

Databases Laboratory Work № 2

The Creation and Maintenance of Databases

Prerequisites:

SQL Server 2017, SQL Server Management Studio 2017

Objectives:

- Study Chapter 2;
- Complete the practical tasks.

Tasks:

1. Create a database in the **MyDocuments/Data** folder, fixing the growth of the primary file in 16MB with limit to 128MB and of the log file with growth of 64MB limited to 1024MB. The secondary files should be defined in a new filegroup and with the growth of 64MB limited to 1024MB;
2. Create a database with the log file located in **MyDocuments/Log**, the name of the log file should be different in the OS environment. It is important that the database should be compatible with SQL Server 2017 and to be accessible to only one user at a specific time.
3. Create a maintenance plan for the database created in the first task. The unused space should be shrunk when it reaches 2000MB. The freed space should be returned to the OS. This plan should be executed every Friday at 12 AM. The report should be saved in **MyDocuments/SQL_event_logs** folder. Initialize the maintenance plan, verify the results in the log file.
4. Create a maintenance plan for the database created in the second task. It should be called "Reconstruire Index". In this plan, the system must accomplish the rebuilding of indices of the tables only (excluding the views). The free space on the page should be 10%. The sorting of indices should be realized in tempdb. After rebuilding, the complete statistics should be collected about the rebuilt indices. The third step of the plan should be the task of erasing the history of the Backup-Restore operations that had taken place in the SQL Server. All the history that is older than 6 weeks should be deleted. This plan should be executed monthly, on the first Sunday. Create the **MyDocuments/SQL_event_logs** folder. The execution report should be placed there and the maintenance process should be logged extensively. Initialize the maintenance plan, verify the results in the log file.

Implementation:

Here is the first database, with the configured file growth, path and filegroups.

Database files:

Logical Name	File Type	Filegroup	Initial Size (MB)	Autogrowth / Maxsize	Path	File Name
Lab2db1	ROWS...	PRIMARY	8	By 16 MB, Limited to 128 MB	C:\My Documents\Data	Lab2.mdf
lab2db_file1	ROWS...	usergroup_1	8	By 64 MB, Limited to 1024 MB	C:\My Documents\Data	lab2_file1.ndf
lab2db_file2	ROWS...	usergroup_1	8	By 64 MB, Limited to 1024 MB	C:\My Documents\Data	lab2_file2.ndf
Lab2_DB1_...	LOG	Not Applicable	8	By 64 MB, Limited to 1024 MB	C:\My Documents\Data	Lab2_log.ldf

Here is the second database, with the configured log file name.

Database files:

Logical Name	File Type	Filegroup	Initial Size (MB)	Autogrowth / Maxsize	Path	File Name
Lab2_DB2	ROWS...	PRIMARY	8	By 64 MB, Unlimited	C:\My Documents\Log	Lab2_DB2.mdf
Lab2_DB2_...	LOG	Not Applicable	8	By 64 MB, Limited to 209715...	C:\My Documents\Log	Lab2_DB2 Log

And as requested, to this database only one user at a time should have access.

▼ **State**

Database Read-Only	False
Database State	NORMAL
Encryption Enabled	False
Restrict Access	SINGLE_USER

The first maintenance plan consists only of shrinking the database when it reaches 2000MB and returning the freed space to the OS.

Shrink Database Task

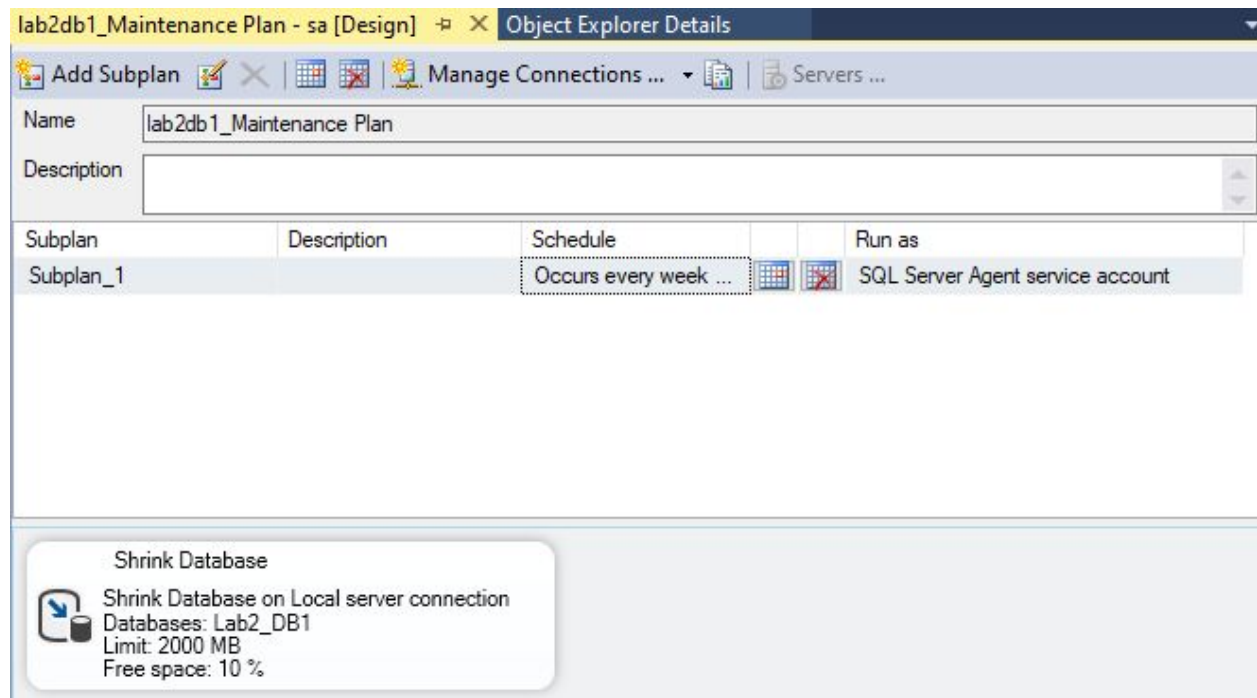
Connection: Local server connection

Database(s): Specific databases ▼

Shrink database when it grows beyond: 2000 MB

Amount of free space to remain after shrink: 10 %

☐ Retain freed space in database files
☒ Return freed space to operating system



In the second maintenance plan we had to create a maintenance plan for the database created in the second task. It should be called “Reconstruire Index”. In this plan, the system must accomplish the rebuilding of indices of the tables only (excluding the views). The free space on the page should be 10%.

Rebuild Index Task

Connection: Local server connection New...

Database(s): Specific databases

Object: Table

Selection: <Select one or more>

Free space options

☐ Default free space per page

☒ Change free space per page to: 10 %

Advanced options

☒ Sort results in tempdb ☒ Pad Index

☐ Keep index online ☐ MAXDOP 1

For index types that do not support online index rebuilds

☒ Do not rebuild indexes

☐ Rebuild indexes offline

☐ Low Priority Used

Abort After Wait None

Max Duration 0 mins

Index Stats Options

Scan type: ☒ Fast ☐ Sampled ☐ Detailed

Optimize index only if:

☒ Fragmentation > 30 %

☒ Page Count > 1000

☐ Used in last 7.00 days

OK Cancel View T-SQL Help

The sorting of indices should be realized in tempdb. After rebuilding, the complete statistics should be collected about the rebuilt indices.

Update Statistics Task

Connection: Local server connection New...

Database(s): Specific databases

Object: Table

Selection: <Select one or more>

Update:

☐ All existing statistics

☐ Column statistics only

☒ Index statistics only

Scan type:

☒ Full scan

☐ Sample by 50

OK Cancel View T-SQL Help

The third step of the plan should be the task of erasing the history of the Backup-Restore operations that had taken place in the SQL Server. All the history that is older than 6 weeks should be deleted. This plan should be executed monthly, on the first Sunday.

History Cleanup Task

Connection: Local server connection New...

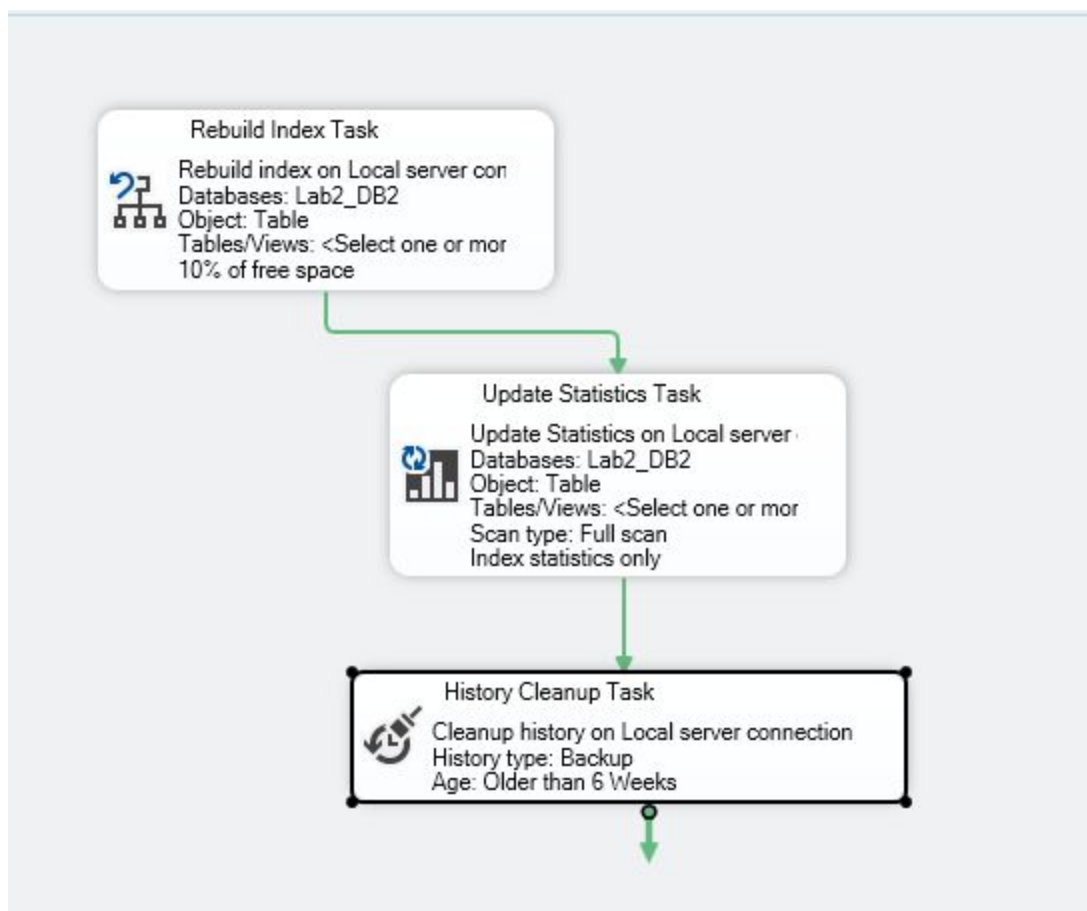
Select the historical data to delete:

- ☒ Backup and restore history
- ☐ SQL Server Agent job history
- ☐ Maintenance plan history

Remove historical data older than:

6 Week(s)

OK Cancel View T-SQL Help



This plan should be executed monthly, on the first Sunday.

Frequency

Occurs: Monthly

☐ Day 1 of every 1 month(s)

☒ The first Sunday of every 1 month(s)

Daily frequency

Conclusion:

During this activity I learned how to create and configure databases. Along it I discovered the multitude of options one is presented with when configuring a database. I became familiar with maintenance plans, how to create them either manually or via Maintenance Plan Wizard, how to configure tasks and how to set up the reports and execution times.