ThinkSystem SR665 Sets World Record with New 5-node SPECmpiL Benchmark Result

Performance Benchmark Result

The Lenovo ThinkSystem SR665 has set a new 5-node 2-socket performance world record with the SPECmpiL_base2007 metric from the MPI L2007 suite of the SPEC MPI 2007 Benchmark. The SPECmpiL Benchmark suite is the industry standard to evaluate MPI-parallel, floating point, compute intensive performance across a wide range of cluster and SMP hardware.

This new benchmark result, published in a new SPEC Report on May 6, 2020, demonstrates that the ThinkSystem SR665 continues Lenovo's leadership with outstanding performance for the server industry.

The ThinkSystem SR665 has achieved the following score (1):

- **SPECmpiL_base2007 = 29.1**

This result is the best 5-node performance in the industry, 4.8 times faster than the NEC result. (2)

Table 1. Comparison of results

Hardware vendor	System	Result (Base)	Total Cores	Total Chips	Total Memory
Lenovo (1)	ThinkSystem SR665 (AMD EPYC 7H12 CPU, 2.6 GHz)	29.1	640	10	5120
NEC (2)	NEC HPC1812Rg-2 (Intel Xeon E5-2650 v4, 2.20 GHz)	6.04	120	10	640

Each of the five SR665 servers was configured as follows for the benchmark audit:

- Lenovo ThinkSystem SR665
- 2x AMD EPYC 7H12 Processors (64 cores, 2.60GHz)
- 1 TB memory (16 x 64GB RDIMMs at 3200MHz)
- 480GB 2.5-inch SSD
- Red Hat Enterprise Linux Server release 8.1, Kernel 4.18.0-147.el8.x86_64

Results referenced are current as of May 6, 2020.

(1) The new Lenovo benchmark result can be found at:
https://www.spec.org/mpi2007/results/res2020q2/mpi2007-20200416-00646.html

(2) The NEC result can be found at:
https://www.spec.org/mpi2007/results/res2017q4/mpi2007-20170912-00565.html

About the ThinkSystem SR665

The Lenovo ThinkSystem SR665 server, now with AMD EPYC 7003 Series processors, delivers outstanding TCO for transactional database, ERP, virtualization, big data & analytics and software-defined deployments. The combination of two AMD EPYC 7003 CPUs with class-leading memory speed, storage, and GPU density, rapidly outpaces the power of prior generation two-socket servers. Lenovo's lauded system reliability, management capabilities, and security infrastructure layer on to the exceptional value that the ThinkSystem SR665 brings to the data center. With the enterprise-class AMD EPYC 7003 Series or 7002 Series processor, the world's first 7nm data center CPU, the ThinkSystem SR665 features two processors with up to an unprecedented 128 total cores with 128 PCIe Gen4 lanes to reduce bottlenecks and increase server utilization.

Compared to the previous processor generations, ThinkSystem SR665 delivers up to 2X performance and 4X floating point capability, providing faster data transfer and analytics 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 health care applications such as medical imaging, EMR, and PACS, or electronic trading platforms for financial services applications.
- Multi-GPU optimized rack server, providing support for up to 8 single-wide GPUs that offer 200% more workload acceleration in AI Inference, and virtualized desktop infrastructure (VDI).
- Support for up to 32 NVMe solid-state drives; when paired with high speed networking, make the system an excellent choice for workloads that need large amounts of low-latency high-bandwidth storage, including virtualized clustered SAN solutions, software-defined storage (SDS), and applications leveraging NVMe over Fabrics.

About SPEC MPI

The SPEC MPI 2007 benchmark suite evaluates Message-Passing Interface (MPI)-parallel, floating point, compute-intensive performance across a wide range of cluster and symmetric multiprocessing (SMP) server hardware. The suite includes the initial MPIM2007 suite, which contains medium-sized working sets and run times, and the newer MPIL2007 suite, which contains larger working sets and longer run times. This MPI 2007 continues the SPEC tradition of giving users the most objective and representative benchmark suite for measuring and comparing high-performance computer systems.

SPEC MPI 2007 focuses on performance of compute intensive applications using the MPI, which means this benchmark emphasizes the performance of all of the following:

- Type of processor
- Number of computer processors
- MPI Library
- Communication interconnect
- Memory architecture
- Compiler used
- Type of shared file system

The benchmark is not intended to stress other computer components such as the operating system, graphics, or the I/O system.

For more information about SPEC MPI 2007, see https://www.spec.org/mpi2007/.

Learn more

To learn more about solutions for compute-intensive applications, please contact your Lenovo Sales Representative.

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

To learn more about the Lenovo ThinkSystem SR665 server, visit the SR665 product web page: https://www.lenovo.com/us/en/data-center/servers/racks/ThinkSystem-SR665-Server/p/77XX7SR552S

Related product families

Product families related to this document are the following:

- 2-Socket Rack Servers
- SPECmpi Benchmark Results
- ThinkSystem SR665 Server

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