

SQL Server Maintenance Plan: Fundamentals and best practices



Sabato 28 settembre 2024

Slide and demo: <https://bit.ly/1nn0va-sat2024-sgovoni>



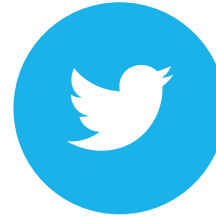
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Agenda

- SQL Server Maintenance Plan
 - What they are
 - How, where, and when to implement a maintenance plan
- Database maintenance tasks (fundamentals)
- Recovery and backup integrity

SQL Server Maintenance Plan: What they are

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- A database maintenance plan is a set of specific and **proactive** activities that must be **regularly performed** on databases to ensure their proper **performance** and **availability**
- Maintenance plans create a **workflow** of the tasks required to make sure that your database is **optimized**, regularly **backed up**, and free of **inconsistencies**

SQL Server Maintenance Plan: What they are

- To create and manage maintenance plans it is necessary to be members of the **sysadmin** role
- Maintenance plans will only be visible in the development environment if the user is a member of the sysadmin role (fixed server role)
- The output (log) generated by maintenance tasks can be in text format (file) or in tabular format (inside the msdb system database)
 - In case of tabular format, the result will be found in `dbo.sysmaintplan_log` and `dbo.sysmaintplan_logdetail`

How, where, and when to implement a
maintenance plan

How, where, and when

How

Maintenance plans can be implemented with:

- Maintenance Plan Wizard
- Maintenance Plan Designer
- T-SQL script
- PowerShell script
- SQL Server Maintenance Solution by Ola Hallengren
 - <https://ola.hallengren.com/>

How, where, and when

Where

Maintenance plans can be implemented within:

- SQL Server Management Studio
 - It is recommended to always use the latest stable version released
 - <https://learn.microsoft.com/sql/ssms/download-sql-server-management-studio-ssms>

How, where, and when

When

- Before starting to use a database
 - Best time 😊, possible difficulties to find the maintenance window
- After a data loss event or performance degradation
 - With the customer stopped or slowed down in daily activities 😞

Database maintenance tasks (fundamentals)

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- Check database integrity | DBCC CHECKDB
- Backup database | BACKUP based on your backup strategy
- Reorganize index | ALTER INDEX
- Rebuild index | ALTER INDEX | DBCC DBREINDEX
- Update statistics | UPDATE STATISTICS
- Shrink database | DBCC SHRINKDATABASE | Pay attention please!
- History cleanup
- Maintenance cleanup task

Database maintenance tasks (fundamentals): Check integrity

- Check database integrity | DBCC CHECKDB
- Checks the logical and physical integrity of all the objects in the specified database by performing the following operations:
 - Runs DBCC CHECKALLOC on the database
 - Runs DBCC CHECKTABLE on every table and view in the database
 - Runs DBCC CHECKCATALOG on the database
 - Validates the contents of every indexed view in the database
 - Validates link-level consistency between table metadata and file system directories and files when storing varbinary(max) data in the file system using FILESTREAM
 - Validates the Service Broker data in the database

Database maintenance tasks (fundamentals): Backup database

- Backup database | BACKUP based on your backup strategy
- Backs up a complete SQL Server database to create a database backup, or one or more files or filegroups of the database to create a file backup
- The backup configuration is based on your backup strategy

Database maintenance tasks (fundamentals): Reorganize index

- Reorganize index | ALTER INDEX
- Reorganize the leaf level of clustered and non-clustered indexes on tables and views, the operation is always performed online with micro-transactions, for this reason, locks on the table are not maintained for long. Queries or updates to the underlying table can continue during the Reorganize operation
- Reorganizing an index uses minimal system resources
- It is not allowed for a disabled indexes

Database maintenance tasks (fundamentals): Rebuild index

- Rebuild index | ALTER INDEX | DBCC DBREINDEX
- Rebuilding an index consists of dropping and recreating the index. This removes fragmentation, reclaims disk space by compacting the pages based on the specified or existing fill factor setting, and reorders the index rows in contiguous pages
- Depending on the type of index and the version of the engine it can be performed offline or online
- Rebuild enables a disabled index

Database maintenance tasks (fundamentals): Update statistics

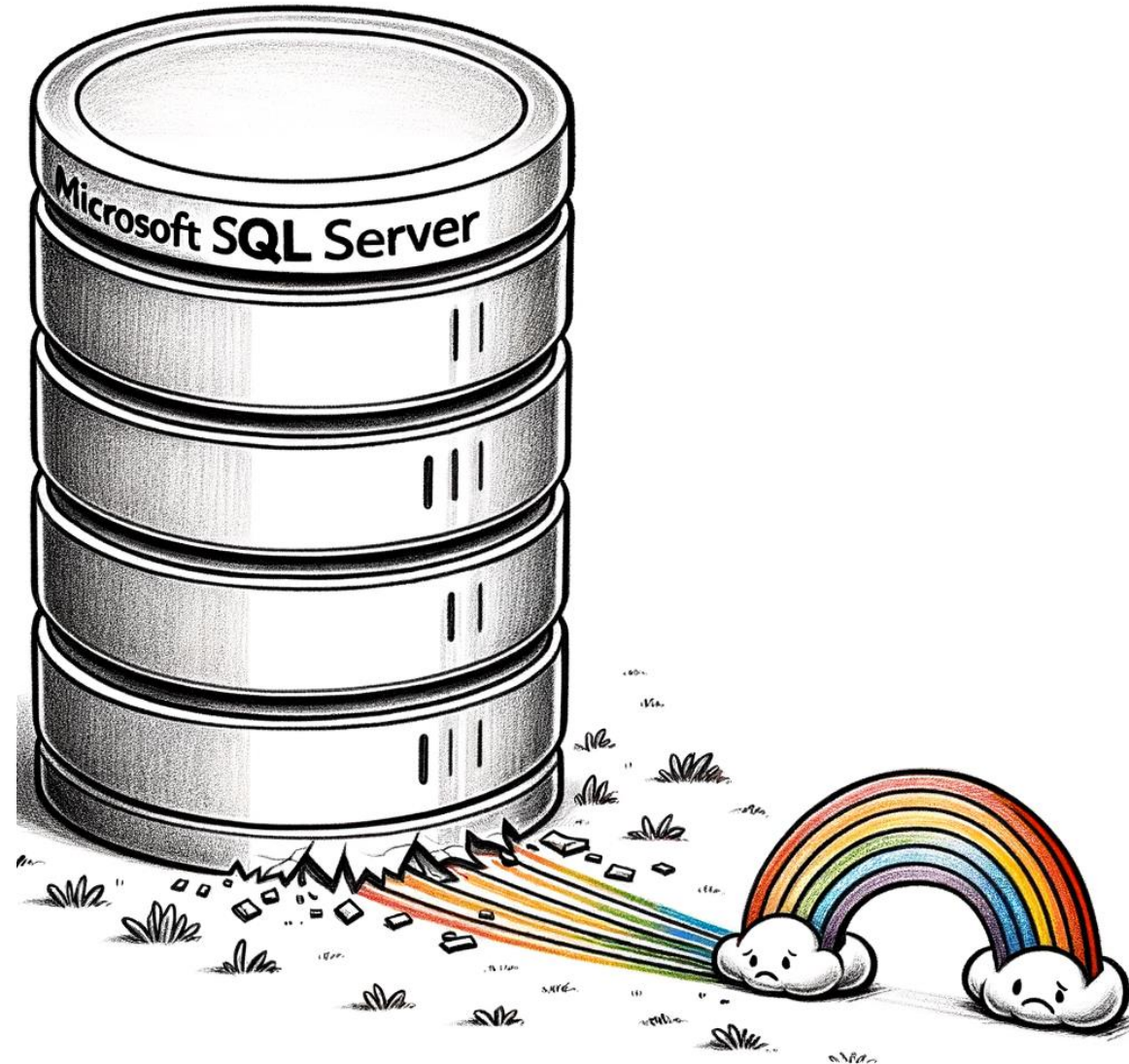
- Update statistics | UPDATE STATISTICS
- Updates data distribution statistics for a table or indexed view. Query Optimizer already updates statistics automatically, but this is often not enough to guarantee optimal performance
- In some cases, you can improve query performance by using UPDATE STATISTICS or the stored procedure sp_updatestats to update statistics more frequently than the default updates
- Rebuilding the index automatically updates the linked statistics
- Updating statistics isn't supported on external tables. To update statistics on an external table, drop and re-create the statistics using sp_drop_create_stats external table

Database maintenance tasks (fundamentals): Shrink database

- Shrink database | [DBCC SHRINKDATABASE](#)

Every time you shrink a database, a rainbow loses one of its colors

DBCC SHRINKDATABASE



Knowledge is common, but action is rare

Knowledge is common, but action is rare

- It is not enough to perform backups; you need to periodically test the recovery and integrity of archived backups!
- What's worse than not having a backup?
- Have a corrupt backup that cannot be restored ☹️

DEMO

Resources

- SQL Server Maintenance Tips
- Guide to SQL Server Maintenance Plans
- SQL Server Management Studio connection to integration services error class not registered
- Previous version of SQL Server Management Studio
- Automating Azure SQL Database maintenance tasks
 - 1° Part: <https://bit.ly/3clqzJE>
 - 2° Part: <https://bit.ly/2wOpJG6>
 - 3° Part: <https://bit.ly/3VYBDGC>

Summary

In this session we covered the essential components required to keep your SQL Server running smoothly. Here are the key takeaways:

- Regular maintenance of SQL Server is crucial for ensuring database availability, integrity, and performance
- Full check integrity is an important task
- It is not enough to perform backups; you need to periodically test the recovery and integrity of archived backups
- Every time you shrink a database, a rainbow loses one of its colors

Q&A



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Thanks!



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