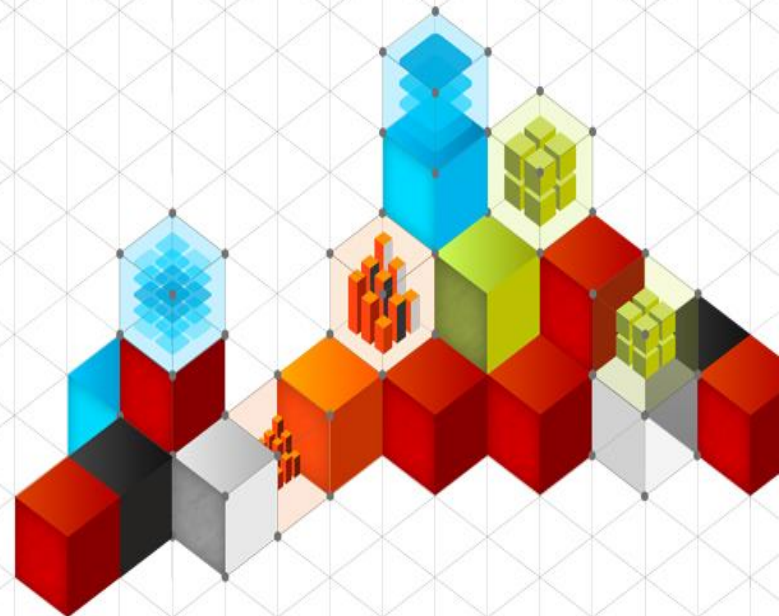


#445 | RALEIGH 2015

# NO MONEY FOR PERFORMANCE MONITORING TOOLS? NO PROBLEM!

**Patrick Keisler**

Senior Premier Field Engineer



# ABOUT THE SPEAKER

## Patrick Keisler

- Senior Premier Field Engineer
- Over 15 years of database experience
- Specialize in administration of high availability and disaster recovery environments

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**Microsoft**  
**CERTIFIED**

Solutions Expert

Data Platform

**Microsoft**

Specialist

Implementing Microsoft  
Azure Infrastructure  
Solutions

**Microsoft**  
**CERTIFIED**

IT Professional

Database Administrator 2008

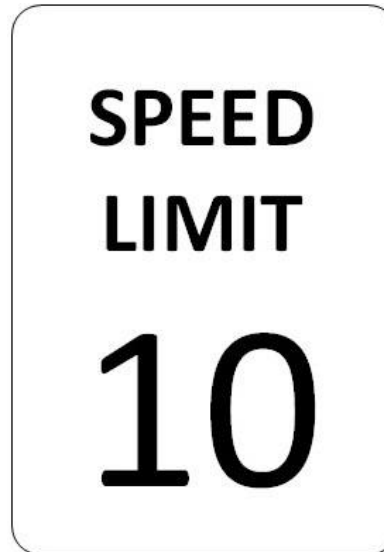
Database Developer 2008

# SESSION AGENDA

- Problem
- Solution

# PROBLEM

- You have SQL Servers
- Those servers have performance issues
- You have no money



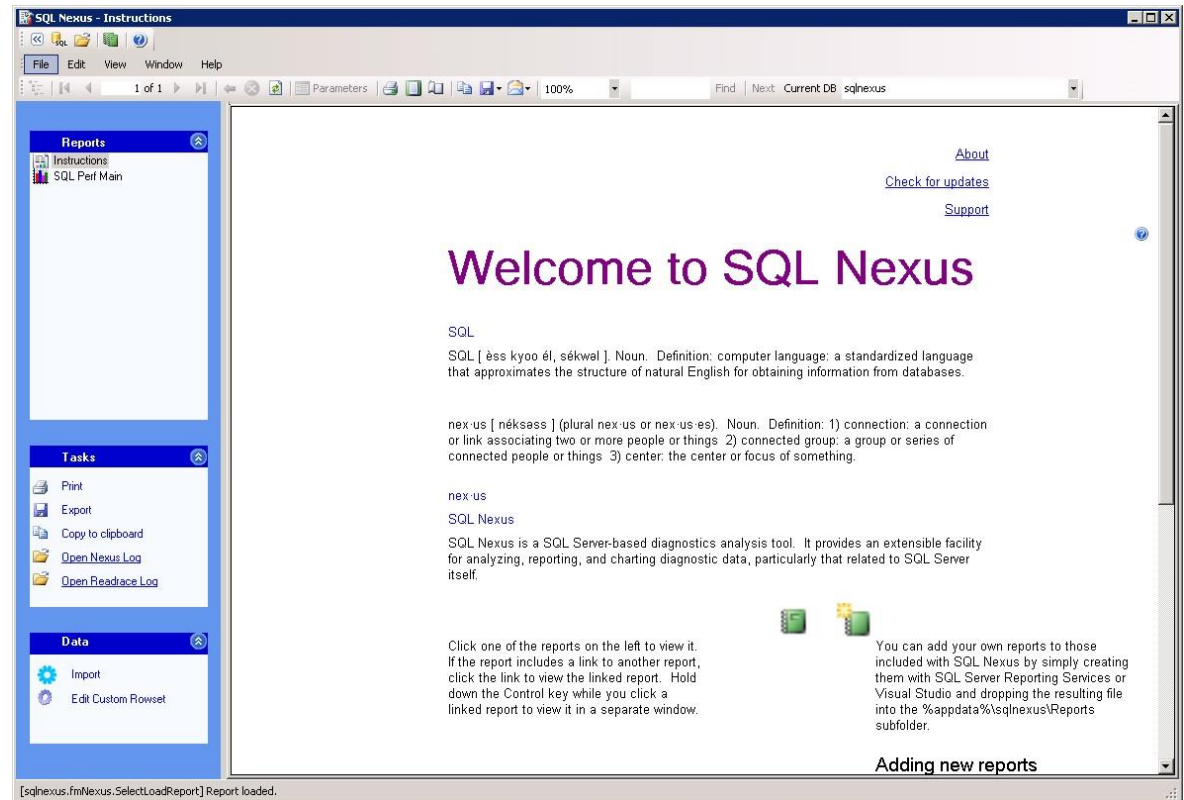
# SOLUTION

- Microsoft has free tools
  - SQLNexus
  - PSSDiag (SQLDiag)
  - PSSDiag Configuration Tool



# SQL NEXUS

- Collect data from your SQL Servers
- Analyze that data
- Report on that data
- SQL 2005 – 2014



# WHAT CAN SQL NEXUS COLLECT?

- Windows OS

- Windows Performance Monitor counters
- Windows event logs (system, application, and security logs)
- Windows configuration settings

- SQL Server

- SQL Server trace events
- SQL Server wait stats
- SQL Server blocking info
- SQL Server configuration settings
- SQL Server dump files

# SQL NEXUS INSTALLATION

- Not just a simple setup.exe
- Multiple components
  - .NET Framework 4.0
  - Microsoft Report Viewer 2010
  - Report Viewer Hotfix
  - RML Utilities
  - SQL Server to store the data
- Blog post to walk you through this  
<http://www.patrickkeisler.com/2015/03/sql-nexus-might-just-save-your-bacon.html>



# SQL NEXUS – COLLECTING DATA

- Uses pre-built CMD files to run the collection
- XML files for each CMD to store the collection configuration
- Separate ones for each version
- StartSQLDiagTrace2012.cmd
  - SQLDiagPerfStats\_Trace2012.XML
- StartSQLDiagDetailed\_Trace2012.cmd
  - SQLDiagPerfStats\_Detailed\_Trace2012.XML
- StartSQLDiagForReplay2012.cmd
  - SQLDiagReplay2012.XML

# SQL NEXUS – COLLECTING DATA

- Nothing to install on the monitored SQL Server
- But you do have to copy the collection files to the server
- Collector must be run locally on the server
- Default settings collect data from **all instances** on the server
- Verify the path to sqldiag.exe is correct in the XML file
- Run the CMD file to start the collector
- To stop it, press Ctrl+C



```
C:\>SQLDIAG
2015/02/21 15:12:47.09 SQLDIAG Output path: C:\Users\Administrator\Desktop\Relea
se4.0.0.64\DataCollectors\PerfStatsScript2012\SQLDiagOutput\
2015/02/21 15:12:47.20 SQLDIAG Collecting from 1 logical machine(s)
2015/02/21 15:12:47.22 SQLDIAG Invalid node fetched. <null>
2015/02/21 15:12:47.22 SQLDIAG Invalid node fetched. <null>
2015/02/21 15:12:47.22 ECH03\* SQL Server version: 11
2015/02/21 15:12:47.22 ECH03\* Machine name: ECH03 (this machine)
2015/02/21 15:12:47.22 ECH03\* Target machine is not a cluster
2015/02/21 15:12:47.23 ECH03\* Instance: SQL2012 (64-bit)
2015/02/21 15:12:47.23 ECH03\* Instance: TEST (64-bit)
2015/02/21 15:12:48.20 SQLDIAG Initialization starting...
2015/02/21 15:12:49.67 ECH03\* Starting Profiler trace
2015/02/21 15:12:49.84 ECH03\* Starting Blocking script
2015/02/21 15:12:50.20 ECH03\* SQL 2012 Perf Stats: SQL 2012 Perf Stats Script
2015/02/21 15:12:50.25 ECH03\* SQL 2012 Perf Stats: SQL 2012 Perf Stats Snapshot

2015/02/21 15:12:50.29 ECH03\* Adding Perfmon counters...
2015/02/21 15:12:53.37 ECH03\* Starting Perfmon
2015/02/21 15:12:53.37 SQLDIAG Initialization complete
2015/02/21 15:12:53.43 ECH03\* Perfmon started
2015/02/21 15:12:53.43 ECH03\* Collecting diagnostic data

2015/02/21 15:12:54.37 SQLDIAG Collection started. Press Ctrl+C to stop.
```

# SQL NEXUS – COLLECTING DATA

- Collector is customizable
- Can change:
  - Instances
  - Perfmon counters
  - Trace events
- Edit the XML file
  - Change enabled to either True or False

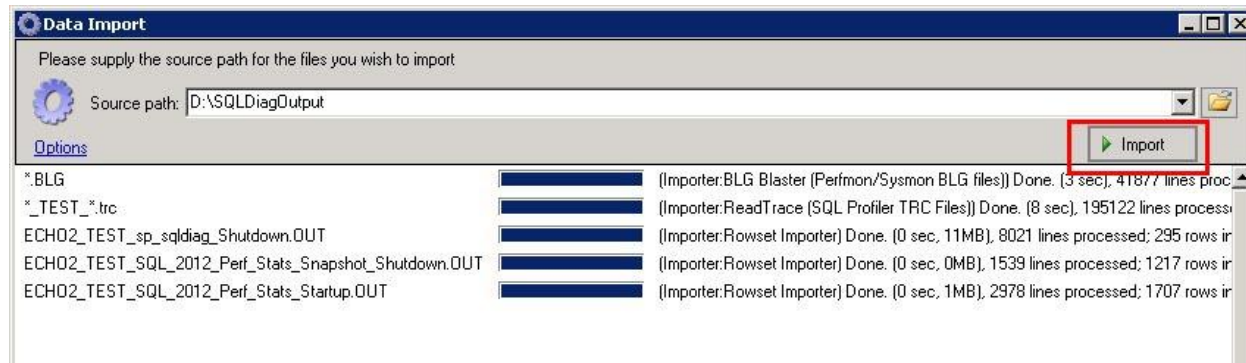
# SQL NEXUS – COLLECTING DATA

- SQL Nexus is NOT real-time monitoring
- Collector uses SQL TRACE
- Not as much overhead as a Profiler Trace
- Collect data for short periods of time
  - Identify a problem
  - Start the collector
  - Reproduce the problem
  - Stop the collector
- Info on the overhead of SQL Trace  
<https://msdn.microsoft.com/en-us/library/cc293614.aspx>



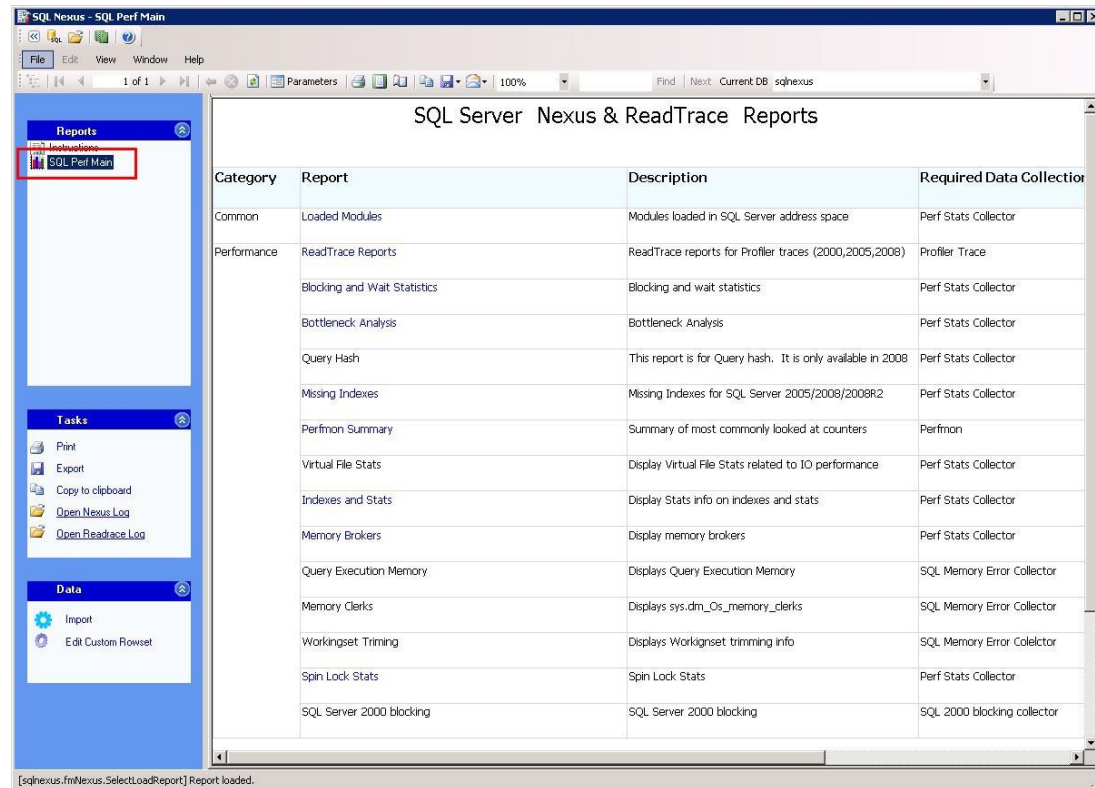
# SQL NEXUS – ANALYZING DATA

- Copy the SQLDiagOutput folder back to your workstation
- Run sqlnexus.exe
- Import the data
  - Could be slow, depending on the amount of data
  - Maybe even hours



# SQL NEXUS – ANALYZING DATA

- Click SQL Perf Main to view the reports
  - ReadTrace Reports
  - Perfmon Summary
  - Blocking & Wait Stats
  - Bottleneck Analysis
  - & many more



# SQL NEXUS – ANALYZING DATA

- **ReadTrace Report**
  - Used to analyze SQL Traces
  - Graphical view of resource utilization
  - Drill into TSQL batches sorted by
    - CPU
    - Reads
    - Writes
    - Duration
  - Analyze individual statements over time

# SQL NEXUS – ANALYZING DATA

- Bottleneck Analysis Report

- CPU utilization by SQL and everything else
- Wait stats during the collection

- More info on wait stats

<https://msdn.microsoft.com/en-us/library/ms179984.aspx>



# SQL NEXUS – ANALYZING DATA

- **Perform Summary Report**
  - Aggregates the perfmon counters
  - Broken out by CPU, IO, Memory, and Network
  - Drill into each one more detailed timeline

# SQL NEXUS – REPORTING

- Can change parameters on all reports
- Reports can be exported to:
  - Excel
  - PDF
- Reports include the graphs & charts
  - That's what management likes to see



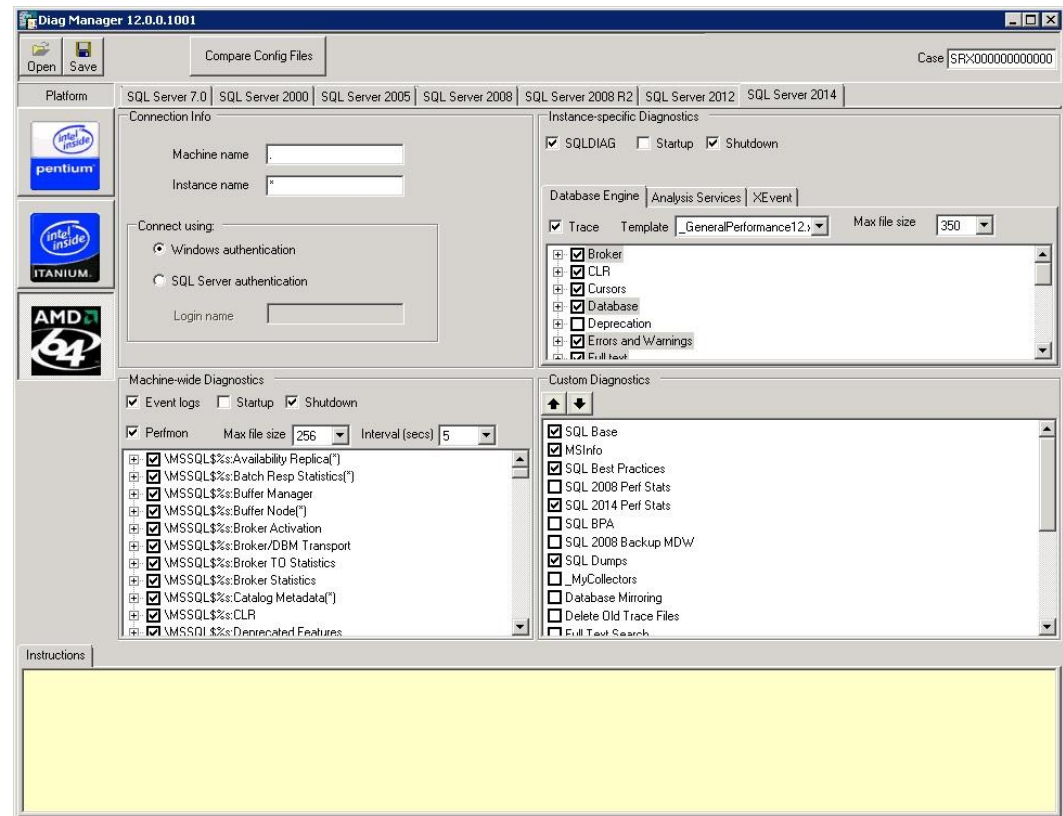
# SQL NEXUS – CUSTOMIZING THE COLLECTOR

- Must edit the XML file



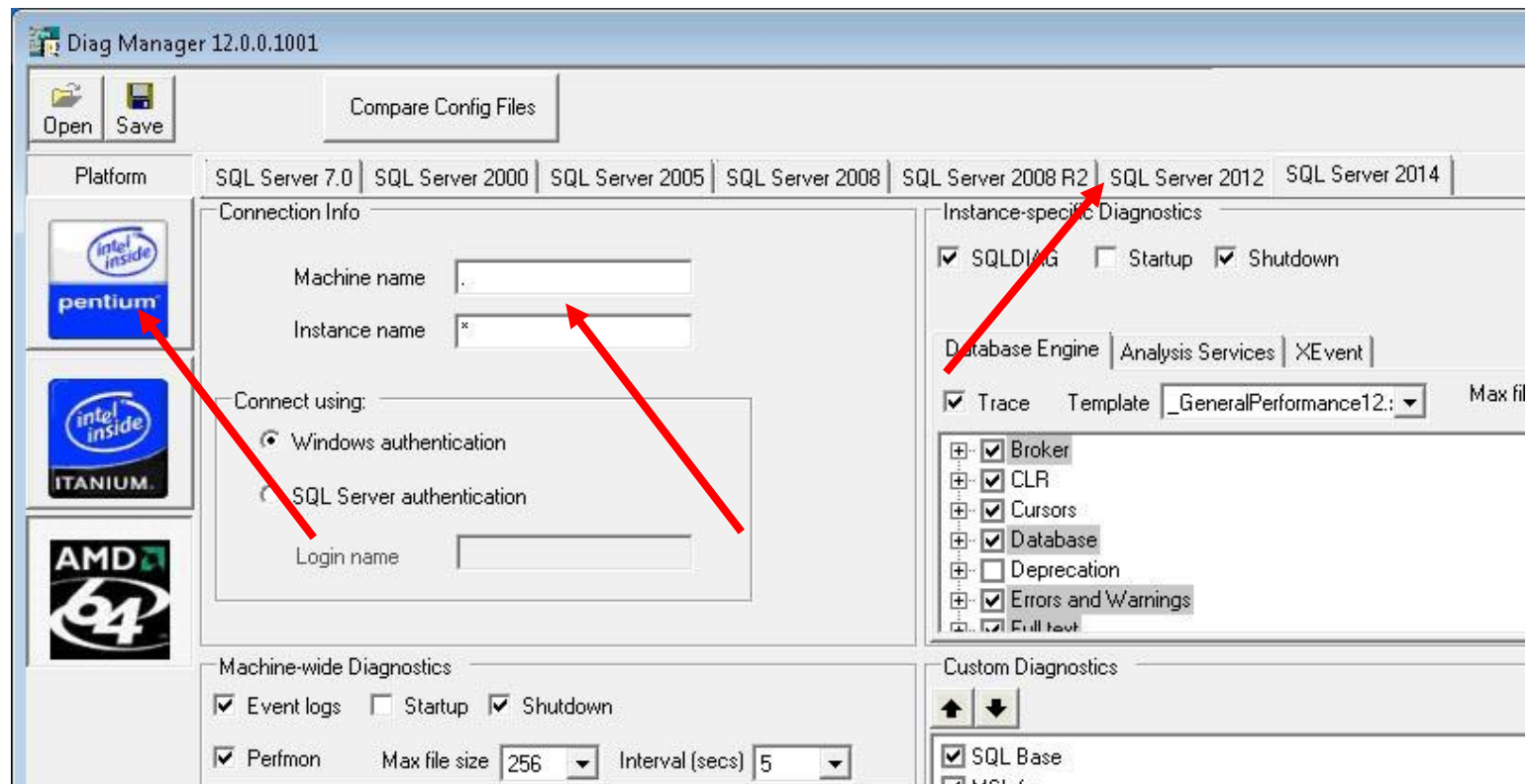
# PSSDIAG CONFIGURATION MANAGER

- Graphical interface to build a data collector
- Every option you can think of
  - SQL Trace events
  - Perfmon counters
  - XEvent traces
  - Event Logs
  - Custom scripts
- SQL 2005 – 2014



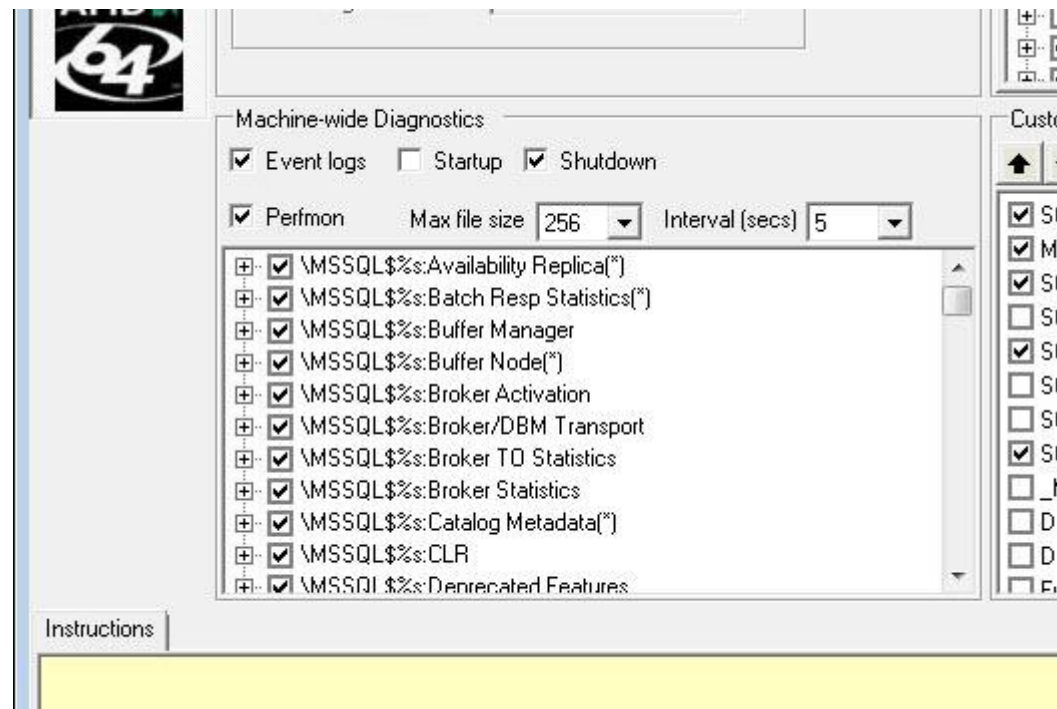
# PSSDIAG CONFIG MANAGER – OPTIONS

- Pick your version of SQL (2005-2014) & CPU type **first**
  - All other settings are revert to default when changed
- Single instance or all instances



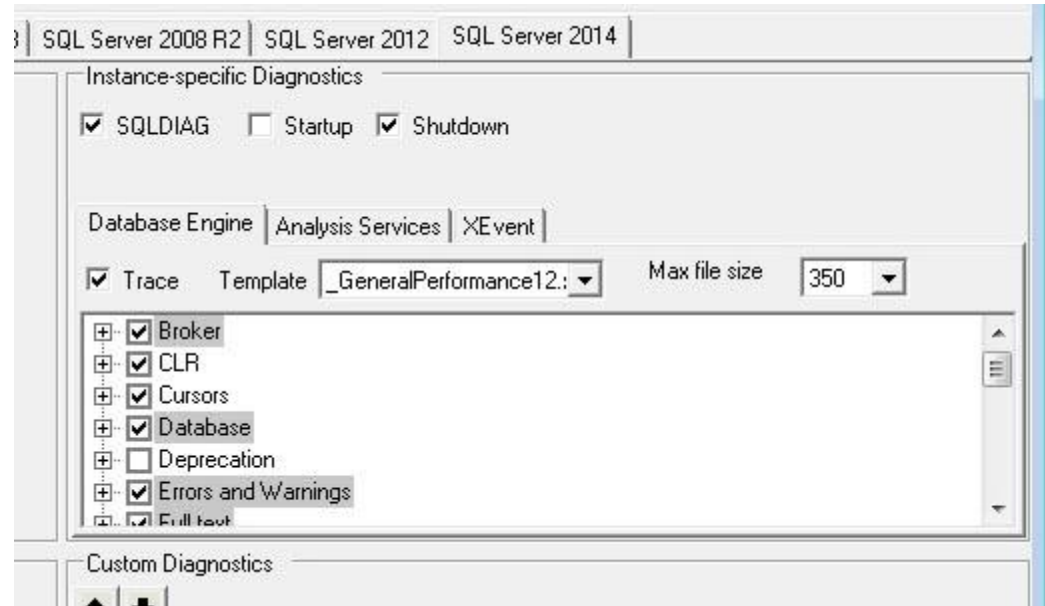
# PSSDIAG CONFIG MANAGER – OPTIONS

- Collect any Perfmon counter
  - SQL Server counters
  - Windows counters
- Less is better



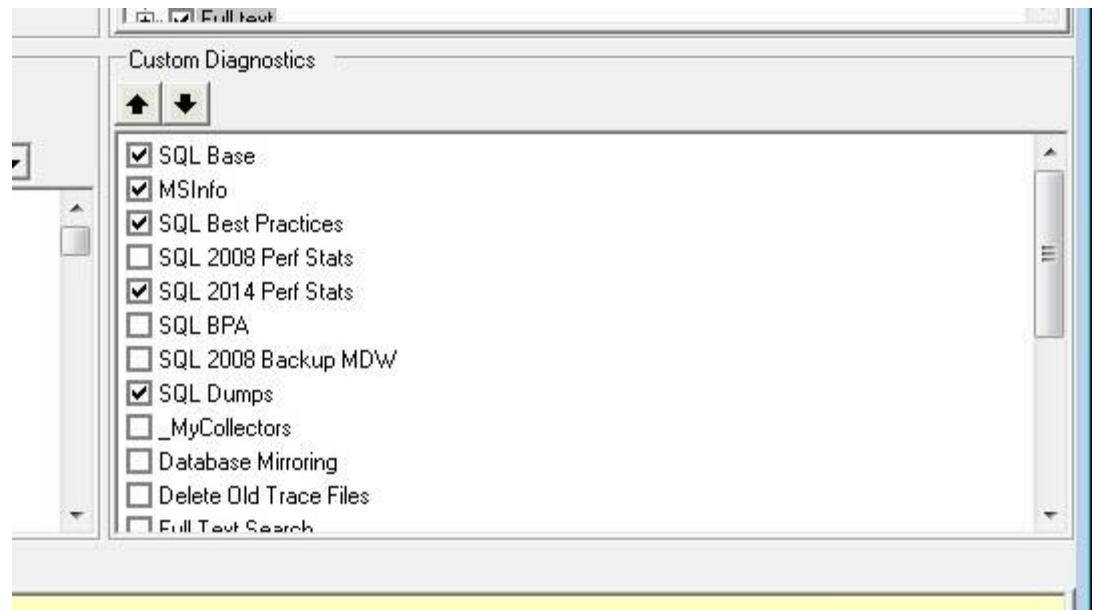
# PSSDIAG CONFIG MANAGER – OPTIONS

- Pick your SQL Trace events



# PSSDIAG CONFIG MANAGER – OPTIONS

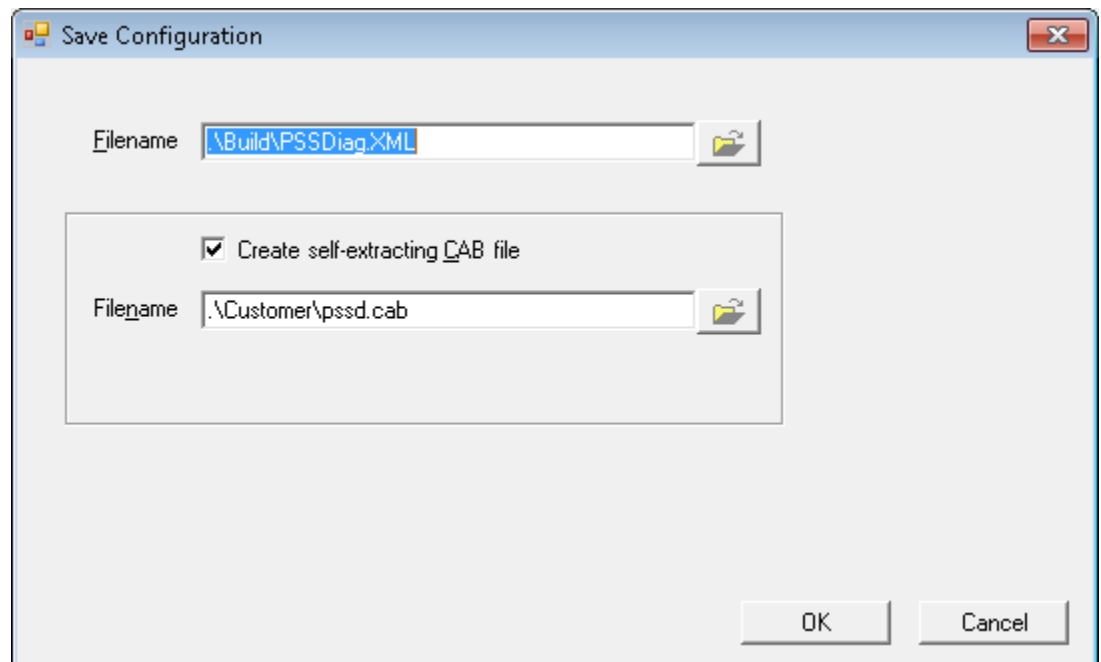
- Add custom scripts



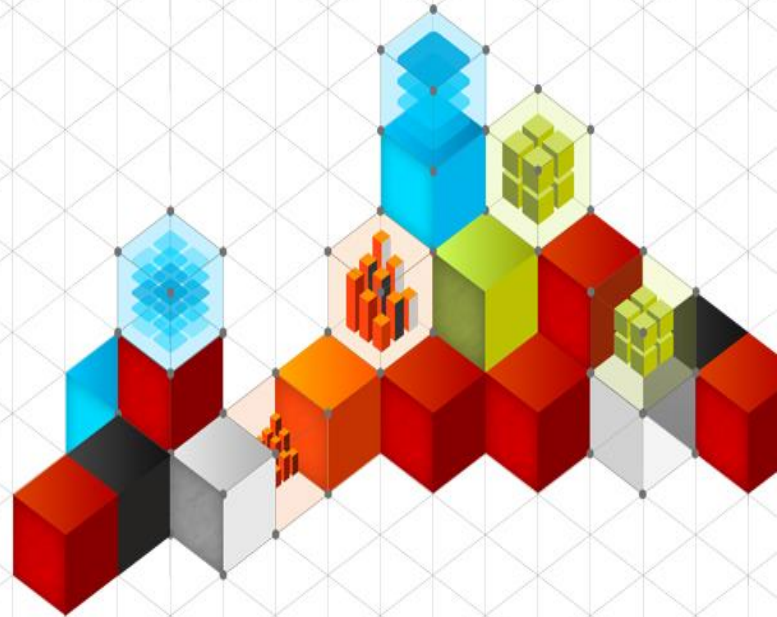


# PSSDIAG CONFIG MANAGER – OPTIONS

- Build the collector package
  - Saved as a self-compressed CAB file
- Copy CAB file to your SQL Server
- Uncompress & run pssdiag.cmd



# DEMO



## OTHER RESOURCES

- PSSDiag Configuration Manager – A Companion for SQLNexus  
<http://www.patrickkeisler.com/2015/07/pssdiag-configuration-manager-companion.html>

NO MONEY? NO PROBLEM!

Questions?