

# An Introduction to Profiler and SQL Trace

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## References and Resources Trevor Barkhouse

### References

Topics from SQL Server Books Online that will be referenced with great frequency... you'll probably want to bookmark these pages:

- A comprehensive list of all of the event classes can be found at "[SQL Server Event Class Reference](#)." Keep in mind that new event classes are introduced with new releases of the product, so not all of them will be available for previous versions of SQL Server.
  - Similar information, for SQL Server 2000, can be found at "[Monitoring with SQL Profiler Event Categories](#)."
- The definition of the columns (properties) of events is detailed at "[Describing Events by Using Data Columns](#)." The column names that are followed by a superscript "1" apply to all event classes. The rest of the columns depend on the event class. To determine which columns are relevant to a specific event class, see the event class documentation (referenced above) or query the [\[sys\].\[trace\\_event\\_bindings\]](#) catalog view.
  - Similar information, for SQL Server 2000, can be found at "[SQL Profiler Data Columns](#)."
- Creating a server-side trace:
  1. Create the trace definition: [\[sys\].\[sp\\_trace\\_create\]](#)
  2. Specify the desired event classes and columns: [\[sys\].\[sp\\_trace\\_setevent\]](#)
  3. Restrict the events that will captured: [\[sys\].\[sp\\_trace\\_setfilter\]](#)
  4. Start, stop, and destroy the trace: [\[sys\].\[sp\\_trace\\_setstatus\]](#)
- Analyzing a trace file with T-SQL:
  - [\[sys\].\[fn\\_trace\\_gettable\]](#)

### Concepts

Information about SQL Trace concepts and design

- Wikipedia articles on "[Instrumentation \(computer programming\)](#)" and "[Tracing \(software\)](#)"
- From SQL Server Books Online:
  - "[SQL Trace Terminology](#)"
  - "[SQL Server Profiler Terminology](#)"
  - "[SQL Trace Architecture](#)"
- "[Performance Monitoring Tools: An Introduction to SQL Profiler](#)" by Buck Woody
- "[Trace and Replay Objects: A New API for SQL Server Tracing and Replay](#)"

## Books on SQL Trace and Profiler

The following books, written by many of the leaders in the field, each have a substantial amount of information on SQL Trace and Profiler

- *Inside SQL Server 2000* by Kalen Delaney (ISBN-13: 9780735609983)
  - Chapter 17, "Configuration and Performance Monitoring," pages 961 - 975
- *Inside Microsoft SQL Server 2005: T-SQL Querying* by Itzik Ben-Gan, et al. (ISBN-13: 9780735623132)
  - Chapter 2, "Physical Query Processing," pages 55 - 57, "Capturing Showplan with SQL Trace"
  - Chapter 3, "Query Tuning"
    - Pages 85 - 89, "Trace Performance Workload"
    - Pages 90 - 103, "Analyze Trace Data"
- *Inside Microsoft SQL Server 2005: T-SQL Programming* by Itzik Ben-Gan, et al. (ISBN-13: 9780735621978)
  - Chapter 9, "Transactions"
    - Pages 383 - 390, "Deadlocks"
    - Pages 386 - 387, "Deadlock Caused by Missing Indexes"
      - This covers using SQL Trace for troubleshooting deadlocks
- *Inside Microsoft SQL Server 2005: The Storage Engine* by Kalen Delaney, et al. (ISBN-13: 9780735621053)
  - Chapter 3, "SQL Server 2005 Configuration," pages 83 - 84, "The Default Trace"
- *Inside Microsoft SQL Server 2005: Query Tuning and Optimization* by Kalen Delaney, et al. (ISBN-13: 9780735621961)
  - Chapter 2, "Tracing and Profiling," pages 57 - 102
- *Microsoft SQL Server 2008 Internals* by Kalen Delaney, et al. (ISBN-13: 9780735626249)
  - Chapter 2, "Change Tracking, Tracing, and Extended Events," pages 86 - 108
- *SQL Server 2008 Query Performance Tuning Distilled* by Grant Fritchey and Sajal Dam (ISBN-13: 9781430219026)
  - Many chapters include trace analysis to illustrate the topics under discussion
- *Mastering SQL Server Profiler* by Brad M. McGehee (ISBN-13: 9781906434151)
  - The entire book is devoted to Profiler and SQL Trace
  - The eBook version can be downloaded, for free, in return for evaluating one of Red Gate Software's tools: "[Free eBook and 14-day trial for faster SQL Server troubleshooting.](#)"
- *Inside Microsoft SQL Server 2008: T-SQL Querying* by Itzik Ben-Gan, et al. (ISBN-13: 9780735626034)
  - Chapter 4, "Query Tuning," pages 148 - 167, 186
- *SQL Server 2008 Administration in Action* by Rod Colledge (ISBN-13: 9781933988726)
  - Chapter 14, "Monitoring and automation," pages 334 - 347
- *Professional SQL Server 2008 Internals and Troubleshooting* by Christian Bolton, et al. (ISBN-13: 9780470484289)
  - Chapter 9, "Viewing Server Performance with Perfmon and the PAL Tool," page 364
  - Chapter 10, "Tracing SQL Server with SQL Trace and Profiler," pages 369 - 436
  - Chapter 12, "Introducing RML Utilities for Stress Testing and Trace File Analysis," pages 459 - 479

## Minimizing the Overhead of a Trace

Guidance on reducing the amount of toll that the trace takes on the target system

- From SQL Server Books Online:
  - ["Optimizing SQL Trace"](#)
  - ["Filtering a Trace"](#)
  - ["Limiting Trace File and Table Sizes"](#)
- ["Performance Impact: Profiler Tracing vs. Server Side SQL Tracing"](#)

## Analyzing Trace Data

Tools and methods that can be used to analyze the data captured by a trace

- ["Correlating a Trace with Windows Performance Log Data"](#)
- ["Description of the Replay Markup Language \(RML\) Utilities for SQL Server"](#)
- ["Perfmon and Profiler for SQL Server"](#)
- [SQL Nexus Tool](#)
- ["SQL Server profiler trace parsing tool – Build performance reports based on profiler traces only"](#)

## Applications of SQL Trace functionality

- ["How to Track Down Deadlocks Using SQL Server 2005 Profiler"](#) by [SQL Server MVP Brad McGehee](#)
- [JumpStartTV.com](#) ["SQL Server Profiler"](#) category
- [MSSQLTips.com](#) ["Profiler / Trace"](#) category
- ["Precision Performance for Microsoft SQL Server using RML Utilities 9.0"](#)
- Security:
  - ["SQL Server 2000 C2 Administrator's and User's Security Guide"](#)
  - ["SQL Server 2000 Auditing"](#)
  - ["SQL Server Tracing: An Automated and Centralized Solution"](#)
- ["SQL Server Profiler Tutorial Video"](#)
- ["Tracing Trigger Execution \(and code path\) using SQL Profiler"](#)

## Other Diagnostics

Information on other sources of diagnostic data, to use with or instead of tracing

- [Dynamic Management Views \(DMVs\) and Functions \(DMFs\)](#)
  - ["Monitoring - SQL Server 2005 Dynamic Views and Functions"](#) by Buck Woody
  - [MSSQLTips.com](#) ["Dynamic Management Views/Functions"](#) category
  - ["Recap of April 2010 DMV a Day Series"](#) of blog posts from SQL Server MVP [Glenn Berry](#)
  - ["Troubleshooting with Dynamic Management Views"](#) by Eric Brown
  - ["Uncover Hidden Data to Optimize Application Performance"](#) by [Ian Stirk](#)
- [Event Tracing for Windows](#)
  - ["Data Access Tracing in SQL Server 2008"](#) white paper
  - MSDN forum FAQ: ["FAQ: Common Questions for ETW and Windows Event Log"](#)

- MSDN Magazine articles:
  - ["Event Tracing: Improve Debugging And Performance Tuning With ETW"](#)
  - ["Core OS Events in Windows 7, Part 1"](#)
  - ["Core Instrumentation Events in Windows 7, Part 2"](#)
- Series from the Advanced Windows Debugging and Troubleshooting blog:
  - ["Part 1 - ETW Introduction and Overview"](#)
  - ["Part 2 - Exploring and Decoding ETW Providers using Event Log Channels"](#)
  - ["Part 3 - ETW Methods of Tracing"](#)
- ["Tools for Software Tracing"](#)
- [Windows Performance Tool Kit/XPerf](#)
  - ["Xperf, a new tool in the Windows SDK"](#)
  - ["Two Minute Drill: Introduction to XPerf"](#)
  - ["Examining Xperf"](#)
- [Extended Events](#) (XE)
  - White paper by SQL Server MVP [Jonathan Kehayias](#): ["Using SQL Server 2008 Extended Events"](#)
  - Endorsement by [Bob Ward](#), a Principal Escalation Engineer in Microsoft [Customer Service and Support \(CSS\)](#): ["Why Should I Use Extended Events in SQL Server 2008?..."](#)
  - Blog post series from SQL Server MVP : ["SQL Server 2008 Extended Events - high performance eventing system"](#)
- [Performance Counter](#) data
  - ["Monitoring Resource Usage \(System Monitor\)"](#)
    - ["Using SQL Server Objects"](#)
  - [Performance Analysis of Logs \(PAL\) Tool](#)
  - ["Performance Monitoring Tools: Windows System Monitor"](#) by Buck Woody
  - ["SQL Server Perfmon \(Performance Monitor\) Best Practices"](#) by [Brent Ozar](#)
  - ["Taking Your Server's Pulse: Use PerfMon to Diagnose Common Server Performance Problems"](#) article in TechNet Magazine
  - ["Vital Signs"](#) Workshop from Microsoft
- [SQLDiag](#), a built-in tool that collects trace, performance counter data, and more... simultaneously

## General Performance and Troubleshooting Guides

Comprehensive Microsoft white papers on tuning and troubleshooting the operating system and SQL Server

- ["Performance Tuning Guidelines for Windows Server 2003"](#) (Microsoft Word document)
- ["Performance Tuning Guidelines for Windows Server 2008"](#)
- ["Performance Tuning Guidelines for Windows Server 2008 R2"](#)
- ["Troubleshooting Performance Problems in SQL Server 2005"](#)
- ["Troubleshooting Performance Problems in SQL Server 2008"](#)