tempDB

Microsoft SQL Server

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About tempDB

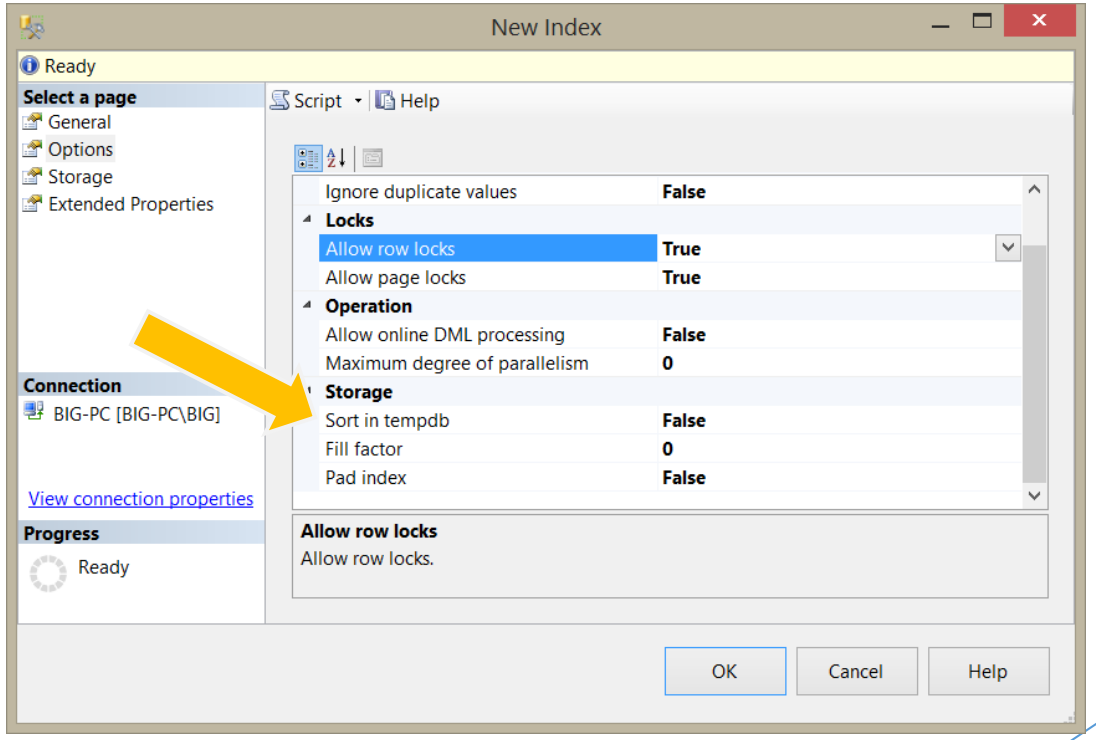
- You can use **TempDB** as a scratchpad (as MS-SQL Server does) to hold temporary data values and tables.
- TempDB is especially useful for aggregating data values from multiple tables in order to generate a summary report.

tempDB Database

- The **tempdb** system database is a global resource that is available to all users connected to the instance of SQL Server.
- Operations within **tempdb** are minimally logged. This enables transactions to be rolled back.
- **tempdb** is re-created every time SQL Server is started so that the system always starts with a clean copy of the database.
- Temporary tables and stored procedures are dropped automatically on disconnect, and no connections are active when the system is shut down. Therefore, there is never anything in **tempdb** to be saved from one session of SQL Server to another.
- Backup and restore operations are not allowed on **tempdb**.

Sort in tempDB

- When you create or rebuild an index, by setting the “Sort in tempdb” option to ON you can direct the SQL Server Database Engine to use tempdb to store the intermediate sort results that are used to build the index.
- Although this option **increases the amount of temporary disk space** that is used to create an index, the option could reduce the time that is required to create or rebuild an index when tempdb is on a set of disks different from that of the user database.

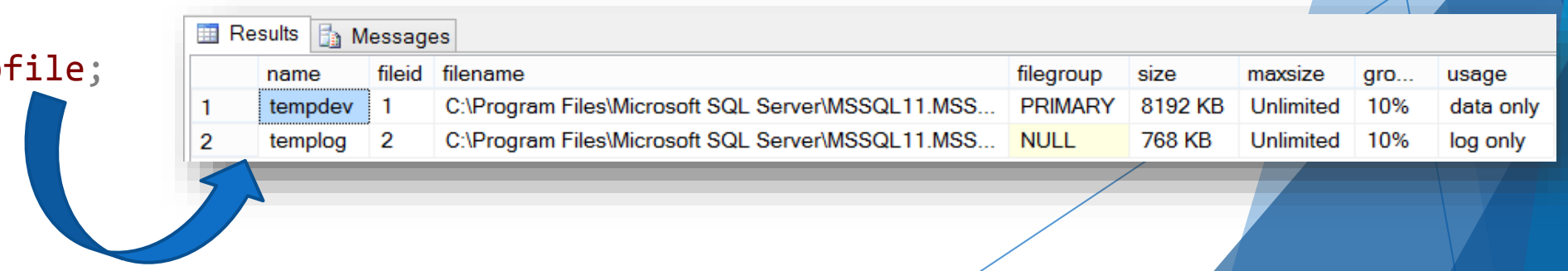


tempDB - Size and Location info using T-SQL

```
use tempdb
GO
SELECT name, (size*8) as FileSizeKB , physical_name  from
sys.database_files

-- Or use the sp_helpfile

USE tempdb;
GO
EXEC sp_helpfile;
GO
```



Results | Messages

	name	fileid	filename	filegroup	size	maxsize	gro...	usage
1	tempdev	1	C:\Program Files\Microsoft SQL Server\MSSQL11.MSS...	PRIMARY	8192 KB	Unlimited	10%	data only
2	templog	2	C:\Program Files\Microsoft SQL Server\MSSQL11.MSS...	NULL	768 KB	Unlimited	10%	log only

tempDB – Autogrouth info using T-SQL

```
SELECT name AS FileName, size*1.0/128 AS FileSizeinMB,
    CASE max_size
        WHEN 0 THEN 'Autogrowth is off.'
        WHEN -1 THEN 'Autogrowth is on.'
        ELSE 'Log file will grow to a maximum size of 2 TB.'
    END,
    growth AS 'GrowthValue', 'GrowthIncrement' =
        CASE
            WHEN growth = 0 THEN 'Size is fixed and will not grow.'
            WHEN growth > 0 AND is_percent_growth = 0
                THEN 'Growth value is in 8-KB pages.'
            ELSE 'Growth value is a percentage.'
        END
FROM tempdb.sys.database_files;
GO
```

How to shrink tempdb using DBCC SHRINKDATABASE

- DBCC SHRINKDATABASE(tempdb, ‘target_percentage_of_free_space’);
- So if the data files in tempdb had enough free space, you could shrink tempdb by running this command to leave 30% of free space at the end of the files:
  - DBCC SHRINKDATABASE(tempdb, 30);

Best practices for TempDB?

- Do not change collation from the SQL Server instance collation.
- Do not change the database owner from sa.
- Do not drop the TempDB database.
- Do not drop the guest user from the database.
- Do not change the recovery model from SIMPLE.
- Ensure the disk drives TempDB resides on have RAID protection i.e. 1, 1 + 0 or 5 in order to prevent a single disk failure from shutting down SQL Server.
  Keep in mind that if TempDB is not available then SQL Server cannot operate.
- Size the TempDB database appropriately

Performance Keys

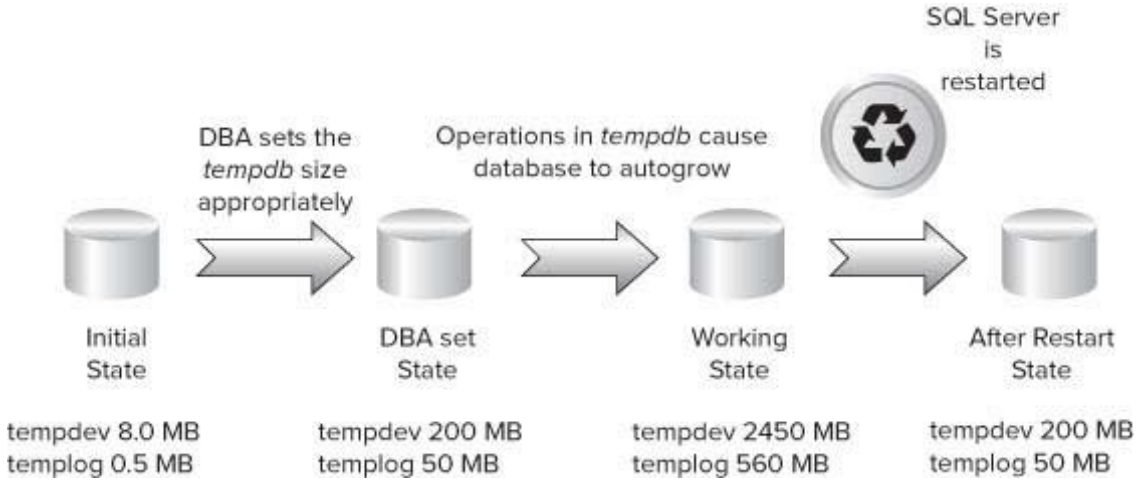
- The size and physical placement of the tempdb database can affect the performance of a system.

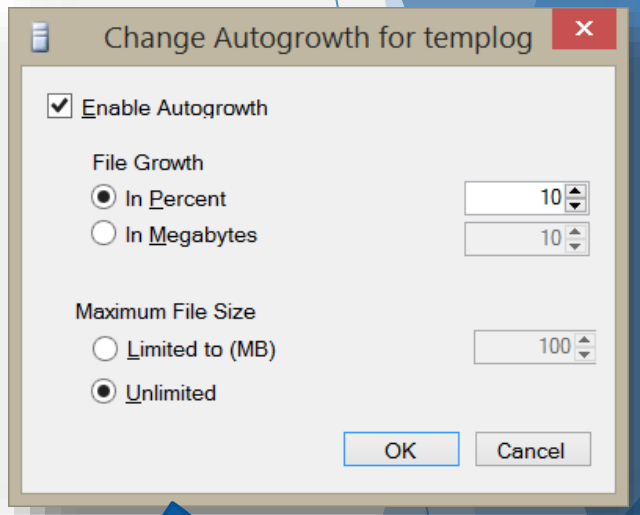
Change tempDB Location

```
USE master;
GO
ALTER DATABASE tempdb
MODIFY FILE
(NAME = tempdev, FILENAME = 'C:\[…]\DATA\TEMPDB\Tempdb.mdf');
GO
ALTER DATABASE tempdb
MODIFY FILE
(NAME = templog, FILENAME = 'C:\[…]\DATA\TEMPDB\Tempdb.ldf');
GO
```

tempDB Initial Size

- With Autogrowth ‘On’, the files cannot be used while they are autogrowing, and it can lead to fragmentation of the files on the hard disk, leading to poor performance.
- The next time SQL Server is restarted, tempdb will be just 8MB and will have to start autogrowing all over again.





http://www.confio.com/logicalread/sql-server-tempdb-best-practices-initial-sizing-w01

To what size should tempdb be set?

- It’s based on the workload, but simply set tempdb to be bigger than the default.
- Move tempdb to its own disk and configure it to almost fill the drive.

Add new files

```
USE [master]
GO
ALTER DATABASE [tempdb] ADD FILE ( NAME = N'tempdev2',
FILENAME = N'C:\Program Files\Microsoft SQL
Server\MSSQL11.MSSQLSERVER\MSSQL\DATA\tempdb2.ndf',
SIZE = 10MB , MAXSIZE = UNLIMITED, FILEGROWTH = 10%)
GO
```

DEMO

Q&A

- Please send your feedback to naji [@] dotnetheroes.com

References

- http://msdn.microsoft.com/en-us/library/ms190768(v=sql.110).aspx (tempDB)
- http://msdn.microsoft.com/en-us/library/ms188281(v=sql.110).aspx (SORT_IN_TEMPDB Option For Indexes)
- http://www.mssqltips.com/sqlservertip/1432/tempdb-configuration-best-practices-in-sql-server/
- http://technet.microsoft.com/en-us/library/ms345368(v=sql.105).aspx