

New World Records Set with the STAC-M3 Benchmark on the ThinkSystem SR650 with Intel Optane DC Persistent Memory

Performance Benchmark Result

The Lenovo ThinkSystem SR650 configured with Intel Optane DC Persistent Memory (DCPMM), the new second-generation Intel Xeon Scalable processors (formerly codenamed “Cascade Lake”) and the Kx Systems kdb+ database has set new performance world records with the Antuco suite of the STAC-M3 benchmark.

These new benchmark results, published in a new STAC Report ([SUT ID KDB190320b](#)) on April 2, 2019, demonstrate that the SR650 continues Lenovo’s leadership with world record breaking performance for the financial services industry.



This system and its Lenovo ThinkSystem SR950 4-socket counterpart (see STAC report [SUT ID KDB190322b](#)) are the first systems containing Intel Optane DC Persistent Memory for which STAC-M3 results have been disclosed.

The STAC-M3 Benchmark suite is the industry standard for testing solutions that enable high-speed analytics on time series data, such as tick-by-tick market data , also known as tick database stacks. The base suite, code-named “Antuco”, contains a range of test cases with varying levels of CPU and storage-I/O intensity.

Compared to previous publicly reported Antuco suite results for single-node 2-socket servers running the Kx Systems kdb+ database, the SR650 with DCPMM set records in 11 of 17 mean response-time benchmark category records:

- STAC-M3.β1.100T.STATS-UI.TIME
- STAC-M3.β1.100T.VWAB-12D-NO.TIME
- STAC-M3.β1.10T.STATS-UI.TIME
- STAC-M3.β1.10T.THEOPL.TIME
- STAC-M3.β1.1T.MOHIBID.TIME
- STAC-M3.β1.1T.QTRHIBID.TIME
- STAC-M3.β1.1T.STATS-UI.TIME
- STAC-M3.β1.1T.VWAB-D.TIME
- STAC-M3.β1.1T.YRHIBID-2.TIME
- STAC-M3.β1.1T.YRHIBID.TIME
- STAC-M3.β1.50T.STATS-UI.TIME

The SR650 was configured as follows for the benchmark audit:

- Lenovo ThinkSystem SR650
- 2x Intel Xeon Platinum 8280L Processors (28 cores, 2.7GHz, 38.5MB last level cache)

- 768GB memory (12x 64GB RDIMMs @ 2933MHz)
- 12x 512GB Intel Optane DC Persistent Memory (DCPMM) modules
- Red Hat Enterprise Linux 7.6 with xfs V5
- Kx Systems kdb+ 3.6
- Security patches for the full range of Spectre/Meltdown vulnerabilities including 1, 2, 3 and L1TF

About the ThinkSystem SR650

The Lenovo ThinkSystem SR650 server now supports Intel Optane DC Persistent Memory and up to two second-generation Intel Xeon Scalable processors. It features up to 36% total performance improvement compared to the previous generation and supports two 300W high-performance GPUs and ML2 NIC adapters with shared management. Unique Lenovo AnyBay technology provides the flexibility to mix-and-match SAS/SATA HDDs/SSDs and NVMe SSDs in the same drive bays. Support is now available for up to 24 NVMe drives.

For medium to large enterprises, and managed and cloud service providers, Lenovo ThinkSystem SR650 is the optimum 2U, two-socket server—the most widely used server type worldwide. It's engineered to deliver high performance with 205W CPUs, low-latency NVMe drives, and high-power GPUs.

With Lenovo's history of reliability, the highly flexible and configurable SR650 is the ideal platform for hyper-converged infrastructure (HCI) or software-defined storage (SDS). It provides a solid foundation for:

- Transforming physical resources into services, using validated designs for hybrid cloud
- Performing analytics on streaming data, using validated designs for Big Data
- Increasing productivity of virtualized transactional systems, using validated designs for OLTP databases.

Lenovo XClarity Controller is an all-new hardware embedded management engine common in every ThinkSystem server. XClarity Controller features an uncluttered graphical user interface, industry standard Redfish-compliant REST APIs, and enables booting in half the time of prior generation servers, with up to 6x faster firmware updates.

Lenovo XClarity Administrator is a virtualized application that centrally manages ThinkSystem servers, storage, and networking. Via reusable patterns and policies, it ramps up and scales infrastructure provisioning and maintenance. It serves as a central integration point to extend your data center management processes to physical IT. Running XClarity Integrators in external IT applications, or integrating through REST APIs, helps you further speed services provisioning, streamline IT management, and contain costs.

About STAC

Securities Technology Analysis Center (STAC) is a company that coordinates a community called the STAC Benchmark™ Council. The STAC Benchmark Council consists of over 485 financial institutions and more than 60 vendor organizations.

The purpose of the STAC Benchmark Council is two-fold:

- To conduct substantive discussions on important technical challenges and solutions in financial services
- To develop technology benchmark standards that are useful to financial organizations

User firms include the largest global banks, brokerage houses, exchanges, asset managers, hedge funds, proprietary trading shops, and other market participants. Vendor firms include innovative providers of hardware, software, and cloud services. STAC-M3 is driven by trading firms in the STAC Benchmark Council, with the participation of relevant software, hardware, and cloud providers. The STAC-M3 benchmark report for the SR650 is publicly available.

Learn more

To learn more about 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 the Lenovo ThinkSystem SR650 server, visit the [SR650 product web page](#).

Related product families

Product families related to this document are the following:

- [2-Socket Rack Servers](#)
- [STAC-M3 Benchmark Results](#)
- [ThinkSystem SR650 Server](#)

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