



PASS SUMMIT 2014

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Backup, Integrity Check, Index and Statistics Maintenance

Inside Ola Hallengren's
Maintenance Solution - DBA-309



NOVEMBER 4-7 | SEATTLE, WA
The Conference for SQL Server Professionals.



Please silence
cell phones



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The Conference for SQL Server Professionals.

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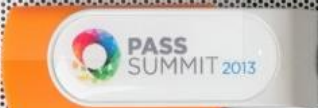
This is Community



Business Analytics Training



Local User Groups Around the World



Session Recordings



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Session Evaluations

3

ways to access

Your feedback is important and valuable.

Submit by 11:59 PM EST
Friday Nov. 7 to
WIN prizes

Evaluation Deadline:
11:59 PM EST, Sunday Nov. 16



Go to
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Download the GuideBook App
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Follow the QR code link displayed
on session signage throughout the
conference venue and in the
program guide

About Me

- Ola Hallengren
- <https://ola.hallengren.com>
- E-mail: ola@hallengren.com
- DBA in Saxo Bank, a Danish investment bank
- Microsoft MVP – SQL Server

An Overview

- Based on stored procedures
- SQL Server 2005 - 2014
- DatabaseBackup - Backup
- DatabaseIntegrityCheck – Integrity Check
- IndexOptimize – Index and Statistics Maintenance
- It is free!

DatabaseBackup

- Full, differential and transaction log backup
- Backup to local drives, network shares or [Azure Blob Storage](#)
- [Mirroring](#) and / or striping of backups to multiple files
- Built-in logic for backup of AlwaysOn Availability Groups
- Checksum, Compression and Encryption
- Supports Red Gate SQL Backup, LiteSpeed and Idera SQL Safe
- Automatic handling of new databases
- Options MAXDOP, BUFFERCOUNT and MAXTRANSFERSIZE

Backup of AlwaysOn Availability Groups

- Define a backup preference for the Availability Group
 - Prefer Secondary (Default)
 - Secondary only
 - Primary
 - Any Replica
- Backup types supported on secondary replicas
 - Copy-only full backups
 - Regular transaction log backups
- Function to check preferred backup replica
`sys.fn_hadr_backup_is_preferred_replica`

DatabaseBackup Availability Group Logic

Backup type	Backup is performed
Full backup	Primary replica
Full backup copy_only	Preferred replica
Differential backup	Primary replica
Transaction log backup	Preferred replica

DatabaseIntegrityCheck

- DBCC CHECKDB
- DBCC CHECKFILEGROUP
- DBCC CHECKTABLE
- DBCC CHECKALLOC
- DBCC CHECKCATALOG
- Options PHYSICAL_ONLY and NOINDEX

Index Maintenance – Challenges

- Indexes are getting fragmented over time, which has a negative impact on performance
- Rebuilding and reorganizing indexes uses system resources and generates blocking
- Large databases and limited maintenance windows

Index Maintenance – Checking the Fragmentation

- Checking the fragmentation using `sys.dm_db_index_physical_stats`
- Only rebuild or reorganize indexes that are fragmented
- Rebuild heavily fragmented indexes
- Reorganize moderately fragmented indexes

Index Maintenance- Rebuild and Reorganize Limitations

- Online rebuild only in Enterprise Edition
- Xml – indexes and spatial indexes cannot be rebuilt online
- Indexes with image or text cannot be rebuilt online
- Indexes with varchar(max), nvarchar(max), or varbinary(max) – Online rebuild only in SQL Server 2012 and 2014
- Index partition – Online rebuild only in SQL Server 2014
- An index with page locking disabled cannot be reorganized

IndexOptimize

- Checking the fragmentation
- Three fragmentation groups; low, medium and high
- Lets you define the fragmentation thresholds
- Lets you define your preferred index maintenance for each group
- Fallback index maintenance in case your preferred index maintenance is not supported for an index
- Updating of statistics
- If an index is rebuilt, updating of statistics for that index is skipped

Selecting Databases

- Common parameter for DatabaseBackup, DatabaseIntegrityCheck and IndexOptimize
- Select All Databases, All User Databases or All System Databases
- Select a single database or a list of databases
- Exclude databases
- Select databases using wildcards

Job Execution

- SQL Server Agent T-SQL Job Step
Execution is aborted after first error
- SQL Server Agent CmdExec Job Step, sqlcmd (and the `-b` option)
Execution continues after an error, and the job reports failure in the end
(recommended)

SQL Server Agent Tokens

- Using SRVR for the local SQL Server instance
- Using SQLLOGDIR (new token in SQL Server 2014) for the output – file directory, makes it easy to move jobs between servers
- Using JOBID, STEPID, STRTDT, and STRTTM in the output – file name to get unique file names

Links

- Download script:
<https://ola.hallengren.com/downloads.html>
- Documentation:
<https://ola.hallengren.com/sql-server-backup.html>
<https://ola.hallengren.com/sql-server-integrity-check.html>
<https://ola.hallengren.com/sql-server-index-and-statistics-maintenance.html>
- License:
<https://ola.hallengren.com/license.html>

Questions?

- I will be in the Community Zone today between 12.00 and 14.00
- You can also contact me at ola@hallengren.com