Revealing Hidden Performance Issues with Extended Events

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Host redgate

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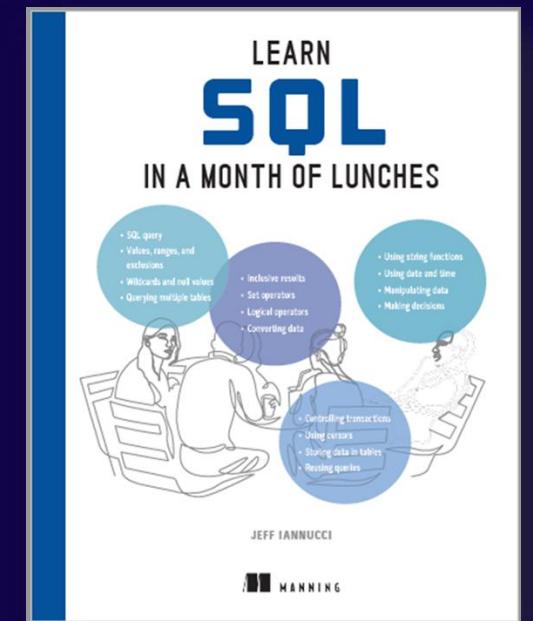
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Hidden Pathways to Achieving Peak SQL Server Performance

- Revealing Hidden Performance Issues with Extended Events (Jeff Iannucci)

- Maximizing SQL Server Performance with Read Committed Snapshot Isolation (Haripriya Naidu)

- Optimized Locking: Improving SQL Server Transaction Concurrency (Deborah Melkin)

- Mitigating Your Data Bloat with Partitioning & Data Virtualization (Andy Yun)

- Deep Dive into Memory Optimized TempDB (Haripriya Naidu)

XML

Select Events To Capture

Introduction

Set Session Properties

Choose Template

Select Events To Capture

Capture Global Fields

Set Session Event Filters

Specify Session Data Storage

Summary

Create Event Session

Select the events you want to capture from the event library.

Event library:

Search Events	in	Event names only

| Name	Category	Channel	Package
query_plan_profile	execution	Analytic	sqlserver
query_post_compilation_showplan	execution	Analytic	sqlserver
query_post_execution_plan_profile	execution	Analytic	sqlserver
query_post_execution_showplan	execution	Analytic	sqlserver
query_post_execution_stats	execution	Analytic	sqlserver
query_pre_execution_showplan	execution	Analytic	sqlserver
query_store_async_queue_diagnostics	query_store	Operational	qds
query_store_auto_enable_failure	query_store	Operational	qds
query_store_auto_enable_on_create	query_store	Operational	qds
query_store_background_cleanup_task_failed	query_store	Operational	qds
query_store_background_task_abort_stats	query_store	Operational	qds
query_store_background_task_creation_failed	query_store	Operational	qds
query_store_background_task_initialization_failed	query_store	Operational	qds
query_store_background_task_persist_failed	query_store	Operational	qds
query_store_background_task_persist_finished	query_store	Operational	qds

query_parameterization_data

Fired on compile for every query relevant for determining if forced parameterization would be useful for this database.
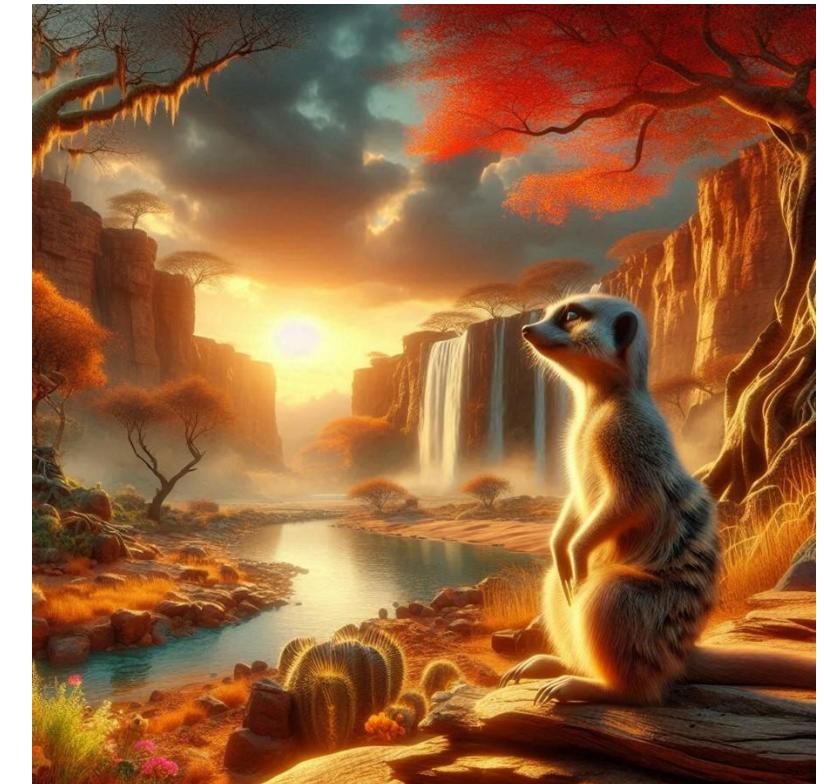
Event Fields	Description
cached_plan_size	Cached plan size (KB).
compile_code	Compile code desciribin...
compile_cpu_time	Query compile cpu time.
compile_duration	Query compile elapsed ...
compile_memory	Memory (KB) used durin...
database_id	ID of the database
has_external_extraction	Indicates whether this s...
has_literals	Indicates whether quer...
is_cached	Indicates whether this s...
is_parameterizable	Indicates whether quer...
is_query_variant	Indicates whether this s...
is_recompiled	Indicates whether this s...
mgf_persistence_used_...	Indicates status of appl...
parameterized_values_...	Number of parameters i...
query_hash	Query hash, which repr...

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What is an Extended Event?

"A SQL Server Extended Event is a lightweight performance monitoring system that allows users to collect and analyze detailed information about database engine events."

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Goals

🔍 Which new Events find performance issues

🔍 Which new Events aren't as helpful

🔍 What painless ways we can view Event info

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Parts of an Extended Event

EVENT

What are we watching for?

ACTION

What information do you want?

TARGET

Where do you want the info?

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Permissions to create an Extended Event

SQL Server **2008** and **2008 R2**:
CONTROL SERVER
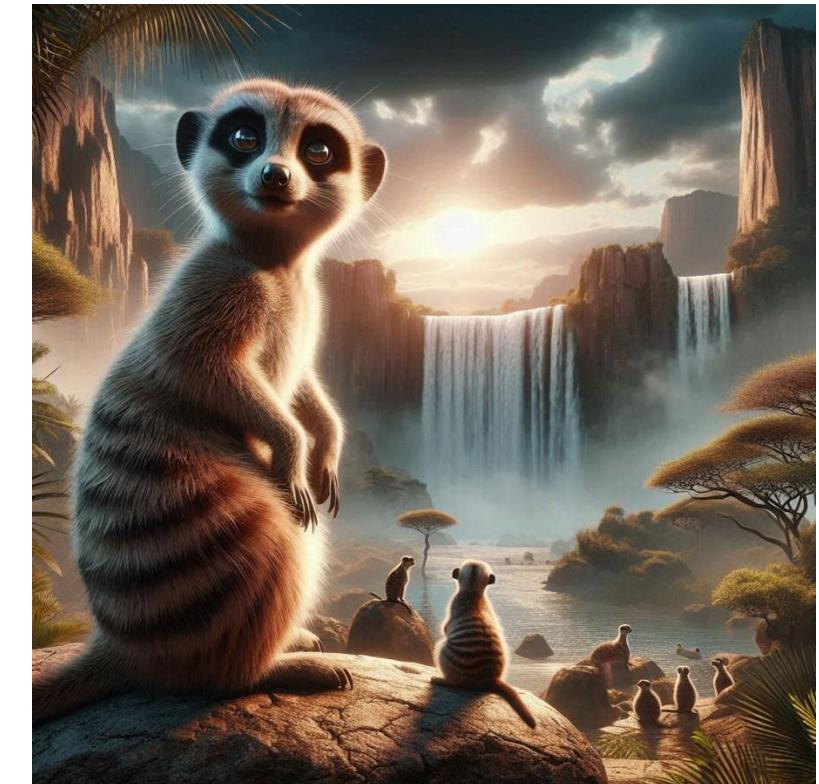
SQL Server **2012** to **2019**:
ALTER ANY EVENT SESSION

SQL Server **2022** and higher:
CREATE/DROP ANY EVENT SESSION

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Permissions to view an Extended Event

SQL Server **2008** to **2019**:

VIEW SERVER STATE

SQL Server **2022** and higher:

VIEW SERVER PERFORMANCE STATE

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What's new with Extended Events?

Query antipatterns
query_antipattern
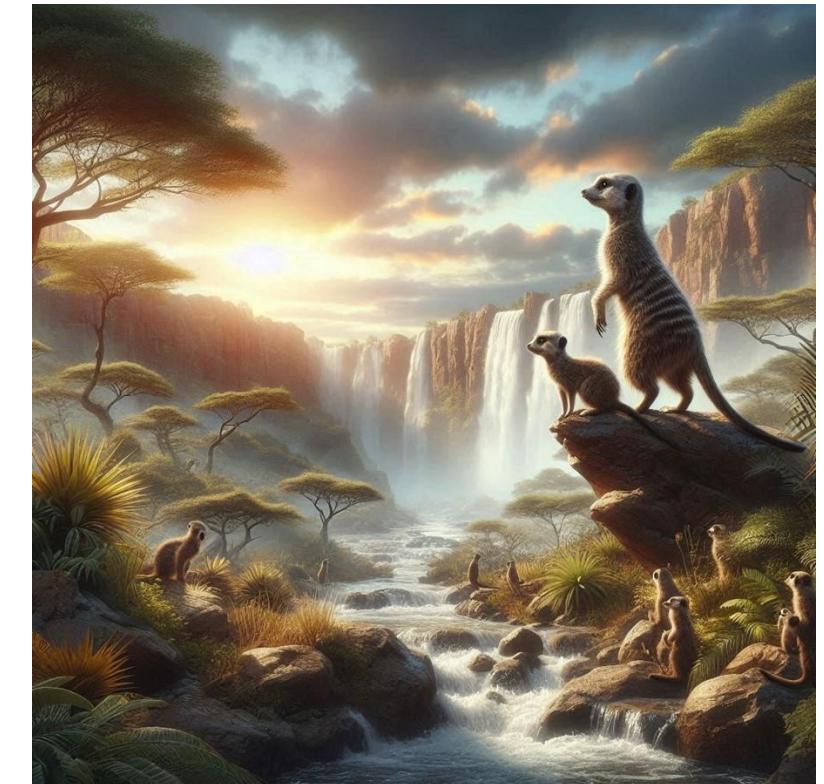
Aborted queries
query_abort

Spills to tempdb
spills_to_tempdb

Measuring extended event overhead

(sys.dm_xe_session_events)

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DEMO TIME!

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The basics

Long-running queries
sql_statement_completed

Blocking
blocked_process_report
(sp_HumanEventsBlockViewer)

Deadlocks
lock_deadlock
(system_health XE)
(sp_BlitzLock)

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Failed and aborted queries

Failed queries
error_reported

Aborted queries
query_abort

Aborted queries – old school
sql_batch_completed
rpc_completed
sp_statement_completed

Antipatterns (well, some...)

Type Convert Preventing Seek
        query_antipattern (...mostly...)

Large Number of OR in Predicate
        query_antipattern (...sort of...)
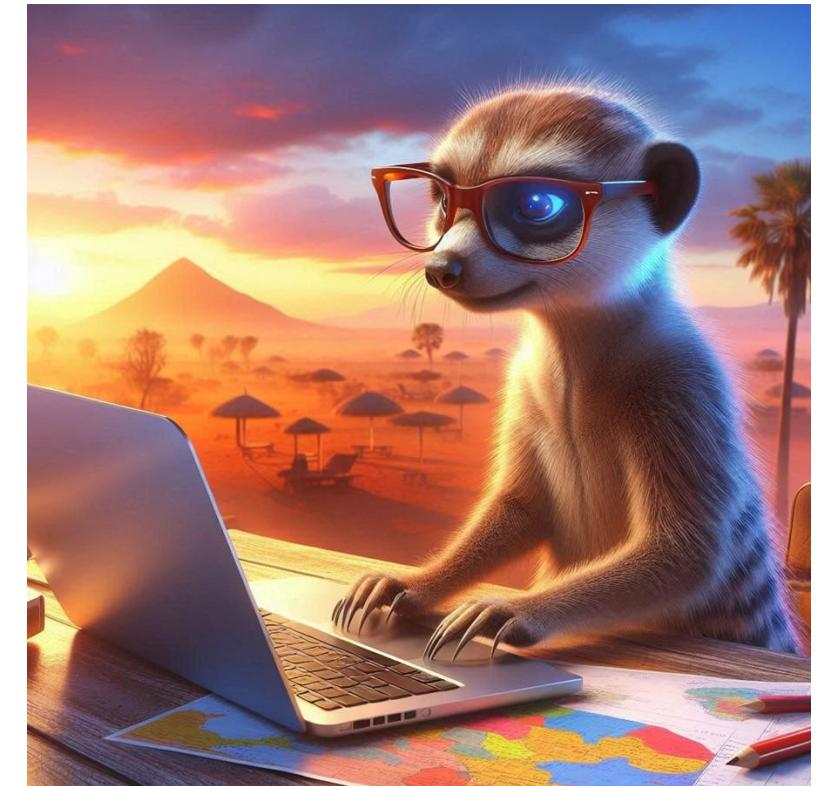
Large IN clause
        ¯_(ツ)_/¯

Non-optimal use of OR
        ¯_(ツ)_/¯

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Monitoring tempdb

Growth
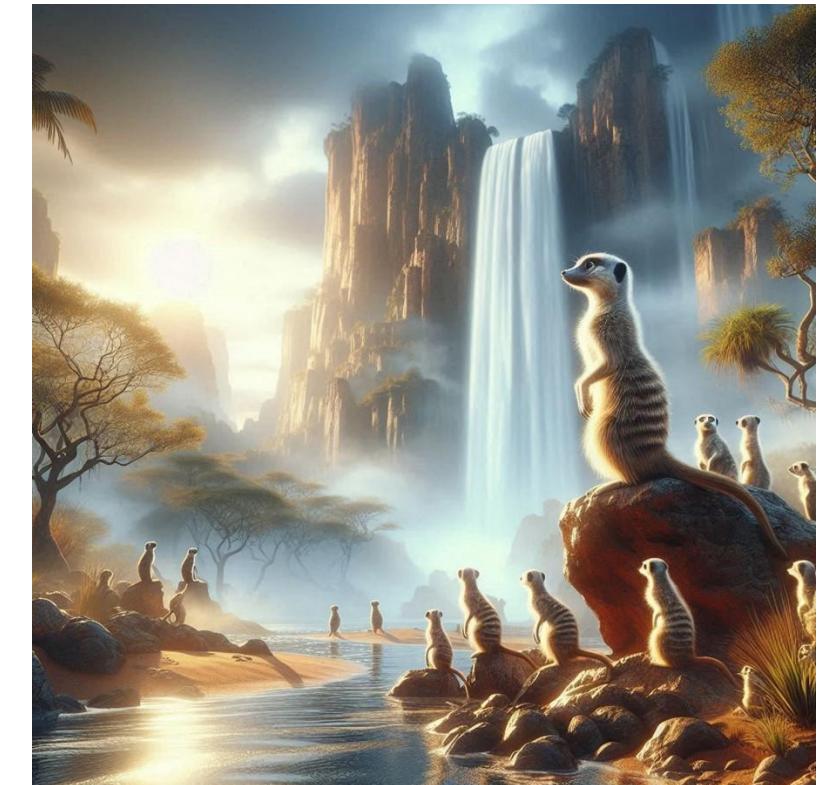
database_file_size_change

database_log_file_used_size_change

Spills

spills_to_tempdb (…maybe…)

sql_statement_completed

Measuring extended events

Impact

Trace flag 9708

sys.dm_xe_session_events

BONUS!

sp_HumanEvents
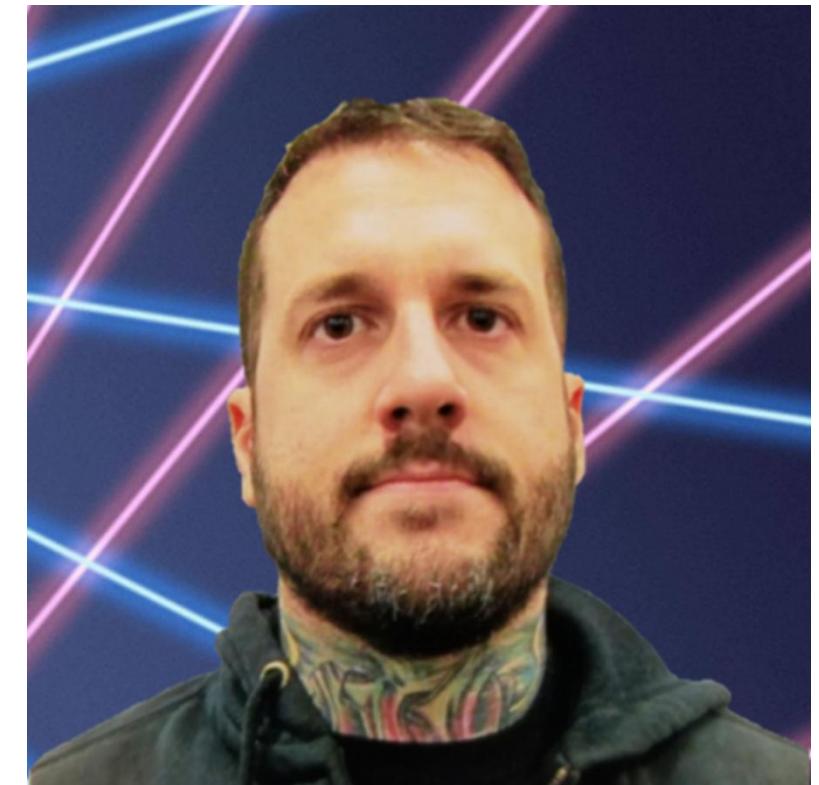
Blocking

Query performance

Compiles

Recompiles

Wait statistics

https://erikdarling.com/sp_humanevents/

ANOTHER BONUS!!

XE Smart Target

Uses XE streaming API to connect

Allows for responses:

- Write to CSV file
- Email
- Execute T-SQL
- Replay
- Write to a table

https://github.com/spaghettidba/XESmartTarget

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MOAR BONUS!!!

dbatools.io

Get-DbaXESession

Read-Dba-XEFile

Get-DbaXESmartTarget

...and 25 more cmdlets!

https://dbatools.io/commands/#Traces

WARNING!

Please do not start all the ~~meerkats~~ extended events at the same time.

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Thank you

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