Cassandra Course Content

Chapter 1 : CURRICULUM INTRODUCTION TO CASSANDRA

- ➢ Limitations of RDMS solutions.
- ➢ NOSQL databases.
- ➢ Common characteristics of NoSQL databases.
- ➢ CAP theorem.
- ➢ What is Cassandra?
- ➢ History of Cassandra.
- ➢ Features of Cassandra.

Chapter 2 : INSTALLING CASSANDRA

- ➢ Downloading Apache Cassandra distribution
- ➢ Preparing the environment – Installing Java , Configuring ports
- ➢ Installing Cassandra using package and tarball installation
- ➢ What are the main configuration files in Cassandra
- ➢ Understanding required directory permissions
- ➢ Starting Cassandra and checking status
- ➢ Accessing Cassandra log files

Chapter 3 : UNDERSTANDING CASSANDRA DATA MODEL

- ➢ Understanding the analogy between RDBMS and Cassandra data model
- ➢ Understanding following database elements
    - • Cluster
    - • Keyspace
    - • Column Family/table
    - • Column
- ➢ Understanding Static and dynamic tables
- ➢ Understanding the primary key
- ➢ Understanding compound primary keys and clustering.

Chapter 4 : UNDERSTANDING CASSANDRA ARCHITECTURE

- Understanding That Cassandra Is a Distributed Database
- Key Cassandra elements
  - Memtable
  - Commit log
  - SSTables
- Learn how Cassandra replicates data
- Learning Gossip protocol – Detecting failures
- Learning What Snitch Is For
- Learning What Gossip Is For
- Learning How Data Gets Distributed
- Learning About Virtual Nodes
- Understanding Write path
- Understanding read path
- Understanding Replication Factor
- Understanding consistency level
- Understanding repair
- Understanding incremental repair

Chapter 5 : CREATING A DATABASE

- Defining a keyspace
- Deleting a keyspace
- Understanding Replication Factor
- Understanding Replication Strategy
- Hands ON/Demo
- Create a keyspace, specify the replication factor and replication strategy while creating keyspace using CQLSH

Chapter 6 : CREATING A TABLE

- Validation Summary
- Required Field Validator
- Compare Validator
- Range Validator
- Regular Expression Validator
- Custom Validator

Chapter 7 : INSERTING DATA IN CASSANDRA

- Using INSERT INTO command
- Using COPY command
- Hands ON/Demo

➢ Use INSERT INTO command to insert data in table. Use COPY command to insert data.

Chapter 8 : UPDATING AND DELETING DATA IN CASSANDRA

➢ Update and delete are also inserts
➢ Updating data
➢ Understanding tombstones
➢ Deleting data
➢ Using TTL
➢ Updating a TTL
➢ Hands ON/Demo
➢ Use UPDATE command to update data. Use DELETE command to delete data. Create expiring columns with TTL.

Chapter 9 : SELECTING HARDWARE

➢ How to choose appropriate hardware
➢ Selecting the right balance of the following resources: memory, CPU, disks, number of nodes, and network.

Chapter 10 : ADDING NODE TO CLUSTER

➢ Understanding Cassandra nodes.
➢ Specifying seed nodes.
➢ Bootstrapping a node.
➢ Adding a node in Cluster.
➢ Hands ON/Demo
➢ Create a cluster containing one node. Bootstrap a new node in the cluster.

Chapter 11 : REMOVING A NODE

➢ Decommissioning a node.
➢ Removing a dead node.
➢ Putting a node back into service.
➢ Hands ON/Demo
➢ Decommission a node from the cluster.

Chapter 12 : REPAIRING NODES

➢ Understanding repair.
➢ Understanding read repair.
➢ What's new in incremental repair.
➢ Run a Repair Operation.
➢ Hands ON/Demo
➢ Repair a cluster using nodetool utility.

Chapter 13 : BACKUP AND RESTORE

- ➤ Creating a Snapshot
- ➤ Restoring from a Snapshot
- ➤ Hands ON/Demo
- ➤ Create backup as part of this hands-on. Restore from the backup to recover data.

Chapter 14 : CONFIGURING SYSTEM AND OUTPUT LOGS

- ➤ Configure system.log file.
- ➤ Configure cassandra.log file.
- ➤ Configure gc.log file.

Chapter 15 : IMPLEMENTING MULTIPLE DATA CENTERS (GEO REDUNDANCY)

- ➤ Multi Data Center support in Cassandra.
- ➤ Changing snitch type.
- ➤ Modifying cassandra-rackdc.properties.
- ➤ Changing Replication Strategy.

Chapter 16 : MONITORING THE CLUSTER

- ➤ Understanding Cassandra monitoring tools.
- ➤ Using Nodetool Utility.
- ➤ Using JConsole.
- ➤ Learning about OpsCenter.
- ➤ Hands ON/Demo
- ➤ Use nodetool utility to manage the cluster. Connect JConsole to cluster and monitor JMX statistics.

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