

Ben Miller

ben@benmiller.net

@DBADuck everywhere

[Github.com/dbaduck/](https://github.com/dbaduck/)

Ultimate Guide to Ola Hallengren's Maintenance Solution



SQL Server® 2008



DBA Duck
CONSULTING
Ben Miller & Associates, Inc.

Ben Miller



Agenda

- Maintenance Solution
- Backup
- Database Integrity Check
- Index Optimize

Maintenance Solution

- Older versions
 - Uses sqlcmd -b in an Operating System job step
- Newer versions
 - Uses TSQL job step
- Contains
 - DatabaseBackup
 - DatabaseIntegrityCheck
 - IndexOptimize

Database Backup

- Key Parameters

- Databases
- Directory / URL (https://, s3://)
- BackupType (FULL, DIFF, LOG)
- Verify (Y,N (default))
- CleanupTime (hours) – not for URL
- CleanupMode (BEFORE_BACKUP, AFTER_BACKUP (default))
- Compress (not in default setup, which means it will use the sys.configurations value)
- Checksum (Y,N (default))

- Other Parameters of Note

- ChangeBackupType
- BackupSoftware

Database Backup - Databases

- Parameter to define the Databases you want
 - USER_DATABASES (Only user databases, excludes Distribution and System)
 - SYSTEM_DATABASES (Only system databases – includes Distribution)
 - ALL_DATABASES (Every database on the system including System)
 - AVAILABILITY_GROUP_DATABASES (those in an Availability Group)
 - Comma Separated list of databases or excludes, can include wildcards %
- What else can I do? Can I Exclude?
 - Minus sign – will remove a database from consideration
 - -DBA will exclude DBA
 - -%DBA% will exclude any database with DBA in the name
- Can be a variable
 - DECLARE @dbs nvarchar(max) = N'USER_DATABASES, DBA'
 - @Databases = @dbs

Database Backup - Directory

- If @Directory is omitted then it goes to the default defined in Database Settings
- @URL = If using URL (https:// s3://)
- Contains a Path or multiple paths separated by a comma
 - If you specify multiple then Ola will divide them up
 - Can be a UNC or a physical drive
 - Can be a URL https:// or s3:// and Ola will change the command to do BACKUP TO URL
- This is the root path for the Backup
 - All the other folders are governed by a different parameter or by defaults

Backup Database - Cleanup

- @CleanupTime is in Hours and is NOT applicable when you backup to URL or S3
- @CleanupMode
 - BEFORE_BACKUP
 - AFTER_BACKUP (default)

Backup Database – Backup Software

- Various Backup Software supported (default is NULL)

BackupSoftware

Specify third-party backup software; otherwise, SQL Server native backup is performed.

Value	Description
NULL	SQL Server native backup (the default)
DATA_DOMAIN_BOOST	Dell EMC Data Domain Boost
LITESPEED	Quest LiteSpeed for SQL Server
SQLBACKUP	Red Gate SQL Backup Pro
SQLSAFE	Idera SQL Safe Backup

Database Backup – Availability Groups

- If you have an AG or more, you can specify which ones to backup
-

Database Backup - Files

- **@NumberOfFiles**
 - Alone it determines how many files to backup to
 - If Multiple Directories are specified then this becomes the number of files without this parameter
- **@MinBackupSizeForMultipleFiles**
 - Specify a minimum size in MB to consider multiple files, then use the files above
- **@MaxFileSize**
 - This is a max size in MB of a backup file. The proc will automatically calculate how many files it should split things into
- **@MaxFileSize and @NumberOfFiles cannot be used together**

Database Backup - Encryption

- **@Encrypt (Y/N)**
 - Do I Encrypt this backup. Must have EncryptionAlgorithm and either ServerCertificate or ServerAsymmetricKey specified
- **@EncryptionAlgorithm**
 - Next slide – pay attention to which Backup Software it applies to
- **@ServerCertificate**
 - Certificate in Master database that you are going to use in Encryption
- **@ServerAsymmetricKey**
 - Asymmetric Key in SQL Server that you are going to use for encrypting the backup
- **@EncryptionKey**
 - Used with LiteSpeed, RedGate, Idera

Encryption Algorithm

EncryptionAlgorithm

Specify the type of encryption.

Value	Description
NULL	No encryption (the default)
RC2_40	RC2 40-bit encryption (LiteSpeed)
RC2_56	RC2 56-bit encryption (LiteSpeed)
RC2_112	RC2 112-bit encryption (LiteSpeed)
RC2_128	RC2 128-bit encryption (LiteSpeed)
TRIPLE_DES_3KEY	Triple DES encryption (SQL Server native encryption or LiteSpeed)
RC4_128	RC4 128-bit encryption (LiteSpeed)
AES_128	AES 128-bit encryption (SQL Server native encryption, LiteSpeed, Red Gate SQL Backup Pro, or Idera SQL Safe Backup)
AES_192	AES 192-bit encryption (SQL Server native encryption or LiteSpeed)
AES_256	AES 256-bit encryption (SQL Server native encryption, LiteSpeed, Red Gate SQL Backup Pro, or Idera SQL Safe Backup)

Database Backup – Backups

- **@MinDatabaseSizeForDifferentialBackups**
 - Minimum database size in MB before a DIFF backup will be taken for this database
 - If @ChangeBackupType = 'Y' then if a DIFF cannot be taken because of size, backup type will change to FULL for this database
- **@LogSizeSinceLastLogBackup**
 - Min size in MB for amount of log generated since last log backup. If met then a log backup will be taken
- **@TimeSinceLastLogBackup**
 - Min time in Seconds since last log backup before this database will have a log backup taken
 - Can only be used with @LogSizeSinceLastLogBackup. Cannot be used standalone
 - If database is in an AG and you are backing up on a secondary, the log will be backed up regardless of this parameter

Database Integrity Check

- <https://ola.hallengren.com>

Index Optimize

- Key Parameters - Indexes
 - Databases
 - FragmentationLow
 - FragmentationMedium
 - FragmentationHigh
 - FragmentationLevel1
 - FragmentationLevel2
 - SortInTempDb
 - MaxDOP
 - MinNumberOfPages
 - MaxNumberOfPages

Index Optimize

- Statistics
 - UpdateStatistics (ALL, INDEX, COLUMNS, NULL (default))
 - OnlyModifiedStatistics / StatisticsModificationLevel

What to Know?

- Ola Hallengren: <https://ola.hallengren.com>

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