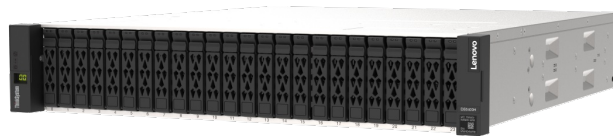


ThinkSystem DE Series Hybrid Flash Array

Achieve affordable performance, reliability, and simplicity for modern enterprise applications



The Challenge

To differentiate your organization from the competition and speed time-to-market, you need quick and valuable insights from your core applications, despite a range of mixed workloads. These applications are your key to success, and for that, you need data storage systems with extreme application performance and nonstop data availability. And that's not all. You also need to consider factors like system capacity, simplicity, and efficiency.

The Solution

The ThinkSystem DE Series Hybrid Flash Array was engineered to do just that. It's ideal for workloads ranging from high-IOPS or bandwidth-intensive streaming applications to high-performance storage consolidation.

Requiring just 2U of rack space, a DE Series hybrid storage subsystem combines high capacity with extreme performance: high-IOPS throughput with up to 44GBps of read bandwidth, and 12.5GBps of write bandwidth. The ThinkSystem DE Series is designed to achieve up to 99.9999% availability via fully redundant I/O paths, advanced data protection features, and extensive diagnostic capabilities.

It's also highly secure, with robust data integrity that protects your critical business data as well as your customers' sensitive personal information.

Simplicity

Scaling is easy due to the modular design of the DE Series and the simple management tools included. You can start working with your data in less than 10 minutes.

ThinkSystem DE Series consists of multiple families of systems that are defined by their controllers. Extensive configuration flexibility, custom performance tuning, and complete control over data placement enable administrators to maximize performance and ease of use.

With up to 2 million IOPS and 44GBps throughput, the DE6600H was engineered for workloads ranging from high-IOPS or bandwidth-intensive streaming applications to high-performance storage consolidation.

The DE6400H provides superior performance and capacity with high availability, security, and enterprise-class data management features for modern enterprise applications with up to 670k IOPs and 20GBps throughput.

Lenovo

The DE4000H system uses hybrid storage models to optimize performance for mixed workloads, with outstanding low latency.

The DE6000H system offers top performance hybrid storage models, which support raw data-read-throughput rates of up to 21GBps.

Multiple viewpoints provided by graphical performance tools supply the key information about storage I/O that administrators need to further refine performance. These systems are targeted at backup and recovery, artificial intelligence workloads, Big Data/analytics, and virtualization, yet they work equally well in general computing environments.

DE Series combines comprehensive features with ease of use. ThinkSystem System Manager will lead you through the provisioning appropriate for your workload, or you can create your own. Dynamic drive pools (DDP) technology dramatically simplifies RAID management, requiring minimal decision-making on your part.

Advanced Data Protection

With DDP technology, there are no idle spares to manage, and you don't need to reconfigure RAID when you expand your system. It distributes data parity information and spare capacity across a pool of drives to simplify the management of traditional RAID groups.

It also enhances data protection by enabling faster rebuilds after a drive failure. DDP dynamic-rebuild technology reduces the likelihood of another failure by using every drive in the pool for faster rebuilds.

The capability to dynamically rebalance data across all drives in the pool when drives are added or removed is one of the key features of DDP technology. A traditional RAID volume group is limited to a fixed number of drives. DDP, on the other hand, lets you add or remove multiple drives in a single operation.

ThinkSystem DE Series Hybrid models offer advanced enterprise-class data protection, both locally and over long distance, including:

- Snapshot / Volume copy
- Asynchronous mirroring (DE6000H, DE4000H and DE2000H only)
- Synchronous mirroring (DE6000H and DE4000H)

Secure Data, Secure Management

All drives get redeployed, retired, or serviced. When this happens, you don't want your sensitive data going out the door with them. Combining local key management with drive-level encryption gives you comprehensive security for data-at-rest with no impact to performance.

DE Series gives you the choice of how to manage the drive authentication keys: You can either do it yourself to reduce cost, or you can use a KMIP-compliant external key manager for easy centralized administration.

XClarity Support

Lenovo XClarity Administrator is a centralized resource management solution that is aimed at reducing complexity, speeding response, and enhancing the availability of Lenovo server systems and solutions. Lenovo XClarity Administrator provides agent-free hardware management for our servers, storage, network switches, hyperconverged and ThinkAgile solutions.

Why Lenovo

Lenovo is the leading provider of x86 systems for the data center. The portfolio includes rack, tower, blade, dense and converged systems, and supports enterprise class performance, reliability, and security. Lenovo also offers a full range of networking, storage, software and solutions, and comprehensive services supporting business needs throughout the IT lifecycle.

Specifications

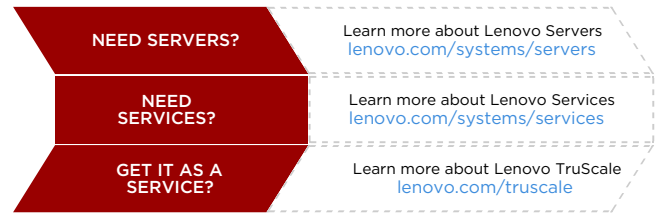
	DE2000H	DE6000H	DE4000H	DE6400H	DE6600H
Form Factor (Controller Enclosure)	2U, 24 drives 2U, 12 drives	4U, 60 drives 2U, 24 drives	2U, 24 drives 2U, 12 drives 4U, 60 drives	2U, 24 drives (NVMe)	2U, 24 drives (NVMe)
Maximum Raw Capacity	Supports up to 1.47PB	Supports up to 8.64PB	Supports up to 3.456PB	Supports up to 4.68PB	Supports up to 7.92PB
Maximum Drives	Supports up to 48 HDDs / 96 SSDs	Supports up to 480 HDDs / 120 SSDs	Supports up to 192 HDDs / 120 SSDs	Supports up to a maximum of 264 drives (24 NVMe in Controller Enclosure + 240 NL-SAS HDDs)	Supports up to a maximum of 444 drives (24 NVMe in Controller Enclosure + 420 NL-SAS HDDs)
Maximum Expansion	2U/12, 2U/24: up to 3 expansions	2U/12, 2U/24: up to 7 expansions 4U/60: up to 3 expansions	2U/12, 2U/24: up to 7 expansions 4U/60: up to 3 expansions	2U/12, 2U/24, 4U/60: up to 4 expansions	2U/12, 2U/24, 4U/60: up to 7 expansions
IOPS	100,000 IOPS	1,000,000 IOPS	300,000 IOPS	670,000 IOPS	2,000,000 IOPS
Sustained Throughput	Up to 3GBps	Up to 21GBps	Up to 9.2GBps	Up to 20GBps	Up to 44GBps
System Memory	16GB	32GB/128GB	16GB/64GB	16GB per controller	32GB or 128GB per controller
Optional I/O Ports (per system)	4x 12Gb SAS 8x 12Gb SAS 8x 10Gb/25Gb iSCSI 8x 16Gb/32Gb FC	8x 16Gb/32Gb FC 8x 10Gb/25Gb iSCSI 8x 12Gb SAS	8x 16Gb/32Gb FC 8x 10Gb/25Gb iSCSI 8x 12Gb SAS	4x 100Gb NVMe/IB, NVMe/RoCe, SRP/IB and iSER/IB 8x 32Gb FC (supports FC SCSI and NVMe/FC) 8x 25Gb iSCSI	8x 100Gb NVMe/IB, NVMe/RoCe, SRP/IB and iSER/IB 16x 32Gb FC (supports FC SCSI and NVMe/FC) 16x 25Gb iSCSI
System Maximums	Hosts: 256 Volumes: 512 Snapshot copies: 512 Mirrors: 32	Hosts/partitions: 512 Volumes: 2,048 Snapshot copies: 2,048 Mirrors: 128	Hosts: 256 Volumes: 512 Snapshot copies: 512 Mirrors: 32	Max hosts: 512 Max partitions: 256 Volumes: 1,024 Max DDP volume size: 2PiB Max RAID volume size: 30 drives Snapshot copies: 1,024	Max hosts: 1024 Max partitions: 512 Volumes: 2,048 Max DDP volume size: 2PiB Max RAID volume size: 30 drives Snapshot copies: 2,048

About Lenovo

Lenovo (HKSE: 992) (ADR: LNVGY) is a US\$62 billion revenue global technology powerhouse, ranked #171 in the Fortune Global 500, employing 77,000 people around the world, and serving millions of customers every day in 180 markets. Focused on a bold vision to deliver smarter technology for all, Lenovo is expanding into new growth areas of infrastructure, mobile, solutions and services. This transformation is building a more inclusive, trustworthy, and sustainable digital society for everyone, everywhere.

For More Information

To learn more more about the ThinkSystem DE Series Hybrid Flash Array, contact your Lenovo representative or Business Partner, or visit lenovo.com/storage. For detailed specs, consult the ThinkSystem DE Series [DE2000H](#), [DE6400H](#), [DE6600H](#), [DE4000H](#), or [DE6000H](#) Hybrid Flash Array product guides.



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