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# Leveraging PSSDiag/SQLDiag for Efficient Troubleshooting

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# About Me

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# Agenda

- Troubleshooting methodology
- Data collection tools
- Analysis tools and methods
- Application of these techniques



# Why Do You Need a “Troubleshooting Methodology?”

- Troubleshooting is a skill of its own (separate from the technologies involved)
- Troubleshooting is “an art and a science”
- A disciplined approach to problem solving improves the process:
  - Results are more consistent and predictable
  - Detours down unproductive paths are reduced



# My Troubleshooting Methodology

- Identify the problem
- Analyze the environment
- Research the symptoms and identify possible solutions
- Implement the leading solution
- Test the resolution
- Tie-up loose ends

Attribution: This methodology is based heavily on those presented in the books listed on the "Resources – Books" slide



# Automating Data Collection

- The key to efficient and effective troubleshooting is having good diagnostic data
- The data should be collected automatically
- As an “accidental” or “involuntary” DBA, I came up with some very primitive ways to collect diagnostic data
- Over the course of my career, I developed better ways of collecting the data



# Microsoft's Free Support Tools

- The Microsoft Customer Service and Support (CSS) and Premier Field Engineering (PFE) teams have the same need for data collection tools
- They're a lot like us, just at a larger scale
- Microsoft engineers have implemented their own tools
- The tools were shared internally, refined, and eventually released to the public



# Enter PSSDiag and SQLDiag

- Utilities designed for collecting diagnostic data for troubleshooting
- Extremely flexible and configurable
- Can collect a variety of data:
  - Operating system configuration information
  - Performance counter data
  - SQL Trace data
  - The output of queries and T-SQL commands
  - ***Anything else that can be scripted***



# Evolution of the Tools

	SQL Server 7	SQL Server 2000	SQL Server 2005	SQL Server 2008
SQLDiag	•	•	•	•
PSSDiag	•	•		
MPS Reports		•	•	•
ReadTrace	•	•	•	•
SQL Nexus		•	•	•
RML Utilities - Reporter		•	•	•

- This diagram only refers to the public versions of the tools
- One should use PSSDiag (download from [MSKB article 830232](#)) with SQL Server 2000



# Demonstrations – Diagnostic Data Collection



# Analyzing the Collected Data

- So, you've collected all of this data... now what?
- Except for the smallest problems, you'll need to automate the analysis of the data too
- Fortunately the Microsoft CSS and PFE teams have again shared a variety of tools that serve this purpose



# Analysis Utilities

- Performance Analysis of Logs (PAL) tool
- SQL Nexus utility
- RML Utilities



# Demonstrations – Diagnostic Data Analysis



# Components of PSSDiag/SQLDiag

	PSSDiag	SQLDiag
Executable	PSSDiag.exe	SQLDiag.exe
Configuration XML file	/I parameter	/I parameter
Configuration file schema	--	SQLDiag_Schema.xsd
Output directory	/O parameter	/O parameter
Support directory	/P parameter	/P parameter
T-SQL create-script(s)	*.sql (various)	MSDiagProcs.sql



# Employing the Tools Proactively

- Comparison data
  - System baselines are extremely valuable
  - Simply having a data collection from a “healthy” server can help immensely
  - Consider retaining/archiving all data collections
- Preconfigured configuration files
  - Less time is needed to start data collection after a problem occurs



# Troubleshooting “Strategies” to Avoid

- Applying past solutions indiscriminately
- Circular troubleshooting
- Fixating on the first problem discovered
- Happy clicking
- Relying on “duct tape” and “band aids”
- Stabbing in the dark



# Resources – Books

Delaney, Kalen et al. *Inside Microsoft SQL Server 2005: Query Tuning and Optimization*. Redmond, WA: Microsoft Press, 2008.

Henderson, Ken et al. *SQL Server 2005 Practical Troubleshooting: The Database Engine*. Boston, MA: Addison-Wesley, 2006.

Northrup, Tony et al. *Microsoft Windows Server 2003 Troubleshooting Guide*. Redmond, WA: Microsoft Press, 2005.

Wolf, Chris. *Troubleshooting Microsoft Technologies: The Ultimate Administrator's Repair Manual*. Boston, MA: Addison-Wesley, 2003.

Attribution: My troubleshooting methodology is primarily derived from the latter two books



# Resources – Tool Downloads (Microsoft)

- General
  - [Log Parser](#)
  - [Microsoft Product Support Reports](#)
  - [Performance Analysis of Logs \(PAL\) Tool](#)
  - [Sysinternals tools](#)
  - [Windows PowerShell](#)
- SQL Server specific
  - [PSSDiag](#)
  - [RML Utilities](#)
  - [SQL Nexus Tool](#)



# Resources – Tool Downloads (Non-Microsoft)

- [7-Zip](#)
- [ClearTrace](#)



# Resources – Creators’ Insights on the Microsoft CSS/PFE Tools

- [“Internal SQL Server Diagnostics Tools, Part 1: PSSDiag”](#)
  - Ken Henderson explains how to use PSSDiag (which went on to become SQLDiag for SQL Server 2005 and later versions), including the GUI configuration utility (DiagConfig.exe)
- [“Random thoughts on my trip to the conference”](#)
  - Ken Henderson provides background on the SQL Nexus utility
- [“RML Utilities for Microsoft SQL Server Released”](#)
  - The CSS SQL Escalation Services team announces the debut of the RML Utilities
- [“The Need for a Performance Analysis of Logs Tool”](#)
  - Clint Huffman discusses the motivation for developing the PAL tool



# Resources – Troubleshooting Papers

- [“Advanced Troubleshooting with Extended Events”](#)
- [“How To Diagnose and Correct Errors 17883, 17884, 17887, and 17888”](#)
- [“Plan Caching in SQL Server 2008”](#)
- [“SQL Server 2005 Waits and Queues”](#)
- [“Statistics Used by the Query Optimizer in Microsoft SQL Server 2008”](#)
- [“Top SQL Server 2005 Performance Issues for OLTP Applications”](#)
- [“Troubleshooting Performance Problems in SQL Server 2005”](#)
- [“Troubleshooting Performance Problems in SQL Server 2008”](#)



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