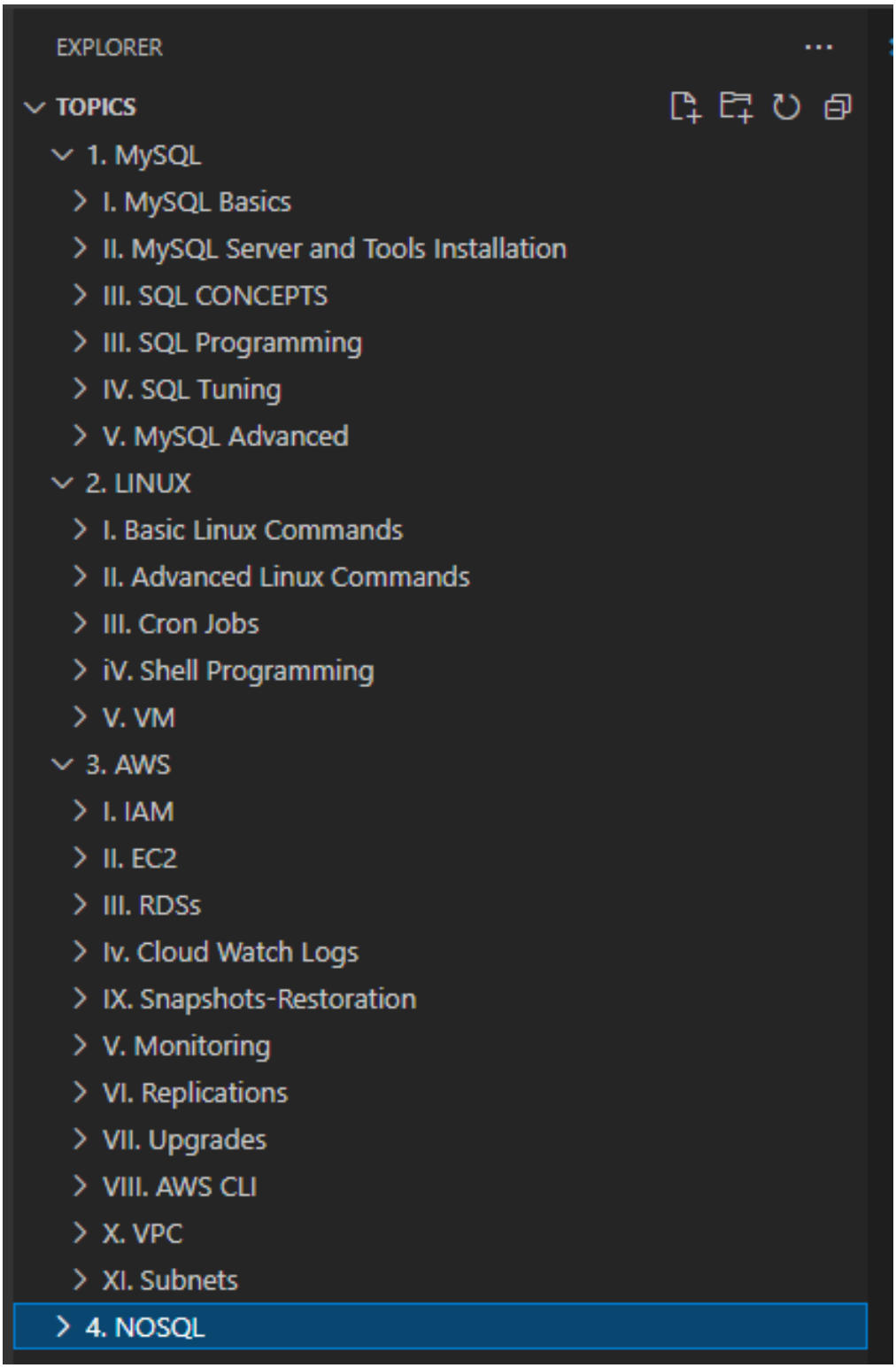
Topics:


EXPLORER
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1. Introduction

→ What is SQL?

SQL is a database computer language designed for the retrieval and management of data in a relational database. SQL stands for Structured Query Language. This tutorial will give you a quick start to SQL. It covers most of the topics required for a basic understanding of SQL and to get a feel of how it works.

→ Why to Learn SQL?

SQL is Structured Query Language, which is a computer language for storing, manipulating and retrieving data stored in a relational database.

→ What is MySQL?

- MySQL is a relational database management system
- MySQL is open-source
- MySQL is free
- MySQL is ideal for both small and large applications
- MySQL is very fast, reliable, scalable, and easy to use
- MySQL is cross-platform
- MySQL is compliant with the ANSI SQL standard
- MySQL was first released in 1995
- MySQL is developed, distributed, and supported by Oracle Corporation
- MySQL is named after co-founder Monty Widenius's daughter: My

→ Who Uses MySQL?

- Huge websites like Facebook, Twitter, Airbnb, Booking.com, Uber, GitHub, YouTube, etc.
- Content Management Systems like WordPress, Drupal, Joomla!, Contao, etc.
- A very large number of web developers around the world

→ SQL Process

When you are executing an SQL command for any RDBMS, the system determines the best way to carry out your request and SQL engine figures out how to interpret the task.

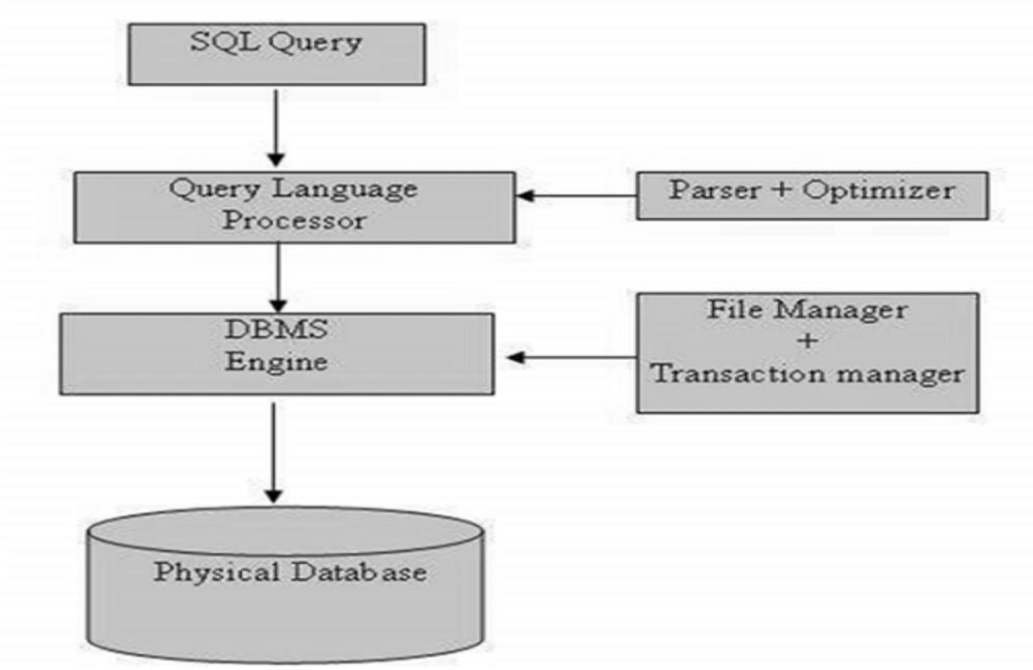
There are various components included in this process.

These components are −

- Query Dispatcher
- Optimization Engines
- Classic Query Engine
- SQL Query Engine, etc.

A classic query engine handles all the non-SQL queries, but a SQL query engine won't handle logical files.

Following is a simple diagram showing the SQL Architecture −



→ Benefits Of MySQL

--> Easy to use:

As it supports SQL language, users don't need to be technically expert to access the database. It can be easily accessed by users with basic SQL knowledge

and experience on other relational databases.

--> Cost Free: Another benefit of using this database is that the user doesn't have to spend money to pay the license fee, as it is free of cost and available on

the official website for download.

--> Customizable Code: As it is available as an open-source tool, software developers have an option to customize the source code as per their own applications

and use it. The source code is freely available to web users. The do's and don'ts of the software are defined in GPL i.e. GNU General Public License.

--> **Secured:** It offers one of the most secured databases in the world and hence used by well-established web applications like Facebook, Twitter, Instagram, etc.

Its various security features like Firewall, Encryption, and User Authentication are the helping hands in protecting sensitive user information from intruders.

--> **Better Performance:** It supports the multi-engine storage feature which facilitates database administrators to configure the database in a way to balance the

workload. Hence, it makes the database flawless in terms of performance.

--> **High Availability:** It offers 24*7 hours availability and offers solutions like Master/Slave Replication and specialized Cluster Servers.

--> **Scalability:** It offers very good scalability to web applications through MySQL Thread Pool provided by MySQL Enterprise Edition. A thread pool provides a

model that is used for managing threads (or processes), like the multi-user connections overhead and execution requests, in a hassle freeway.

--> **Platform-Friendly:** It is a platform friendly database supporting a number of platforms like Microsoft Windows, Oracle Solaris, AIX, Symbian, Linux, MAC OS,

etc.

--> **Friendly Interface:** It has a user-friendly interface with a lot of self-management features and different automated processes like configuration and

administration related tasks, which allows users to do the job effectively from Day 1.

→ Why is MySQL Used?

MySQL Enterprise Firewall

Enterprise Firewall protects databases against security threats such as SQL Injection, Sniff Attack, or Trojan Horse. It monitors the database constantly, sends alerts if required, and even blocks any suspicious or unauthorized activity. It prepares a whitelist of approved SQL statements according to which it measures the authenticity of user activity.

MySQL Enterprise Encryption

Encryption is a data securing process through which sensitive data can be encoded and only authorized users can decode the same. It offers the provision of encrypting data through Public Key Cryptography. MySQL Enterprise Encryption facilitates:

Data Encryption using RSA, DSA, or DH algorithms.
Key Generation to perform Data Encryption and Decryption.
Digital Signature to authenticate senders.
Avoids data exposure by authorizing DBAs to manage encrypted information.

MySQL Transparent Data Encryption (TDE)

MySQL TDE offers better security by encrypting critical information at the physical data files level. Physical files of the database get encrypted even before data gets written to storage devices and they only get decrypted during the reading process. This prevents hackers or malicious users from accessing sensitive data.

User Authentication

Different user authentication modules, like Linux Pluggable Authentication Modules (PAM) or Windows Active Directory, have been offered by the Enterprise Edition that can be easily plugged in with the existing applications to enhance their security by maintaining a centralized directory. This feature eliminates the need to maintain the user's portfolio within individual systems.

MySQL Enterprise Audit

This is an Enterprise solution that performs auditing based on defined policies. The audit is being performed to track user activity in order to control security and prevent misuse of information. This solution allows administrators to

Enable or disable the audit stream.
Customize policies to perform logging for all or selected user activities.
Perform integration of XML based audit log file with MySQL, Oracle, or other solutions.

InnoDB Transactional Support

MySQL storage engine InnoDB supports ACID-compliant transactions within the database for ensuring its security. Features like Multi-Version Concurrency Control (MVCC), maintains database snapshots at different points of time, and foreign keys implementation helps in maintaining database integrity.

MySQL Online Backup

Using Online Backup, database backups can be taken while the database is the inactive state. Along with “Hot” or “Online” backup, it allows Full, Partial, Incremental, or Selective backups. It also allows database recovery using the “Point In Time Recovery” (PITR) method.

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