

## ThinkSystem SR645 Sets 2 World Records with New SPECchpc 2021 Small Benchmark Result Performance Benchmark Result

The Lenovo ThinkSystem SR645 has set two performance world records with new 2-socket results of the SPECchpc 2021 Small benchmark.

These new benchmark results, published in new SPEC reports on March 22, 2022, demonstrate that the ThinkSystem SR645 continues Lenovo's leadership with outstanding performance for the server industry.



The ThinkSystem SR645 has achieved the following scores:

- **SPECchpc\_2021\_sml\_base = 0.687**
- **SPECchpc\_2021\_sml\_peak = 0.687**

The SPECchpc 2021 Benchmark suite is the industry standard to evaluate hardware-based accelerator devices and the performance of parallel computing workloads.

The Lenovo ThinkSystem SR645 server was configured as follows:

- 2x AMD EPYC 7773X ("Milan-X") processor (each 64 cores, 2.20 GHz, 768 MB L3 cache)
- 1 TB memory (16x 64GB RDIMMs at 3200 MHz)
- 1 TB 2.5-inch SSD
- Red Hat Enterprise Linux 8.3

The results are current as of March 22, 2022. To view details of the results, see the following SPEC web page:

<https://spec.org/hpc2021/results/res2022q1/hpc2021-20220221-00080.html>

To view all SPECchpc 2021 results, go to

<https://spec.org/hpc2021/results/>

### About the ThinkSystem SR645

The Lenovo ThinkSystem SR645 server, now with AMD EPYC 7003 Series processors, delivers outstanding TCO for transactional database, ERP, virtualization and software-defined deployments. The combination of two AMD EPYC 7003 CPUs with class-leading memory speed and core density in a 1U chassis is a step forward compared to prior generation two-socket servers. Lenovo's lauded system reliability, management capabilities, and security infrastructure layer on to the exceptional value that the ThinkSystem SR645 brings to the data center. The ThinkSystem SR645 features two processors with up to an unprecedented 128 total cores with 128 PCIe Gen4 lanes to bring better efficiency to customers looking for the ultimate in core density and high speed direct attached storage in their data centers.

Compared to previous processor generations, the ThinkSystem SR645 delivers up to 2X performance and 4X floating point capability, providing faster data transfer and transaction capabilities without sacrificing memory capacity or I/O with PCIe Gen4 support and faster memory speeds up to 3200 MHz.

Key features:

- 128 cores across two processors to handle heavy-lift ERP, CRM, and virtualization workloads; provides cutting edge application efficiency in database applications, or electronic trading platforms for financial services applications.
- Compact 1U server with dense NVMe storage is an ideal platform for software defined storage or a hyperconverged solution
- Class-leading core density in the 1U form factor coupled with high speed 3200 MHz memory and PCIe Gen4 IO makes an ideal platform for advanced analytics

## About SPEChpc 2021

High Performance Computing (HPC) systems are getting built with an increased level of heterogeneity. The numerous types of accelerators bring in tremendous extra computing power, while at the same time introduce big challenges in performance evaluation and characterization. More complications are added to the problem when multiple parallel and accelerator programming models have been developed with each only supporting a subset of the computing devices.

The SPEChpc 2021 Benchmark Suite address these challenges by providing a set of application benchmark suites using a comprehensive measure of real-world performance for the state-of-the-art HPC systems. They offer well-selected science and engineering codes that are representative of HPC workloads and are portable across CPU and accelerators, along with certain fair comparative performance metrics.

SPEChpc 2021 focuses on compute intensive parallel performance across one or more nodes, which means these benchmarks emphasize the performance of the following components:

- Processors & GPUs - The CPU chips and optionally, an acceleration device such as a GPU
- Memory - The memory hierarchy, including caches and main memory
- Interconnects - The communication between nodes of a cluster
- Compilers - C, C++, and Fortran compilers, including optimizers
- MPI - The MPI implementation.

The SPEChpc 2021 benchmark suite is broken out into four workloads, Tiny, Small, Medium and Large:

- SPEChpc2021 Tiny workloads use up to 60 GB of memory and are intended for use on a single node using between 1 and 256 ranks.
- SPEChpc2021 Small workloads use up to 480 GB of memory and are intended for use on one or more nodes using between 64 and 1024 ranks
- SPEChpc2021 Medium workloads use up to 4 TB of memory and are intended for use on a mid-size cluster using between 256 and 4096 ranks
- SPEChpc2021 Large workloads use up to 14.5 TB of memory and are intended for use on a larger clusters using between 2048 and 32,768 ranks

## Learn more

To learn more about solutions for HPC applications, contact your Lenovo Sales Representative or visit <https://www.lenovo.com/us/en/servers-storage/solutions/hpc/>

To find out more about SPEC, visit <https://www.spec.org>

To learn more about the Lenovo ThinkSystem SR645 server, visit the SR645 product web page: <https://www.lenovo.com/us/en/p/servers-storage/servers/racks/thinksystem-sr645/77xx7sr352s>

## Related product families

Product families related to this document are the following:

- [2-Socket Rack Servers](#)
- [SPEChpc Benchmark Results](#)
- [ThinkSystem SR645 Server](#)

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