Database Files

SQL Server databases have three types of files, as shown in the following table.

File	Description
Primary	The primary data file contains the startup information for the database and points to the other files in the database. User data and objects can be stored in this file or in secondary data files. Every database has one primary data file. The recommended file name extension for primary data files is .mdf.
Secondary	Secondary data files are optional, are user-defined, and store user data. Secondary files can be used to spread data across multiple disks by putting each file on a different disk drive. Additionally, if a database exceeds the maximum size for a single Windows file, you can use secondary data files so the database can continue to grow. The recommended file name extension for secondary data files is .ndf.
Transaction Log	The transaction log files hold the log information that is used to recover the database. There must be at least one log file for each database. The recommended file name extension for transaction logs is .ldf.

In SQL Server, **logs** capture events and activities within the database engine, aiding in monitoring, troubleshooting, and auditing. Below are examples of different types of logs in SQL Server:

For Example:

SQL Server Error Log

Captures startup events, errors, warnings, and messages generated by the SQL Server instance.

```
2024-10-16 12:34:56.32 Server      SQL Server is starting up.
2024-10-16 12:35:01.45 Server      Recovery completed for database 'MyDatabase' (database ID 5).
2024-10-16 12:35:05.23 spid13s     Error: 18456, Severity: 14, State: 1.
2024-10-16 12:35:05.23 spid13s     Login failed for user 'sa'. Reason: Password did not match.
```

Transaction Log

Keeps a record of all database modifications (INSERT, UPDATE, DELETE) and transactions to ensure consistency and recovery.

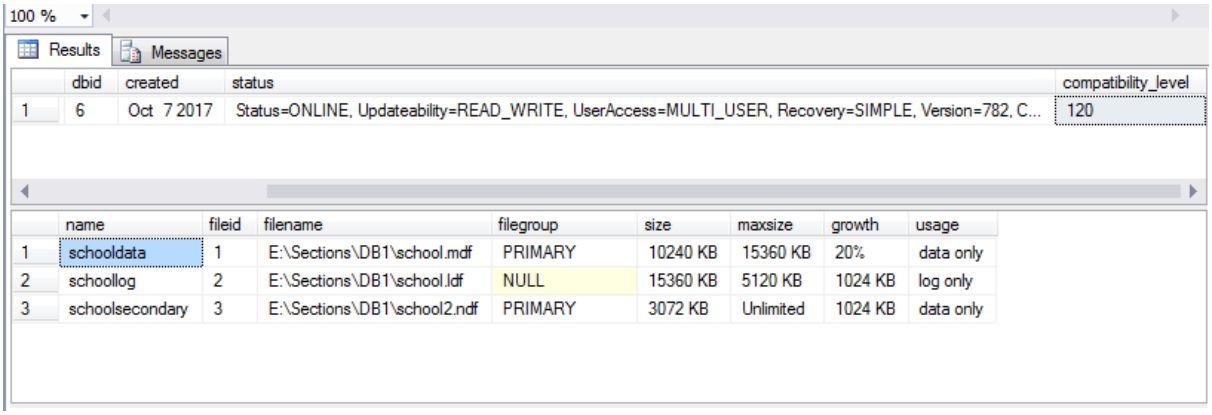
```
TransactionID: 12345, Time: 2024-10-16 13:15:32
Operation: INSERT INTO Orders (OrderID, CustomerID, TotalAmount)
Status: Committed
```

```
use master
create database school
on
primary (name=schooldata,
         filename='F:\Program Files\Microsoft SQL Server\MSSQL$NEW\Data\school.mdf',
         size=10MB,
         maxsize=15MB,
         filegrowth=20%)
log on
        (name=schoollog,
         filename='F:\Program Files\Microsoft SQL Server\MSSQL$NEW\Data\school.ldf',
         size=3MB,
         maxsize=5MB,
         filegrowth=1MB)

   /*add file*/
    alter database school
    add file (name=schoolsecondary,
              filename='F:\Program Files\Microsoft SQL
Server\MSSQL$NEW\Data\school2.ndf',
              size=3MB)

   /*modify file*/
    alter database school
     modify file (name='schoollog', size=15MB)

   /*remove file*/
   alter database school
   remove file schoolsecondary
```

Creating a database without specifying files

In case no primary file is specified, the primary database file is the size of the model database primary file. The transaction log is set to the larger of these values: 512KB or 25% the size of the primary data file. Because MAXSIZE is not specified, the files can grow to fill all available disk space.

```
Drop database school

/*to know information*/
exec sp_helpdb
exec sp_helpdb 'school'
exec sp_helpfile 'schooldata'
exec sp_helpfile 'schoollog'
```



100 %

Results | Messages

	dbid	created	status	compatibility_level
1	6	Oct 7 2017	Status=ONLINE, Updateability=READ_WRITE, UserAccess=MULTI_USER, Recovery=SIMPLE, Version=782, C...	120

	name	fileid	filename	filegroup	size	maxsize	growth	usage
1	schooldata	1	E:\Sections\DB1\school.mdf	PRIMARY	10240 KB	15360 KB	20%	data only
2	schoollog	2	E:\Sections\DB1\school.ldf	NULL	15360 KB	5120 KB	1024 KB	log only
3	schoolsecondary	3	E:\Sections\DB1\school2.ndf	PRIMARY	3072 KB	Unlimited	1024 KB	data only