

# Everyday Extended Events



SQL  
*intersection*

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# Reminder: Intersect with Speakers and Attendees

- **Tweet tips and tricks that you learn and follow tweets posted by your peers!**
  - Follow: #SQLIntersection and/or #DEVIntersection
- **Join us – Thursday Evening – for SQLafterDark**
  - Doors open at 7:30 pm
  - Trivia game starts at 8:00 pm
    - Winning team receives something fun!*
  - Raffle at the end of the night
    - Lots of great items to win including a seat in a SQLskills Immersion Event!*
  - The first round of drinks is sponsored by SQL Sentry and SQLskills

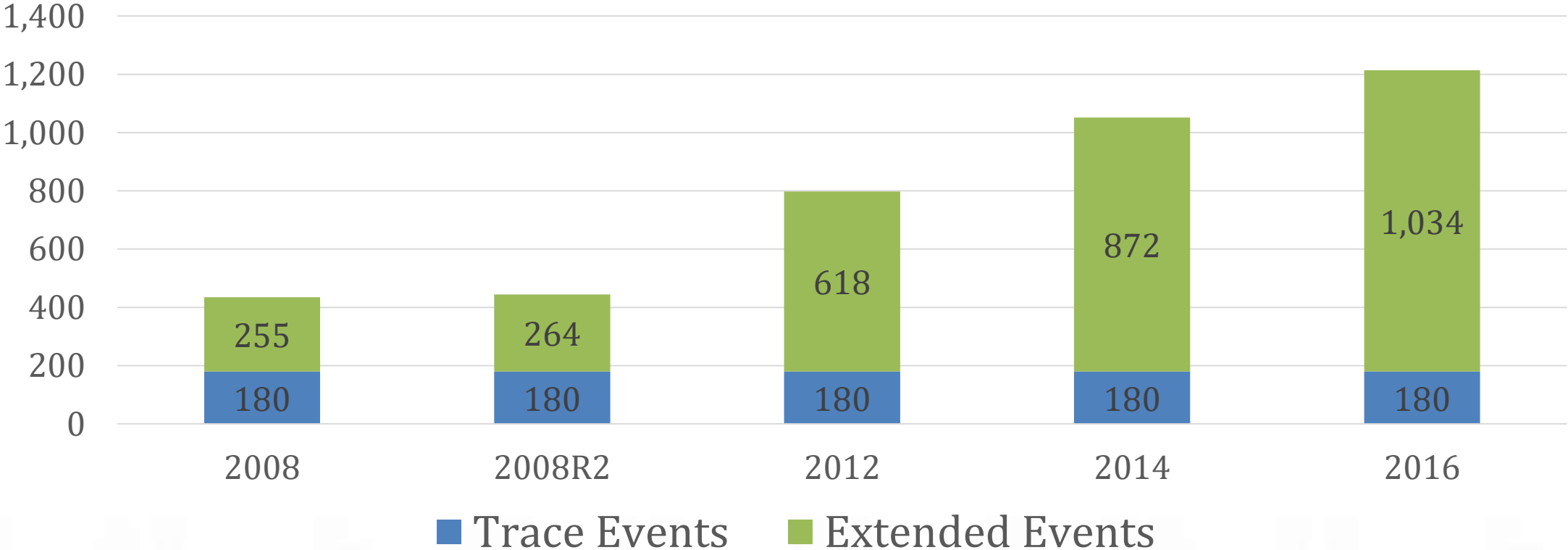


# Overview of Extended Events

# Events

- **A single *thing* or *happening* that occurs**
- **Examples:**
  - file\_read\_completed
  - file\_write\_completed
  - sql\_statement\_starting
  - sql\_statement\_completed
  - degree\_of\_parallelism
  - page\_compression\_attempt\_failed

# Number of Events



# Fields

- **Information about the event**

- **Event**

- database\_id
    - file\_id
    - duration
    - size

- **Global**

- client\_hostname
    - query\_plan\_hash
    - session\_id
    - sql\_text

# Predicates

- **The WHERE clause**
- **Set on Event or Global field**
- **Common equality operators such as =, >, <**
- **Some that use state of the operator**
  - `greater_than_max_int64`
    - Maintains the maximum value of the field passed to it
    - Only fires when it encounters a value that is greater than the current maximum
    - Sets a new maximum
    - Repeat



# The power of Extended Events: Pre-processing



[http://blogs.msdn.com/b/extended\\_events/archive/2010/06/24/today-s-subject-predicates.aspx](http://blogs.msdn.com/b/extended_events/archive/2010/06/24/today-s-subject-predicates.aspx)

# Measuring “Observer Overhead” of SQL Trace vs. Extended Events

Test	Avg Requests/sec	BatchDuration h:mm:ss
Baseline	2345	00:13:35
Trace file	1920	00:16:40
Profiler local	215	02:29:00
Profiler remote	260	02:03:20
Extended Events event_file	2102	00:15:15
Extended Events ring_buffer	2073	00:15:40
Extended Events streaming	1546	00:16:35

<http://sqlperformance.com/2012/10/sql-trace/observer-overhead-trace-extended-events>

# Targets

- Where do you want to save data?

Target	Memory	File	OS		Sync	Async
Event Counter	x				X	
Event File		X				X
Event Pairing	x					X
ETW			X		X	
Histogram	x					X
Ring buffer	x					x

# Sessions

- Add all this together, you have a session
- View currently *running* sessions with `sys.dm_xe_sessions`

# Creating sessions

- Use “New Session...” (not the Wizard)
- Script to T-SQL so you understand the format

# Viewing output

- **Use the UI!**
- **Grouping & aggregation**
- **Filtering**
- **Save view**
  
- **...or learn and use XQuery**

# Built-in sessions

## ■ **system\_health**

- ❑ Error severity  $\geq 20$
- ❑ Memory errors
- ❑ Non-yielding scheduler errors
- ❑ Deadlocks
- ❑ Latch waits  $> 15$  seconds
- ❑ Lock waits  $> 30$  seconds
- ❑ Long preemptive waits
- ❑ CLR allocation & virtual allocation failures
- ❑ ...and more

## ■ **AlwaysOn\_health**

- ❑ availability\_replica\_state\_change
- ❑ availability\_group\_lease\_expired
- ❑ availability\_replica\_automatic\_failover\_validation
- ❑ error\_reported (multiple error numbers): for transport or connection issues
- ❑ data\_movement\_suspend\_resume
- ❑ alwayson\_ddl\_executed
- ❑ availability\_replica\_manager\_state
- ❑ error\_reported (1480): Database Replica Role Change

# My Top Sessions



# Capture queries and resources

- **Purpose: capture query activity**
- **Show:**
  - UI
    - Aggregation
  - Filter
  - Targets:
    - Ring buffer
    - Event File

# Capture stored procedure parameters

- **Purpose:** capture what parameters were used when a stored procedure was executed
- **Show:**
  - UI – parameters

# Track I/O for database files

- **Show:**
  - Targets
    - Event Counter
    - Histogram
      - Event: file\_read\_completed
      - Base buckets on: Field file\_id

# Capture index page splits for detecting fragmentation

- **Show:**
  - Target
    - Event File
    - Querying to get more info

# 15 Second I/O Errors

- **Alert + Job + Session**

- Alert on error 833
- Job to start XE session
- Session to capture query for reads > 15 seconds and writes > 15 seconds

# Capture deadlock graphs

- **View Target Data**
  - The Deadlock tab is sneaky!

# Help the Community

# A GitHub Repository

- [github.com/grrlgeek/extended-events](https://github.com/grrlgeek/extended-events)



# Questions?

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[@grrl\\_geek](#)

[blogs.lessthandot.com](http://blogs.lessthandot.com)

[concurrency.com/blog](http://concurrency.com/blog)



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Don't forget to complete an online evaluation!

## **Everyday Extended Events**

Your evaluation helps organizers build better conferences  
and helps speakers improve their sessions.

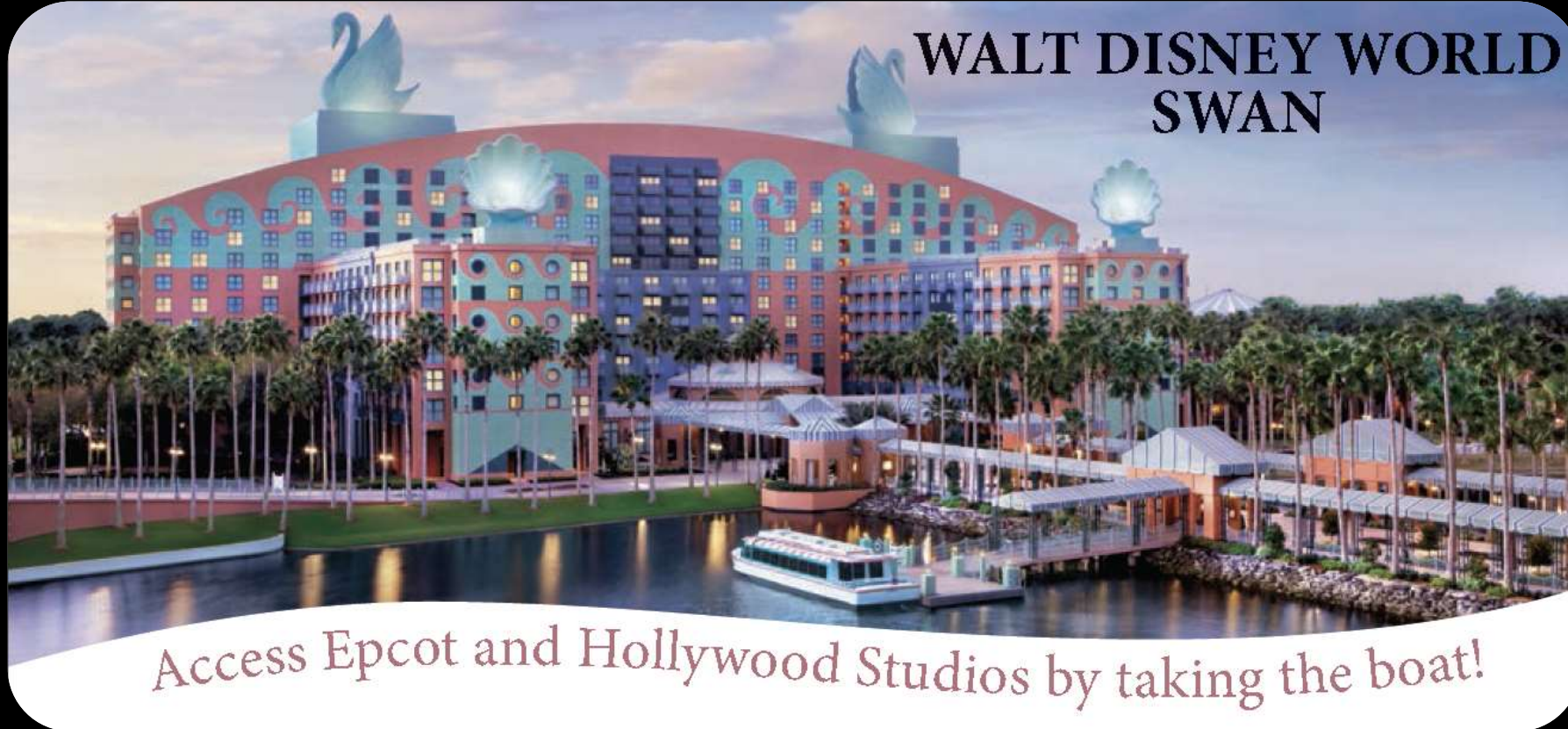


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**Thank you!**

# Save the Date!

[www.SQLintersection.com](http://www.SQLintersection.com)



# 2017

## May 21-24

*We're back in Orlando!*



*Leave the every day behind and enter a world of wonder and enchantment at the Walt Disney World® Resort. Located in the heart of the most magical place on earth, the Walt Disney World Swan and Dolphin Resort provides a truly extraordinary backdrop for our event! Beautiful tropical landscaping, tranquil waterways and classic art and architecture work together to create a stunning landmark!*