Prerequisite : Course 1 & basic AWS cloud

Day 1: AWS IAM

Introduction to AWS Identity and Access Management (IAM)

- Understanding IAM Basics: Users, Groups, Roles, and Policies
- Overview of IAM Access Control and Authorization Mechanisms

IAM Policies and Permissions

- Creating and Managing IAM Policies
- Granting Least Privilege Access with IAM Policies
- Policy Evaluation and Enforcement in AWS IAM

IAM Users and Groups Management

- Creating and Managing IAM Users and Groups
- Implementing IAM User Authentication and Access Control
- Best Practices for IAM User and Group Management

IAM Roles and Cross-Account Access

- Understanding IAM Roles and Their Use Cases
- Configuring Cross-Account Access with IAM Roles
- Implementing Role-Based Access Control (RBAC) with IAM

IAM Security Best Practices

- Securing AWS Resources with IAM Best Practices
- Implementing Multi-Factor Authentication (MFA) and Strong Password Policies
- Monitoring and Auditing IAM Access and Activity

Introduction to AWS IAM Control Tower

- Overview of AWS IAM Control Tower
- Key Features and Benefits of IAM Control Tower
- Use Cases and Scenarios for IAM Control Tower Implementation

Setting Up AWS IAM Control Tower

- Configuring AWS IAM Control Tower in AWS Management Console
- Defining Organizational Units (OUs) and Guardrails
- Implementing IAM Control Tower Policies and Compliance Controls

Managing AWS Accounts with IAM Control Tower

- Managing AWS Accounts and Workloads with IAM Control Tower
- Implementing Account Vending and Lifecycle Management
- Enforcing Governance and Compliance Policies Across AWS Accounts

Hands-On Lab: IAM and IAM Control Tower Implementation

- Step-by-Step Guide: Creating IAM Users, Groups, and Roles
- Practical Demonstration: Configuring IAM Policies and Permissions
- Lab Exercise: Setting Up IAM Control Tower and Defining Guardrails

IAM and IAM Control Tower Best Practices

- Implementing IAM and IAM Control Tower Best Practices for Security and Compliance
- Addressing Common Challenges and Pitfalls in IAM Management
- Optimizing IAM and IAM Control Tower Configuration for Efficiency and Scale

Day 2:

Introduction to Serverless Computing

- Understanding Serverless Architecture and Benefits
- Overview of AWS Lambda and its Role in Serverless Computing

AWS Lambda Basics

- Exploring AWS Lambda Features and Use Cases
- Creating and Configuring Lambda Functions
- Lambda Triggers and Event Sources

Developing Lambda Functions

- Writing Lambda Function Code in Supported Languages (e.g., Python, Node.js)
- Handling Input and Output Data in Lambda Functions
- Testing and Debugging Lambda Functions Locally

API Gateway Fundamentals

- Introduction to AWS API Gateway
- API Gateway as a Service Proxy and HTTP Endpoint
- Creating and Configuring API Gateway Resources and Methods

Building RESTful APIs with API Gateway

- Defining API Resources, Methods, and Integration Types
- Configuring API Gateway Authorization and Authentication
- Implementing API Gateway Request and Response Mapping

Day 3: Serverless Application Development with DynamoDB Integration

Introduction to DynamoDB

- Overview of Amazon DynamoDB as a NoSQL Database Service
- DynamoDB Data Model: Tables, Items, and Attributes
- Key Features of DynamoDB: Scalability, Performance, and Pricing

Integrating AWS Lambda with DynamoDB

- Using DynamoDB as the Data Store for Serverless Applications
- Reading and Writing Data to DynamoDB from Lambda Functions
- Managing DynamoDB Access and Permissions

Building Serverless CRUD APIs with Lambda and DynamoDB

- Implementing Create, Read, Update, and Delete (CRUD) Operations
- Designing DynamoDB Table Structure for Efficient Querying
- Securing API Endpoints and DynamoDB Access Controls

Advanced API Gateway Features

- API Gateway Request Validation and Response Mapping Templates
- Rate Limiting, Throttling, and Caching Strategies in API Gateway
- Custom Domain Names and SSL Certificates for API Gateway Endpoints

Serverless Application Deployment and Monitoring

- Deploying Serverless Applications with AWS SAM (Serverless Application Model)
- Monitoring and Logging Lambda Functions and API Gateway Endpoints
- Troubleshooting Serverless Applications and Performance Optimization Strategies

Hands-On Lab: Building and Deploying Serverless Applications

- Step-by-Step Guide: Building a Serverless API with Lambda, API Gateway, and DynamoDB
- Practical Exercises: Testing, Debugging, and Deploying Serverless Applications
- Lab Demonstration: Monitoring and Managing Serverless Application Performance

Day 4:

Introduction to AWS Glue

- Overview of AWS Glue as a Fully Managed ETL (Extract, Transform, Load) Service
- Key Features and Benefits of AWS Glue for Data Integration and Data Preparation

Getting Started with AWS Glue

- Setting Up AWS Glue Data Catalogs, Jobs, and Crawlers
- Understanding Glue Databases, Tables, and Schemas
- Configuring Glue Connections and IAM Roles for Data Access

Data Transformation with AWS Glue

- Writing and Executing ETL Jobs in AWS Glue
- Transforming Data using Glue Dynamic Frames and Built-in Transforms
- Implementing Custom Transformations with Python and Spark

Data Catalog and Metadata Management

- Utilizing AWS Glue Data Catalog for Metadata Storage and Management
- Cataloging Data Sources and Schemas with AWS Glue Crawlers
- Enabling Data Discovery and Exploration with AWS Glue Catalog APIs

AWS EventBridge Overview

- Introduction to AWS EventBridge as an Event Bus for Serverless Architectures
- Key Components and Concepts of EventBridge: Rules, Event Buses, and Event Patterns
- Use Cases and Integration Scenarios for Event-Driven Architectures

Event Routing and Processing with EventBridge

- Configuring EventBridge Rules and Targets for Event Routing
- Integrating AWS Services, Custom Applications, and External Systems with EventBridge
- Monitoring and Managing EventBridge Events using CloudWatch Logs and Metrics

EventBridge Schema Registry

- Introduction to EventBridge Schema Registry for Event Payload Validation and Transformation
- Defining and Managing Event Schemas in EventBridge
- Enforcing Schema Validation and Data Transformation Rules for Event Processing

Hands-On Lab: Building ETL Jobs with AWS Glue

- Step-by-Step Guide: Creating and Executing AWS Glue ETL Jobs for Data Transformation
- Practical Exercises: Extracting, Transforming, and Loading Data using AWS Glue Dynamic Frames
- Lab Demonstration: Working with AWS Glue Data Catalogs and Crawlers for Metadata Management

Day 5: Advanced AWS Services Integration

AWS Glue with Amazon S3 and Amazon Redshift

- Integrating AWS Glue with Amazon S3 for Data Lake and Data Warehouse Solutions
- Loading and Querying Data in Amazon Redshift with AWS Glue ETL Jobs
- Optimizing Data Pipeline Performance and Cost Efficiency with Glue and Redshift

Real-Time Data Processing with AWS Glue and Kinesis

- Streaming Data Ingestion and Processing using AWS Glue Streaming ETL Jobs
- Configuring Glue Jobs to Read and Write Data Streams from Amazon Kinesis
- Building Real-Time Analytics Solutions with AWS Glue and Kinesis Data Analytics

Data Governance and Security with AWS Glue

- Implementing Data Encryption, Access Control, and Compliance Policies in AWS Glue
- Managing Data Quality, Lineage, and Governance with AWS Glue Data Catalog Features
- Integrating AWS Glue with AWS Security Services for End-to-End Data Protection

Advanced EventBridge Use Cases

- Implementing Pub/Sub Messaging Patterns with EventBridge Event Buses
- Orchestrating Microservices and Serverless Workflows with EventBridge Rules and Targets
- Building Complex Event Processing (CEP) Systems with EventBridge and AWS Lambda

Hands-On Lab: Event-Driven Architecture with AWS Services

- Designing and Implementing Event-Driven Workflows using AWS Glue and EventBridge
- Creating and Testing EventBridge Rules, Event Patterns, and Target Integrations
- Lab Demonstration: Building a Real-Time Data Pipeline with AWS Glue, Kinesis, and Lambda