MongoDB Developer and Administrator Course Agenda

# Lesson 1: NoSQL Database Introduction

* What is NoSQL?
* Why NoSQL?
* Difference Between RDBMS and NoSQL Databases
* Benefits of NoSQL
* Types of NoSQL
* Key-Value Database
* Document Database
* Column-Based Database
* Graph Database
* CAP Theorem
* Mongo DB as Per CAP

# Lesson 2: MongoDB - A Database for the Modern Web

* What is MongoDB?
* JSON
* BSON
* MongoDB Structure
* Document Store Example
* MongoDB as a Document Database
* Transaction Management in MogoDB
* Easy Scaling
* Scaling Up vs. Scaling Out
* Vertical Scaling and Horizontal Scaling
* Features of MongoDB
* Secondary Indexes
* Replication
* Memory Management
* Replica Set
* Auto Sharding
* Aggregation and MapReduce
* Collection and Database
* Schema Design and Modeling
* Reference Data Model
* Embedded Data Model
* Data Types
* Core Servers of MongoDB
* MongoDB’s Tools
* MongoDB Installation
* Use Cases

# Lesson 3: CRUD Operations in MongoDB

* Data Modification in MongoDB
* Batch Insert in MongoDB
* Ordered Bulk Insert and Unordered Bulk Insert
* Inserts: Internals and Implications
* Retrieving the documents
* Specify Equality Condition
* $in, “AND” Conditions
* $or Operator
* Specify AND/OR Conditions
* Regular Expression
* Array Exact Match
* Array Projection Operators
* $Where Query
* Cursor
* Pagination
* Advance query option
* Update Operation
* $SET
* $Unset and $inc Modifiers
* $Push and $addToSet
* Positional Array Modifications
* Upsert
* Removing Documents

# Lesson 4: Indexing and Aggregation

* Introduction to Indexing
* Types and Properties of Index
* Sort Order
* Text Indexes
* Text Search
* Index Creation
* Index Creation on Replica Set
* Remove, Modify, and Rebuild Indexes
* Listing Indexes
* Measure Index Use
* Control Index Use
* Index Use Reporting
* Geospatial Indexes
* MongoDB’s Geospatial Query Operators
* $GeoWith Operator
* Proximity Queries in MongoDB
* Aggregation
* Pipeline Operators and Indexes
* Aggregate Pipeline Stages
* MapReduce
* Aggregation Operations

# Lesson 5: Replication and Sharding

* Introduction to Replication
* Master-Slave Replication
* Replica Set in MongoDB
* Automatic Failover
* Replica Set Members
* Write Concern
* Write Concern Levels
* Write Concern for a Replica Set
* Modify Default Write Concern
* Read Preference
* Read Preference Modes
* Blocking for Replication
* Tag Set
* Configure Tag Sets for Replica set
* Replica Set Deployment Strategies
* Replica Set Deployment Patterns
* Oplog File
* Replication State and Local Database
* Replication Administration
* Sharding
* When to Use Sharding?
* What is a Shard?
* Choosing a Shard Key
* Range-Based Shard Key
* Hash-Based Sharding
* Impact of Shard Keys on Cluster Operation
* Production Cluster Architecture
* Config Server Availability
* Production Cluster Deployment
* Add Shards to a Cluster
* Enable Sharding for Database and a Collection
* Maintaining a Balanced Data Distribution
* Splitting
* Chunk Size and Type
* Shard Balancing
* Customized Data Distribution with Tag Aware Sharding
* Tag Aware Sharding

# Lesson 6: Developing Java and Node JS Application with MongoDB

* Capped Collection
* TTL Collection Features
* GridFS
* MongoDB Drivers and Client Libraries
* Develop Java Application with MongoDB
* Connecting to MonogDB from Java Program
* Create Collection From Java Program
* Insert Documents From Java Program
* Retrieve Documents Using Java Code
* Update Documents Using Java Code
* Delete Documents Using Java Code
* Store Images Using GridFS API
* Retrieve Images Using GridFS API
* Remove Image Using GridFS API
* Connection Creation Using Node JS
* Insert Operations Using Node JS
* Update Operations Using Node JS
* Retrieve Documents Using Node JS
* Using DB Cursor to Retrieve Documents
* Mongoose ODM Module in Node JS
* Defining Schema Using Mongoose

# Lesson 7: Administration of MongoDB Cluster Operations

* Capped Collection
* TTL Collection Features
* GridFS
* Memory-Mapped Files
* Journaling Mechanics
* Storage Engines
* Power of 2-Sized Allocations
* No Padding Allocation Strategy
* Diagnosing Performance Issues
* Optimization Strategies for MongoDB
* Configure Tag Sets for Replica Set
* Optimize Query Performance
* Monitoring Strategies for MongoDB
* MongoDB Utilities
* MongoDB Commands
* MongoDB Management Service (MMS)
* Data Backup Strategies in MongoDB
* Copying Underlying Data Files
* Backup with MongoDump
* Fsync and Lock
* MongoDB Ops Manager Backup Software
* Security Strategies in MongoDB
* Authentication Implementation in MongoDB
* Authentication in a Replica set
* Authentication on Sharded Clusters
* Authorization
* End-to-End Auditing for Compliance