DAMMIT JIM!
DR MCCOY'S FIELD GUIDE TO SYSTEM_HEALTH (AND THE DEFAULT TRACE)

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SHE'S DEAD, JIM
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I'VE LOOKED AT THE CURRENT SYSTEM STATE
memegenerator.net


WE DON'T TRACK THAT


DAMMIT JIM! I'M A DBA, NOT A PSYCHIC!
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CHAPTER 1: THE DEFAULT TRACE

WHAT IS THE DEFAULT TRACE?

- First introduced in SQL Server 2005
- Server-side trace
- Event classes
  - Database
  - Errors and Warnings
  - Full-Text
  - Objects
  - Security Audit
  - Server
- Can be disabled (but not deleted)

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MINING THE DEFAULT TRACE

- SQL Server Profiler
- T-SQL
  - sys.fn_trace_gettable
  - sys.trace_events

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SO LET'S JUST KEEP USING THIS...

- Relatively high overhead
- Low-level of detail per event
- Limited number of events
- Based on deprecated method (trace)

- It is still useful... *for now*

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CHAPTER 2: SYSTEM_HEALTH

WHAT IS SYSTEM_HEALTH?

- First introduced in SQL 2008
- Uses Extended Events
- Lower resource utilization
- Much more comprehensive
- Events captured in ring buffer
- Lost on system shutdown

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"A TRUE BLACK BOX"

- Significantly improved in SQL 2012
- More events
- Subset of events persisted to .xel files
- AlwaysOn_health added

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ALWAYSON_HEALTH

- XEvents session for AlwaysOn Availability Groups
- Subset of AG XEvents
- Created with first availability group
- Automatically started on all replicas

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WHAT INFORMATION DOES SYSTEM_HEALTH CONTAIN?

- sp_server_diagnostics
- Selected errors
- Ring buffer events

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SP_SERVER_DIAGNOSTICS

- Special process
  - Internal, preemptive, high-priority thread
  - Reserved memory
  - No locking, synchronization conflicts
- Runs every 5 seconds by default
- Captures data using XEvents
  - System
  - Resource
  - Query Processing
  - I/O
  - Events

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ERRORS

- Errors with severity 20+
- Memory-related errors
- Non-yielding scheduler
- Deadlocks
- Latch waits > 15 sec
- Lock waits > 30 sec
- Preemptive waits (external API)
- CLR allocation failures

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ERRORS

- Most error events include:
  - Callstack
  - SQL text
  - Session ID
  - More details

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RING BUFFER EVENTS

- Memory broker
- Scheduler monitor
- Memory node OOM
- Security
- Connectivity

I haven't found documentation on what any of these contain…

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THIS SOUNDS A LOT LIKE THE DEFAULT TRACE…

- Lower resource usage
- Many more events
- Much more detail per event
- Maintained short-term in ring buffer

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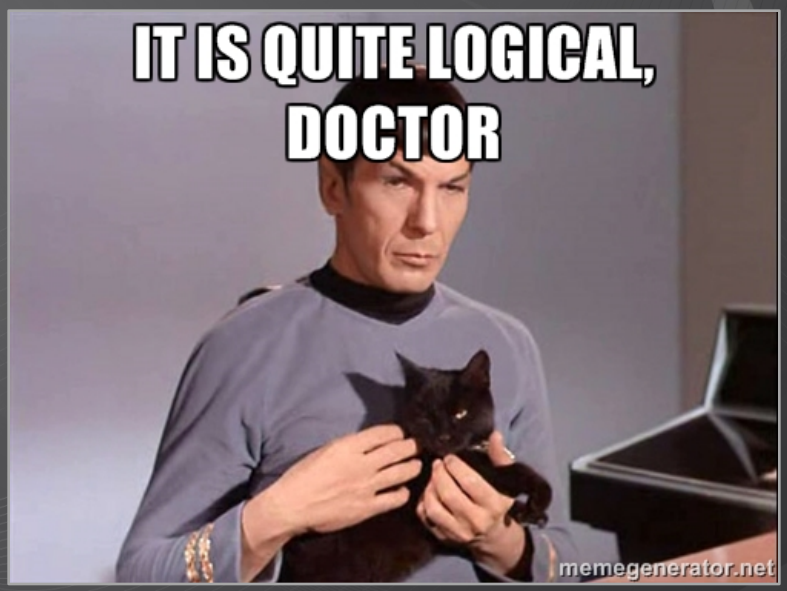
SOUNDS LIKE IT COULD WORK
HOW DO WE USE IT?
memegenerator.net


IT IS QUITE LOGICAL, DOCTOR
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MINING SYSTEM_HEALTH

- Data stored as binary XML

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MINING SYSTEM_HEALTH

- Data stored as binary XML
- … in the ring buffer
  - 4MB
  - Rolls over frequently

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MINING SYSTEM_HEALTH

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- Extract using XQuery

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MINING SYSTEM_HEALTH

- Data stored as binary XML
- … in the ring buffer
  - 4MB
  - Rolls over frequently
- Extract using XQuery
- Minimal documentation

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MINING SYSTEM_HEALTH

- Extended Events viewer
  - Not used for ring_buffer target
- T-SQL: sys.dm_xe_*
  - sys.dm_xe_sessions
  - sys.dm_xe_session_targets
  - sys.dm_xe_session_events

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UMMM… IT'S NOT THERE…

- system_health can be recreated
- Execute u_tables.sql in the install directory
  - C:\Program Files\Microsoft SQL Server\MSSQL*xx*.<*instanceid*>\MSSQL\Install
- Start session after recreating

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CHAPTER 3: IDEAS

CHAPTER 4: EPILOGUE

REVIEW

- Default trace: Good, but outdated
- system_health: Lower overhead, more complete
- Both are great troubleshooting tools

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RESOURCES

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QUESTIONS?

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THANK YOU FOR ATTENDING!

~ Please remember to fill out your comment cards ~