MongoDB course content

MongoDB DBA Training:

The Mongodb DBA training provides a complete knowledge how to handle the mongodb database administration work as independently. MongoDB is document database which is top most rated database in NoSQL category. It has been preferred by many customers since I has very good features like good scalability and dynamic schema. The course is designed to get complete architecture knowledge and hands on experience so that candidate can work in real time environment.

Course Objective:

This course gives complete knowledge to administrate the mongodb database in real time environment. After taking this course you will become confident to work in real time environment and you can able to handle the projects and production issues independently.

Who can learn MongoDB administration?

1.RDBMS DBA's(Oracle,MSSQL, MySQL etc)

2. SQL Developers

3. (IT Professionals who knows basics any database)

Job Opportunities:

Very good opportunities are there in the market for NoSQL and BigData technologies. In NoSQL especially for MongoDB there are lot openings coming but in market only limited resources are there. So it's good to start moving on the new emerging technologies on the right time.

Syllabus:

1. **Introduction to NoSQL**
2. **Linux Basic Administration**
3. **Architecture**
4. **CRUD operations**
5. **Schema Design and Data modeling**
6. **Indexes (performance tuning)**
7. **Administration commands**
8. **Backup and Security**
9. **Replication**
10. **Scalability(Sharding)**
11. **Monitoring and other Tools**

Detailed Topic Coverage:

1. **Introduction to NoSQL**
    a. **Theories to be covered,**
        . What is NoSQL?
        . Why NoSQL databases are required
        .Types of NoSQL Database
        . ACID and BASE property
        .CAP Theorem
        .Benefits of NoSQL database
        .Installation
        .Start and Stop the Mongodb process
    b. **Practical Session,**
        .Setting a linux machine in AWS cloud or VM Ware,
        .Installing mongodb 3.2 on windows and Linux
        .MongoDB Configuration
        .Starting and stopping the process
        . connecting through mongo shell

2. **Architecture**
    A. Theories to be covered,
        . Overview of Mongodb
        .Document, collection, Databases
        .JSON and BSON
        .ObjectID Data type
        .Journaling
        .Storage Engine (WiredTiger, MMAP and In-memory)
        .Capped collection
        .TTL Index
        .GridFS
    B. Practical Session
        .Creating/Dropping Database, collection
        .Understanding the storage engine
        .Creating capped collection and TTL Indexes
        .Default system collections
3. **CRUD operations**
    A. Theories to be covered,
        .Create, Read, update & Remove the documents
        .Bulk insert operation
        .Updating multiple document
        .Sorting the documents
        .Limiting document
        .Filtering documents
        .Dropping the collections

B.Practical sessions

. All the above topics

4. Data Modeling.

A. Theories to be covered.

.Dynamic Schema

.What is modeling?

.RDBMS and Mongodb Data modeling difference

.Embedded Documents

.Reference Documents

B. Practical Session:

.Schema Creation

.Creating Embedded document

.Creating reference document

5. Indexes

A. Theories to be covered.

.Introduction to Indexing

.Types of indexes

.Creating indexes

.managing indexes

.Index rebuilding.

.Explain execution plans

B. Practical Session:

.All the above topics

6. Standalone Database Administration

A. Theories to be covered.

.Server & Database health check

.Termination running operations

.Managing the log files

.Locking and connections

.Profiling for performance issues

.Changing configuration files

.Authentication and Authorization

.Users and Roles

.Role based access control

.Copy and Clone database

.Troubleshooting issues

.Upgrading the database

B. Practical Session:

. All the above topics

7. Replication

A. Theories to be covered,

.Concept of replication

.ReplicaSet member roles

.Voting and Electing primary

.Role of Oplog in replication

.Read and Write concern

.Arbitor, Hidden and Delayed replica node

.Priority setting

.Replicaset nodes health check

.Concept of resyncing the nodes

.Rollbacks during failover

.Keyfile authentication

B. Practical Session:

.Building 2 node replica set using keyfile authentication

. Add/Remove a node to existing replicaset

.Changing priorities of noes, making delayed nodes and hindden nodes

. Resync a member of Replicaset

.Changing Oplog szie

.Replicaset health checks

.Handling rollbacks

.Checking the read, write concerns

8. Sharding

A. Theories to be covered.

.Concept of Scalability

.Sharding concept

.Shardkey and chunks

.Choosing Shardkey

.Sharding components

.Types of Sharding

.Balanced data distribution

.Sharded and Non-sharded collection

.Sharded ReplicaSet

.Tag aware Sharding

B. Practical Session,

.All of the Above

9. Mongo backup and restore

. mongodump/mongorestore

.oplog backups

. LVM backups

. backups using mms/ops manager

B. practical session:

. mongoexport/mongoimport

. mongodump/mongorestore

. point in time recovery using oplog

10. Monitoring and Other Tools.

A. Theories to be covered.

. MMS manager / Cloud Manager

. Ops manager

. mongo utility commands

. mongo developer tools

. Mongodb Atlas

. Mongodb Client drives

B. Practicals to be covered

. All the above

Module 1:

What Is NoSQL?

Why NoSQL databases are required.

Types of NoSQL Database

NoSQL vs SQL Comparison

ACID & BASE Property

CAP Theorem

Benefits of NoSQL databases

Installation

Start and Stop the mongodb process

Module 2:

Architecture

Document, Collection, Databases

JSON and BSON

Storage Engines (WiredTiger and MMAP)

Read Path

Journaling

Write Path

Working Set

Capped Collection

Oplog collection

TTL Index

GridFS

Module 3:

CRUD Operations

Mongodb Data Types

Inserting, Update, Deleting the documents

Querying the documents

Bulk insert operation

Updating multiple document

Limiting documents

Filtering documents

Module 4:

Schema Design and Data modeling

Dynamic Schema

What is Data modeling?

RDBMS and Mongodb Data modeling difference

Embedding Document

Reference Document

Module 5:

Indexes

- Index concepts in mongodb
- Types of indexes
- Indexes and its use cases
- Creating Indexes
- Managing Indexes
- Index strategies

Module 6:

Database Administration

- Database status
- Troubleshooting issues
- Current Operations
- Rotating log files
- Users and Roles
- Copy and Clone database
- DB and Collection Stats
- Explain plan
- Profiling
- Changing configuration files
- Upgrading the database

Module 7:

Backup and Security

- Concept of backups
- mongoexport/mongoimport
- mongodump/mongorestore
- Oplog backups
- LVM Backups
- Backups using MMS/Ops Manager
- Purpose of security
- Authentication and authorization
- Role based access control

Moduel 8:

Replication

- Concept of replication
- ReplicaSet member roles
- Voting and Electing primary
- Role of Oplog in replication
- Read and Write Concern
- Arbiter,Hidden and Delayed replica node
- Priority settings
- Replicaset nodes health check
- Concept of resyncing the nodes

- Rollbacks during failover
- Keyfile authentication

Module 9:

Scalability

- Concept of Scalability
- Sharding concept
- Shardkey and Chunks
- Choosing shardkey
- Sharding components
- Types of Sharding
- Balanced data distribution
- Sharded and Non-sharded collection
- Sharded Replicaset
- Tag aware sharding

Module 10:

Monitoring and Other Tools

- MMS Manager
- Ops Manager
- Mongo utility commands
- Mongo developer tools
- Mongodb Atlas