Microsoft SQL Server 2014: Record-Setting Performance

You can bet your business on Microsoft SQL Server 2014

New benchmark tests performed by software and hardware partners across a variety of workloads prove that SQL Server 2014, with groundbreaking in-memory technology built-in, is the data platform for the most demanding database applications. Learn more: www.microsoft.com/sql.

"We've been absolutely blown away by the performance that we've seen with Microsoft's SQL Server 2014"

Gary Smerdon
Fusion-io

HIGHLIGHTS

- **Hewlett Packard sets TPC-H world records with HP ProLiant DL 580 G8:** Using SQL Server 2014 and its in-memory columnstore index, HP achieved two new world records with 404,005.7 QphH on the 10TB configuration, and 461,837.8 QphH on the 3TB configuration beating Oracle's previous best results for both TPC-H configurations.
- **IBM posts TPC-H 1TB beating Oracle by 60% and shows 800% performance gains using SQL Server In-Memory OLTP on IBM System x3850 X6:** IBM posted a new TPC-H 1TB result at 519,976 QphH and showed 800% performance gains with SQL Server 2014 in-memory OLTP.
- **Fujitsu sets TPC-E world record with PRIMQUEST 2800E:** Using SQL Server 2014, Fujitsu posted a result of 8,582.52 tpsE (8-socket), a new world-record for this important OLTP industry-standard benchmark.
- **Fusion-io increases SQL 2014 in-memory OLTP performance more than 4x:** An industry leader in flash-based accelerated storage technology, Fusion-io used SQL Server 2014 in-memory OLTP with their ioDrive2 Duo PCI-E technology to achieve an additional 4x gain for in-memory SQL 2014 tables vs. using a multi-million dollar enterprise storage array, at a fraction of the cost.
- **LSI Corporation improved database throughput more than 24x:** Using SQL Server 2014 and its in-memory OLTP feature with the LSI Nytro WarpDrive technology, LSI realized more than 24x throughput (TPS) gains compared to previous versions of SQL Server.
- **Bwin.party increased transaction throughput nearly 17x:** The world's largest regulated online gaming company used SQL Server 2014 in-memory to increase transaction throughput 16.7x and scale to an incredible 250,000 requests per second.

World Record Performance

Microsoft partners choose to build critical applications on SQL Server 2014 because of its record-setting performance levels.

World record for 10TB and 3TB TPC-H with ProLiant DL 580 G8

Hewlett Packard posted two new TPC-H world-record benchmark results for 10TB and 3TB data warehousing workloads using SQL Server 2014 with its in-memory columnstore index. The 10TB 404,005.7 QphH **result broke the world record** for this TPC-H configuration, **besting Oracle's previous record**[1]. The 3TB 461,837.8 QphH is also a world-record TPC-H result, besting Oracle's previous best result[2]. Both results also bested Oracle in price/performance by a wide margin.

The TPC Benchmark™H (TPC-H) is a decision support benchmark that consists of a suite of business oriented ad-hoc queries and concurrent data modifications. The queries and the data populating the database have been chosen to have broad industry-wide relevance.

This benchmark illustrates decision support systems that examine large volumes of data, execute queries with a high degree of complexity, and give answers to critical business questions.

See the HP TPC-H 10TB result here, and read about the HP TPC-H 3TB result here.

IBM System x3850 X6 Proves 800% Performance Gains with SQL Server 2014 In-Memory OLTP

IBM posted a new TPC-H 1TB result, and at 519,976 QphH this result **beats Oracle's best result on this configuration by 60%**[3]. This TPC-H result takes advantage of SQL Server 2014's in-memory columnstore index. IBM has also conducted extensive testing of SQL Server 2014 in-memory OLTP. IBM tested a SQL Server configured with four 15-core processors.

The tests were run with the database created on an IBM DS3500 storage subsystem, and the results were compared against the same database created using SQL Server 2014 in-memory OLTP with the DS3500 providing storage for data durability (database checkpoints and transaction logs). The SQL Server 2014 in-memory OLTP feature improved workload performance for requests per second **by 800%**.

See the IBM TPC-H 1 TB result here, and read about IBM's SQL Server 2014 in-memory OLTP testing on the IBM System x3850 X6 here.

World record for TPC-E with PRIMQUEST 2800E

Fujitsu reported a TPC-E of 8,582.52 tpsE[4] while running SQL 2014 on an 8-socket system. **This is a new world record**, besting the previous result on a similar 8-socket configuration by 57%.

The TPC-E benchmark models a brokerage firm with customers who generate transactions related to trades, account inquiries, and market research. The brokerage firm interacts with financial markets to execute orders on behalf of the customers and updates relevant account information accordingly.

The benchmark is scalable, such that the number of customers can be varied to represent the workloads of different size businesses, and defined, in that the required mix of transactions the benchmark maintains is set. The TPC-E metric (transactions per second or tps) refers to the number of trade-result transactions the server can sustain over a period of time.

See the Fujitsu SQL Server 2014 world-record TPC-E result here.

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Breakthrough Performance Gains with SQL Server 2014

FUSION-iO

In-memory performance gains of 4x

Backing SQL Server in-memory OLTP databases with Fusion-io Memory products helps drive the highest transaction performance levels possible. The Fusion-io storage subsystem delivers consistent low latency, ultra-high bandwidth, and strong reliability that helps optimize SQL Server 2014 in-memory OLTP functionality. This is the simplest, most cost-effective approach compared to legacy storage architecture. In testing, Fusion-io increased SQL Server 2014 in-memory OLTP performance **over 4 times** by using their ioDrive2 Duo 2.4TB hardware (vs. a multi-million dollar enterprise storage array). Learn more here.

SQL Server 2014 in-memory OLTP Performance Testing with Fusion-io ioDrive2 Duo 2.4TB Hardware vs. Multi-million Dollar Storage Array

	Enterprise Array	ioDrive2 Duo 2.4TB	Benefits
User transaction wait time (ms)	1329	117	Reduced user wait times by 91%
Transaction throughput (MB/s)	42	172	Increased throughput by 409% to serve more customers
Transactions processed in 45 minutes	6,362,883	28,328,639	Processed 445% more transactions to improve productivity
Database startup time (sec)	222	72	Reduced startup time by 67%

LSI

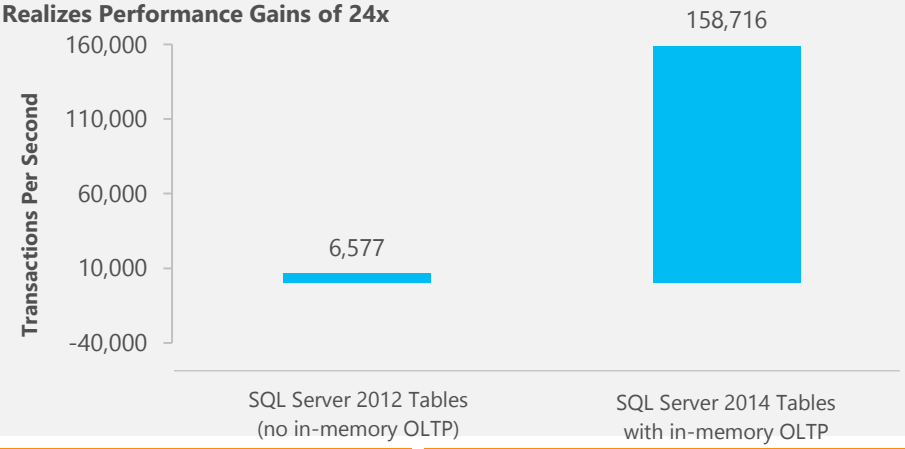
Throughput improved 24x

LSI, a leading designer of semiconductors and software that accelerates storage and networking in datacenters, conducted extensive testing of SQL Server 2014 in-memory OLTP technology using their Nytro WarpDrive technology.

The results showed throughput gains of **24 times** using SQL Server 2014 in-memory tables. Specifically, their configuration went from 6,577 transactions per second to 158,716 transactions per second with SQL Server 2014 and in-memory OLTP tables.

Learn more here.

SQL Server 2014 in-memory OLTP with LSI Nytro WarpDrive Realizes Performance Gains of 24x



bwin.party

Transaction throughput up 17x

bwin.party, the world's largest regulated online gaming company, used SQL Server 2014 in-memory OLTP to increase their overall transaction throughput by 16.7x.

With in-memory OLTP, the bwin.party gaming system can scale up to 250,000 requests per second (vs. 15,000 TPS on SQL Server 2012), giving the company the ability to easily handle new players on the website.

Learn more here.

"With SQL Server 2014, we can support close to 20 times the number of players on our site if we need to"

Rick Kutschera
bwin.party

[1]As of April 15, 2014. SQL Server 2014 HP 10TB TPC-H Result: http://www.tpc.org/tpch/results/tpch_result_detail.asp?id=114041502&layout=
[2]As of April 15, 2014. SQL Server 2014 HP 3TB TPC-H Result: http://www.tpc.org/tpch/results/tpch_result_detail.asp?id=114041501&layout=
Oracle 10TB TPC-H Result: http://www.tpc.org/tpch/results/tpch_result_detail.asp?id=113112501&layout=
[3]As of April 15, 2014. Fujitsu TPC-E Result: http://www.tpc.org/tpce/results/tpce_result_detail.asp?id=114041401
[4]As of April 15, 2014. IBM TPC-H 1TB Result: http://www.tpc.org/tpch/results/tpch_result_detail.asp?id=114041601&layout=

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