ThinkSystem SR665 and ThinkSystem DE6000H Set World's First SPECvirt Datacenter 2021 Benchmark Result

Performance Benchmark Result

Lenovo has published the world's first SPECvirt Datacenter 2021 benchmark result utilzing four ThinkSystem SR665 servers and the ThinkSystem DE6000H Hybrid Storage Array.

The Lenovo solution achieved the following score (1):

- **SPECvirt Datacenter-2021 5.952 per host @ 4 Hosts**

The SPECvirt Datacenter 2021 benchmark is a multi-host benchmark for measuring the performance of a scaled-out datacenter. The benchmark uses real-world and simulated workloads to measure the overall efficiency of virtualization solutions and their management environments.

Each of the four SR665 servers used to achieve this record level of virtualized data center performance had the following configuration:

- 2x AMD AMD EPYC 7763 64-core processors at 2.45 GHz (2 processors, 64 cores, 128 threads)
- 2048 GB of Lenovo TruDDR4 memory
- 1x ThinkSystem Emulex LPe35002 PCIe 32Gb 2-Port SFP+ Fibre Channel Adapter
- 2x ThinkSystem Broadcom 57414 10/25GbE SFP28 2-port PCI Ethernet Adapters
- VMware vSphere ESXi 7.0 U2a

The vSphere cluster was managed via VMware vCenter Server (VCSA) 7.0 U2b.

For SAN storage, the solution included the ThinkSystem DE6000H Hybrid Storage Array. The SAN was comprised of one DE6000H 4U60 controller enclosure with 60x 800GB 3DWD SSDs. The Emulex 32Gb FC adapters in the servers were connected to the DE6000H controller using a ThinkSystem DB620S FC switch.

All network traffic (vMotion, intra-host, and client-to-host) was routed through two Broadcom 25Gb Ethernet adapters in each server and managed through a ThinkSystem NE10032 RackSwitch.

Results referenced are current as of September 2, 2021. To view all SPECvirt Datacenter 2021 results, visit https://www.spec.org/virt_datacenter2021/results/.

(1) The total solution availability for this benchmark result is July 2021. See the details for this result at https://www.spec.org/virt_datacenter2021/results/res2021q3/virt_datacenter2021-20210809-00002-perf.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.
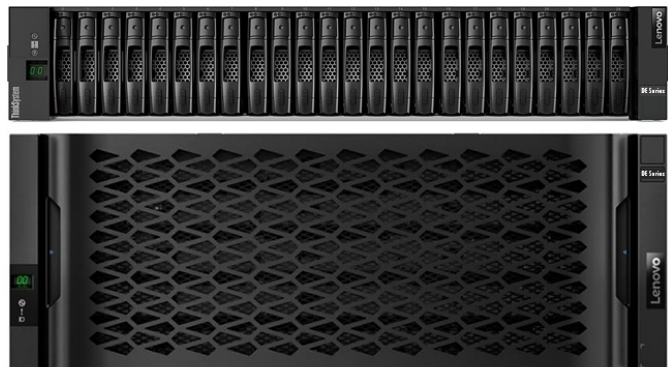
Key features:

- 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 the Lenovo ThinkSystem DE6000H Storage

Lenovo ThinkSystem DE6000H is a scalable, hybrid mid-range storage system that is designed to provide high performance, simplicity, capacity, security, and high availability for medium to large businesses. The ThinkSystem DE6000H delivers enterprise-class storage management capabilities in a performance-optimized system with a wide choice of host connectivity options, flexible drive configurations, and enhanced data management features.

Available as either a 2U or 4U enclosure, the DE6000H is a perfect fit for a wide range of enterprise workloads, including big data and analytics, video surveillance, technical computing, backup and recovery, and other storage I/O-intensive applications.

The DE6000H scales up to 480 drives with the attachment of expansion enclosures. It offers flexible drive configurations with the choice of 2.5-inch (SFF) or 3.5-inch (LFF) drive form factors using SAS HDDs and SSDs.

Key features:

- Scalable, high performance mid-range hybrid storage with dual active/active controller configurations with 16 GB or 64 GB cache per controller for high availability and performance.

- Faster application response times with support for NVMe over Fabrics.

- 12 Gb SAS drive-side connectivity.

- High levels of performance and data protection with Dynamic Disk Pools (DDP) technology, as well as support for traditional RAID 0, 1, 3, 5, 6, and 10.

- Flexible storage protocols to match diverse client needs with support for SAS, iSCSI, FC, NVMe/FC, and NVMe/RoCE.
- Available in two different enclosure form factors:
  - DE6000H 2U24 SFF: 2U with 24 SFF drive bays
  - DE6000H 4U60: 4U with 60 LFF drive bays
- Support for three different expansion enclosures::
  - DE240S 2U24 SFF: 2U with 24 SFF drive bays
  - DE120S 2U12 LFF: 2U with 12 LFF drive bays
  - DE600S 4U60 LFF: 4U with 60 LFF drive bays
- Base scalability to up to 192 SFF or 240 LFF drives with the optional upgrade to increase the number of LFF drives to 480 by attaching expansion enclosures to satisfy growing needs for storage capacity and performance.
- Rich set of standard storage management functions available at no extra cost, including Dynamic Disk Pools, SSD read cache, snapshots, volume copy, thin provisioning, and encryption (requires optional FIPS drives).

About the SPECvirt Datacenter 2021 benchmark

The SPECvirt Datacenter 2021 benchmark is a new multi-host benchmark for measuring the performance of a scaled-out data center. The benchmark uses real-world and simulated workloads to measure the overall efficiency of virtualization solutions and their management environments.

The SPECvirt Datacenter 2021 benchmark provides a methodical way to measure a virtualization platform's performance in a dynamic virtualized data center environment. It models typical, modern-day usage of virtualized infrastructure, such as VM resource provisioning, cross-node load balancing (including management operations such as VM migrations), and VM power on/off. The benchmark exercises data center operations under load including dynamically provisioning new workload VMs and powers on pre-existing VMs.

SPECvirt Datacenter 2021 is used to compare the performance of different hardware platforms and configurations in multi-host virtualized data center environments. Customers implementing or evaluating virtualization platforms can use the benchmark to compare the performance and scalability of various server platforms and storage solutions, to make appropriate hardware choices, and to measure platform performance on an ongoing basis.

Learn more

To learn more about power-efficient solutions for virtualization 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/p/77XX7SR552S

Related product families

Product families related to this document are the following:

- 2-Socket Rack Servers
- DE Series Storage
- SPECvirt Benchmark Results
- ThinkSystem SR665 Server

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