SQL Server Performance Troubleshooting Techniques and Tools

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Agenda

11:30 - SQL Server 2000 Performance Troubleshooting Techniques

- Profiler Trace
- Read Trace Tool
- Profiler trace templates

11:50 - SQL Server 2005 Performance Troubleshooting Techniques

- SQLNexus
- PSSDiag Tool

12:05 - SQL Server 2008 Data Collector (DMW)

- Recommendations and best practices

12:25 - Questions and answers

About João Loureiro

- SQL Server Support Escalation Engineer (2nd tier support level)
- Bridge between frontline support layer and product group
- SQL Server TAP Escalation Engineer (part of SQL Server Beta program)
- Blog: http://blogs.msdn.com/joaol
- Engaged on Service Packs, hot fixes and new product releases.

Scenario in SQL2000

My application is running slow

- No easy ways to identify which query is running slow or taking most resources. Need to enable the profiler.

Issue:

- How to parse and aggregate profiler trace information
- Overhead of running profiler
- Problems might not be always reproducible
- Profiler trace analysis is a high time consuming task

Tools for Resolving Resource Bottlenecks

- Performance Monitor
- SQL Server Profiler
- DMVs (available on SQL 2005/2008)
- Data collector and the management data warehouse (MDW) (available on 2008)
- SQL Server Activity Monitor
- Other tools – SQLNexus, ReadTrace and PSSDiag.
- Extended Events (available on 2008)

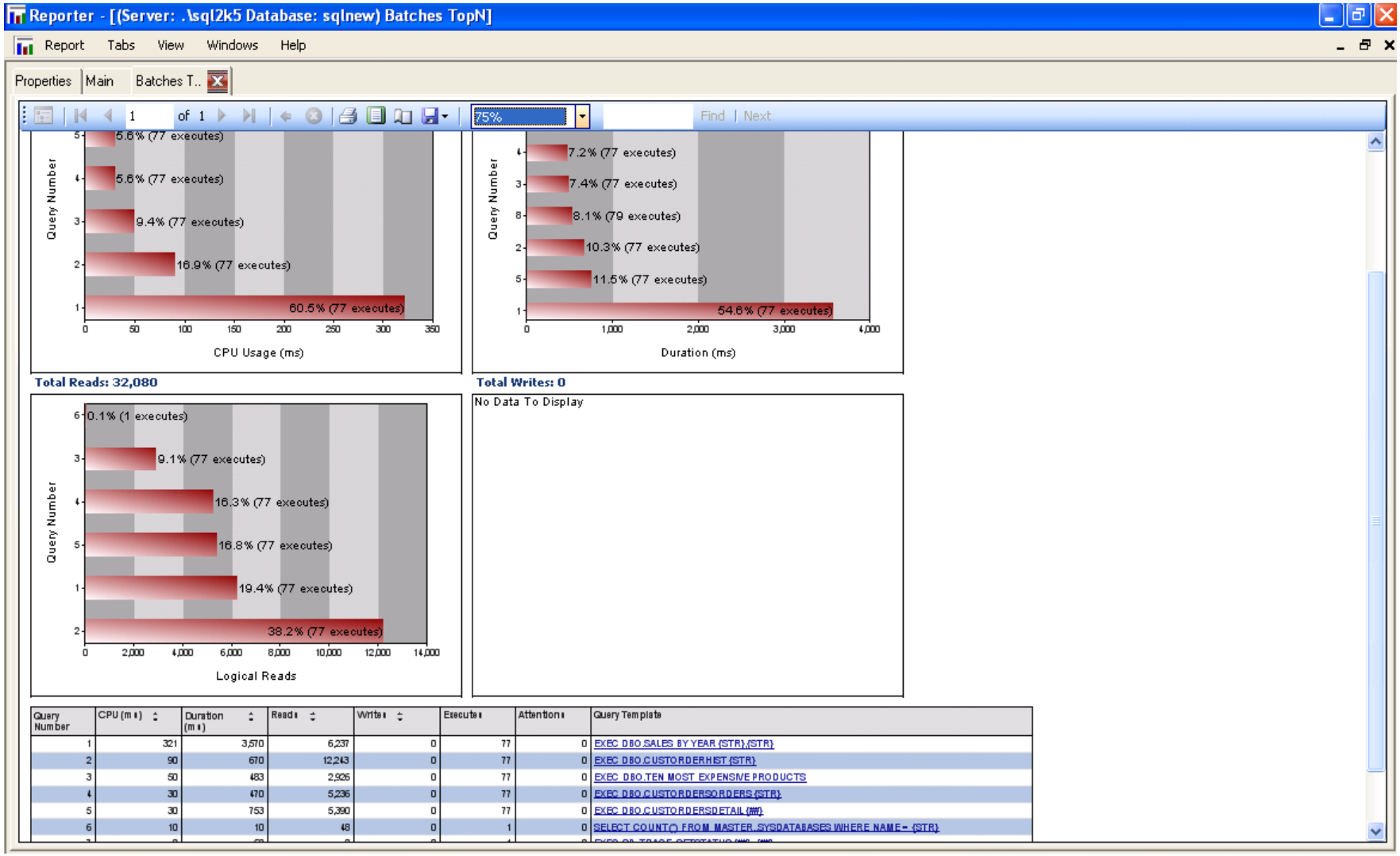
ReadTrace - RMLUtils

• The RML utilities allow you to process SQL Server trace files and view reports showing how SQL Server is performing. For example, you can quickly see:

- Which application, database or login is using the most resources, and which queries are responsible for that
- Whether there were any plan changes for a batch during the time when the trace - was captured and how each of those plans performed
- What queries are running slower in today's data compared to a previous set of data

• Supports SQL Server versions 2000, 2005 and 2008.

ReadTrace - RMLUtils



demo

Demo 1 – SQL Server 2000 Performance Troubleshooting

What is Dynamic Management View (DMV)

Expose server state in querytable format

- State is generally in memory (not persisted)

Low overhead

- Many DMVs expose information that needs to be maintained anyway

What's new for SQL Server 2005/8?

- Many more DMVs and a new framework

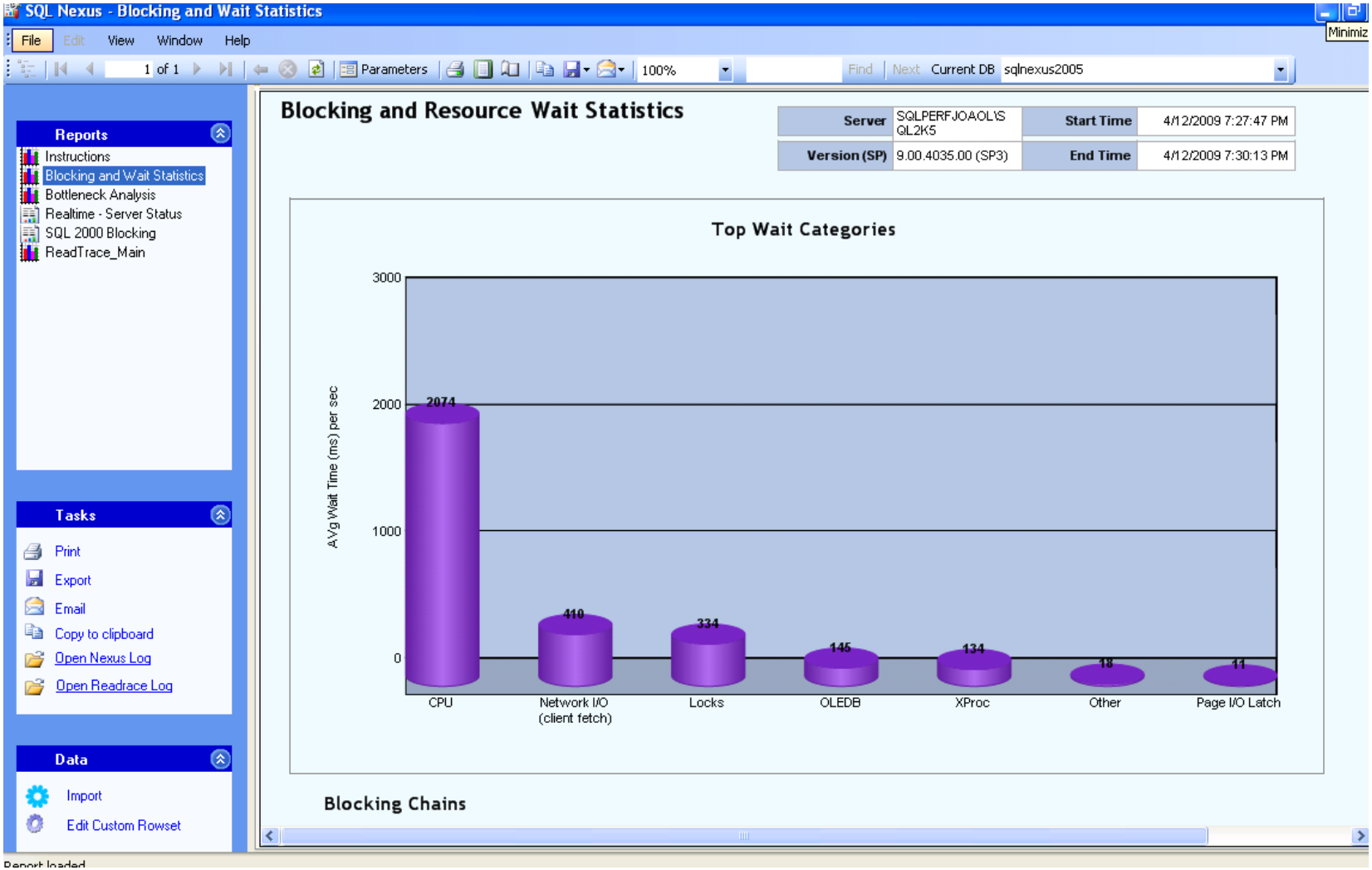
Examples

- Sys.dm_os_scheduler
- Sys.dm_tran_active_transactions
- Sys.dm_exec_query_stats
- sys.dm_exec_requests
- Sys.dm_db_index_usage_statistics

SQL Nexus

- Fast, easy data loading
- Visualize loaded data via reports
- Trace aggregation to show the TOP N most expensive queries (using ReadTrace).
- Wait stats analysis for visualizing blocking and other resource contention issues (based on the new SQL 2005 Perf Stats Script or SQL 2008 Perf Stats).
- Full-featured reporting engine
- Extensibility

SQL Nexus


SQL Nexus - Blocking and Wait Statistics
File
Edit
View
Window
Help
Parameters
100%
Find
Next
Current DB
sqlnexus2005
Reports
Instructions
Blocking and Wait Statistics
Bottleneck Analysis
Realtime - Server Status
SQL 2000 Blocking
ReadTrace_Main
Tasks
Print
Export
Email
Copy to clipboard
Open Nexus Log
Open Readrace Log
Data
Import
Edit Custom Rowset
Blocking and Resource Wait Statistics
Server
SQLPERFJOAOL\SQL2K5
Start Time
4/12/2009 7:27:47 PM
Version (SP)
9.00.4035.00 (SP3)
End Time
4/12/2009 7:30:13 PM
Top Wait Categories
Avg Wait Time (ms) per sec
3000
2000
1000
0
2074
410
334
145
134
18
11
CPU
Network I/O (client fetch)
Locks
OLEDB
XProc
Other
Page I/O Latch
Blocking Chains
Report loaded

demo

Demo 2 – SQL Server 2005 Performance Troubleshooting

Data Collector

Pain Points

Difficult to monitor database performance

- SQL Profiler too intrusive
- DMVs very powerful, but often difficult to interpret
- 3rd party tools available, but expensive

Competing databases have good tools available

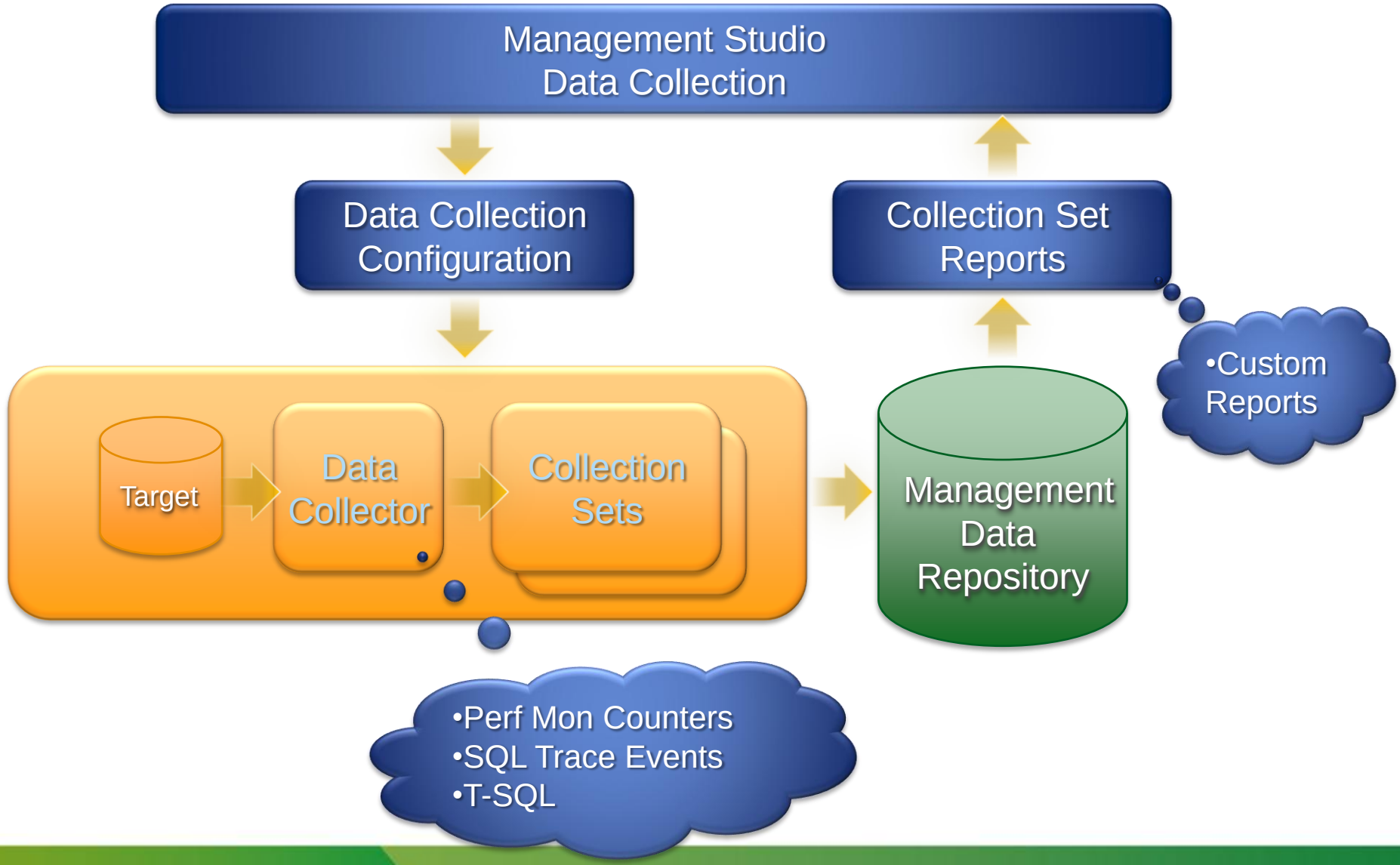
SQL Server 2008

• SQL 2008 introduces Data Collector; sometimes loosely referred to as Management Data Warehouse (MDW)

• Scalable, aggregatable, fully customizable, light-weight mechanism to collect performance data

• Out of the box solution, has several preconfigured reports

Data Collector



Data Collector

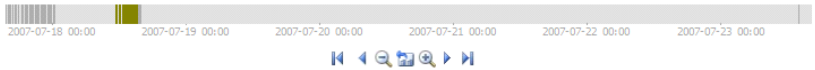
Server Activity History

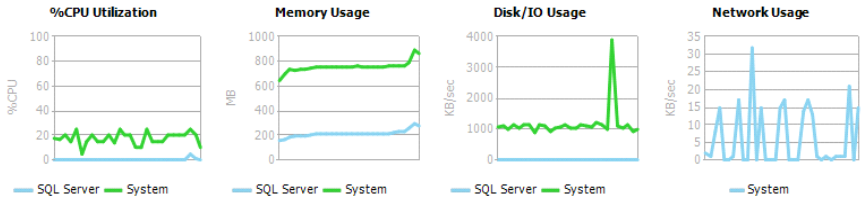
on macies4 at 7/23/2007 4:21:24 PM

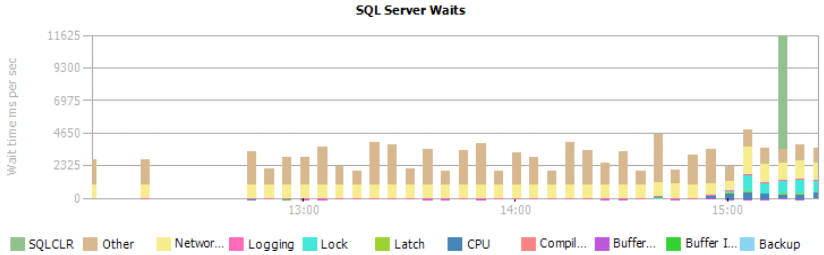
This reports provides an overview of resource utilization, resource consumption and server activity for the SQL Server instance and for the host operating system.

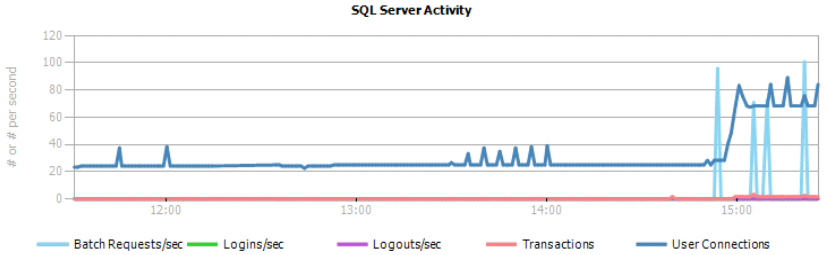
Navigate through the historical snapshots of data by using the time line below.

Current time range: 7/18/2007 11:30:25 AM to 7/18/2007 3:30:25 PM









Data for this report has been collected by Server Activity collection set.

Collection set state: Stopped; Last upload time: 7/23/20073:22:34 PM;

demo

Demo 3 – SQL Server 2008 Performance Troubleshooting

Additional Resources

- SQLNexus - http://www.codeplex.com/sqlnexus
- ReadTrace - http://sqlnexus.codeplex.com/Wiki/View.aspx?title=ReadTrace
- http://blogs.msdn.com/joaol/archive/2008/12/31/sql-server-profiler-trace-parsing-tool-build-performance-reports-based-on-profiler-traces-only.aspx
- Troubleshooting Performance Problems in SQL Server 2008 WhitePaper - http://msdn.microsoft.com/en-us/library/dd672789.aspx
- Session slides and demos - http://blogs.msdn.com/joaol/

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