

SQL Server: Maintenance Plans

Module 7: Maintenance Plan Challenges and Alternatives

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Introduction

- **Database Maintenance Plans, regardless of how they are actually implemented, have some significant drawbacks that limit their usage on larger databases**
- **Understanding these limitations, and the available alternatives, can result in better maintenance configurations for larger databases**
- **In this module we'll cover:**
 - Index maintenance limitations
 - Fragmentation-based analysis approaches
 - Michelle Ufford's reindexing script
 - Ola Hallengren's maintenance scripts

Index Maintenance Limitations

- **The Rebuild Index and Reorganize Index maintenance tasks affect all indexes in a given database, regardless of how fragmented the indexes are**
 - This means that an index may be rebuilt despite having no fragmentation
- **For databases that are Mirrored, participate in Availability Groups, or are Log Shipped, this can result in a large amount of log generation that has no benefit whatsoever**
- **To prevent this, index maintenance should be performed based on analysis of current fragmentation levels to determine if a rebuild or a reorganization is the most efficient operation**

Fragmentation-Based Analysis

- In SQL Server 2000, fragmentation analysis of indexes could be accomplished using DBCC SHOWCONTIG
- From SQL Server 2005 onward, fragmentation analysis of indexes can be accomplished with the sys.dm_db_index_physical_stats DMF
- Despite SQL Server having the capability to analyze the fragmentation level of individual indexes, this is not implemented in the Database Maintenance Plans for SQL Server
- Third-party solutions using custom Transact-SQL scripts can easily be implemented to replace the index maintenance options of Database Maintenance Plans
- Third-party solutions using custom Transact-SQL scripts can also replace many, if not all, of the Database Maintenance Plan features to allow better scalability for large databases

Michelle Ufford's Reindexing Script

- **Michelle Ufford is a SQL Server MVP and former production DBA for GoDaddy, that managed the SQL Servers that handled the Super Bowl workloads with minimal downtime**
- **Michelle's scripts provide the following features:**
 - A time limit option to provide control over how long defrags run
 - A static table managing index defrag scans for VLDBs
 - This way, you can start and stop the defrag process without the need to rescan
 - A parameter to perform a full rescan even if there are still indexes remaining to defrag from your last rescan
 - An option to sort by page count, range scan count (the default), or fragmentation level
 - There are now min and max parameters for page counts
 - An option to sort in tempdb
 - Try/catch logic to handle errors during execution
 - The script will now force a rebuild for indexes with `allow_page_locks = off`

Ola Hallengren's Maintenance Scripts

- **Provide multiple database selection options:**
 - System databases only
 - User databases only
 - All databases
 - Individual databases
 - Databases with inclusions or exclusions
- **Low, medium and high fragmentation thresholds that determine the specific operation to be performed based on the threshold values**
- **Options to set fragmentation levels, minimum page counts, whether to sort in tempdb, maxdop, and fillfactors for index operations**
- **The ability to perform index operations at the partition level**
- **The ability to update non-index column statistics including the ability to set sample ratios or only modified statistics**
- **The ability to specify certain indexes or exclude Microsoft provided indexes and statistics**

Ola Hallengren's Maintenance Scripts (2)

- **Provide the ability to perform DBCC CHECKDB operations against databases**
- **Provide the ability to rebuild non-index-column level statistics for all statistics in the database**
- **Provide the ability to log all operations to log files in the file system for post maintenance analysis**
- **Provide the ability to clean up log files and maintenance task entries in the system databases**
- **Uses sqlcmd command line execution in the SQL Agent jobs, which allows easy modification using Windows Task Scheduler for Web, Workgroup, and Express Editions without SQL Agent**

Summary

- While Database Maintenance Plans provide a good built-in solution for managing SQL Server databases, they are not the best solution for performing common maintenance tasks in SQL Server
- For larger databases, custom Transact-SQL scripts that are freely available online offer the best solution for database maintenance with the best configuration options to meet critical business requirements