**Pre-requisites and Important Notes:**

* Participants should be comfortable to work with AWS and Azure
* Participants should have experience on working with On Premise databases like MongoDB, Cassandra etc.
* Trainer will use sample data for demonstration
* Scope of this training is limited to the topics which are mentioned in this TOC. In case any other related or subtopic to be covered during the training, that needs to be explicitly mentioned in this TOC.
* Sample data available at AWS documentation will be used for demonstration and Hands-on
* Trainer will explain the topics via Demonstration. Participants need to do the hands-on post training hours daily.
* All the participants need to pre-reed the study material and PPTs before coming to the session for next day.
* Every participant needs to invest at least 2 hours for offline study as well. However, 4 hours is recommended.
* This training will be 70% to 80% on Demonstration by the trainer.

**Day 1 (4 Hours)**

**NoSQL Concepts**

1. Introduction to NoSQL (JSON and BSON)
2. Database
3. Collection
4. Document
5. Items
6. Partitions and Data distribution

**Day 2, 3 & 4 (12 Hours)**

**AWS Key spaces**

1. Introduction
2. Architecture
3. Installation and Configurations
4. Cluster setup, DR, etc.
5. User administration
6. Implement PITR and Restore
7. Multi-Region Replication
8. Sharding
9. Migrate Apache Cassandra workloads to Amazon Keyspaces using AWS Glue and its pros and Cons
   1. Prerequisites and limitations
   2. Architecture
   3. Tools
10. Best practices
    1. Encryption
    2. Cost Optimization
11. Security aspects
    1. Data protection
    2. AWS Identity and Access Management
    3. Logging and monitoring
    4. Resilience and disaster recovery
    5. Encryption
12. Performance tuning
    1. NoSQL design for Amazon Keyspaces
    2. Client driver connections
    3. Data modelling
    4. Optimizing costs
13. Logging and monitoring in Amazon Keyspaces
    1. Monitoring tools for Amazon Keyspaces
    2. Monitoring Amazon Keyspaces with Amazon CloudWatch
    3. Logging Amazon Keyspaces API calls with AWS CloudTrail
    4. Creating CloudWatch alarms to monitor Amazon Keyspaces
14. Migration through the DMS and limitations
    1. All data sources and targets not supported

**Day 5, 6 & 7 (12 Hours)**

**AWS DynamoDB**

1. Introduction
2. Architecture
3. Installation and configuration
4. User administration
5. Cluster setup
6. Resilience and disaster recovery in Amazon DynamoDB
   1. On-demand backup and restore
   2. Point-in-time recovery Point-in-time recovery
   3. Global tables that sync across AWS regions
7. Using On-Demand backup and restore for DynamoDB
   1. Using AWS Backup with DynamoDB
   2. Using DynamoDB backup and restore
8. Global tables - multi-Region replication for DynamoDB
   1. Setting up DynamoDB Replication using Global Tables
   2. Understanding DynamoDB Global Tables
   3. Replicate data seamlessly across Regions with global tables
   4. Determining the global table version you are using
9. Using write sharding to distribute workloads evenly
   1. Sharding using random suffixes
   2. Sharding using calculated suffixes
10. Best practices for designing and architecting with DynamoDB
    1. NoSQL design for DynamoDB
    2. Using deletion protection to protect your table
    3. Best practices for designing and using partition keys effectively
    4. Best practices for using sort keys to organize data
    5. Best practices for using secondary indexes in DynamoDB
    6. Best practices for storing large items and attributes
    7. Best practices for managing many-to-many relationships
    8. Best practices for modeling relational data in DynamoDB
    9. Best practices for querying and scanning data
    10. Best practices for DynamoDB table design
    11. Best practices for DynamoDB global table design
    12. Best practices for managing the control plane in DynamoDB
11. Security and compliance in Amazon DynamoDB
    1. AWS managed policies for Amazon DynamoDB
    2. Data protection in DynamoDB
    3. AWS Identity and Access Management (IAM)
    4. Configuration and vulnerability analysis in Amazon DynamoDB
12. Security best practices
    1. DynamoDB preventative security best practices
    2. DynamoDB detective security best practices
13. Performance tuning

**Skipped as it is related to integration with EMR**

* 1. DynamoDB provisioned throughput
  2. Adjusting the mappers
  3. Retry duration
  4. Parallel data requests
  5. Process duration
  6. Request time

1. Logging and monitoring in DynamoDB
   1. Monitoring tools
   2. Monitoring with Amazon CloudWatch
   3. Logging DynamoDB operations by using AWS CloudTrail
   4. Creating CloudWatch alarms to monitor DynamoDB
2. Migration through the DMS
   1. Migrating from a relational database to a DynamoDB table
   2. Prerequisites for using DynamoDB as a target
   3. Limitations when using DynamoDB as a target
   4. Using object mapping to migrate data to DynamoDB

**Day 8, 9 & 10 (12 Hours)**

**Azure Cosmos DB**

1. Introduction
2. Architecture
3. Installation and configuration
4. Cluster setup
5. DR
6. **User administration**
7. Backup and Restore
8. Replication & Sharding concepts
9. Best practices
10. Security aspects – encryption, user management
11. Performance tuning
12. Monitoring setup and configuration Azure and proper alert configuration

**Day 11, 12 & 13 (12 Hours)**

**AWS Document DB**

1. Introduction
2. Architecture
3. Installation and configuration
4. MongoDB vs DocumentDB
5. Understanding of Mongo Profiler
6. Cluster setup
7. DR
   1. Overview of Amazon DocumentDB Global Clusters
   2. Failover for Amazon DocumentDB Global Clusters
   3. Resilience in Amazon DocumentDB
8. User administration
   1. Authenticating with identities
   2. Managing access using policies
   3. How Amazon DocumentDB works with IAM
   4. Identity-based policy examples for Amazon DocumentDB
   5. Managing Access Permissions to Your Amazon DocumentDB Resources
   6. Using Identity-Based Policies (IAM Policies) for Amazon DocumentDB
   7. AWS managed policies for Amazon DocumentDB
9. Backup and Restore
   1. Dumping
   2. Restoring
   3. Importing and Exporting Data
   4. Cluster Snapshot
   5. Creating a Cluster Snapshot
   6. Restoring from a Cluster Snapshot
   7. Restoring to a Point in Time
   8. Deleting a Cluster Snapshot
10. Amazon DocumentDB High Availability and Replication
    1. Read Scaling
    2. High Availability
    3. Adding Replicas
    4. Replication Lag
11. DocumentDB Elastic Clusters
    1. How do I get started with Elastic Clusters?
    2. How does Elastic Clusters work?
    3. What types of sharding does Elastic Clusters support?
    4. How is Elastic Clusters different from MongoDB sharding?
    5. How do I define a shard key?
    6. Concepts associated with Elastic Clusters
12. Best practices
    1. Basic Operational Guidelines
    2. Instance Sizing
    3. Working with Indexes
    4. Cost Optimization
    5. Using Metrics to Identify Performance Issues
    6. TTL and Timeseries Workloads
    7. batchInsert and batchUpdate
13. Security aspects
    1. Data Protection
    2. Identity and Access Management
    3. Managing Users
    4. Database Access Using Role-Based Access Control
    5. Logging and Monitoring in Amazon DocumentDB
14. Upgrading your Amazon DocumentDB cluster using AWS Database Migration Service
    1. Enable Change Streams
    2. Modify the Change Streams Retention Duration
    3. Migrate Your Indexes
    4. Create a AWS DMS Replication Instance
    5. Create an AWS DMS Source Endpoint
    6. Create an AWS DMS Target Endpoint
    7. Create and run a migration task
    8. Changing the application endpoint to the target Amazon DocumentDB cluster
15. Performance tuning
    1. Analyze cache performance?
    2. Find and terminate long running or blocked queries?
    3. See a query plan and optimize a query?
    4. List all running operations on an instance?
    5. Determine the open cursors on an instance?
    6. Analyze index usage and identify unused indexes?
16. Migration from MongoDB to DocumentDB
    1. Launch an Amazon EC2 instance
    2. Install and configure MongoDB community edition
    3. Create an AWS DMS replication instance
    4. Create source and target endpoints
    5. Create and run a migration task
17. Monitoring Amazon DocumentDB
    1. Monitoring a cluster's status
    2. Monitoring an instance's status
    3. Viewing Amazon DocumentDB recommendations
    4. Event Subscriptions
    5. Monitoring Amazon DocumentDB with CloudWatch
    6. Logging Amazon DocumentDB API Calls with CloudTrail
    7. Monitoring with Performance Insights
    8. Set CloudWatch alarms
18. Migration through the DMS
    1. Mapping data from a source to an Amazon DocumentDB target
    2. Connecting to Amazon DocumentDB Elastic Clusters as a target
    3. Ongoing replication with Amazon DocumentDB as a target
    4. Limitations to using Amazon DocumentDB as a target
    5. Using endpoint settings with Amazon DocumentDB as a target
    6. Target data types for Amazon DocumentDB

**Day 14 & 15 (8 Hours)**

**Misc Topics**

1. Migrations between
   1. Migrate from MongoDB to AWS DocumentDB
      1. Launch an Amazon EC2 instance
      2. Install and configure MongoDB community edition
      3. Create an AWS DMS replication instance
      4. Create source and target endpoints
      5. Create and run a migration task
   2. Migrate from MongoDB to Azure CosmosDB
      1. MongoDB to Cosmos DB migration benefits
      2. MongoDB to Cosmos DB migration planning
      3. MongoDB to Cosmos DB data migration
      4. MongoDB to Cosmos DB application migration
      5. Migrate MongoDB workloads to Cosmos DB
   3. Migrate from MongoDB to AWS DynamoDB
      1. Setting the Environment
      2. Creating an IAM User for Database Migration Service
      3. Creating an Encryption Key
      4. Creating a MongoDB Database
      5. Creating a DynamoDB Table
2. Differences between MongoDB, AWS DocumentDB, AWS DynamoDB and Azure CosmosDB
3. Cassandra DB vs Amazon Keyspaces DB management
4. Other Topics
   1. Create Database, Collection, Document in each database
   2. Create, Insert, and Update many documents in each database
   3. Find the long-running queries and a deep understanding of the explain plan
   4. Index the queries and understand the technics
   5. Data Modeling
   6. Query & Index management
   7. Basic overview of aggregation queries
   8. Architecture, Core Components, API’s, Data types, Naming rules
   9. How Read/Write/Inset/Update/Upsert/Delete Operations work.
   10. Troubleshooting & Error debugging
   11. NoSQL Workbench and Code Examples