

NEC Storage Series
February 2016

Orchestrating a brighter world

NEC

SAN Storage Product Family

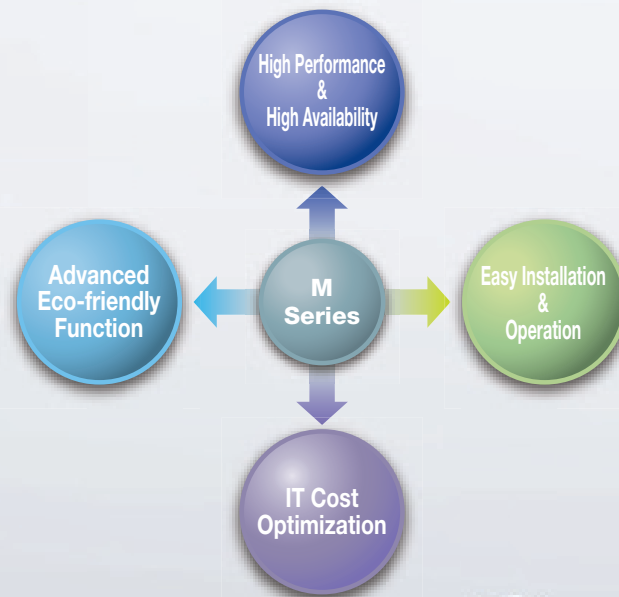
NEC Storage M Series



New NEC M-Series Storage with enhanced performance and improved features emerging as the preferred choice for virtualized Infrastructure

Demands on Storage Units

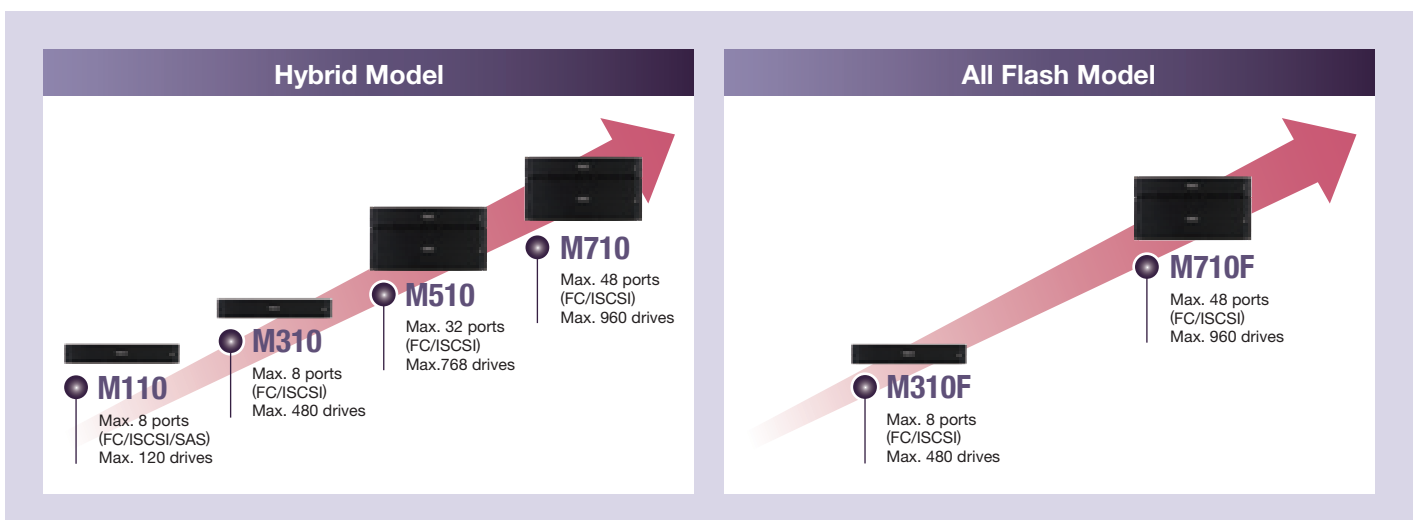
- Continual performance enhancement for virtualization, cloud and big data environment.
- Reduction of storage management workload with virtualization technology.
- Efficient data management with hybrid storage and data tiering.
- Dramatic reduction in power consumption by storage units supporting environmental awareness.
- Ensure continuous operations in the face of unforeseen failures.
- Reduce the cost of storing ever-increasing amounts of business data.
- Increase operational efficiency through robust integration with server virtualization.
- Construct a disaster response site to prepare for earthquakes and fires.



The ever increasing growth of data mandates IT reforms by implementing virtualized and cloud based environments. This drastically changing environment requires a storage unit designed with these changes in mind. NEC's M Series storages have been developed to satisfy these needs by bringing together high reliability technology, functional software, and tools to maximize productivity of virtualized and cloud environments.

M Series provides high performance and high availability to support business continuity, advanced eco-friendly performance to reduce power consumption and cooling costs, easy installation and operation to reduce management workload, and economic efficiency to meet today's TCO demands to store and archive data. M Series utilizes advanced storage virtualization technologies such as thin provisioning, data allocation optimization leveraging high-speed solid state drive (SSD), and volume management which are compatible with server virtualization.

M Series offers a diverse product lineup including basic models (M110 & M310), high performance models (M510 & M710), hybrid versions of models, and All Flash Storage (M310F & M710F) optimized for SSD to achieve higher performance and faster response, all developed to respond to the needs of the next generation infrastructures.



High performance & High Availability

M Series ensures continuous high-speed access to critical business data with high availability and reliability.

- Automatic allocation of data to a suitable device according to its access frequency.
- All components are redundant to provide maximum availability.
- High availability and reliability with NEC's patented Super Phoenix Technology.
- Superior security with Self Encrypting Drives and Secure Erasure function.
- All Flash Storage optimized for flash to accelerate business applications and improve response time.

Easy Installation & Operation

M Series simplifies storage management by offering autonomous operation utilizing virtualization technologies as a user friendly GUI.

- Dynamic Pool management enables expansion of capacity and performance without disruption.
- Thin Provisioning provides non-disruptive scaling capacity through over-subscription.
- Remote backup is easy and economical using a direct iSCSI interface, eliminating complexity and cost of an FC to iSCSI gateway.
- Data can be migrated between storage units without using an FC switch.
- User-friendly GUI makes storage management and operation easy.

Advanced Eco-friendly Function

M Series promotes environmental conservation by actively adopting eco-friendly components.

- Eco-friendly design employs 80PLUS® PLATINUM and 80PLUS® GOLD certified high-efficiency power supplies as well as low-power processors.
- M Series can be used even in 40°C(104°F) environments, reducing cooling and electricity cost.
- Reduce power consumption by providing a visual power consumption display in GUI and implementing autonomous MAID function.
- ENERGY STAR certified. (M110)

IT Cost Optimization

M Series contributes to the reduction of TCO by optimizing the investment cost and making daily operations highly efficient.

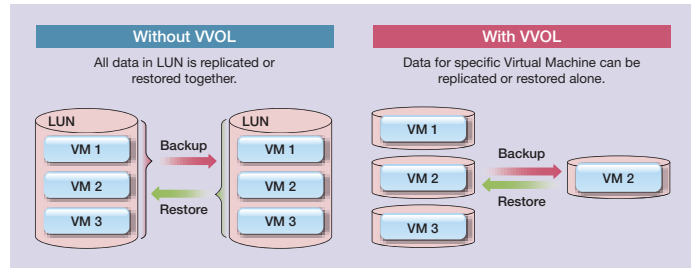
- Devices (SAS, Nearline SAS, SSD) and interfaces (FC, iSCSI, SAS) can be selected and intermixed according to your needs, optimizing investment cost.
- Management software and basic replication is bundled with the entry level M110.
- Management in a virtual environment is simplified through integration with virtualization management software.

Virtualization with NEC Storage M Series

Simplified management of individual Virtual Machines (VM) and Virtual Desktops (VDI) in VMware environment

M Series supports VMware vSphere Virtual Volumes (VVOL) feature that enables storage features like backup & restore, snapshot, and Quality of Service (QoS) to be done at the VVOL level.

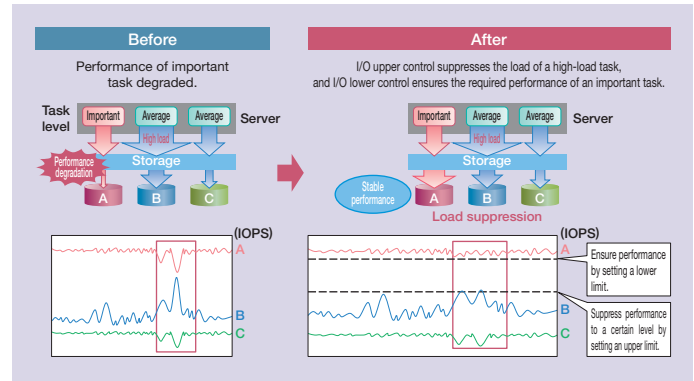
M110 M310 M510 M710 M310F M710F



Assuring business performance through automatic SLA optimization

M series can control I/O flow by setting I/O threshold limits to each logical disk. Unlike many others, M Series allows both minimum and maximum thresholds to be used. It allows storage resources to be fairly allocated to normal priority applications while priority tasks preferentially acquire needed resources. M series stabilizes operations of the entire system, allowing you to meet SLAs that require guaranteed Quality of Service (QoS).

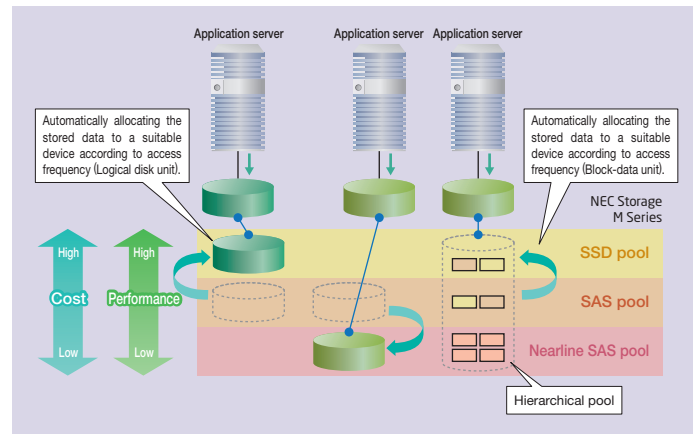
M110 M310 M510 M710 M310F M710F



Hybrid Data Tiering automatically tiers data to the most suitable device according to access frequency

M Series can create tiers with different types of devices; SSD, SAS HDD and Nearline SAS HDD. Once stored, data is automatically reallocated to a suitable tier through routine monitoring so that frequently accessed data is moved to a high speed SSD pool and infrequently accessed data is moved to a low-cost nearline SAS pool. This keeps data on the appropriate tier as access patterns change, maximizes storage performance, and optimizes your investment in storage.

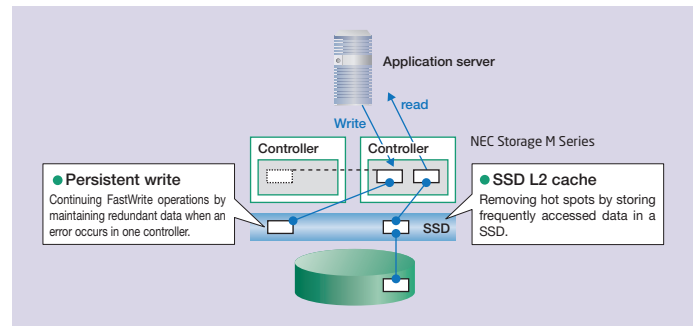
M110 M310 M510 M710



SSD L2 cache & Persistent Write ensuring stable & high-speed performance

M Series uses SSD which has a superior read performance as L2 cache, so throughput of frequently accessed data can be improved. In case of an error in one controller, Persistent Write will continue Fast Write operations, storing write data in SSD to keep data redundancy.

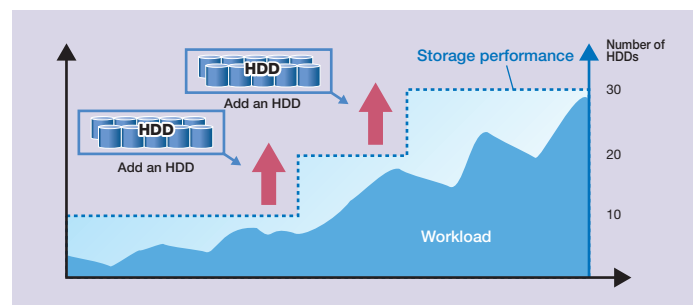
M110 M310 M510 M710



Expanding capacity and performance by simply adding drives using Advanced Dynamic Pool

M Series offers Advanced Dynamic Pool allowing storage managers to simply increase pool capacity by non-disruptively adding drives. It also automatically optimizes data across the pool to improve performance.

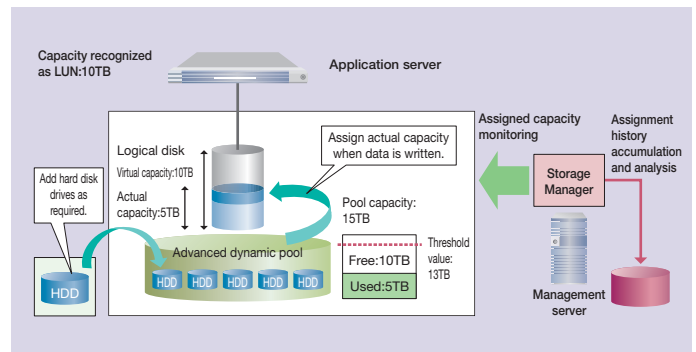
M110 M310 M510 M710 M310F M710F



Minimize storage cost with capacity virtualization with Thin Provisioning

Thin provisioning maximizes storage investment efficiency by virtualizing logical volumes. Thin provisioning allows logical volumes to be oversubscribed, making the logical volume look as if it has more physical resources than actually in the system. When physical capacity is insufficient, new physical capacity can be non-disruptively added to the virtual volume. Thin provisioning allows lower initial investment cost and lower power cost.

M110 M310 M510 M710 M310F M710F

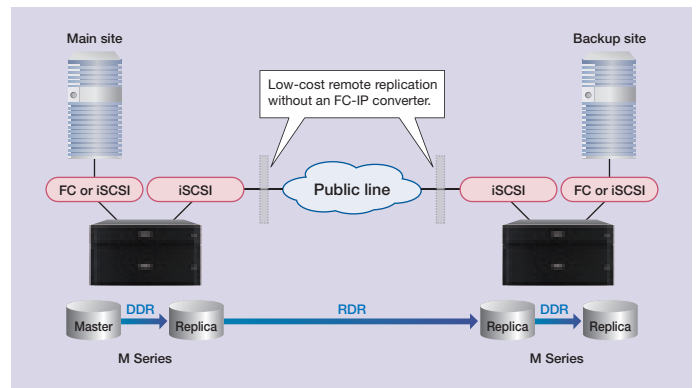


Business Continuity with NEC Storage M Series

Low-cost disaster prevention and response

Constructing a backup site can cost a great deal of money and resources. M Series' Remote Data Replication (RDR) uses an IP line with iSCSI eliminating the need for an FC-IP converter. This enables development of cost-efficient disaster prevention and response measures. In addition, low-cost operation is possible due to reduced total network setup & operational cost.

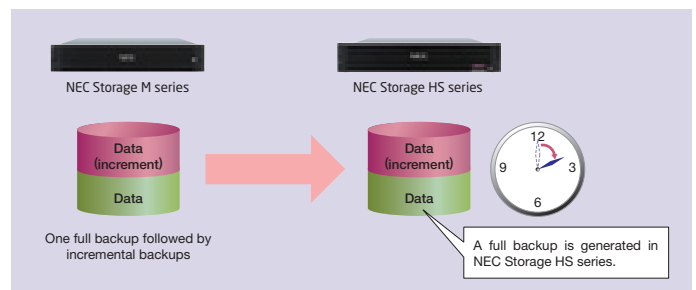
M110 M310 M510 M710 M310F M710F



Direct backup & restore to NEC HYDRAsTOR (HS Series) Storage

M Series can perform direct backup & restore to NEC HYDRAsTOR (HS Series) Storage without an external backup server or software.

M110 M310 M510 M710



RAID protecting against double failures, handling increasing data capacities

HDD capacity is increasing so is the risk of data loss because a second HDD can fail while recovering a damaged HDD. M Series exploits NEC's patented RAID triple mirror that achieves the high-speed performance of RAID-1 with the double parity reliability of RAID-6.

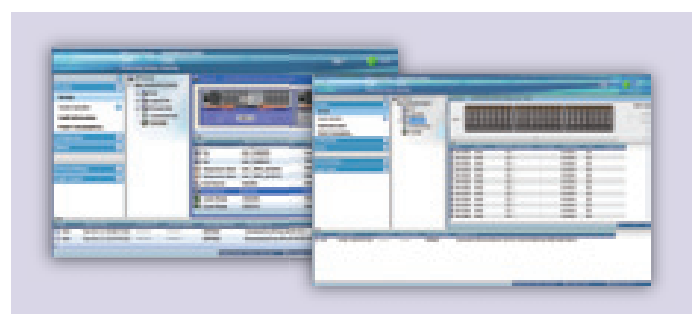
M110 M310 M510 M710 M310F M710F

NEC Storage M Series' Ease of Operation

Intuitive GUI allows even first-time users to easily manage the storage unit

Storage capacity, disk load, and operational status of each component can be checked in a visual web browser window. Navigation windows show you how to set up replication, change capacity of a pool, and respond to failures. The easy-to-understand GUI environment eliminates operational errors.

M110 M310 M510 M710 M310F M710F

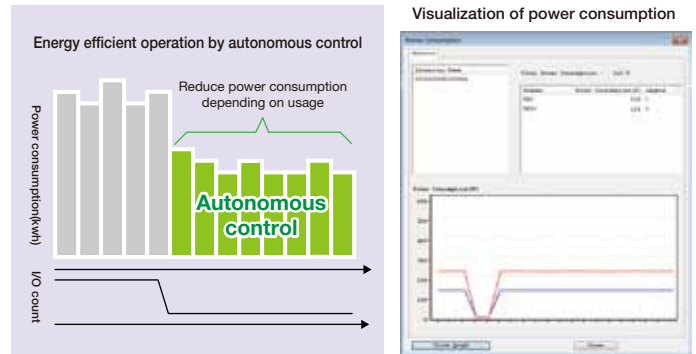


Green technology with NEC Storage M Series

Low-power operations by visualization of power consumption and autonomous device control

The power consumption of all M Series units in the same infrastructure environment can be managed with real-time visualizations. In addition, components such as CPU, fan and HDD autonomously control power consumption based on storage unit usage. Energy efficient operations are also promoted by reduction of unnecessary power consumption when the storage unit is in the idle state.

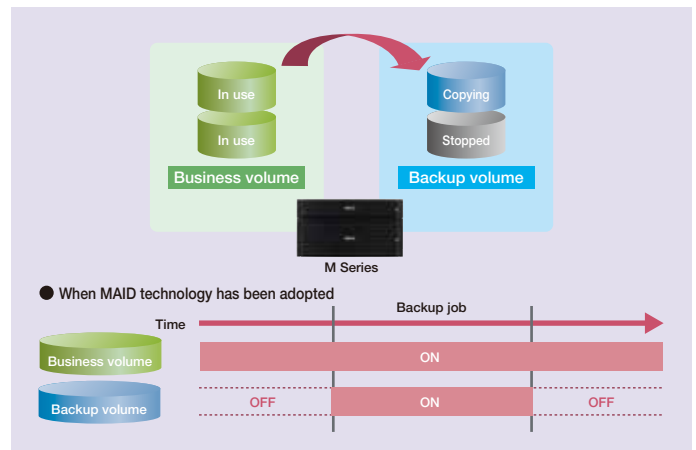
M110 M310 M510 M710 M310F M710F



Saving power resources by the autonomous MAID technology

M Series adopts MAID (Massive Array of Inactive Disks) technology for energy efficiency. HDD in a backup volume, for instance, is not used except for backup time. MAID technology can autonomously turn the motor of an HDD off (when idle) and on (when needed).

M110 M310 M510 M710



Reducing power consumption with advanced power saving technologies

M Series employs low-power processors, 80 PLUS power supplies (80 PLUS PLATINUM for M510, M710, and M710F; 80PLUS GOLD for M110, M310, M310F, and Disk Enclosure). Power-saving components are an emphasis in the design of M Series. These characteristics allow M Series to be used in 40°C (104°F) environments which results in reducing power consumption of air conditioners.

M110 M310 M510 M710 M310F M710F

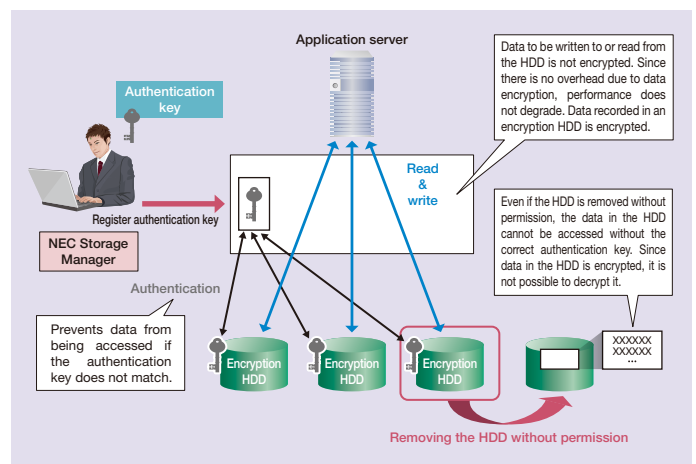


Data protection with NEC Storage M Series

Advanced security such as data-at-rest encryption

M Series uses a Self-Encrypting Drives (SED) to encrypt data. Furthermore, M Series features a variety of other security functions including access restrictions to the volumes, write-once-read-many definitions (WORM) and prevention of erroneous operations.

M110 M310 M510 M710 M310F M710F



● NEC Storage M110, M310, M510, M710

Model name		NEC Storage M110	NEC Storage M310	NEC Storage M510	NEC Storage M710
Units		Disk Array Controller (2.5" and 3.5") Disk Enclosure (2.5" and 3.5")		Disk Array Controller Disk Enclosure (2.5" and 3.5")	
	Disk Enclosures (Max.)	9	19	64	80
	Drive slots in total (Max.)	120	480	768	960 ⁸
	Drive slots per enclosure	24 slots (2.5" Disk Array Controller, Disk Enclosure) 12 slots (3.5" Disk Array Controller, Disk Enclosure)		24 slots (2.5" Disk Enclosure) 12 slots (3.5" Disk Enclosure)	
	Drive interface	SAS 3.0 (12Gbps)			
Host interface	Fibre channel	8 Gbps/16 Gbps			
	iSCSI	10 Gbps (Optical/Copper)			
	SAS	12 Gbps			
	Number of ports (Max.)	FC: 8, iSCSI: 8, SAS: 8 ⁵	FC: 8, iSCSI: 8	FC: 32, iSCSI: 16	FC: 48, iSCSI: 24 ⁸
Cache memory	Capacity	16GB ⁹	24GB or 48GB	48GB or 96GB	96GB or 192GB
	Battery backup time	Unlimited (Save to a dedicated area.)			
RAID level		RAID-0, 1, 5, 6, 10, 50, 60, TM ⁷			
Number of drives		3 to 120 ⁶	3 to 480	3 to 768	3 to 960 ⁸
Storage capacity (Max.) ¹		566.4TB	1132.8TB	3625.1TB	4531.4TB
Drive type	SAS HDD	2.5" 600GB, 1.2TB, 1.8TB (10,000rpm) / 300GB, 600GB (15,000rpm) 3.5" 300GB (15,000rpm) ⁹			
	NL-SAS HDD ²	2.5" 1TB, 2TB (7,200rpm) 3.5" 2TB, 4TB, 6TB (7,200rpm)			
	SAS SSD	2.5" 200GB, 400GB, 1.6TB 3.5" 200GB, 400GB, 1.6TB			
	SED SAS HDD ³	2.5" 600GB (10,000rpm) / 600GB (15,000rpm)			
	SED NL-SAS HDD ^{2,3}	3.5" 4TB (7,200rpm)			
	SED SAS SSD ³	2.5" 200GB 3.5" 200GB			
Dimensions (WxDxH)	Disk array controller (Rack unit)	482.0 x 556.0 x 87.4 mm (2U, without Front Bezel) 482.0 x 556.0 x 87.4 mm (2U, with Front Bezel) ¹⁰		482.0 x 633.8 x 175.4 mm (4U, without Front Bezel) 482.0 x 643.8 x 175.4 mm (4U, with Front Bezel) ¹⁰	
	Disk enclosure (Rack unit)	482.0 x 548.5 x 87.4 mm (2U, without Front Bezel) 482.0 x 558.5 x 87.4 mm (2U, with Front Bezel) ¹⁰			
Weight	Disk array controller	29kg or less (2.5") 33kg or less (3.5")		48kg or less	
	Disk enclosure	26kg or less (2.5") 29kg or less (3.5")			
Power voltage/frequency/phase		AC 100-240V, 50/60Hz, Single phase DC 48V			AC 100-240V, 50/60Hz, Single phase
Power consumption (Max. / 25°C)	Disk array controller	SAS HDD	520W(525VA) / 425W	565W(570VA) / 455W	965W(975VA) / 825W
		NL-SAS HDD ²	485W(490VA) / 390W	530W(535VA) / 420W	
	Disk enclosure	SAS HDD	350W(350VA) / 285W		1,190W(1,200VA) / 1,065W
NL-SAS HDD ²	315W(320VA) / 250W				
Ambient conditions	Temperature	5 to 40°C (when operating), -10 to 60°C (when not operating)			
	Humidity	10 to 80% RH (when operating), 5 to 80% RH (when not operating)			
Supported OS ⁴		Windows, Linux, VMware	FC: Windows, Linux, VMware, HP-UX, AIX, Solaris iSCSI: Windows, Linux, VMware		

*1: "TB" represents 1,024³B.
*2: NL-SAS: Nearline SAS
*3: SED: Self-Encrypting Drive
*4: Please contact NEC for possible restrictions.
*5: M110 supports a dual controller model and a single controller model. The single controller model supports 4 ports and 8 GB cache memory.
*6: Up to 12 SSDs can be installed in an M110.
*7: It is not recommended to use RAID-0, which has a risk of data loss in case of one drive error. The RAID levels available for SSD are RAID-1, 5, 6, 10, 50, and 60.
*8: Host ports and drive slots are added exclusively, so this number indicates the maximum number of each value.
*9: Will be released by the end of 1Q/CY2016.
*10: The Front Bezel is sold separately.

● NEC Storage M310F, M710F

Model name		NEC Storage M310F	NEC Storage M710F
Units		Disk Array Controller (2.5") Disk Enclosure (2.5")	Disk Array Controller Disk Enclosure (2.5")
	Disk Enclosures (Max.)	19	80
	Drive slots in total (Max.)	480	960 ⁴
	Drive slots per enclosure	24 slots (Disk Array Controller, Disk Enclosure)	
	Drive interface	SAS 3.0 (12Gbps)	
Host interface	Fibre channel	8 Gbps/16 Gbps	
	iSCSI	10 Gbps (Optical/Copper)	
	Number of ports (Max.)	FC: 8, iSCSI: 8	FC: 48, iSCSI: 24 ⁴
Cache memory	Capacity	48GB	192GB
	Battery backup time	Unlimited (Save to a dedicated area.)	
RAID level		RAID-1, 5, 6, 10, 50, 60	
Number of drives		3 to 480	3 to 960 ⁴
Storage capacity (Max.) ¹		531.0TB	1062.0TB
Drive type	SAS SSD	2.5" 200GB, 400GB, 1.6TB	
	SED SAS SSD ²	2.5" 200GB	
Dimensions (WxDxH)	Disk array controller (Rack unit)	482.0 x 556.0 x 87.4 mm (2U, without Front Bezel) 482.0 x 556.0 x 87.4 mm (2U, with Front Bezel) ⁵	482.0 x 633.8 x 175.4 mm (4U, without Front Bezel) 482.0 x 643.8 x 175.4 mm (4U, with Front Bezel) ⁵
	Disk enclosure (Rack unit)	482.0 x 548.5 x 87.4 mm (2U, without Front Bezel) 482.0 x 558.5 x 87.4 mm (2U, with Front Bezel) ⁵	
Weight	Disk array controller	28kg or less	48kg or less
	Disk enclosure	25kg or less	
Power voltage/frequency/phase		AC 100-240V, 50/60Hz, Single phase	
Power consumption (Max. / 25°C)	Disk array controller	580W(590VA) / 475W	1,190W(1,200VA) / 1,065W
	Disk enclosure	370W(375VA) / 305W	
Ambient conditions	Temperature	5 to 40°C (when operating), -10 to 60°C (when not operating)	
	Humidity	10 to 80% RH (when operating), 5 to 80% RH (when not operating)	
Supported OS ³		FC: Windows, Linux, VMware, HP-UX, AIX, Solaris iSCSI: Windows, Linux, VMware	

*1: "TB" represents 1,024³B.
*2: SED: Self-Encrypting Drive
*3: Please contact NEC for possible restrictions.
*4: Host ports and drive slots are added exclusively, so this number indicates the maximum number of each value.
*5: The Front Bezel is sold separately.

Main Software for NEC Storage M Series


Category	Software Product Name	M110	M310	M510	M710	M310F	M710F	Feature
Storage Management								
Device Management	NEC Storage Manager	✓	✓ ^{*1}	✓ ^{*1}	✓ ^{*1}	✓ ^{*1}	✓ ^{*1}	Integrated storage operations management
	NEC Storage Manager Integration Base	✓	✓ ^{*1}	✓ ^{*1}	✓ ^{*1}	✓ ^{*1}	✓ ^{*1}	Integrated operations management in collaboration with SigmaSystemCenter
	NEC Storage Manager Suite	✓						Package product consists of Storage Manager and Integration Base
Performance Management	NEC Storage PerformanceMonitor	✓	✓	✓	✓	✓	✓	Monitors storage performance in real-time and accumulates monitoring data
	NEC Storage PerformanceNavigator	✓	✓	✓	✓	✓	✓	Efficiently analyzes storage performance data
	NEC Storage PerformanceMonitor Suite	✓	✓	✓	✓	✓	✓	Package product consists of PerformanceMonitor and PerformanceNavigator
	NEC Storage Analyzer for VMware vCenter Operations	✓	✓	✓	✓	✓	✓	Collaborates with VMware to analyze server and storage performance together
Replication Management	NEC Storage ReplicationNavigator Suite	✓	✓	✓	✓			Facilitates creation of backup system
Storage Control								
Storage Control	NEC Storage BaseProduct		✓	✓	✓	✓	✓	Basic functions to control storage
	NEC Storage Manager Express	✓ ^{*2}	✓ ^{*1}	✓ ^{*1}	✓ ^{*1}	✓ ^{*1}	✓ ^{*1}	Operations management of one storage without management server
	NEC Storage ControlCommand	✓ ^{*2}	✓ ^{*1}	✓ ^{*1}	✓ ^{*1}	✓ ^{*1}	✓ ^{*1}	CLI to control storage from application servers
Replication	NEC Storage DynamicDataReplication	✓ ^{*3*4}	✓	✓	✓	✓	✓	Replicates volume in the same storage unit
	NEC Storage RemoteDataReplication	✓ ^{*3}	✓	✓	✓	✓	✓	Replicates volume in a remote storage unit
	NEC Storage RemoteDataReplication Asynchronous	✓ ^{*3}	✓	✓	✓	✓	✓	Asynchronously creates a remote replication volume through low-speed line
	NEC Storage DynamicSnapVolume	✓ ^{*3*5}	✓ ^{*5}	✓ ^{*5}	✓ ^{*5}	✓ ^{*5}	✓ ^{*5}	Creates a snapshot which is the differential of original volume
	NEC Storage DirectDataShadow Option	✓	✓	✓	✓			Creates backup of M Series volumes in HS Series without backup server
	NEC Storage ReplicationControl SQL Option	✓	✓	✓	✓	✓	✓	Enables non-disruptive backup of Microsoft SQL Server
	NEC Storage ReplicationControl FileSystem Option	✓	✓	✓	✓	✓	✓	Enables non-disruptive backup of Linux file systems
	Disaster Recovery	NEC Storage RemoteDataReplication/DisasterRecovery			✓	✓		✓
Resource Control	NEC Storage VirtualCachePartitioning		✓	✓	✓	✓	✓	Divides storage cache memory and allocates them to tenants
	NEC Storage ThinProvisioning	✓ ^{*2}	✓ ^{*1}	✓ ^{*1}	✓ ^{*1}	✓ ^{*1}	✓ ^{*1}	Virtualizes volume capacity to show it has more capacity than actually has
	NEC Storage StoragePowerConserver	✓ ^{*2}	✓ ^{*1}	✓ ^{*1}	✓ ^{*1}			Reduces power consumption by powering off the motor of unused HDD
	NEC Storage PerforOptimizer	✓	✓	✓	✓	✓ ^{*6}	✓ ^{*6}	Autonomously reallocates the data according to the access frequency
	NEC Storage PerforCache	✓	✓	✓	✓			Uses SSD as L2 cache memory
	NEC Storage DataMigration	✓ ^{*2}	✓ ^{*1}	✓ ^{*1}	✓ ^{*1}	✓ ^{*1}	✓ ^{*1}	Migrates data from an existing NEC storage unit to M Series unit
	NEC Storage VolumeProtect	✓	✓	✓	✓	✓	✓	Preserves data in a tamper proof format for retention period
	NEC Storage IO Load Manager	✓	✓	✓	✓	✓	✓	Controls I/O flow corresponding to the upper/lower limit set to each volume
	NEC Storage Virtual Volume	✓	✓	✓	✓	✓	✓	Collaborates with VMware Virtual Volume to operate corresponding to VM
High Availability	NEC Storage SecureEraser	✓	✓	✓	✓	✓	✓	Securely erases the data in storage
	NEC Storage PathManager	✓ ^{*2}	✓	✓	✓	✓	✓	Automatically switches path in case of I/O path failure

*1: Bundled with NEC Storage BaseProduct.
 *2: Bundled with M110.
 *3: Not supported by a single controller model.
 *4: NEC Storage DynamicDataReplication Express is bundled with M110.
 *5: Bundled with NEC Storage DynamicDataReplication.
 *6: M310F and M710F support reallocation of a logical disk between SSD pools.

Environmental compliance		M110	M310	M510	M710	M310F	M710F
● RoHS Compliance	This product complies with the European Union directive on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS).	✓	✓	✓	✓	✓	✓
● Eco Symbol & Eco Symbol Star ^{*1}	Eco Symbol is a label placed on products that meet NEC prescribed environmental soundness standards. Eco Symbol Star is a label for the environmentally leading products among the Eco Symbol products.	✓	✓	✓	✓	✓	✓

*1: Eco Symbol & Eco Symbol Star are self-declaration type of ISO environmental labels (Type II). For details, see the following web site.
http://www.nec.com/en/global/eco/product/eco_pro/index.html

- Microsoft and Windows are trademarks or registered trademarks of Microsoft Corporation in the United States and other countries.
- Linux is a trademark or registered trademark of Linus Torvalds in the United States and other countries.
- Red Hat is a trademark or registered trademark of Red Hat, Inc. in the United States and other countries.
- VMware is a trademark or registered trademark of VMware, Inc. in the United States and other countries.
- All other products, brands, and trade names used in this document are trademarks or registered trademarks of their respective holders.

	Safety notice	Before you use this product, please read carefully and comply with the cautions and warnings in manuals such as User's Guide and Installation Guide. Incorrect use may cause a fire, electrical shock or injury.
---	----------------------	--

For further information please contact your local NEC representative or:

<p>Corporate Headquarters (Japan) NEC Corporation www.nec.com</p>	<p>North America (USA, Canada) NEC Corporation of America www.necam.com</p>	<p>APAC (South Asia, South East Asia, Oceania) NEC Asia Pacific Pte. Ltd. sg.nec.com</p>	<p>EMEA (Europe, Middle East, Africa) NEC Enterprise Solutions www.nec-enterprise.com</p>
---	---	---	--