**MongoDB and MariaDB Trainer**

**Trainer Name. : Kishore**

**Email :** [dbversity@gmail.com](mailto:dbversity@gmail.com)

**Website/blog :** <http://www.dbversity.com/>

**Mode of Training :** Online & Corporate trainings on MongoDB, NoSQL, MariaDB, MySQL Technologies

**Skype ID :** dbversity

**Clients worked for :** UST Global, Ericsson, Adobe, CapGemini, Accenture, IBM, TriCore, Benchmark IT Solutions ..etc

**Exp in Training & IT** : 5 years & 11 years respectively

**Commercials :** Online INR 3,000/Hour & Onsite/Classroom - INR 25,000-30,000/Day (depends of the pax)

**MongoDB Day wise Course Contents**

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**Day 1**

**Design Goals, Architecture and Installation**

**Learning Objectives** - In this module, you will get an understanding of Databases, Design Goals, Requirement of NoSQL/MongoDB, Architecture of MongoDB etc. This Module will also cover installation of MongoDB and associated utilities/tools.

**Topics** - Understanding Base Concepts of Database, Database Categories, What is NoSQL? Why NoSQL? Benefit over RDBMS, Types of NoSQL Database, and NoSQL vs. SQL Comparison, ACID & Base Property, CAP Theorem, and Implementing NoSQL, What is MongoDB? Overview of MongoDB, Design Goals for MongoDB Server and Database, MongoDB Tools, Depth Understanding of Database, Collection, Documents and Key /Values etc., Introduction to JSON and BSON Documents, Use Cases,

**Day 2:**

**Design consideration**

Installation/Running MongoDB on various platforms Windows, Linux, MAC OS etc., Environment Setup (Live Hands on), Usage of various MongoDB Tools available with MongoDB .

Package, MongoDB Development Architecture, MongoDB Production Architecture, Project: Problem Statement.

**Day 3:**

**CRUD Operations**

**Learning Objectives** - In this module, you will get an understanding of CRUD Operations and their functional usage. Read/write operations with CRUD.

**Topics -**MongoDB CRUD Introduction, MongoDB CRUD Concepts, MongoDB CRUD Concerns (Read & Write Operations), Concern Levels, Journalling etc., Cursor, Query Optimizations, Query Behaviours in MongoDB, Distributed Read & Write Queries, MongoDB Datatypes, MongoDB CRUD Syntax & Queries, Indexing, aggregation,

**Replication (Live Hands on).**

**Learning Objectives** - In this module, you’ll get an understanding of Replica Set Members, Replica Set Oplog,, Replica Set Data Synchronization, Replica Set Deployment Architectures, Replica Set High Availability, Master Slave Replication, Redundancy and Data Availability, Replication in MongoDB, Asynchronous Replication, Automatic Failover, Read Operations, Additional Features

**Day 4**

**Sharding (Live Hands on)**

**Learning Objectives** - In this module, you’ll get an understanding of Sharded Cluster Components, Shard Keys, Hashed Sharding, Ranged Sharding, Sharding Reference, Chunks, Advantages of Sharding, Considerations Before Sharding, Sharded and Non-Sharded Collections, Connecting to a Sharded Cluster, Sharding Strategy & Additional Resources

**Day 5**

**Schema Design and Data Modelling**

**Learning Objectives** - In this module, you will learn Schema Design and Data Modelling in mongoDB®. Various data structure and tools available to manage Data Model in MongoDB.

**Topics** - Data Modelling Concepts, Type of Data Modelling, Why Data Modelling? Data Modelling Approach, Analogy between RDBMS & MongoDB Data Model, MongoDB Data Model (Embedding & Linking), Challenges for Data Modelling in MongoDB, Data Model Examples and Patterns, Model Relationships between Documents: Model One-to-One Relationships with Embedded Documents, Model One-to-Many Relationships with Embedded Documents, Model One-to-Many Relationships with Document References, Model Tree Structures: Model Tree Structures with Parent References, Model Tree Structures with Child References, Model Tree Structures with an Array of Ancestors, Model Tree Structures with Materialized Paths, Model Tree Structures with Nested Sets, Model Specific Application Contexts: Model Data for Atomic Operations, Model Data to Support Keyword Search, Data Model References, Use Case of Data modelling.

Miscellaneous Topics and Q&A

**MongoDB course Framework**

This course covers all topics relevant to working on MongoDB and is designed for database developers and DBAs.

**Design Goals, Architecture and Installation**

Understanding of Databases, Design Goals, Requirement of NoSQL/MongoDB, Architecture of mongoDB and why NOSQL databases like MongoDB.

**Topics** - Understanding Base Concepts of Database, Database Categories, What is NoSQL? Why NoSQL? Benefit over RDBMS, Types of NoSQL Database, and NoSQL vs. SQL Comparison, ACID & Base Property, CAP Theorem, and Implementing NoSQL, What is MongoDB? Overview of MongoDB, Design Goals for MongoDB Server and Database, MongoDB Tools, Depth Understanding of Database, Collection, Documents and Key /Values etc., Introduction to JSON and BSON Documents, Installation/Running MongoDB on various platforms Windows & Linux OS . Environment Setup (Live Hands on), Usage of various MongoDB Tools available with MongoDB Package.

**CRUD Operations**

Understanding of CRUD Operations and their functional usage. Read/write operations with CRUD. Working with collections, documents & manipulating them.

**Topics -**MongoDB Development Architecture, MongoDB Production Architecture, MongoDB CRUD Introduction, MongoDB CRUD Concepts, MongoDB CRUD Concerns (Read & Write Operations), Concern Levels, Journalling etc., Cursor, Query Optimizations, Query Behaviours in MongoDB, Distributed Read & Write Queries. Working with document structures: MongoDB Datatypes, References, MongoDB CRUD Syntax & Queries, working with keys, IDs, embedded sub documents, auto incrementing, working with cursors .

**Schema Design and Data Modelling**

**Learning Objectives** - In this module, you will learn Schema Design and Data Modelling in mongoDB®. Various data structure and tools available to manage Data Model in MongoDB.

**Topics** - Data Modelling Concepts, Type of Data Modelling, Why Data Modelling? Data Modelling Approach, Analogy between RDBMS & MongoDB Data Model, MongoDB Data Model (Embedding & Linking), Challenges for Data Modelling in MongoDB, Data Model Examples and Patterns, Model Relationships between Documents: Model One-to-One Relationships with Embedded Documents, Model One-to-Many Relationships with Embedded Documents, Model One-to-Many Relationships with Document References, Model Tree Structures: Model Tree Structures with Parent References, Model Tree Structures with Child References, Model Tree Structures with an Array of Ancestors, Model Tree Structures with Materialized Paths, Model Tree Structures with Nested Sets, Model Specific Application Contexts: Model Data for Atomic Operations, Model Data to Support Keyword Search, Data Model References, Use Case of Data modelling.

**Administration**

MongoDB® Administration activities such as Health Check, Backup, Recovery, Data Import/Export, Performance tuning etc.

**Topics -**Administration Concept in MongoDB, Health Check of MongoDB Database, Monitoring of Various issues related with Database, Monitoring at Server, Database, Collection Level, and Various Monitoring Tools related to MongoDB, Database Profiling, Locks, Memory Usage, No of connections, page fault etc., Backup and Recovery Methods for MongoDB, Export and Import of Data to and From MongoDB, Run time configuration of MongoDB, Production Notes/Bets Practices, Data Managements in MongoDB (Capped Collections/ Expired data from TTL), Hands on Administrative Tasks.

**Scalability and Availability**

Understand the setup and configuration of mongoDB® High Availability, Disaster Recovery, and Load Balancing.

**Topics**- Introduction to Replication (High Availability), Concepts around Replication, What is ReplicaSet and Master Slave Replication? Type of Replication in MongoDB, How to setup a replicated cluster, Managing ReplicaSets etc., Introduction to Sharding (Horizontal Scaling), Concepts around Sharding, What is shards, Key, ConfigServer, Query Router etc.? How to setup a Sharding, Type of Sharding (Hash Based, Range Based etc.), and Managing Shards.

**Indexing and Aggregation Framework**

Learning the Indexing and Aggregation Framework in mongoDB®.

**Topics**- Index Introduction, Index Concepts, Index Types, Index Properties, Index Creation, Index Tutorial, Indexing Reference,Designing /working & optimizing Indexes and their various types.

Aggregation to Introduction, Approach to Aggregation, Type of Aggregation (Pipeline, MapReduce & Single Purpose) and Performance Tuning.

**Application Engineering and MongoDB Tools**

**Learning Objectives** - Learn mongoDB tools to develop and deploy your applications. This module will also help you understand the multiple package components and advance concepts related with MongoDB integration, Hadoop and MongoDB integration.

**Topics** - MongoDB Package Components, Configuration File Options, MongoDB Limits and Thresholds, Connection String URI Format/ Integration of any compatible tool with MongoDB, API and Drivers for MongoDB, MMS/OpsManager (MongoDB Monitoring Service), HTTP and Rest Interface, Integration of MongoDB with Hadoop and Data Migration MongoDB with Hadoop (MongoDB to Hive).

**Project, Additional Concepts and Case Studies**

**Learning Objectives** - Learn security related with MongoDB, Integration with various tools and technology. Also you will see to integrate with various reporting and Analytical tools like Pentaho, Jaspersoft etc.

**Topics** - Security Introduction, Security Concepts, Security Tutorials, Integration of MongoDB with Jaspersoft, Integration of MongoDB with Pentaho, Integration of MongoDB with Hadoop/Hive, Integration of MongoDB with Java, Integration of MongoDB with GUI Tool Robomongo, Project on MongoDB and Java.

Brief on Advanced MongoDB concepts based on time availability.

**MariaDB Course contents**

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1. Developer Track
2. DBA Track

**Topics to be covered in developer Track**

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| Day | Topic / Chapter | Duration |
| Day 1 | Introduction | 6 hrs. |
| MariaDB Services and Support |
| Supported Operating Services |
| MariaDB Documentation Resources |
| MariaDB Installation on Linux and Windows |
| MariaDB General Architecture |
| MariaDB Clients |
| Invoking Client Programs |
| Using Option Files |
| MySQL Query Browser |
| Querying for Table Data |
| Lab Exercise |
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| Day 2 | SQL Operators | 6 hrs. |
| Data Modelling/Database designing in MariaDB |
| Database design principles |
| Points to be considered while moving from Oracle to MariaDB |
| Introduction to Engines in MariaDB |
| Creating Database and Tables |
| Lab Exercise |
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| Day 3 | DML in MariaDB | 6 hrs. |
| JOINS in MariaDB |
| Subqueries in MariaDB |
| Query Optimization and tuning |
| MariaDB Cluster operations |
| Lab Exercise |

**Topics to be covered in DBA Track**

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|  | **Day** |  | **Topics / Chapter** |  | **Duration** |
|  |  |  | Introduction |  |  |
|  |  |  |  |  |  |
|  |  |  | Architecture |  |  |
|  |  |  |  |  |  |
|  |  |  | Installation |  |  |
|  |  |  |  |  |  |
|  |  |  | Distributions & Versions |  |  |
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|  | Day 1 |  | Client Utilities |  | 6 hrs. |
|  |  |  |  |  |  |
|  |  |  | Configuration |  |  |
|  |  |  |  |  |  |
|  |  |  | Resource Usage |  |  |
|  |  |  |  |  |  |
|  |  |  | Logs Files |  |  |
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|  |  |  | Lab Exercise |  |  |
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|  |  |  |  |  |  |
|  |  |  | Table Schema / Metadata |  |  |
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|  | Day 2 |  | Storage Engines |  | 6 hrs. |
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|  |  | User & Server Security |  |
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|  |  |  | Lab Exercise |  |  |
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|  |  |  | Backups & Restoration |  |  |
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|  |  |  | Table Maintenance |  |  |
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|  | Day 3 |  | Views |  | 6 hrs. |
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|  |  |  | Transaction and Locking |  |  |
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|  |  |  | Lab Exercise |  |  |
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|  |  |  |  |  |  |
|  |  |  | High Availability |  |  |
|  |  |  |  |  |  |
|  |  |  | MariaDB Replication |  |  |
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|  | Day 4 |  | Server Optimization (Server / DB / |  | 6 hrs. |
|  |  | Query) |  |
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|  |  |  | Partitioning |  |  |
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|  |  |  | Lab Exercise |  |  |
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|  |  |  | Monitoring & Troubleshooting |  |  |
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|  |  |  | Galera Architecture |  |  |
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|  |  |  | Installing MariaDB & Galera |  |  |
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|  | Day 5 |  | State Transfer |  | 4 hrs. |
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|  |  |  | Caveats |  |  |
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|  |  |  | Multi Master Conflicts |  |  |
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|  |  |  | Lab Exercise |  |  |
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