Revealing Hidden Performance Issues with Extended Events

Jeff Iannucci

Download all slides and scripts

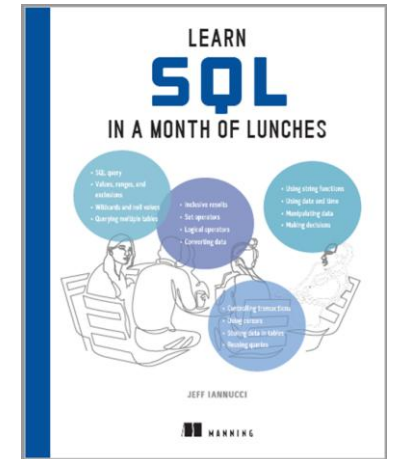
https://github.com/desertdba/Presentations

Who in the world is Jeff Iannucci?

Consultant at Straight Path Solutions

Content Author at Pluralsight

Author of "Learn SQL in a Month of Lunches"

XE

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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.
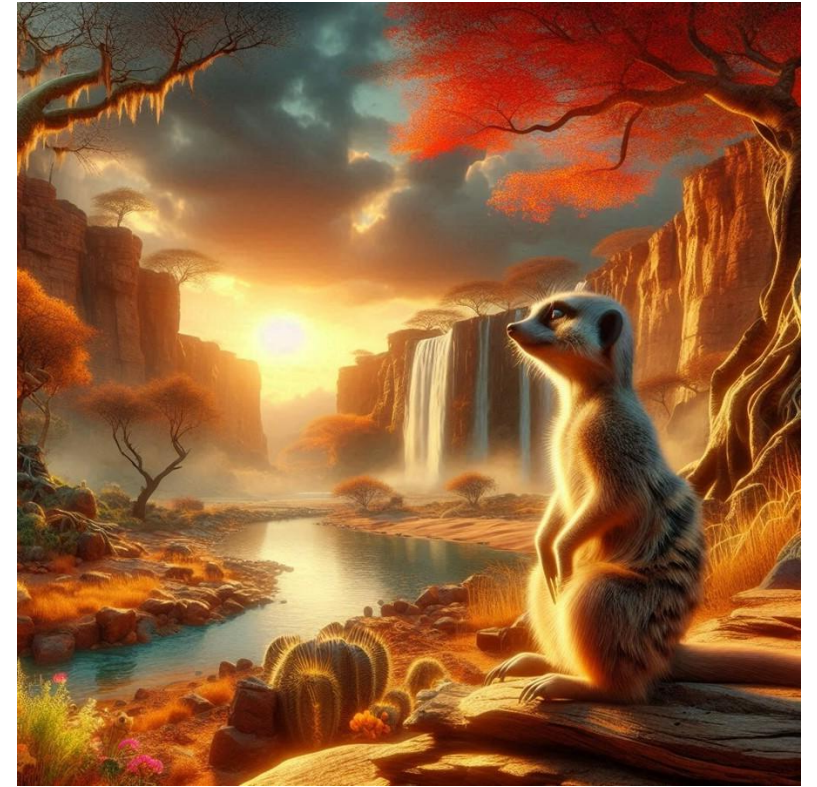
Event Fields	Description
cached_plan_size	Cached plan size (KB).
compile_code	Compile code describin...
compile_cpu_time	Query compile cpu time.
compile_duration	Query compile elapsed ...
compile_memory	Memory (KB) used durin...
database_id	ID of the database
has_external_extraction	Indicates whether 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."

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!

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
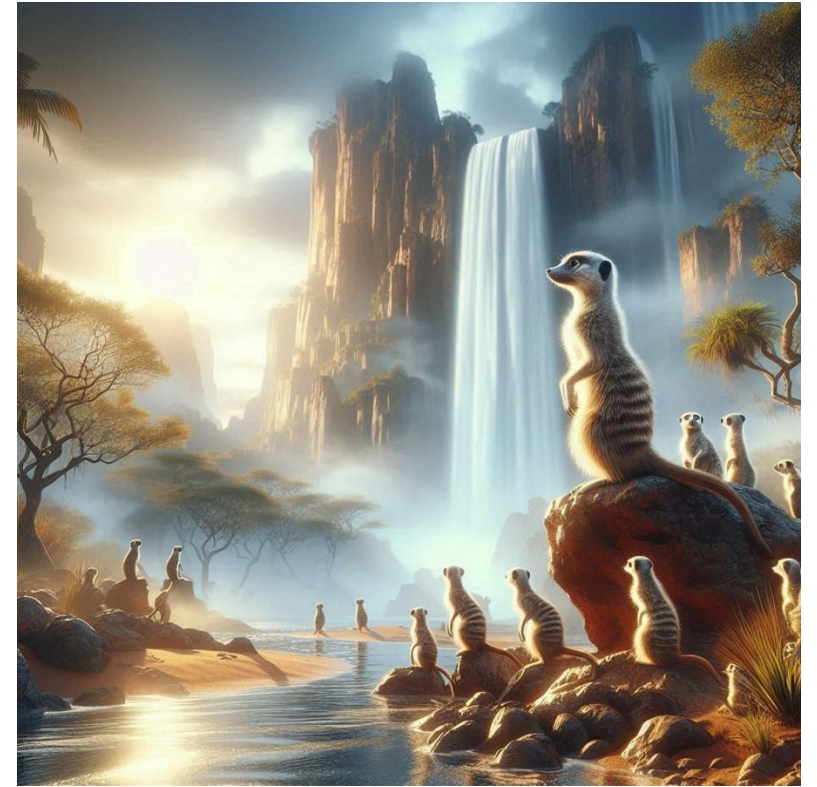   ¯_(ツ)_/¯

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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

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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

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.

Thank you!!

https://github.com/desertdba/Presentations

www.linkedin.com/in/jeff-iannucci

jeff@desertdba.com

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