Model and Resource System Databases

Model System Database

- The **model** database is used as the template for all databases created on an instance of SQL Server.
- Because **tempdb** is created every time SQL Server is started, the **model** database must always exist on a SQL Server system.
- The entire contents of the **model** database, including database options, are copied to the new database.
- Some of the settings of **model** are also used for creating a new **tempdb** during start up, so the **model** database must always exist on a SQL Server system.
- Newly created user databases use the same recovery model as the model database.

Model Database Usage

- When a CREATE DATABASE statement is issued, the first part of the database is created by copying in the contents of the **model** database.
- The rest of the new database is then filled with empty pages.
- If you modify the **model** database, all databases created afterward will inherit those changes.
- For example, you could set permissions or database options, or add objects such as tables, functions, or stored procedures.

Physical Properties of model database

- The following table lists the initial configuration values of the **model** data and log files for SQL Server SQL Managed Instance.
- The sizes of these files may vary slightly for different editions of SQL Server.

File	Logical Name	Physical Name	File Growth
Primary data	modeldev	model.mdf	Autogrow by 64 MB until the disk is full.
Log	modellog	modellog.ldf	Autogrow by 64 MB to a maximum of 2 terabytes.

Restrictions of model database

The following operations cannot be performed on the **msdb** database:

- Adding files or filegroups.
- Changing collation. The default collation is the server collation.
- Changing the database owner. **model** is owned by **sa**.
- Dropping the database.
- Dropping the **guest** user from the database.
- Enabling change data capture.
- Participating in database mirroring.
- Removing the primary filegroup, primary data file, or log file.
- Renaming the database or primary filegroup.

Restrictions of model database (contd)

- Setting the database to OFFLINE.
- Setting the primary filegroup to READ_ONLY.
- Creating procedures, views, or triggers using the WITH ENCRYPTION option. The encryption key is tied to the database in which the object is created. Encrypted objects created in the **model** database can only be used in **model**.

Resource System Database

- The Resource database is a read-only database that contains all the system objects that are included with SQL Server.
- SQL Server system objects, such as sys.objects, are physically persisted in the Resource database.
- But they logically appear in the sys schema of every database.
- The Resource database does not contain user data or user metadata.
- The Resource database makes upgrading to a new version of SQL Server an easier and faster procedure.

Physical Properties of resource database

- The physical file names of the Resource database are mssqlsystemresource.mdf and mssqlsystemresource.ldf.
- These files are located in <*drive*>:\Program Files\Microsoft SQL Server\MSSQL<version>.<*instance_name*>\MSSQL\Binn\ and should not be moved.
- Each instance of SQL Server has one and only one associated mssqlsystemresource.mdf file, and instances do not share this file.
- SQL Server cannot back up the Resource database.
- You can perform your own file-based or a disk-based backup by treating the mssqlsystemresource.mdf file as if it were a binary (.EXE) file, rather than a database file, but you cannot use SQL Server to restore your backups.
- Restoring a backup copy of mssqlsystemresource.mdf can only be done manually.

Accessing the Resource Database

- The Resource database should only be modified by or at the direction of a Microsoft Customer Support Services (CSS) specialist.
- The ID of the Resource database is always 32767.
- Other important values associated with the Resource database are the version number and the last time that the database was updated.