ThinkSystem SR650 Sets World Record with New One-Node SPEC ACCEL OpenMP Result

Performance Benchmark Result

The Lenovo ThinkSystem SR650 server has set a new 1-node 2-socket performance world record with the SPECaccel_omp_base metric from the SPEC ACCEL Benchmark. The SPEC ACCEL Benchmark suite is the industry standard to evaluate hardware-based accelerator devices and the performance of parallel computing workloads.

This new benchmark result, published in a new SPEC Report on April 2, 2019, demonstrate that the ThinkSystem SR650 continues Lenovo's leadership with outstanding performance for the server industry.

The ThinkSystem SR650 has achieved the following score (1):

- **SPECaccel_omp_base = 6.79**

This result is the best 1-node 2-socket performance in the industry, 10.5% faster than the Intel 1-node Phi result (2), and 15.2% faster than the Intel 1-node 2-socket result (3).

Table 1. Comparison of results

Hardware vendor	System	Result (Base)	Cores	CPUs	Memory
Lenovo (1)	ThinkSystem SR650 (Intel Xeon Platinum 8280, DDR4-2933 MHz, HT off, Turbo on)	6.79	56	2	768
Intel (2)	Endeavour Node (Intel Xeon Phi CPU 7250F, 1.40 GHz, SMT on, Turbo on, flat MCDRAM)	6.14	68	1	96
Intel (3)	Intel Server System R2208WFTZS (Intel Xeon Platinum 8180, 2.50 GHz, SMT on, Turbo on)	5.89	56	2	192

The SR650 was configured as follows for the benchmark audit:

- Lenovo ThinkSystem SR650
- 2x Intel Xeon Platinum 8280 Processors (28 cores, 2.70GHz)
- 768 GB memory (24x 32GB RDIMMs running at 2933MHz)
- 1 TB 12Gbps SAS 2.5" SSD
- Red Hat Enterprise Linux Server release 7.6, Kernel 3.10.0-957.el7.x86_64
- Accelerator: (system processors)

Results referenced are current as of April 2, 2019.

(1) The new Lenovo benchmark result can be found at:
https://www.spec.org/accel/results/res2019q2/accel-20190312-00124.html

(2) The Intel Phi result can be found at:
https://www.spec.org/accel/results/res2017q3/accel-20170630-00088.html

(3) The Intel result can be found at:
https://www.spec.org/accel/results/res2017q3/accel-20170718-00090.html

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 SPECaccel

The SPEC ACCEL benchmark suite provides a comparative measure the performance of hardware accelerator devices and their supporting software tool chains using computationally-intensive parallel applications. The suite is comprised of scientific applications used in High Performance Computing (HPC) and focuses on parallel computing performance.

The suite has been ported using several accelerator programming models each of which has been released as separate benchmark components:

- SPEC ACCEL OpenCL -- based on the Open Computing Language (OpenCL) 1.1 framework
- SPEC ACCEL OpenACC -- based on the Open Accelerators (OpenACC) 1.0 programming standard for parallel computing
- SPEC ACCEL OpenMP -- based on the Open Multi-Processing (OpenMP) 4.5 application programming interface

The product consists of source code benchmarks that are developed from real user applications.

For more information and SPEC ACCEL results, see http://www.spec.org/accel/.

Learn more

To learn more about solutions for parallel computing workloads, please contact your Lenovo Sales Representative.

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

To learn more about the Lenovo ThinkSystem SR650 server, visit the SR650 product web page: https://www.lenovo.com/us/en/data-center/servers/racks/ThinkSystem-SR650/p/77XX7SRSR65

Related product families

Product families related to this document are the following:

- 2-Socket Rack Servers
- SPECaccel Benchmark Results
- ThinkSystem SR650 Server

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