Walchand Linux Users' Group

Presents Club Service On

DATA REPLICATION

using

MongoDB

- WHAT IS MONGODB?
- WHAT IS DATA REPLICATION?
- CRUD OPERATIONS ON MONGODB
- HANDS-ON DATA REPLICATION AND CRUD

N2 Classroom
9th Nov
5:30 PM

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DATA REPLICATION USING MONGODB

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Agenda

MONGODB

- Introduction
- SQL and NoSQL Difference
- Advantages and Disadvantages of MongoDB
- MongoDB CRUD Operations
- Data Replication in MongoDB

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Why DataBase?

- Before dbms, file system was widely used
- Drawbacks of file system

1. File sharing
2. Data redundancy
3. Inconsistency
4. Security
5. Concurrency

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SQL and NoSQL

- Relational Database Management System (RDBMS)
- Fixed or static or predefined schema
- Not suitable for hierarchical data storage.
- Vertically Scalable
- Follows ACID property
- MySQL, PostgreSQL, Oracle

- Non-relational or distributed database system
- Dynamic schema
- Best suited for hierarchical data storage.
- Horizontally Scalable
- Follows CAP
- MongoDB, GraphQL, HBase

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Introduction

- MongoDB is a database based on a non-relational document model
- It is also called as NoSQL database
- NoSQL means Not-Only-SQL
- Differs from conventional relational databases such as Oracle, MySQL
- Default port number of Mongo instance : 27017

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Collections

- Group of MongoDB documents
- Equivalent to Tables in Relational Databases
- Stores documents in BSON format.

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History

- MongoDB ---> "Humongous" ---> Gigantic
- Founded in 2007 by Dwight Merriman, Eliot Horowitz and Kevin Ryan – the team behind DoubleClick
- RDBMS systems based on SQL were not supporting rapid development.

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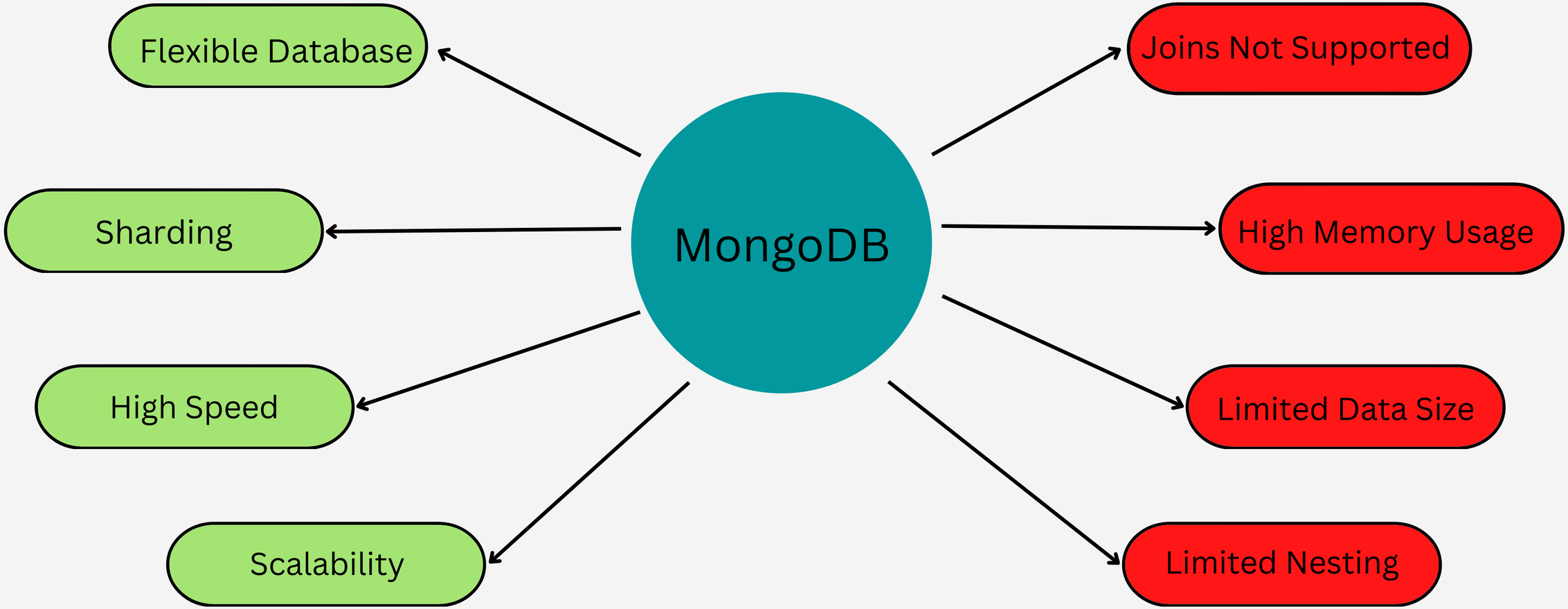
Advantages and Disadvantages



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Real Life Examples

- India's Aadhar
- Forbes
- Shutterfly
- eBay

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MongoDB CRUD Operations

- CRUD operations are create, read, update, and delete documents

C	insert()
R	find()
U	update()
D	remove()

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Create Operations

- Create or Insert operations to add new documents to collection

Method	Usage
db.collection.insertOne()	insert a single document in the collection.
db.collection.insertMany()	insert multiple documents in the collection
db.createCollection()	create an empty collection.

Read Operations

- Read operations retrieve documents from a collection

Method	Usage
db.collection.find()	Retrieve documents from the collection

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Update Operations

- The update operations are used to update or modify the existing document in the collection.

Method	Usage
db.collection.updateOne()	update a single document that satisfy the given criteria.
db.collection.updateMany()	update multiple documents that satisfy the given criteria.
db.collection.replaceOne()	replace single document that satisfy the given criteria.

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Delete Operations

- The delete operation are used to delete or remove the documents from a collection.

Method	Usage
db.collection.deleteOne()	delete a single document that satisfy the given criteria
db.collection.deleteMany()	delete multiple documents that satisfy the given criteria

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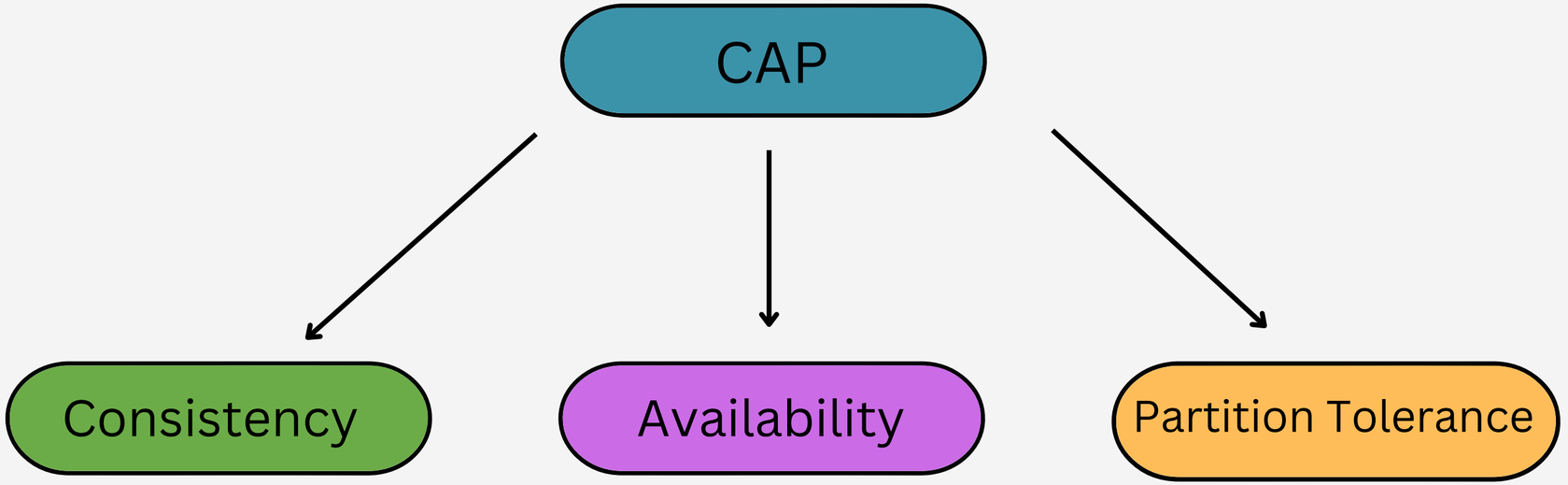
Cap Theorem

- Distributed system can provide only two of three desired properties



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ACID Properties

Atomicity	Consistency	Isolation	Durability
All or None	Sum of transaction data before and after transaction are constant	Interference of two transactions do not occur	After update or modification, data remains.

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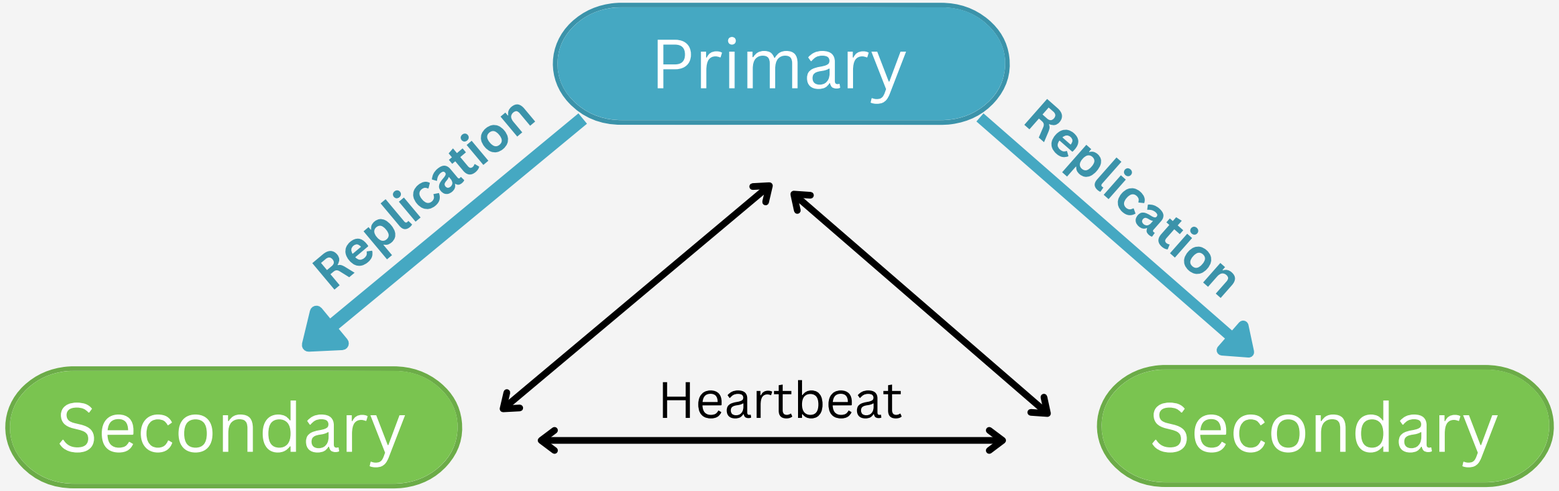
Data Replication

Process in which replica of data is maintained in multiple nodes

- Primary and Secondary node
- Data Redundancy and Availability
- Fail control



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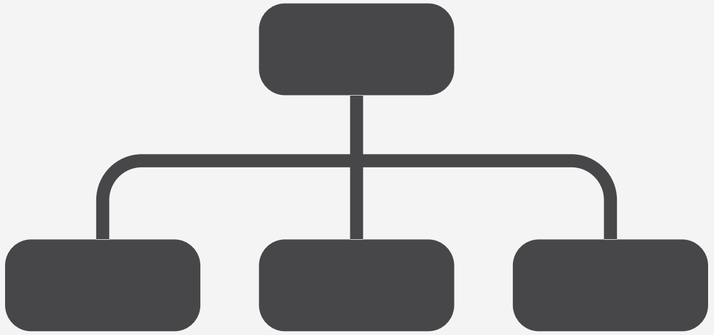
Properties of Data Replication

- Fault tolerance
- Reduce Latency
- Multi services
- Scalability
- Good Application service



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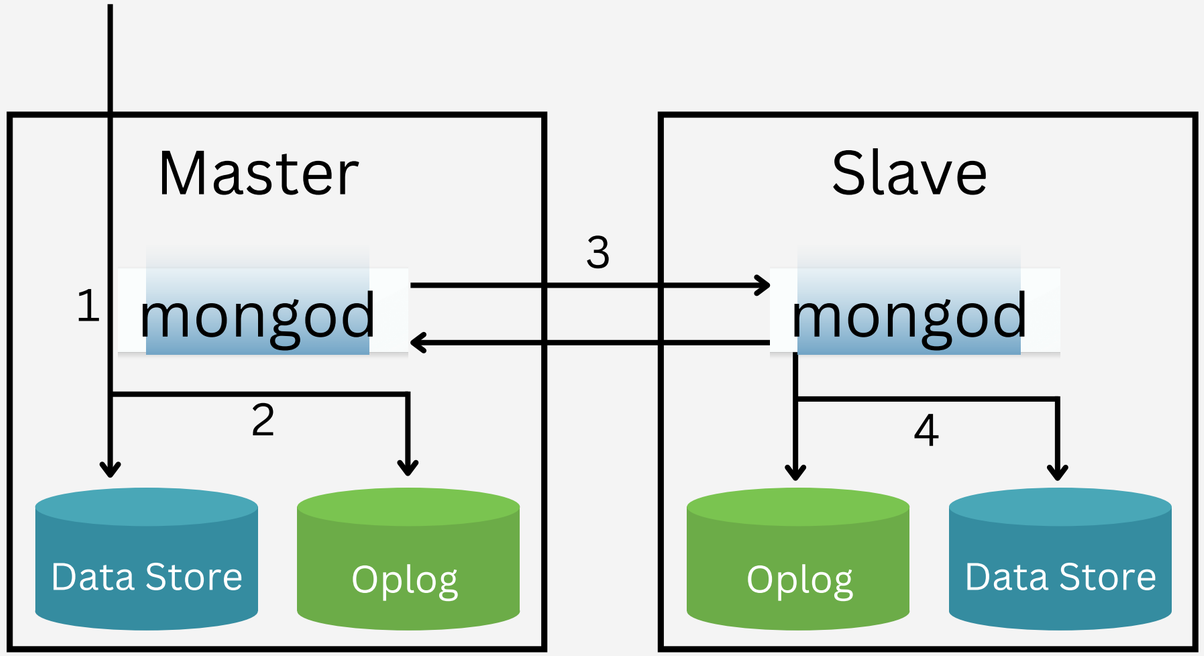
Oplog

The oplog (operations log) is a special capped collection that keeps a rolling record of all operations that modify the data stored in your databases.



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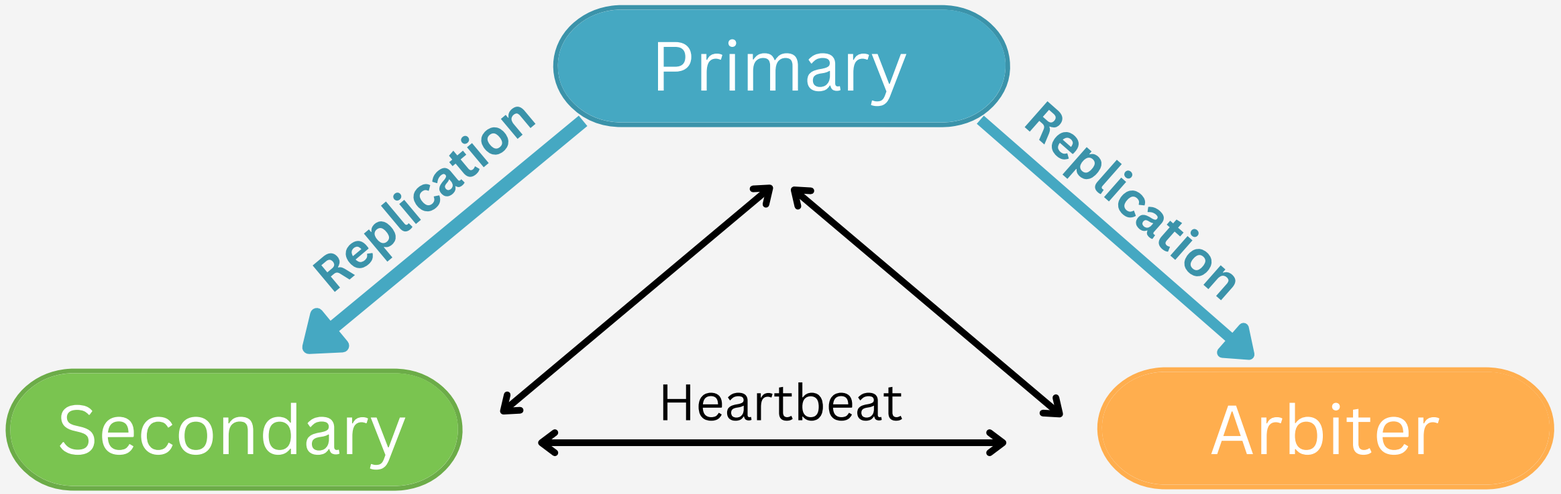
Arbiter

An arbiter does not store a copy of the data and requires fewer resources



A replica set can have up to 50 members, but only 7 voting members.

Demo Part

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Commands

Method	Description
mongod	To Create an instance of mongoDB
mongo	Enter into mongo shell
rs.initiate();	Initiate Replica Set
rs.add("<hostname>");	Adds host to Replica Set
rs.remove("<hostname>");	Removes host from Replica Set
rs.status();	Return status of Replica Set
rs.conf();	Return current config of Replica Set

Thank You