**Discussion 4.1 – What is MongoDB**

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# What is MongoDB?

MongoDB is a powerful, flexible, and scalable general-purpose database. It combines the ability to scale out with features such as secondary indexes, range queries, sorting, aggregations, and geospatial indexes. MongoDB is a *documented-oriented* database, its primary advantage is scalability, among others.

# What are Collections?

Collections are a group of documents, like the Row in a relational database is a Document in MongoDB, the Table represents a Collection. There are several good reasons for separating collections:

* Keeping different kinds of documents in the same collection can be a nightmare for developers and admins. Developers need to make sure that each query is only returning documents adhering to a particular schema or that the application code performing a query can handle documents of different shapes.
* If we’re querying blog posts, it’s a hassle to weed out documents containing author data. It’s much faster to get a list of collections than to extract a list of the types of documents in a collection.
* Grouping documents of the same kind together in the same collection allows for data locality. Getting several blog posts from a collection containing only posts will likely require fewer disk seeks than getting the same posts from a collection containing posts and author data.
* We begin to impose some structure on our documents when we create indexes. (This is especially true in the case of unique indexes.) These indexes are defined per collection. By putting only documents of a single type into the same collection, we can index our collections more efficiently.

# What are Documents?

Documents are the heart of the database; they are a set of ordered keys with associated values. The keys in a document are string types. Any UTF-8 character is allowed in a key, with a few exceptions:

Keys must not contain the ***null*** character. This character is used to signify the end of a key. The “.” and “$” characters have some special properties and should be used only in certain circumstances.

# What is MongoDB's version of an auto-generated primary key?

ObjectId is the default type for "\_id". The ObjectId class is designed to be lightweight, while still being easy to generate in a globally unique way across different machines. MongoDB’s distributed nature is the main reason why it uses ObjectIds as opposed to something more traditional, like an autoincrementing primary key: it is difficult and time-consuming to synchronize autoincrementing primary keys across multiple servers. Because MongoDB was designed to be a distributed database, it was important to be able to generate unique identifiers in a sharded environment.

# What are the key differences between MongoDB and MySQL?

It is a well-known fact that SQL databases have ruled the world of data technologies and have been the primary source of data storage for over 4 decades. Generally, the SQL databases are used, mainly for accessing relational databases.

Soon enough data started growing exponentially and scalability became a major issue, at that time NoSQL rolled in to save the day.

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| SQL Database | NoSQL Database (MongoDB) |
| Relational Database | Non-relational database |
| Supports SQL query language | Supports JSON query language |
| Table based | Collection based and key-value pair |
| Row based | Document based |
| Column based | Field based |
| Support foreign key | No support for foreign key |
| Support for triggers | No support for triggers |
| Contains schema which is predefined | Contains dynamic schema |
| Not fit for hierarchical data storage | Best fit for hierarchical data storage |
| Vertically scalable - increasing RAM | Horizontally scalable - add more servers |
| Emphasizes on ACID properties (Atomicity, Consistency, Isolation and Durability) | Emphasizes on CAP theorem (Consistency, Availability and Partition tolerance) |

Sources:

* MongoDB: The Definitive Guide, Chodorow
* <https://www.studytonight.com/mongodb/mongodb-vs-rdbms>