

EXPERIMENT NO 1

Problem Statement:

Study of MySQL Open source software. Discuss the characteristics like efficiency, scalability, performance and transactional properties.

Objective:

To explore and understand the key characteristics of MySQL open-source software, including efficiency, scalability, performance, and transactional properties.

Prerequisites:

- Basic understanding of databases and SQL.
- MySQL installed on your system.

Lab Setup:

1. Install MySQL:

- If not already installed, download and install MySQL from the official website: MySQL Downloads.
- Follow the installation instructions for your operating system.

2. Access MySQL Server:

- Open a terminal or command prompt and log in to MySQL using the command:

bashCopy code

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mysql -u username -p
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- Enter your password when prompted.

Theory:

What is MySQL?

MySQL is the world's most popular open source database. According to DB-Engines, MySQL ranks as the second-most-popular database, behind Oracle Database. MySQL powers many of the most accessed applications, including Facebook, Twitter, Netflix, Uber, Airbnb, Shopify, and Booking.com.

Since MySQL is open source, it includes numerous features developed in close cooperation with users over more than 25 years. So it's very likely that your favorite application or programming language is supported by MySQL Database.

MySQL is a relational database management system

Databases are the essential data repository for all software applications. For example, whenever someone conducts a web search, logs in to an account, or completes a transaction, a database system is storing the information so it can be accessed in the future.

A relational database stores data in separate tables rather than putting all the data in one big storeroom. The database structure is organized into physical files optimized for speed. The logical data model, with objects such as data tables, views, rows, and columns, offers a flexible programming environment. You set up rules governing the relationships between different data fields, such as one to one, one to many, unique, required, or optional, and "pointers" between different tables. The database enforces these rules so that with a well-designed database your application never sees data that's inconsistent, duplicated, orphaned, out of date, or missing.

The "SQL" part of "MySQL" stands for "Structured Query Language." SQL is the most common standardized language used to access databases. Depending on your programming environment, you might enter SQL directly (for example, to generate reports), embed SQL statements into code written in another language, or use a language-specific API that hides the SQL syntax.

MySQL is open source

Open source means it's possible for anyone to use and modify the software. Anybody can download MySQL software from the internet and use it without paying for it. You can also change its source code to suit your needs. MySQL software uses the GNU General Public License (GPL) to define what you may and may not do with the software in different situations.

If you feel uncomfortable with the GNU GPL or need to embed MySQL code into a commercial application, you can buy a commercially licensed version from Oracle.

MySQL benefits

MySQL is fast, reliable, scalable, and easy to use. It was originally developed to handle large databases quickly and has been used in highly demanding production environments for many years.

Although MySQL is under constant development, it offers a rich and useful set of functions. MySQL's connectivity, speed, and security make it highly suited for accessing databases on the internet.

MySQL's key benefits include

Ease of use: Developers can install MySQL in minutes, and the database is easy to manage.

Reliability: MySQL is one of the most mature and widely used databases. It has been tested in a wide variety of scenarios for more than 25 years, including by many of the world's largest companies. Organizations depend on MySQL to run business-critical applications because of its reliability.

Scalability: MySQL scales to meet the demands of the most accessed applications. MySQL's native replication architecture enables organizations such as Facebook to scale applications to support billions of users.

Performance: MySQL HeatWave is faster and less expensive as demonstrated by multiple standard industry benchmarks, including TPC-H, TPC-DS, and CH-benCHmark.

High availability: MySQL delivers a complete set of native, fully integrated replication technologies for high availability and disaster recovery. For business-critical applications, and to meet service-level agreement commitments, customers can achieve

- Recovery point objective = 0 (zero data loss)
- Recovery time objective = seconds (automatic failover)

Security: Data security entails protection and compliance with industry and government regulations, including the European Union General Data Protection Regulation, the Payment Card Industry Data Security Standard, the Health Insurance Portability and Accountability Act, and the Defense Information Systems Agency's Security Technical Implementation Guides. MySQL Enterprise Edition provides advanced security features, including authentication/authorization, transparent data encryption, auditing, data masking, and a database firewall.

Flexibility: The MySQL Document Store gives users maximum flexibility in developing traditional SQL and NoSQL schema-free database applications. Developers can mix and match relational data and JSON documents in the same database and application.

Conclusion:

Like this we understood the key characteristics of MySQL open-source software, including efficiency, scalability, performance, and transactional properties.