

Course Content MongoDB

1. Course introduction and mongodb Essentials (basics)
2. Introduction to NoSQL databases
 - 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
3. 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 MongoDB
 - 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

4. 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

5. 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

6. 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

7. 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 MongoDB 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

8. 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

9. Project

- Project on MongoDB to have production like experience