

New World Records Set with the STAC-M3 Benchmark on the ThinkSystem SR950 with Intel Optane DC Persistent Memory Performance Benchmark Result

The Lenovo ThinkSystem SR950 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 and Kanaga suites of the STAC-M3 benchmark.

This system and its Lenovo ThinkSystem SR650 2-socket counterpart (see STAC report [SUT ID KDB190320b](#)) 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. STAC-M3 benchmarks are grouped into suites. The base suite, code-named “Antuco”, contains a range of test cases with varying levels of CPU and storage-I/O intensity. The optional “Kanaga” suite consists of two test sequences that extend Antuco benchmarks across larger quantities of data in order to measure the volume-scalability of a database stack.

These new benchmark results were published on April 2, 2019 in a new STAC Report, [SUT ID KDB190322b](#). These results demonstrate that the SR950 continues Lenovo’s leadership with world record breaking performance for the financial services industry.

The SR950 with DCPMM achieved leadership performance in 9 of 17 benchmark categories in the Antuco suite:

- 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.β1.10T.VOLCURV.TIME
- STAC-M3.β1.1T.MOHIBID.TIME
- STAC-M3.β1.1T.STATS-UI.TIME
- STAC-M3.β1.1T.WKHIBID.TIME
- STAC-M3.β1.1T.WRITE.TIME

The SR950 with DCPMM also achieved leadership performance in 8 of 9 benchmark categories in the Kanaga suite when using a two-year data set size. The results from this stack under test (SUT) can be compared directly to results from this same system when the entire database resided in the 3DNAND drives (see [SUT ID KDB190322a](#)).

- STAC-M3.β1.100T.TRUNC.YR1VWAB-12D-HO.TIME
- STAC-M3.β1.100T.TRUNC.YR2VWAB-12D-HO.TIME
- STAC-M3.β1.10T.TRUNC.YR2-MKTSNAP.TIME
- STAC-M3.β1.1T.TRUNC.2YRHIBID.TIME
- STAC-M3.β1.1T.TRUNC.YR1VWAB-12D-HO.TIME
- STAC-M3.β1.1T.TRUNC.YR2VWAB-12D-HO.TIME
- STAC-M3.β1.50T.TRUNC.YR1VWAB-12D-HO.TIME
- STAC-M3.β1.50T.TRUNC.YR2VWAB-12D-HO.TIME

The ThinkSystem SR950 server was configured as follows for the benchmark audit:

- Lenovo ThinkSystem SR950
- 4x Intel Xeon Platinum 8280L Processors (28 cores, 2.5GHz, 38.5MB last level cache)
- 1.5TB memory (24x 64GB RDIMMs at 2933MHz)
- 24x 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 SR950

Lenovo ThinkSystem SR950 is designed for your most demanding, mission-critical workloads, such as in-memory databases, large transactional databases, batch and real-time analytics, ERP, CRM, and virtualized server workloads. The powerful 4U ThinkSystem SR950 can grow from two to eight second-generation Intel Xeon Scalable Family processors, and with 96 DIMM sockets, supports up to 24 TB of high-speed memory. The modular design of SR950 speeds upgrades and servicing with easy front or rear access to all major subsystems to maximize server availability. The ThinkSystem SR950 also supports Intel Optane DC Persistent Memory delivering a new, flexible tier of memory designed specifically for data center workloads that offer an unprecedented combination of high-capacity, affordability and persistence.

The SR950 packs numerous fault-tolerant and high-availability features into a high-density, 4U rack-optimized design that reduces the space needed to support massive network computing operations and simplify servicing. 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.

ThinkShield is a comprehensive approach to security designed to secure the data center, from the foundation of your infrastructure to the network's edge and guard against a security breach. ThinkShield protects your business with each offering, from development through disposal.

About STAC

The Securities Analysis Technology Center (STAC) is a company that coordinates a community called the STAC Benchmark Council.

The STAC Benchmark Council consists of over 300 financial institutions and more than 50 vendor organizations whose purpose is to explore technical challenges and solutions in financial services and to develop technology benchmark standards that are useful to financial organizations.

User firms include the largest global banks, brokerage houses, exchanges, hedge funds, proprietary trading shops, and other market participants. Vendor firms include innovative manufacturers of processor, server, storage, and network hardware, as well as horizontal-market software providers and vertical specialists.

STAC-M3 benchmarks are governed by user firms in the STAC Benchmark Council. The STAC-M3 benchmark report for the SR950 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 SR950 server, visit the [SR950 product web page](#).

Related product families

Product families related to this document are the following:

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

Notices

Lenovo may not offer the products, services, or features discussed in this document in all countries. Consult your local Lenovo representative for information on the products and services currently available in your area. Any reference to a Lenovo product, program, or service is not intended to state or imply that only that Lenovo product, program, or service may be used. Any functionally equivalent product, program, or service that does not infringe any Lenovo intellectual property right may be used instead. However, it is the user's responsibility to evaluate and verify the operation of any other product, program, or service. Lenovo may have patents or pending patent applications covering subject matter described in this document. The furnishing of this document does not give you any license to these patents. You can send license inquiries, in writing, to:

Lenovo (United States), Inc.
1009 Think Place - Building One
Morrisville, NC 27560
U.S.A.
Attention: Lenovo Director of Licensing

LENOVO PROVIDES THIS PUBLICATION "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Some jurisdictions do not allow disclaimer of express or implied warranties in certain transactions, therefore, this statement may not apply to you.

This information could include technical inaccuracies or typographical errors. Changes are periodically made to the information herein; these changes will be incorporated in new editions of the publication. Lenovo may make improvements and/or changes in the product(s) and/or the program(s) described in this publication at any time without notice.

The products described in this document are not intended for use in implantation or other life support applications where malfunction may result in injury or death to persons. The information contained in this document does not affect or change Lenovo product specifications or warranties. Nothing in this document shall operate as an express or implied license or indemnity under the intellectual property rights of Lenovo or third parties. All information contained in this document was obtained in specific environments and is presented as an illustration. The result obtained in other operating environments may vary. Lenovo may use or distribute any of the information you supply in any way it believes appropriate without incurring any obligation to you.

Any references in this publication to non-Lenovo Web sites are provided for convenience only and do not in any manner serve as an endorsement of those Web sites. The materials at those Web sites are not part of the materials for this Lenovo product, and use of those Web sites is at your own risk. Any performance data contained herein was determined in a controlled environment. Therefore, the result obtained in other operating environments may vary significantly. Some measurements may have been made on development-level systems and there is no guarantee that these measurements will be the same on generally available systems. Furthermore, some measurements may have been estimated through extrapolation. Actual results may vary. Users of this document should verify the applicable data for their specific environment.

© Copyright Lenovo 2020. All rights reserved.

This document, LP1112, was created or updated on April 2, 2019.

Send us your comments in one of the following ways:

- Use the online Contact us review form found at:
<http://lenovopress.com/LP1112>
- Send your comments in an e-mail to:
comments@lenovopress.com

This document is available online at <http://lenovopress.com/LP1112>.

Trademarks

Lenovo and the Lenovo logo are trademarks or registered trademarks of Lenovo in the United States, other countries, or both. A current list of Lenovo trademarks is available on the Web at <https://www.lenovo.com/us/en/legal/copytrade/>.

The following terms are trademarks of Lenovo in the United States, other countries, or both:

Lenovo®

ThinkSystem

XClarity®

The following terms are trademarks of other companies:

Intel®, Optane™, and Xeon® are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries.

Linux® is the trademark of Linus Torvalds in the U.S. and other countries.

Other company, product, or service names may be trademarks or service marks of others.