



Swiss IT Pro User Group

SQL Server 2005 Working with Dynamic Management Views

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General Overview

- SQL Server 2005 introduced Dynamic Management Views (DMV's) which are built-in views that return server state information about values, objects, and settings in SQL Server. These views can be used to monitor the health of a server instance, diagnose problems, and tune performance.
- This session focuses on which DMV's are the most useful, as well as some general principles on their usage.

Agenda

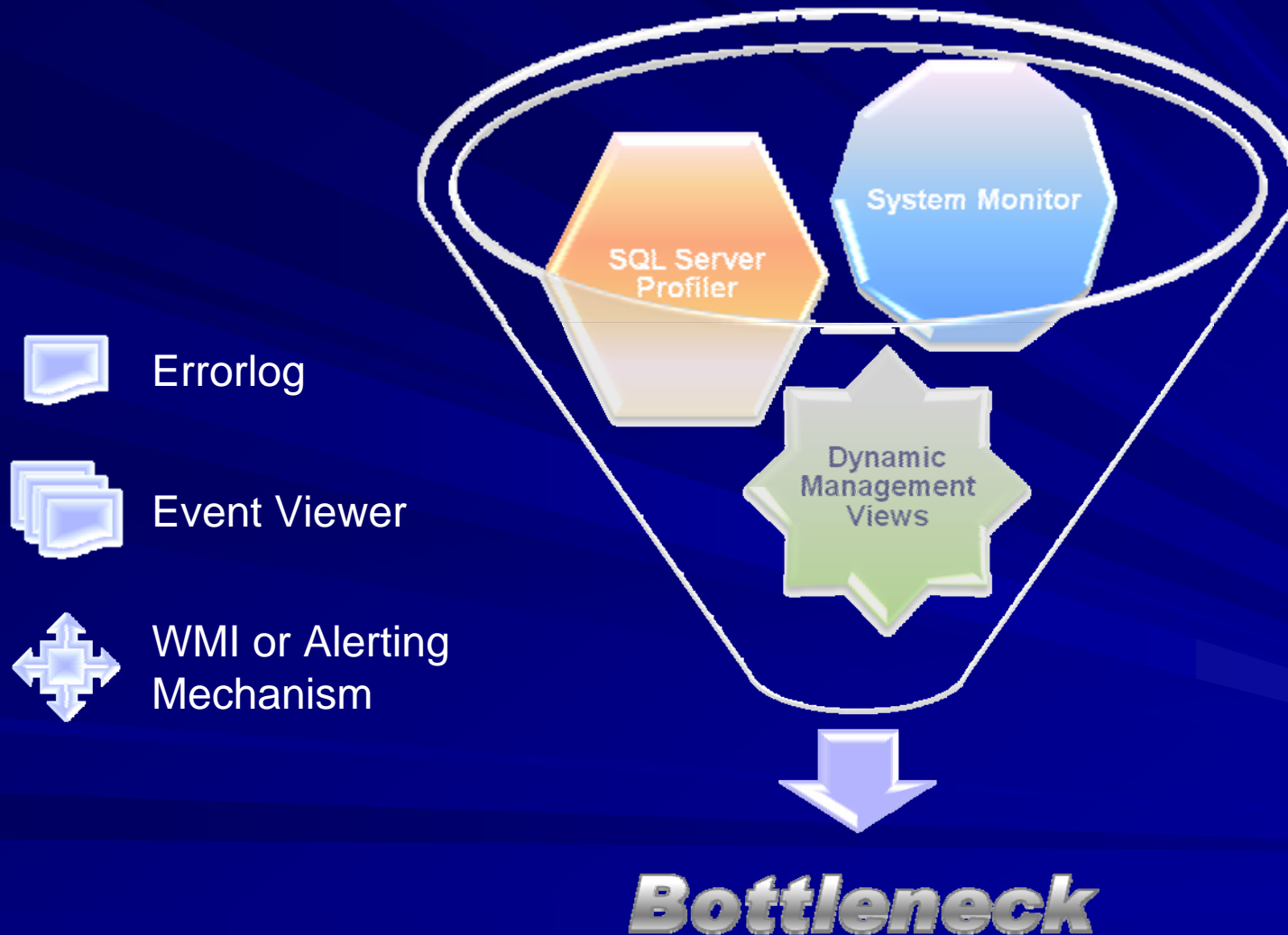
- Overview of investigative tools
- Overview of system view types
- DMV categories
- Practical Usage
- Questions

What we won't cover

- Other investigative toolsets
- Detailed drill down of each DMV

- Show interest, and we can present on these in the future
(*feedback forms*)

Standard Investigative Tools



System View Types ⁽¹⁾

SQL Server 2005 provides the following sets of system views that expose metadata

Catalog Views

- Expose catalog metadata information that is used by the Microsoft SQL Server 2005 Database Engine (Instance scoped objects)
- Fall into the following categories:
 - CLR Assembly Catalog Views
 - Objects Catalog Views
 - Databases and Files Catalog Views
 - Partition Function Catalog Views
 - Database Mirroring Catalog Views
 - Scalar Types Catalog Views
 - Data Spaces and Full-text Catalog Views
 - Schemas Catalog Views
 - Endpoints Catalog Views
 - Security Catalog Views
 - Extended Properties Catalog Views
 - Service Broker Catalog Views
 - Linked Servers Catalog Views
 - Server-wide Configuration Catalog Views
 - Messages (For Errors) Catalog Views
 - XML Schemas (XML Type System) Catalog Views

Information Schema Views

- Defined in a special schema named INFORMATION_SCHEMA
- Provide an internal, system table-independent view of the SQL server metadata
- Contains metadata for all data objects stored in that particular database

Compatibility Views

- Expose the same metadata that was available in SQL Server 2000.
- Do not expose any of the metadata related to features that are introduced in SQL Server 2005

System View Types (2)

SQL Server 2005 provides the following sets of system views that expose metadata

Notification Services Views

- Consolidated look at Notification Services instance and application data
- Assists in debugging, tracking, and troubleshooting Notification Services applications

Replication Views

- Access to data in replication system tables.
- Created in a user database when that database is enabled as a publication or subscription database

Dynamic Management Views / Functions

- Return server state information that can be used to:
 - Monitor the health of a server instance
 - Diagnose problems, and
 - Tune performance.
- Two types of dynamic management views and functions:
 - Server-scoped dynamic management views and functions.
 - Database-scoped dynamic management views and functions.
- Organized into the following categories:
 - Common Language Runtime
 - Database Mirroring
 - Database
 - Execution
 - Full-Text Search
 - I/O
 - Indexes
 - Query Notifications
 - Replication
 - Service Broker
 - SQL Server Operating System
 - Transactions

DMVs

- Based on the internal memory structures
- Materialized into in-memory tables, similar to Table Variables
- Presented as DMV's only when they get queried
- Read-only, no locking or blocking occurs on them
- Under load, they are still up to date, even on a scheduler hang.
 - None of the DMV's are persisted to disk, so on SQL Server restart, the values are lost.

* Thanks to Michael Epprecht - MS

Dynamic View Listing ⁽¹⁾

There are close to 100 DMVs available for Querying

Common Language Runtime

- sys.dm_clr_appdomains
- sys.dm_clr_loaded_assemblies
- sys.dm_clr_properties
- sys.dm_clr_tasks

Database Mirroring

- sys.dm_db_mirroring_connections

Database

- sys.dm_db_file_space_usage
- sys.dm_db_partition_stats
- sys.dm_db_session_space_usage
- sys.dm_db_task_space_usage

Execution

- sys.dm_exec_background_job_queue
- sys.dm_exec_background_job_queue_stats
- sys.dm_exec_cached_plans
- sys.dm_exec_cached_plan_dependent_objects
- sys.dm_exec_connections
- sys.dm_exec_cursors
- sys.dm_exec_plan_attributes
- sys.dm_exec_query_memory_grants
- sys.dm_exec_query_optimizer_info
- sys.dm_exec_query_plan
- sys.dm_exec_query_resource_semaphores
- sys.dm_exec_query_stats
- sys.dm_exec_requests
- sys.dm_exec_sessions
- sys.dm_exec_sql_text
- sys.dm_exec_text_query_plan
- sys.dm_exec_xml_handles

Dynamic View Listing (2)

There are close to 100 DMVs available for Querying

Full-Text Search

- sys.dm_fts_active_catalogs
- sys.dm_fts_index_population
- sys.dm_fts_memory_buffers
- sys.dm_fts_memory_pools
- sys.dm_fts_population_ranges

Index-Related

- sys.dm_db_index_operational_stats
- sys.dm_db_index_physical_stats
- sys.dm_db_index_usage_stats
- sys.dm_db_missing_index_columns
- sys.dm_db_missing_index_details
- sys.dm_db_missing_index_groups
- sys.dm_db_missing_index_group_stats

I/O Related

- sys.dm_io_backup_tapes
- sys.dm_io_cluster_shared_drives
- sys.dm_io_pending_io_requests
- sys.dm_io_virtual_file_stats

Query Notifications

- sys.dm_qn_subscriptions

Replication

- sys.dm_repl_articles
- sys.dm_repl_schemas
- sys.dm_repl_tranhash
- sys.dm_repl_traninfo

Dynamic View Listing (3)

There are close to 100 DMVs available for Querying

SQL Server Operating System

- sys.dm_os_buffer_descriptors
- sys.dm_os_child_instances
- sys.dm_os_cluster_nodes
- sys.dm_os_hosts
- sys.dm_os_latch_stats
- sys.dm_os_loaded_modules
- sys.dm_os_memory_cache_clock_hands
- sys.dm_os_memory_cache_counters
- sys.dm_os_memory_cache_entries
- sys.dm_os_memory_cache_hash_tables
- sys.dm_os_memory_clerks
- sys.dm_os_memory_objects
- sys.dm_os_memory_pools
- sys.dm_os_performance_counters
- sys.dm_os_schedulers
- sys.dm_os_stacks
- sys.dm_os_sys_info
- sys.dm_os_tasks
- sys.dm_os_threads
- sys.dm_os_virtual_address_dump
- sys.dm_os_waiting_tasks
- sys.dm_os_wait_stats
- sys.dm_os_workers

Dynamic View Listing (4)

There are close to 100 DMVs available for Querying

Service Broker

- `sys.dm_broker_activated_tasks`
- `sys.dm_broker_connections`
- `sys.dm_broker_forwarded_messages`
- `sys.dm_broker_queue_monitors`

Transaction Related

- `sys.dm_tran_active_snapshot_database_transactions`
- `sys.dm_tran_active_transactions`
- `sys.dm_tran_current_snapshot`
- `sys.dm_tran_current_transaction`
- `sys.dm_tran_database_transactions`
- `sys.dm_tran_locks`
- `sys.dm_tran_session_transactions`
- `sys.dm_tran_top_version_generators`
- `sys.dm_tran_transactions_snapshot`
- `sys.dm_tran_version_store`

DEMO

Walkthrough the UI to show where DMV's are located.

DEMO

Quick Look into some DMV's at work.

Topic Resources

- [Troubleshooting Performance Problems in SQL Server 2005.](#)
- [SQL Server 2005 profiling with Dynamic Management Views \(DMV's\).](#)
- MSDN Webcast: Top 10 Dynamic Management Views in SQL Server 2005.

Recap

- DMV's are based on the internal memory structures that the SQL OS, buffer manager, lock manager, etc keep.
- Administrators should get to know DMV's and the other sys tables (that are in effect DMV's) as they are still usable if things go wrong.
- DMVs are a powerful addition to the SQL Server Toolset for troubleshooting issues understanding general overall health
- ?? Questions ??

Community

- Swiss PASS Chapter

- www.sqlpass-swiss.org



- Swiss IT Pro user group

- www.swissitpro.ch

- Monthly sessions in Zurich and Geneva



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Thank you