



PASS SUMMIT 2013

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Charlotte, NC

Periodic Table of DMOs

Part 2012: The SQL

Tim Ford

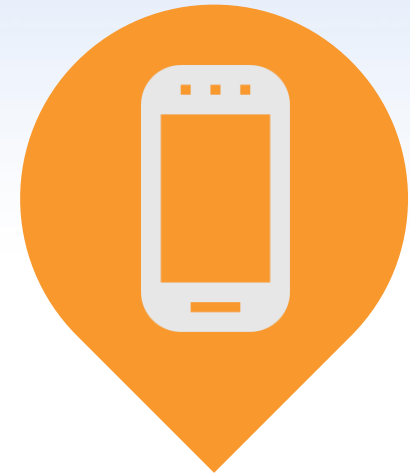
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3

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About Tim



**SQL Cruise: Learn. Relax. Network.
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Agenda

Today's Lesson Plan and Class Experiments include...

- An (extremely) Brief History of DMOs
- A Tour of the Periodic Table of DMOs
- Resource Consumption Demo-pallosa
- All-Together Now: Baselines, Persisting Metadata, and Reporting

In the beginning

but we consider that to be SQL 2005

Like Dynamic Management Objects... but Not Dynamic Management Objects

INFORMATION_SCHEMA Views

ANSI Compliant

Structure-based

Where are the performance metrics?

Compatibility Views (aka *System Tables*)

Welcome to the Year 2000. It's Bieber-free, there are still 3 Bee Gees, and Tom Hanks was still stranded on a beach with a volleyball. Nobody hungered for games. Harry Potter just met the prisoner of Azkaban and *Friends* was still a TV show.

Catalog Views

Closest thing to Dynamic Management Objects

Modeled after the SQL 2000 System Tables...but not your older brother's System Tables!

Dynamic Management Objects

Modular

Structured to tell a story

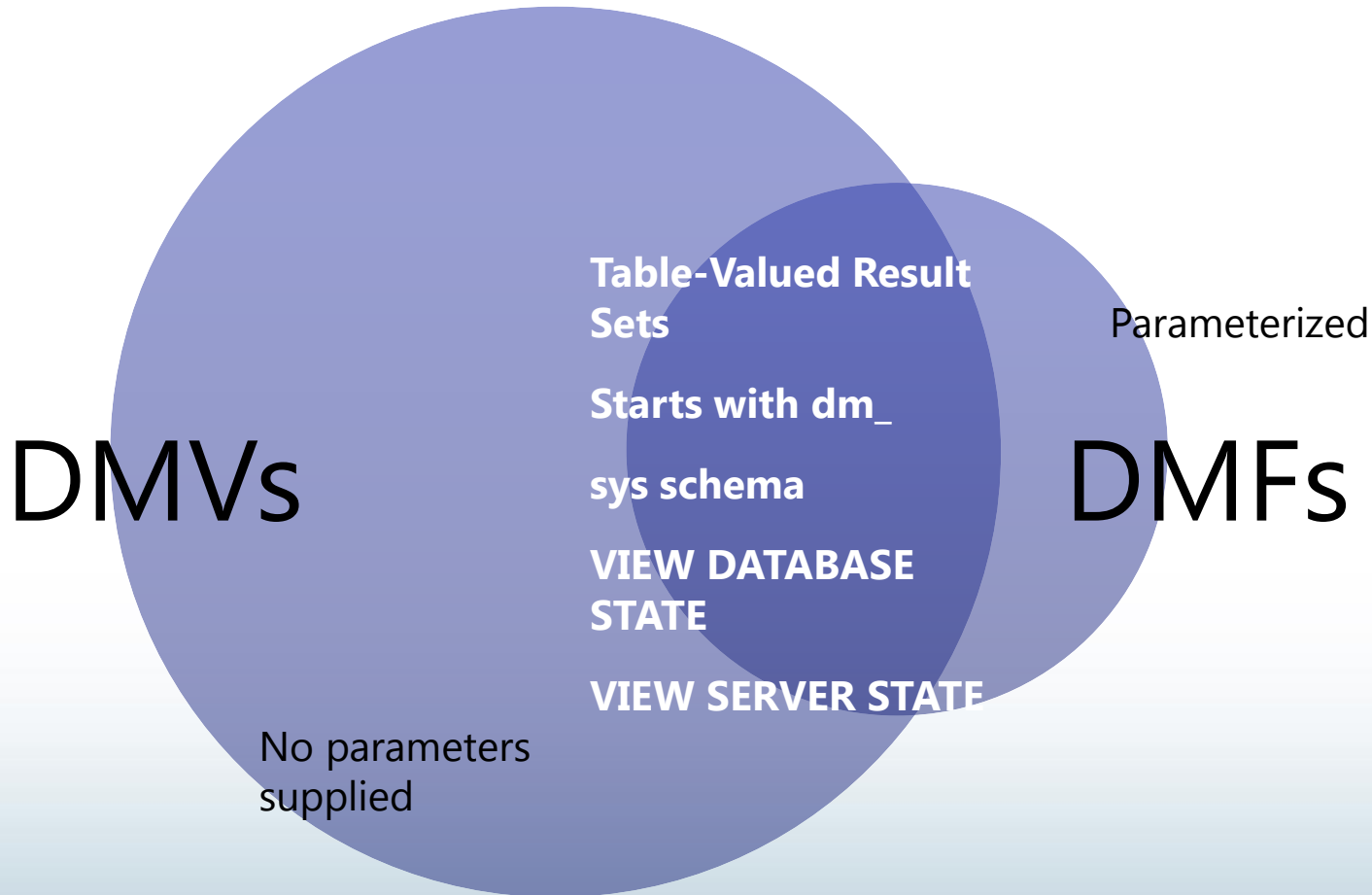
Flexible

Easily joinable to other DMOs, Compatibility Views, Catalog Views and system functions

Understandable

Naming conventions do away with the jargon and ACRONYMS

Dynamic Management Views v. Functions



Dynamic Management Objects

23 out of 36 New DMOs associated with High Availability

All twelve Availability Group DMVs

Two new clustering DMVs

Nine are associated with the logging structure underlying much of the High Availability architectures.

Increased Focus on Object and Server Metadata

Page, File and Log Allocation/Usage DMOs

Coupled with added DMOs for Server metadata in SQL 2008R2



Dynamic Management Object Classification Key

The user and internal activity that has or is occurring on the instance and the associated query engine and procedure cache information that results from the activity.

<p>Broken down into three subclasses (Physical, Usage, and Missing Indexes) these DMOs provide insight into how indexes are structured, used, or recommended for creation.</p>	<p>Performance DMOs</p> <p>PRF</p> <p>(dark green)</p>	<p>While many DMOs address performance, unlike <code>INFORMATION_SCHEMA</code> views, these six are vital for providing metrics for IO, performance counters, and Wait Stats metadata.</p>
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Tied closely to performance, hence the same shade of colors, Monitoring DMOs encompass CDC, Extended Events, Auditing, Service Broker, and Resource Governor

These involve SQL constructs that are on the fringe of SQL: Full-Text Search, CLR, Filestream, and File Table are all covered here.

High Availability architectures get a lot of attention in SQL Server 2012. Most of the new DMOs are related to Availability Groups. Mirroring, Log Shipping, and replication all get attention.

Thick line = division between classes

Dynamic Management Function

SUBCLASS

- +2012 (fx)
- _2012

Symbol

- +2008 = Appears 1st in 2008
- +R2 = Appears 1st in 2008R2
- +2012 = Appears 1st in 2012
- +2008 = Removed in 2008
- +R2 = Removed in 2008R2
- +2012 = Removed in 2012

Dynamic Management
Object Name

Narrow solid line = division between sub-classes.
Narrow dashed line = division within a sub-class.

SQLOS-MEMORY	+2008 M os_sys_memory	BD os_buffer_descriptors	+2008 PM os_process_memory	mO os_memory_objects	+2008 mN os_memory_nodes
	mCE os_memory_cache_entries	mCH os_memory_cache_clock_hands	+2008 mNS os_memory_node_access_stats	+2008 mB os_memory_brokers	mCC os_memory_cache_counters
	mHT os_memory_cache_hash_tables	VAD os_virtual_address_dump	mA os_memory_allocations	+2012 mBC os_memory_broker_clerks	mP os_memory_pools
				mC os_memory_clerks	

The Memory DMOS

buffer... cache... clerks.. oh my!



dm_exec_cached_plans

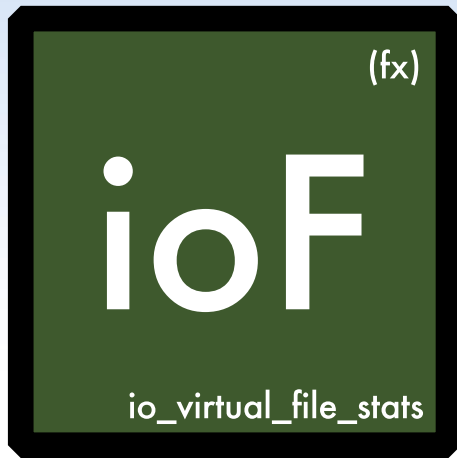


dm_os_sys_info

The Swiss Army Knife DMV

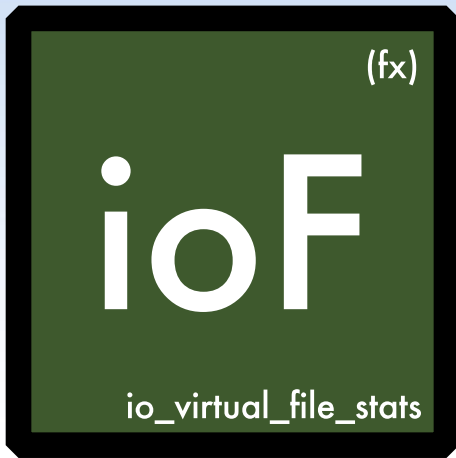
Changes Aren't Permanent, But Change Is

SQL SERVER 2005	SQL SERVER 2008	SQL SERVER 2008R2	SQL SERVER 2012
Column_name	Column_name	Column_name	Column_name
cpu_ticks	cpu_ticks	cpu_ticks	cpu_ticks
ms_ticks	ms_ticks	ms_ticks	ms_ticks
cpu_count	cpu_count	cpu_count	cpu_count
cpu_ticks_in_ms			
hyperthread_ratio	hyperthread_ratio	hyperthread_ratio	hyperthread_ratio
physical_memory_in_bytes	physical_memory_in_bytes	physical_memory_in_bytes	physical_memory_kb
virtual_memory_in_bytes	virtual_memory_in_bytes	virtual_memory_in_bytes	virtual_memory_kb
bpool_committed	bpool_committed	bpool_committed	committed_kb
bpool_commit_target	bpool_commit_target	bpool_commit_target	committed_target_kb
bpool_visible	bpool_visible	bpool_visible	visible_target_kb
stack_size_in_bytes	stack_size_in_bytes	stack_size_in_bytes	stack_size_in_bytes
os_quantum	os_quantum	os_quantum	os_quantum
os_error_mode	os_error_mode	os_error_mode	os_error_mode
os_priority_class	os_priority_class	os_priority_class	os_priority_class
max_workers_count	max_workers_count	max_workers_count	max_workers_count
scheduler_count	scheduler_count	scheduler_count	scheduler_count
scheduler_total_count	scheduler_total_count	scheduler_total_count	scheduler_total_count
deadlock_monitor_serial_number	deadlock_monitor_serial_number	deadlock_monitor_serial_number	deadlock_monitor_serial_number
	sqlserver_start_time_ms_ticks	sqlserver_start_time_ms_ticks	sqlserver_start_time_ms_ticks
		sqlserver_start_time	sqlserver_start_time
		affinity_type	affinity_type
		affinity_type_desc	affinity_type_desc
		process_kernel_time_ms	process_kernel_time_ms
		process_user_time_ms	process_user_time_ms
		time_source	time_source
		time_source_desc	time_source_desc
		virtual_machine_type	virtual_machine_type
		virtual_machine_type_desc	virtual_machine_type_desc



IO

IO... it's off to work we go!

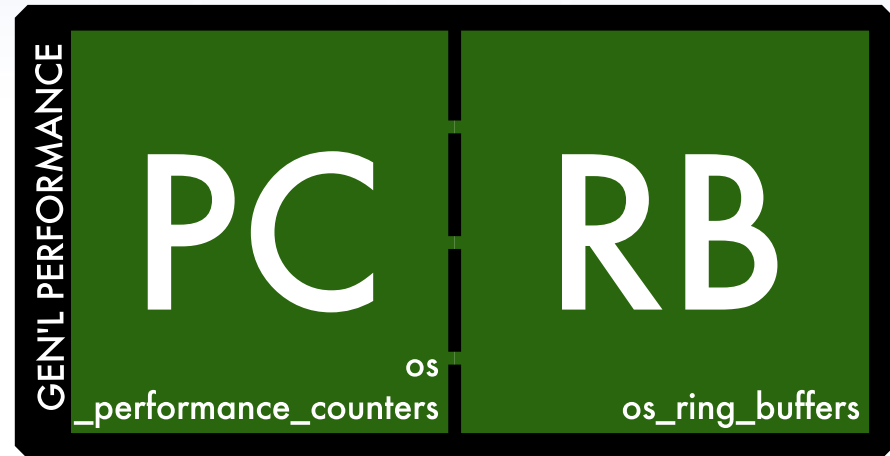


Base-lining IO::RAM

Just how (relatively) active is that
buffer pool?

General Performance DMVs

dm_os_performance_counters and dm_os_ring_buffers



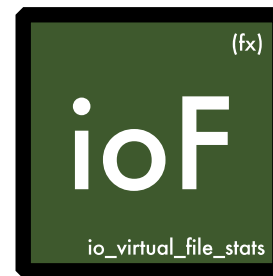
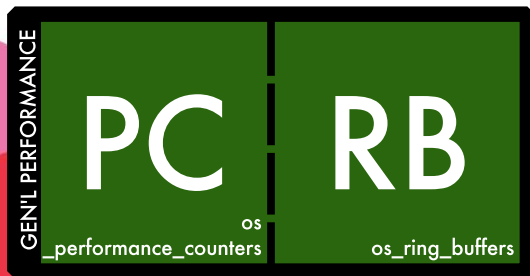
SQL Server Wait Stats

... that MEAN something!



Baseline Collection & Reporting

... if you don't save it, it don't mean a thing



Take-Aways

If you only remember **three** things...

... then remember these

four:

- Wait Stats: What have you done for me lately?
- Baseline: consistency, note the differences, trend graphically
- Persist the DMO metadata, but keep it trimmed.
- Dazzle your superiors and customers with Reporting Services

Downloads

thesqlagentman.com/presentationfiles/

Q & A

No Dumb Questions, Hopefully No
Dumb Answers Either.



Thank you

for attending this session and the
2013 PASS Summit in Charlotte, NC