

## STAC-M3 Benchmark Results for System x3850 X6 Performance Benchmark Result

Lenovo x3850 X6 and its large memory capacity sets world records with the STAC-M3 benchmark.

The Lenovo X6 enterprise servers are made for analytics. With up to 39% greater performance than previous generations, and superior scalability, these systems – and their predecessors based on Enterprise X-Architecture (EXA) -- already have an impressive history of benchmark wins, many of them with the Securities Technology Analysis Center (STAC).



These results, published in a new STAC Report ([SUT ID KDB160425](#)) on June 6, 2016, demonstrates that the X6 continues its leadership with world record breaking performance for the financial services industry.

This report features the latest Lenovo System x3850 X6 using Intel E7-8890 v4 processors with 6 TB of memory running the STAC-M3 “Shasta” big memory benchmark suite using the kdb+ database from Kx Systems. Compared to other systems using kdb+, the x3850 X6 set world records in 13 of 15 categories, and set records in all 15 categories compared to previous benchmarks using Intel Xeon E7-4850 v2 processors.

Comparing the mean response times of this System Under Test (SUT) to those of a 4-socket Intel Xeon E7-4850 v2 system configured with 6TB of DRAM ([SUT ID KDB140116](#)) previously tested against STAC-M3 Shasta, this new SUT was significantly faster in the following ways:

- Faster in all of the 15 required benchmarks
  - 6 of which were over 2x faster
  - 10 of which were over 45% faster
- 2.96x faster in the theoretical P&L benchmark (STAC-M3.B1.10T.THEOPL/s.TIME).
- 2.67x faster in the volume curves benchmark (STAC-M3.B1.10T.VOLCURV/s.TIME).
- 64% faster in the aggregated statistics benchmark (STAC-M3.B1.10T.STATS-AGG/s.TIME)
- 53% faster in the year-high bid benchmark (STAC-M3.B1.1T.YRHIBID/s.TIME).

The system under test in the audit consisted of:

- Lenovo System x3850 X6 server
- 4x Intel Xeon E7-8890 v4 processors (24 cores, 2.2 GHz, 60MB cache)
- 6 TB memory (96x 64GB) DDR4 memory @ 1600 MHz
- 3x Intel SSD DC P3700 2 TB NVMe add-in cards
- Red Hat Enterprise Linux 7.2 -kernel 3.10.0-327
- Kx Systems kdb+ 3.3

The key metric in STAC-M3 is query response time. In particular STAC benchmarks test high-speed analytics on time-series data -- tick-by-tick market data, or "tick database" stacks. Technology innovations bring better processing speeds and associated reductions in the cost of processing.

Among innovations that can impact benchmarks are new kinds of non-volatile memory (e.g., flash), new integration methods into the stack, software, new processors, memory speeds and quantity, and server architectures; advanced file systems; and more scalable storage systems. STAC-M3 involves stringent testing of all of these factors. The Shasta suite in particular focuses on big memory analytics, a key to accelerating analytics by enabling larger in-memory computing.

## **About the x3850 X6**

The System x3850 X6 is a 4U, 4-socket rack server that delivers maximum performance and availability for business-critical applications and databases.

With system support for up to 96 processor cores, 6TB of system memory, and over 85TB of flash storage, the x3850 X6 not only is known for its leadership performance, but also for its ability to scale in order to power traditional databases as well as new in-memory database and analytics solutions. Now customers can achieve leadership solution performance by virtualizing high performance databases and applications on the same server.

For maximum scalability, the eight-socket x3950 X6 server can uniquely support up to 12 TB of DDR4 memory, 192 cores, 22 PCIe slots, and over 150 TB of internal flash storage - providing many compute configuration options to enable massive compute power.

X6 platforms are the sixth generation of enterprise X Architecture (EXA) technology and represent more than 15 years of investment and innovation to exceed industry standards.

## **About STAC**

STAC-M3 benchmarks are governed by user firms in the STAC Benchmark Council. The Council is comprised of more than 250 financial institutions and other "algorithmic enterprises," as well as 50 vendor organizations. Lenovo is a member of STAC. This group develops benchmark standards under the direction of user firms such as large global banks, brokerage houses, exchanges, hedge funds, proprietary trading shops, and other market participants.

Benchmarks are conducted in challenging areas such as time-series analytics, risk simulations, and processing of very high-speed data. STAC uses these community source standards to provide technology research and testing tools to members of the Council, as well as to make reports such as the latest STAC Report on the x3850 X6 publicly available.

## **Learn more**

To learn more about X6 solutions for the financial services industry, please contact your Lenovo Sales Representative.

To find out more about STAC, visit the [STAC Research web site](#).

To learn more about Lenovo's X6 portfolio of servers, visit the [Lenovo mission-critical servers product page](#).

## Related product families

Product families related to this document are the following:

- [Mission-Critical Rack Servers](#)
- [Direct-Attached Storage](#)
- [4-Socket Rack Servers](#)
- [STAC-M3 Benchmark Results](#)

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