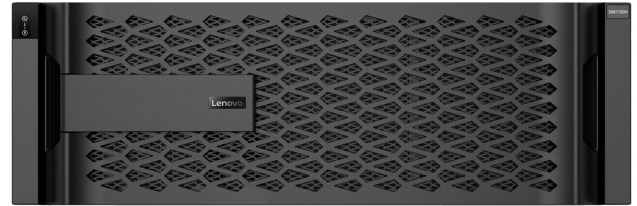# ThinkSystem DM Series Hybrid Flash

Hybrid Flash - fast, flexible, reliable, and secure

The Challenge
Enabling the data-driven business across flash, disk and cloud

Storage has evolved from an IT afterthought to a crucial component within a company's infrastructure. Businesses are feeling the pressure to keep up with the explosive data growth. Standard hard disks are no longer an acceptable medium to keep up with the always-adapting needs a company has when it comes to storage.

Shrinking budgets, overextended staff, and the never-ending growth of data that must be stored and accessed efficiently dictate the need for a new approach.

You still have to worry about storage uptime, scalability, and cost efficiency, but now you also need to take advantage of flash acceleration, cloud integration, unified support for SAN and NAS, and simplified data mining for competitive advantage.

For those data centers hampered by structural limitations in legacy storage and data architectures, this can be problematic. Traditional storage arrays tend to consist of isolated data silos and cannot meet today's service-level requirements or easily leverage public or private clouds.

The Solution
Unified scale-out hybrid storage with best-in-class data management

A new approach to storage is needed that combines high-performance hardware and adaptive, scalable storage software into an integrated solution. It must support current workloads, yet also take advantage of the new applications and evolving IT models.

ThinkSystem DM Series Hybrid Flash systems are designed to support your IT needs. These hybrid storage arrays provide a unified storage solution to manage all your block-and-file workloads on one array.

DM Series Hybrid Flash systems simplify the task of managing growth and complexity by delivering high performance, supporting a broad range of unified workloads, and seamlessly scaling of performance and capacity. For growing organizations that are concerned about budgets and meeting challenging IT needs, ThinkSystem DM Series Hybrid Flash systems are the perfect choice.

This flexibility enables you to place your data in the precise storage environment that delivers the ideal combination of performance, capacity, and cost effectiveness so you can keep up with changing business needs while meeting your core IT requirements.

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Scale and Adapt to Meet Changing Needs

Scaling up is easy with DM Series hybrid storage. Simply add more storage, flash acceleration, and upgrade the controllers. To scale out, grow from a base of two nodes to a 12-array cluster containing up to 67PB (SAN) or 134PB (NAS) of capacity. You can cluster with DM Series all-flash models for flexible growth as your business demands.

Adding and replacing storage systems and components is nondisruptive. This enables you to perform updates while running your usual workloads, without having to worry about maintenance windows.

Extreme Availability, Nondisruptive Operations

You have demanding availability requirements and DM Series enterprise storage is engineered to meet them. Highly reliable Lenovo hardware, innovative software, and sophisticated service analytics deliver 99.9999% ("six-9s") availability or greater through a multilayered approach.

Software and firmware updates, hardware repair and replacement, load balancing, and tech refreshes are performed real-time, with no need for planned downtime. Integrated data protection technologies protect your data, accelerate recovery, and integrate with leading backup applications for easier management. DM Series systems provide industry leading data security to protect against ransomware with preemptive detection and enhanced recovery, based on machine learning.

MetroCluster expands your data protection to eliminate risk of data loss by synchronously mirroring data between locations for nonstop availability of information. You can configure a MetroCluster storage array to mirror data within a single data center, or between two different locations up to 700Km away.

Optimize Hybrid Cloud Deployment

Many organizations today use cloud IT models as a service-oriented IT architecture to enhance return on investment and assets. For this reason, we optimized DM Series hybrid running for private and hybrid cloud with secure multitenancy, quality of service (QoS), nondisruptive operations, and easily defined tiers of service.

To help you meet the demands of enterprise applications, DM Series hybrid tightly integrates with the industry-standard OpenStack cloud infrastructure. This enables you to build a private cloud that delivers a robust service-oriented IT architecture.

For an enterprise-class hybrid cloud that offers predictable performance and availability, combine your DM Series storage array with Cloud Volumes. Cloud Volumes seamlessly integrates with and replicates data to multiple clouds, such as IBM Cloud, Amazon Web Services (AWS), or Microsoft Azure. This way you are not locked into one cloud provider.

Build the Right Long-Term Platform

Reduce your TCO and improve your ROI with technologies such as deduplication, compression, compaction, thin provisioning, and space-efficient Snapshot copies — all leading to a lower cost per effective gigabyte of storage.

ThinkSystem Intelligent Monitoring is an intelligent and intuitive digital advisor which uses AI and predictive analytics to provide imperative insights, proactive care and optimization, and customized dashboards enabling users to manage multiple DM and DE Series systems in a single web-accessible platform. Preemptive system information and alerts will expose risk factors and prevent problems before they affect your business and cut down on support costs and engagements. Intelligent capacity and performance monitoring will allow you to stay ahead of the curve and plan accordingly to meet your business's growth needs.

With Lenovo XClarity management software you can seamlessly integrate and manage all of your Lenovo ThinkSystem servers, storage, and networking together.

Specifications

Scale-Out	DM7100H	DM5000H	DM3000H
NAS Scale-out: 12 arrays			
Maximum Drives (HDD/SSD)	8640	1728	1728
Maximum Raw Capacity	134PB	23.5PB	27.6PB
Maximum onboard Flash Cache Based on NVMe Technology	48TB	24TB	24TB
Maximum Flash Pool	288TB	288TB	288TB
Maximum Memory	3072GB	768GB	768GB
SAN Scale-out: 6 Arrays			
Maximum Drives (HDD/SSD)	4320	864	864
Maximum Raw Capacity	67PB	11.7PB	13.8PB
Maximum Onboard Flash Cache Based on NVMe Technology	24TB	12TB	12TB
Maximum Flash Pool	144TB	144TB	144TB
Maximum Memory	1536GB	284GB	384GB
Cluster Interconnect	2x 100GbE	4x 10GbE	4x 10GbE
Per High Availability Pair Specifications	Active-Active Dual Controller		
Maximum Drives (HDD/SSD)	720	144	144
Maximum Raw Capacity	11.2PB	1.9PB	2.3PB
Maximum Onboard Flash Cache Based on NVMe Technology	4TB	2TB	2TB
Maximum Flash Pool	24TB	24TB	24TB
Controller Form Factor	4U	2U / 24 drives	2U / 12 drives
ECC Memory	256GB	64GB	64GB
NVRAM	32GB	8GB	8GB
PCIe Expansion Slots	10	0	0
Onboard I/O: UTA 2 (8Gb/16Gb FC, 1GbE/10GbE, or FCVI ports MetroCluster Only	0	8	8
FC Target Ports (32Gb autoranging, maximum)	32	Not Applicable	Not Applicable
FC Target Ports (16Gb autoranging, maximum)	8	Not Applicable	Not Applicable
40GbE Ports (maximum)	Not Applicable	Not Applicable	Not Applicable
25GbE Ports	24	Not Applicable	Not Applicable
10GbE Ports (maximum)	32	8	8
10GbE BASE-T Ports (1GbE autoranging) (maximum)	16	8	8
100GbE ports (40GbE autoranging)	16	Not Applicable	Not Applicable
12Gb / 6Gb SAS Ports (maximum)	32	4	4
OS Version	9.7 and later	9.4 and later	
Expansion Shelves	DM240S, DM120S, DM600S		
Protocols Supported	FC, iSCSI, NFS, pNFS, CIFS/SMB, S3		
Host/Client Operating Systems Supported	Microsoft Windows, Linux, VMware ESXi		

DM Series Hybrid Software	The DM Series software bundle includes a set of products that delivers leading data management, storage efficiency, data protection, high performance, and advanced capabilities such as instant cloning, data replication, application-aware backup and recovery, and data retention.

Software Features

Feature	Function	Benefits
Ransomware Protection	Provides built-in, robust features that detect ransomware activity, prevent its spread, and enable quick recovery – including automatically taking snapshots and alerting administrators when abnormal file activity is detected	Automatically protects against ransomware attacks and enables quick recovery to avoid paying the ransom
Data Reduction	Utilizes data compaction, compression, and deduplication to reduce the storage space needed for your data	Reduces the amount of storage that you need to purchase and maintain
Unified Data Management	Onboard management of Block, File and Object data	Flexibility to manage and store every type of data on one system and one management interface
FlexClone®	Instantaneously creates file, LUN, and volume clones without requiring additional storage	Saves time in testing and development and minimize storage use
FlexGroup™	Enables a single namespace to scale up to 20PB and 400 billion files	Maintains consistent high performance and resiliency for compute-intensive workloads
FlexVol®	Creates flexibly sized volumes across a large pool of disks and one or more RAID groups	Enables storage systems to be used at maximum efficiency and reduces hardware investment
MetroCluster	Combines array-based clustering with synchronous mirroring to deliver continuous availability	Maintains business continuity for critical enterprise applications and workloads
SnapMirror® Business Continuity	Non-disruptive failover active-active cross site clusters. Based on existing SnapMirror Synchronous Replication.	Zero data loss, zero downtime—with no more application failover. If there is a failure, the application will continue to run, with no need to restart.
QoS (adaptive)	Easy setup of QoS policies; automatically adjusts storage resources based on work-load changes	Simplifies operations and maintains consistent workload performance within IOPS boundaries
RAID-TEC and RAID DP Technologies	Provides triple parity or double-parity RAID implementation to protect against data loss	Protect data without the performance impact of other RAID implementations
SnapCenter®	Provides host-based data management of Lenovo storage for databases and business applications	Offers application-aware backup and clone management; automates error-free data restores
SnapMirror®	Enables automatic, incremental asynchronous and synchronous data replication	Provides flexibility and efficiency to support backup, data distribution, and disaster recovery
SnapRestore®	Rapidly restores single files, directories, or entire LUNs and volumes from any Snapshot copy backup	Instantaneously recover files, and complete volumes from your backup with SnapCenter and supported database plugins
SnapLock®	Provides WORM file-level locking, preventing changes and deletion of the file	Supports regulatory compliance and organizational data retention requirements. Enables air-gap separation of Snapshot copies for enhanced ransomware protection and quick recovery from an attack
Volume and Aggregate Encryption	Provides built-in FIPS 140-2 data-at-rest encryption	Easily and efficiently protect at-rest data by encrypting any volume or aggregate on DM Series system

Software Bundles

There are several DM Series software bundles available:

- The Unified Premium bundle for customers who require systems with clustering, application-aware snapshots, and enhanced management capabilities
- The Unified Fundamentals (WW excluding PRC) and Unified Base (PRC only) bundles for customers who need a unified storage solution with data efficiency features, snapshots, and replication (Fundamentals only)
- The SAN Premium, SAN Fundamentals (WW excluding PRC), and SAN Base (PRC only) bundles for customers who want to start with a block storage array that provides advanced data management features, with the possibility to upgrade to unified storage in the future.

About Lenovo

Lenovo (HKSE: 992) (ADR: LNVGY) is a US$70 billion revenue global technology powerhouse, ranked #159 in the Fortune Global 500, employing 75,000 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.

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