What Are Open Source Databases?

- Open source databases store vital information in software which the organization can control.
- An open source database allows users to create a system based on their unique requirements and business needs.
- It is free and can also be shared.
- The source code can be modified to match any user preference.

What Is An Open Source Database Management System?

- Open source database management systems reduce the costs associated with the licences of traditional closed database systems.
- The first open source database management system was MySQL in 1995.

Open source Database management Software

- Database management software is meant to store data in an organized way so you can retrieve the necessary data when you want it.
- It becomes easy to manage data using open source DBMS.
- There are various types of free open source database software that can be used to store data.
- You can choose amongst them based on the kinds and sizes of data.

SQLite

- SQLite is an open source, zero-configuration, self-contained, stand alone, transaction relational database(structured) engine designed to be embedded into an application.
- SQLite Features/ Why to use SQLite
  - **SQLite is totally free:** SQLite is open-source. So, no license is required to work with it.
  - **SQLite is serverless:** SQLite doesn't require a different server process or system to operate.
  - **SQLite is very flexible:** It facilitates you to work on multiple databases on the same session on the same time.
  - **Configuration Not Required:** SQLite doesn't require configuration. No setup or administration required.

- **SQLite is a cross-platform DBMS:** You don't need a large range of different platforms like Windows, Mac OS, Linux, and Unix. It can also be used on a lot of embedded operating systems like Symbian, and Windows CE
- **Storing data is easy:** SQLite provides an efficient way to store data
- **Variable length of columns:** The length of the columns is variable and is not fixed. For example, if you have a varchar(200) column, and you put a 10 characters' length value on it, then SQLite will allocate only 20 characters' space for that value not the whole 200 space
- SQLite is written in ANSI-C and provides simple and easy-to-use API.
- SQLite is available on UNIX (Linux, Mac OS-X, Android, iOS) and Windows (Win32, WinCE, WinRT).

Cassandra

- Cassandra is a highly scalable, high-performance distributed database designed to handle large amounts of data across many commodity servers, providing high availability with no single point of failure.
- Data structures used in Cassandra are more specified than data structures used in relational databases. Cassandra data structures are faster than relational database structures.
- It is a type of NoSQL database.
- Cassandra was first developed at Facebook for inbox search.
- Facebook open sourced it in July 2008.
- Apache incubator accepted Cassandra in March 2009.
- Cassandra is a top level project of Apache since February 2010.
- The latest version of Apache Cassandra is 3.2.1.

- Cassandra Use Cases/Application

  - Messaging Cassandra is a great database for the companies that provides Mobile phones and messaging services. These companies have a huge amount of data, so Cassandra is best for them.
  - Internet of things ApplicationCassandra is a great database for the applications where data is coming at very high speed from different devices or sensors.
  - Product Catalogs and retail apps Cassandra is used by many retailers for durable shopping cart protection and fast product catalog input and output.
  - Social Media Analytics and recommendation engine Cassandra is a great database for many online companies and social media providers for analysis and recommendation to their customers.

MariaDB (Platform: Windows, Linux and Mac)

- An open source software, MariaDB relational DBMS software is compatible with MySQL.
- It can be used for various purposes like banking, website management, and much more.
- This free open source database management system is created by the same developers who have developed MySQL.
- Hence, it can be used as a replacement of MySQL as well.

Supported Languages: C#, C++, Java, and Python.

Features:

- It makes use of the standard query language called MySQL.
- It has high scalability and easy integration.
- You get a real-time access to your databases.
- It includes some core functionalities of MySQL including enhanced features like server optimization, storage engines, and patches.
- MariaDB is a great alternative if you want to switch from MySQL.
- This free DBMS software can be easily installed and implemented.

MongoDB (Platform: Cross-platform)

- MongoDB follows a document data-base model.
- You can use this for developing new apps and renewing the existing ones.
- MongoDB database management further provides new-age features for real-time analytics and the internet of things.

RDBMS	MongoDB
Database	Database
Table	Collection
Tuple/Row	Document
column	Field

- **Supported Languages:** C#, C, C++, Java, Ruby, Node.js, Perl, Scala, and PHP

Features:

- This free DBMS software provides flexibility in deployment for data migrations.
- Data is stored like JSON – like documents.
- This free simple database management system is extremely fast and very easy to use.
- It supports JSON and NoSQL type of documents.
- Any structural data can be stored as well as access easily.
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MySQL (Platform: Windows, Linux, and Mac)

- MySQL helps in building scalable database applications. There are different editions available for this free database management software like standard, enterprise and classic edition which helps you to build scalable database applications.
- MySQL is currently the most popular database management system software used for managing the relational database.
- It is open-source database software, which is supported by Oracle Company.
- It is fast, scalable, and easy to use database management system in comparison with Microsoft SQL Server and Oracle Database.
- It is commonly used in conjunction with PHP scripts for creating powerful and dynamic server-side or web-based enterprise applications.

- MySQL uses a standard form of the well-known SQL data language.
- MySQL works on many operating systems and with many languages including PHP, PERL, C, C++, JAVA, etc.
- MySQL works very quickly and works well even with large data sets.
- MySQL is very friendly to PHP, the most appreciated language for web development.
- MySQL supports large databases, up to 50 million rows or more in a table. The default file size limit for a table is 4GB, but you can increase this (if your operating system can handle it) to a theoretical limit of 8 million terabytes (TB).

MySQL Features

- MySQL is a relational database management system. This database language is based on the SQL queries to access and manage the records of the table.
- MySQL is easy to use.
- It is secure
- Compatible on many operating systems
- High Performance & High Productivity
- Platform Independent

Benefits of Open Source Database Management System

Minimize Data Redundancy

- Duplicate data may create in several places in a basic file management system. This might create data redundancy causing loss of labor and space. In a free open source database management system, several files are integrated in one platform for reducing data duplicity significantly.

Sharing Of Data

- In a free open source database management system, data can also be shared between multiple users of the database. All users have their own rights and they can access the database up to a particular level. Only the DBA i.e. Database Administration has the complete access of the database.

Data Consistency

- A free open source DBMS system controls its redundancy and duplicity which later controls data consistency. Data consistency simply means that if you are updating data in a file then all files need not to be updated again. With an open source free DBMS, the data is stored in just one database, so it becomes more consistent.

Search Capability

- Databases are used so that you get the right data at the right time, with minimum searching. There are numerous queries users may ask about the data. Search speed of an open source DBMS is usually fast and produces quick results.

Backup and Recovery

- The backup and recovery in any open source DBMS software is extremely easy. These days, data loss is a huge issue for all the organizations. In a traditional file system, you need to backup your data at several intervals, but if you are using an open source DBMS, data is backed up automatically.

Data Migration

- In a database, there are a set of data pieces that are accessed frequently. In an open source dbms, these bits of data are stored in places that can be accessed frequently without any hassle.

SQL vs NoSQL

Index	SQL	NoSQL
1)	Databases are categorized as Relational Database Management System (RDBMS).	NoSQL databases are categorized as Non-relational or distributed database system.
2)	SQL databases have fixed or static or predefined schema.	NoSQL databases have dynamic schema.
3)	SQL databases display data in form of tables so it is known as table-based database.	NoSQL databases display data as collection of key-value pair, documents, graph databases or wide-column stores.
4)	SQL databases are vertically scalable.	NoSQL databases are horizontally scalable.
5)	SQL databases use a powerful language "Structured Query Language" to define and manipulate the data.	In NoSQL databases, collection of documents are used to query the data. It is also called unstructured query language. It varies from database to database.

6)	SQL databases are best suited for complex queries.	NoSQL databases are not so good for complex queries because these are not as powerful as SQL queries.
7)	SQL databases are not best suited for hierarchical data storage.	NoSQL databases are best suited for hierarchical data storage.
8)	MySQL, Oracle, Sqlite, PostgreSQL and MS-SQL etc. are the example of SQL database.	MongoDB, BigTable, Redis, RavenDB, Cassandra, Hbase, Neo4j, CouchDB etc. are the example of nosql database