified Solutions Architect Associate certification OR
- Have at least 1 year of experience operating AWS workloads

Content:

Module 1: Course Overview

- Logistics
- Student resources
- Agenda
- Introductions

Module 2: Building a Web Application on AWS

- Discuss the architecture of the application you are going to build during this course
- Explore the AWS services needed to build your web application
- Discover how to store, manage, and host your web application

Module 3: Getting Started with Development on AWS

- Describe how to access AWS services programmatically
- List some programmatic patterns and how they provide efficiencies within AWS SDKs and AWS CLI
- Explain the value of AWS Cloud9

Module 4: Getting Started with Permissions

- Review AWS Identity and Access Management (IAM) features and components permissions to support a development environment
- Demonstrate how to test AWS IAM permissions
- Configure your IDEs and SDKs to support a development environment
- Demonstrate accessing AWS services using SDKs and AWS Cloud9

Lab 1: Configure the Developer Environment

- Connect to a developer environment
- Verify that the IDE and the AWS CLI are installed and configured to use the application profile
- Verify that the necessary permissions have been granted to run AWS CLI commands
- Assign an AWS IAM policy to a role to delete an Amazon S3 bucket

Module 5: Getting Started with Storage

- Describe the basic concepts of Amazon S3
- List the options for securing data using Amazon S3
- Define SDK dependencies for your code
- Explain how to connect to the Amazon S3 service
- Describe request and response objects

Module 6: Processing Your Storage Operations

- Perform key bucket and object operations

Module 7: Getting Started with Databases

- Describe the key components of DynamoDB
- Explain how to connect to DynamoDB
- Describe how to build a request object
- Explain how to read a response object
- List the most common troubleshooting exceptions

Module 8: Processing Your Database Operations

- Develop programs to interact with DynamoDB using AWS SDKs
- Perform CRUD operations to access tables, indexes, and data
- Describe developer best practices when accessing DynamoDB
- Review caching options for DynamoDB to improve performance
- Perform DynamoDB operations using SDK

Lab 3: Develop Solutions Using Amazon DynamoDB

- Interact with Amazon DynamoDB programmatically using low-level, document, and highlevel APIs in your programs
- Retrieve items from a table using key attributes, filters, expressions, and paginations
- Load a table by reading JSON objects from a file
- Search items from a table based on key attributes, filters, expressions, and paginations
- Update items by adding new attributes and changing data conditionally
- Access DynamoDB data using PartiQL and object-persistence models where applicable

Module 9: Processing Your Application Logic

- Develop a Lambda function using SDKs
- Configure triggers and permissions for Lambda functions
- Test, deploy, and monitor Lambda functions

Lab 4: Develop Solutions Using AWS Lambda Functions

- Create AWS Lambda functions and interact programmatically using AWS SDKs and AWS CLI
- Configure AWS Lambda functions to use the environment variables and to integrate with other services
- Generate Amazon S3 pre-signed URLs

Module 12: Granting Access to Your Application Users

- Analyze the evolution of security protocols
- Explore the authentication process using Amazon Cognito
- Manage user access and authorize serverless APIs
- Observe best practices for implementing Amazon Cognito
- Demonstrate the integration of Amazon Cognito and review JWT tokens

Lab 6: Capstone – Complete the Application Build

- Create a Userpool and an Application Client for your web application using
- Add new users and confirm their ability to sign-in using the Amazon Cognito CLI
- Configure API Gateway methods to use Amazon Cognito as an authorizer
- Verify JWT authentication tokens are generated during API Gateway calls
- Develop API Gateway resources rapidly using a Swagger importing strategy

Set up your web application frontend to use Amazon Cognito and API Gateway configurations and verify the entire application functionality

Module 13: Deploying Your Application

- Identify risks associated with traditional software development practices
- Understand DevOps methodology
- Configure an AWS SAM template to deploy a serverless application
- Describe various application deployment strategies
- Demonstrate deploying a serverless application using AWS SAM

Module 14: Observing Your Application

- Differentiate between monitoring and observability
- Evaluate why observability is necessary in modern development and key components
- Understand CloudWatch's part in configuring the observability
- Demonstrate using CloudWatch Application Insights to monitor applications
- Demonstrate using X-Ray to debug your applications

Lab 7: Observe the Application Using AWS X-Ray

- Instrument your application code to use AWS X-Ray capabilities

- Explain how to handle multiple and large objects
- Create and configure an Amazon S3 bucket to host a static website
- Grant temporary access to your objects
- Demonstrate performing Amazon S3 operations using SDKs

Lab 2: Develop Solutions Using Amazon S3

- Interact with Amazon S3 programmatically using AWS SDKs and the AWS CLI
- Create a bucket using waiters and verify service exceptions codes
- Build the needed requests to upload an Amazon S3 object with metadata attached
- Build requests to download an object from the bucket, process data, and upload the object back to the bucket
- Configure a bucket to host the website and sync the source files using the AWS CLI
- Add IAM bucket policies to access the S3 website.

Day 2

using AWS SDKs and verify the access to bucket objects
- Deploy the AWS Lambda functions with .zip file archives through your IDE and test as needed
- Invoke AWS Lambda functions using the AWS Console and AWS CLI

Module 10: Managing the APIs

- Describe the key components of API Gateway
- Develop API Gateway resources to integrate with AWS services
- Configure API request and response calls for your application endpoints
- Test API resources and deploy your application API endpoint
- Demonstrate creating API Gateway resources to interact with your application APIs

Lab 5: Develop Solutions Using Amazon API Gateway

- Create RESTful API Gateway resources and configure CORS for your application
- Integrate API methods with AWS Lambda functions to process application data
- Configure mapping templates to transform the pass-through data during method integration
- Create a request model for API methods to ensure that the pass-through data format complies with application rules
- Deploy the API Gateway to a stage and validate the results using the API endpoint

Day 3

Module 11: Building a Modern Application

- Describe the challenges with traditional architectures
- Describe the microservice architecture and benefits
- Explain various approaches for designing microservice applications
- Explain steps involved in decoupling monolithic applications
- Demonstrate the orchestration of Lambda Functions using AWS Step Functions
- Enable your application deployment package to generate logs
- Understand the key components of an AWS SAM template and deploy your application
- Create AWS X-Ray service maps to observe end-to-end processing behavior of your application
- Analyze and debug application issues using AWS X-Ray traces and annotations

Module 15: Course Wrap-up

- Course overview
- AWS training courses
- Certifications
- Course feedback

Further Information:

For More information, or to book your course, please call us on 00 20 (0) 2 2269 1982 or 16142

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