MSSQL Database Architecture

Database Architecture

- SQL Server maps the database over a set of operating system files that store the database objects.
- Physically, a SQL Server database is a set of two or more operating system files.
- Each database file has two names:
- **A logical filename**: This is the name you reference in Transact-SQL statements.
- **A physical filename:** This is the name that you can view in the operating system directory tree.
- SQL Server database files can be stored on either a FAT or an NTFS filesystem.
- Primary data file:
- Secondary data file:
- Transaction log file:

Primary data file

- This is the initial default file.
- It contains the configuration information for the database, pointers to the other files in the database, and all of the database objects.
- Every database has one primary data file.
- The preferred filename extension for a primary data file is .mdf.
- Although you can store user objects within the main data file, but it is not recommended.

Secondary data file

- Secondary data files are optional and used to hold user database objects.
- You can create one or more secondary files within the database to hold the user database objects.
- The recommend filename extension for a secondary data file is .ndf.
- Secondary data files can be spread across multiple disks.
- And are useful as the database's additional storage area.

Transaction log file

- This is the log file for the database that holds information about all database modification events.
- The information in the transaction log file is used to recover the database.
- A database can have one or more transaction log files.
- Multiple transaction log files do not improve database performance as the SQL Server database engine writes log information sequentially.
- The recommended filename extension for transaction logs is .ldf.

Filegroups

- In SQL Server databases, you can group the secondary data files logically for administrative purposes.
- This administrative grouping of data files is called filegroups.
- By default, the SQL Server databases are created with one filegroup, also known as the default filegroup (or primary filegroup) for the database.
- The primary database is a member of the default filegroup and can add secondary database files to the default filegroup, Not recommended.
- It is recommended that you create separate filegroups for your secondary data files.
- This is known as a secondary filegroup (or user-defined filegroup).
- The SQL Server database engine allows you to create one or more filegroups, which can contain one or more secondary data files.
- Transaction log files do not belong to any filegroup.
- The main advantage of filegroups is that they can be backed up or restored separately, or they can be brought online or taken offline separately.