

Diagnosing SQL Server Database-level Configuration Issues



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Module Overview



Database-level configuration queries

Interpreting query results

Best-practice configuration settings



Database Properties

Returns many
useful database
properties

Recovery model

Log reuse wait
description

Statistics
properties

Delayed durability

Query Store status



Database Properties



Database owner should be sa, not an individual login



Log reuse wait description and log used % are very important to regularly monitor



Compatibility level very important due to new cardinality estimator



Statistics properties can be critical for query performance



Isolation level properties have a role in concurrency/locking/blocking issues



Demo



Database properties



Database Filenames and Paths

**Database
filenames**

**Database file
locations**

Database file sizes



Database Filenames and Paths



Shows all SQL Server database files and where they are located in the file system



This helps you understand how your storage subsystem is being used



Make sure none of your database files are using percent growth



This also lets you see the size on disk of all of your database files



Demo



Database filenames and paths



VLF Counts

**VLF counts for all
databases on
instance**

**Keeping VLF
counts low is
important**

**Uses new DMF for
SQL Server 2017**



VLF Counts



Returns VLF counts for all databases on the instance



High VLF counts cause several negative effects



Longer crash recovery and longer recovery portion of restores



SQL Server takes longer to startup and makes FCI failovers take longer



Demo



VLFF counts



Last Backup by Database

**Database
name and
recovery model**

**Log reuse wait
description**

**Last backup time
for each
backup type**



Last Backup by Database



Shows all SQL Server databases, their recovery model, and log reuse wait description



Helps you spot runaway transaction logs



Last full, differential, and transaction log backup date/time shown



Lets you evaluate your database backup schedule



Demo



Last backup by database



File Sizes and Space

**Database
filenames and
locations**

**Total size and
available space in
each file**

**File group and
auto growth
information**



File Sizes and Space



Returns location, size and available space for all files in current database



Lets you see if all data files in the same file group are the same size



Lets you see how much free space is in all of your database files



Helps you spot runaway transaction logs



Demo



File sizes and space



Database-scoped Configurations

Useful new feature
was added in
SQL Server 2016

Lets you control
some properties
that used to be
instance-level

MAXDOP

Legacy CE

Parameter sniffing,
QE hotfixes,
identity cache



Database-scoped Configurations



Returns five important property values for the current database



Before SQL Server 2016, these were controlled only at the instance-level



You can set separate values for AG primary and AG replica databases



Gives more flexibility in making more granular configuration changes

Demo



Database-scoped configurations



Table Properties

**Useful properties
for each table
and index**

**Replication
properties**

**Helps identify row
store data
compression
candidates**



Table Properties



Returns useful information for each table and index in current database



Helps identify possible row-store data compression candidates



Shows if table is involved in replication or change data capture



Shows if it is a memory-optimized table or a temporal table



Demo



Table properties



Query Store Options

**Query Store state
for current
database**

**Maximum storage
size and
storage usage**

**Capture mode and
cleanup mode**



Query Store Options



Shows all Query Store options for the current database



Query Store is a very useful feature, enabled per user database



Sometimes you might want to change default Query Store options



Erin Stellato blog post goes into more detail: <http://bit.ly/2HzOPZe>



Demo



Query Store options



Automatic Tuning Options

**Tuning option
name**

**Desired and actual
state of the option**

**Description why
desired and actual
state are different**



Automatic Tuning Options



Another very useful new feature in SQL Server 2017



This feature relies upon Query Store being enabled



Help eliminate performance regressions from query plan instability



Automates plan forcing with Query Store

Demo



Automatic tuning options



What We Covered



Database-level configuration queries

Interpreting query results

Best-practice configuration settings

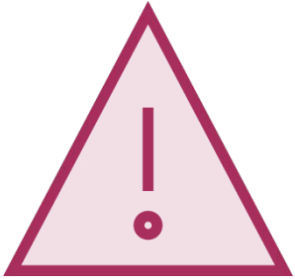




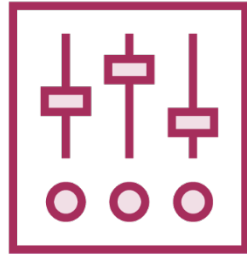
What now?



Course Summary



Many SQL Server instances have basic configuration issues



DMV queries can detect most configuration issues



Proper configuration gives better performance and reliability



Use best practice configuration settings as a baseline

