# Dell PowerVault MD32XX/36XX Series

Support Matrix

## Notes, cautions, and warnings

ⓘ | **NOTE: A NOTE indicates important information that helps you make better use of your product.**

△ | **CAUTION: A CAUTION indicates either potential damage to hardware or loss of data and tells you how to avoid the problem.**

⚠ | **WARNING: A WARNING indicates a potential for property damage, personal injury, or death.**

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# Contents

# Introduction

This document provides information about supported software and hardware for Dell EMC PowerVault MD3200, MD3220, MD3200i, MD3220i, MD3600i, MD3600f, MD3620i, MD3620f, MD3260, MD3260i, MD3660i, and MD3660f storage arrays, and usage considerations, recommendations, and rules.

ⓘ **NOTE: Unless specified, all information in this document is applicable to the latest RAID controller firmware version available at Dell.com/support.**

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# Changes in version A22

- Updated the supported physical disks section

# Supported data protocols

**Table 1. Dell EMC PowerVault MD-Series Models and supported Data protocols**

| Dell PowerVault MD Array Model [3] | Data protocol |
| --- | --- |
| MD3200 [1] | 6 Gbps direct attached SAS storage array with 12 drives (3.5 inches) |
| MD3220 [1] | 6 Gbps direct attached SAS storage array with 24 drives (2.5 inches) |
| MD3200i [1] | 1 Gbps iSCSI network storage array with 12 drives (3.5 inches) |
| MD3220i [1] | 1 Gbps iSCSI network storage array with 24 drives (2.5 inches) |
| MD3600i [1] | 10 Gbps iSCSI network storage array with 12 drives (3.5 inches) |
| MD3620i [1] | 10 Gbps iSCSI network storage array with 24 drives (2.5 inches) |
| MD3600f [1] | 8 Gbps Fibre Channel network storage array with 12 drives (3.5 inches) |
| MD3620f [1] | 8 Gbps Fibre Channel network storage array with 24 drives (2.5 inches) |
| MD3260 [2] | 6 Gbps direct Attached SAS storage dense array |
| MD3260i [2] | 1 Gbps iSCSI network storage dense array |
| MD3660i [2] | 10 Gbps iSCSI network storage dense array |
| MD3660f [2] | 8 Gbps Fibre Channel network storage dense array |

ⓘ **NOTE:**

1   Dell EMC PowerVault MD3200, MD3220, MD3200i, MD3220i, MD3600i, MD3620i, MD3600f, and MD3620f models support 120 physical disk drive slots in base configuration. With premium feature activation, 192 physical disk drive slots are supported.

2   Dell EMC PowerVault MD3x60i/f dense array has default 120 drive slots support (with 20 drives minimum, four in first row of each drawer), and 180 drive slots support with PFK.

3   Premium Feature Key (PFK) is optional on all models.

# Dell EMC PowerVault MD Series storage array rules

This section contains both general and model-specific connectivity and consideration rules for Dell EMC PowerVault MD storage arrays. The rules listed in Table 2 apply only to all storage array models. For rules applying to specific Dell EMC PowerVault MD models, see Table 3 and Table 4.

(i) **NOTE: Dell EMC PowerVault MD3260, MD3260i, MD3660i, and MD3660f platforms are supported in dual-RAID controller (duplex) configurations only.**

### Table 2. Dell EMC PowerVault MD Series storage array rules for all models

| Rule | Dell EMC PowerVault MD32x0 series | Dell EMC PowerVault MD32x0i series | Dell EMC PowerVault MD36x0i series | Dell EMC PowerVault MD36x0f series |
| --- | --- | --- | --- | --- |
| | 6 Gbps SAS | 1 Gbps iSCSI | 10 Gbps iSCSI | 8 Gbps Fibre Channel |
| Maximum number of host servers a single storage array can connect to with one RAID controller module installed | 4 | 32 | 64 | 64 |
| Maximum number of host servers a single storage array can connect to with two RAID controller modules installed | 8 (4, if using high availability) | 32 | 64 | 64 |
| Maximum number of Dell EMC 6 Gb SAS HBA cards supported in a single host server attached to single array. (Dell EMC recommends that you use two Dell EMC 6 Gb SAS HBA cards for all redundant cabling configurations.) | 2 (each card has two ports) | N/A | N/A | N/A |
| Unused ports on a Dell EMC 6 Gb SAS HBA card already connected to a PowerVault MD3260 cannot connect to another device (such as a tape drive or other model storage array). | Yes | N/A | N/A | N/A |
| Maximum number of PowerVault MD Series Storage Arrays a host server may connect to: | 2 (HA) | 4 | 4 | 4 |
| A hot-spare for a disk group must be a physical disk drive of equal or greater disk space than any of the member drives. | Yes | Yes | Yes | Yes |
| When using out-of-band management with SMcli by specifying the RAID controller management port IP addresses on the Dell EMC PowerVault MD Storage Array, SMcli commands that change the attributes of a virtual disk, virtual disk copy, or snapshot virtual disk, must have management access to the owning RAID controller module. Dell EMC recommends that you specify both management port IP addresses on the | Yes | Yes | Yes | Yes |

| Rule | Dell EMC PowerVault MD32x0 series | Dell EMC PowerVault MD32x0i series | Dell EMC PowerVault MD36x0i series | Dell EMC PowerVault MD36x0f series |
|---|---|---|---|---|
| | 6 Gbps SAS | 1 Gbps iSCSI | 10 Gbps iSCSI | 8 Gbps Fibre Channel |
| SMcli invocation: SMcli 192.168.128.101 192.168.128.102-c. | | | | |
| On Linux systems Device Mapper, multipath drivers are required for multipath support. | Yes | Yes | Yes | Yes |
| Coexistence of several Linux multi-path drivers is not supported. When using a Dell EMC PowerVault MD3200 or MD3600 series array with Linux host servers, only the Linux Device Mapper failover driver is supported. | Yes | Yes | Yes | Yes |
| Virtual disks on Dell EMC PowerVault MD Series storage arrays cannot be used for booting. | Yes | Yes | Yes | Yes |
| Disk Groups can be migrated between a Dell EMC PowerVault MD3260/3260i/3660i/3660f by following the appropriate disk group migration procedure. | Yes | Yes | Yes | Yes |
| Maximum size of a virtual disk in a dynamic disk pool is 64 TB. | Yes | Yes | Yes | Yes |
| Disk pools cannot be migrated. | Yes | Yes | Yes | Yes |
| Maximum disk space per array for dynamic disk pooling. | 1024 TB | 256 TB | 256 TB | 1024 TB |
| Maximum SSD cache size allowed depends on the installed RAM per controller:<br><br>• 2 GB RAM per controller supports up to 2 TB SSD read cache<br>• 4 GB RAM per controller supports up to 4 TB SSD read cache | Yes | Yes | Yes | Yes |
| All iSCSI Host ports on a controller have to be at the same port speed. | N/A | Only 1 Gbps Supported | Yes | N/A |
| iSCSI Host ports will only auto-negotiate to the port speed set in MDSM. | N/A | Only 1 Gbps Supported | Yes | N/A |
| If the iSCSI initiators are connected to Dell EMC PowerVault MD3200i and/or MD3600i series through the network switches, ensure that your switches support IEEE 802.3x flow control, and the flow control is enabled for both sending and receiving on all switch ports and server NIC ports. If you do not enable the flow control, your iSCSI storage array may experience the degradation of the I/O performance. Alongside enabling the Ethernet IEEE 802.3x flow control, Dell EMC recommends that you disable unicast broadcast storm control on the switch ports connected to the | N/A | Yes | Yes | N/A |

| Rule | Dell EMC PowerVault MD32x0 series | Dell EMC PowerVault MD32x0i series | Dell EMC PowerVault MD36x0i series | Dell EMC PowerVault MD36x0f series |
|---|---|---|---|---|
| | 6 Gbps SAS | 1 Gbps iSCSI | 10 Gbps iSCSI | 8 Gbps Fibre Channel |
| iSCSI initiators and target arrays and turn on the "PortFast" mode of the spanning tree protocol (STP) on the switch ports connected to the iSCSI initiators and target arrays. Note that turning on the "PortFast" mode is different from turning off the whole operation of STP on the switch. With "PortFast" on, the STP is still enabled on the switch ports. Turning STP off may affect the entire network and can leave the network vulnerable to physical topology loops. | | | | |
| For optimal I/O performance, avoid having more than one iSCSI session originating from one host iSCSI port to the same controller. Ideally, connect the iSCSI host NIC to only one iSCSI target port on the storage subsystem. | N/A | Yes | Yes | N/A |
| For Dell EMC-Oracle tested and validated solutions on the Dell EMC PowerVault MD arrays, visit the following site: http://en.community.dell.com/techcenter/enterprise-solutions/w/oracle_solutions/1429.compatibility-matrices-and-validated-reference-architectures. | Yes | Yes | Yes | Yes |
| The number of VD copies is limited to a maximum of 511 with a maximum of 8 concurrent copies (applicable to RAID controller firmware version 07.84.xx.xx) | Yes | Yes | Yes | Yes |
| Remote Replication is not supported in simplex mode. | N/A | Yes | Yes | Yes |
| Maximum number of iSCSI sessions. | N/A | 192 per port | 448 per port | N/A |
| Online Physical Disk Firmware Upgrade is supported. | Yes | Yes | Yes | Yes |
| When using physical disks of 6 TB or larger capacity, it is recommended to use either a RAID 6 Disk Group or a Dynamic Disk Pool (DDP). Due to the increased amount of time taken to reconstruct and copy-back, the chances for a second drive failure increases on either a RAID 1/10 or a RAID 5 Disk Group. | Yes | Yes | Yes | Yes |

Table 3. Dell EMC PowerVault MD-Series storage array rules for non-dense, 2U models only (MD3200, MD3220, MD3200i, MD3220i, MD3600i, MD3620i, MD3600f and MD3620f)

| Rule | Dell EMC PowerVault MD3200 series | Dell EMC PowerVault MD3200i series | Dell EMC PowerVault MD3600i series | Dell EMC PowerVault MD3600f series |
|---|---|---|---|---|
| | 6 Gbps SAS | 1 Gbps iSCSI | 10 Gbps iSCSI | 8 Gbps Fibre Channel |
| Support for up to 120 physical disk drive slots (system default configuration). You can attach up to nine Dell EMC MD1200 and/or MD1220 series expansion | Yes | Yes | Yes | Yes |

| Rule | Dell EMC PowerVault MD3200 series | Dell EMC PowerVault MD3200i series | Dell EMC PowerVault MD3600i series | Dell EMC PowerVault MD3600f series |
| --- | --- | --- | --- | --- |
| | 6 Gbps SAS | 1 Gbps iSCSI | 10 Gbps iSCSI | 8 Gbps Fibre Channel |
| enclosures to a Dell EMC PowerVault MD storage array. Any mixture of MD1200 and MD1220 enclosures supports up to 120 physical slots. | | | | |
| Support for up to 192 physical slots through a premium feature option. You can attach up to 15 Dell EMC MD1200 and/or MD1220 series expansion enclosures to a Dell EMC PowerVault MD storage array. Any mixture of MD1200 and MD1220 enclosures for a total of 192 physical slots is supported. | Yes | | Yes | Yes | Yes |
| Maximum number of physical disk drives in a RAID5 or RAID6 disk group is 30. There is no limitation with RAID0 and RAID10 disk groups. | Yes | | Yes | Yes | Yes |
| Attached MD1200 series expansion enclosures must be run in unified mode. | Yes | | Yes | Yes | Yes |
| The number of snapshots pre 07.84.xx.xx controller firmware is limited to:<br><br>• Maximum of 256 snapshots per array<br>• Maximum of 16 per VD | Yes | | Yes | Yes | Yes |
| The number of remote replicas (legacy) is limited to maximum of 16 pairs. | N/A | | N/A | N/A | Yes |
| The number of snapshots starting with 07.84.xx.xx controller firmware code is limited to:<br><br>• Maximum of 512 snapshots per array<br>• Maximum of 128 snapshots per VD<br>• Maximum of 32 snapshots per snapshot group | Yes | | Yes | Yes | Yes |
| The number of remote replicas is limited to the maximum of 32 for each array. | N/A | | Yes | Yes | Yes |

*Note: the MD3200 column shows the first value and the remaining three columns (MD3200i, MD3600i, MD3600f) contain the subsequent values.*

**Table 4. Dell EMC PowerVault MD-Series storage array rules for dense, 4U models only**

| Rule | MD3260 series | MD3260i series | MD3660i series | MD3660f series |
| --- | --- | --- | --- | --- |
| | 6 Gbps SAS | 1 Gbps iSCSI | 10 Gbps iSCSI | 8 Gbps Fibre Channel |
| Support for up to 120 physical disk drive slots (system default configuration). You can attach one Dell EMC MD3060e enclosure to a Dell EMC PowerVault MD dense storage array. | Yes | Yes | Yes | Yes |
| Support for up to 180 physical slots through a premium feature option. You can attach up to two Dell EMC MD3060e enclosures to a Dell EMC PowerVault MD dense storage array, for a total of 180 physical slots. | Yes | Yes | Yes | Yes |

| Rule | MD3260 series | MD3260i series | MD3660i series | MD3660f series |
|---|---|---|---|---|
| | 6 Gbps SAS | 1 Gbps iSCSI | 10 Gbps iSCSI | 8 Gbps Fibre Channel |
| Maximum number of physical disk drives in a RAID5 or RAID6 disk group is 30. There is no limitation with RAID0 and RAID10 disk groups. | Yes | Yes | Yes | Yes |
| A minimum of 20 SAS HDDs or SSDs are required in each MD3x60 enclosure (4 in front of each drawer) | Yes | Yes | Yes | Yes |

# Default IPv4 settings for management ports on Dell EMC PowerVault MD series storage arrays

ⓘ NOTE: **No default gateway is set.**

By default, the management ports on the storage array are set to DHCP. If DHCP fails, the following IPv4 settings are used:

**Table 5. Default IPv4 Management Port Addresses**

| Controller | IPv4 address | Subnet mask |
| --- | --- | --- |
| Controller 0 | 192.168.128.101 | 255.255.255.0 |
| Controller 1 | 192.168.128.102 | 255.255.255.0 |

Topics:

- Default IPv4 settings for iSCSI ports on Dell EMC PowerVault MD36x0i array
- Default IPv4 settings for iSCSI ports on Dell EMC PowerVault MD32x0i storage array

# Default IPv4 settings for iSCSI ports on Dell EMC PowerVault MD36x0i array

ⓘ NOTE: **No default gateway is set.**

By default, the iSCSI ports on the storage array are set to the static IPv4 settings listed in Table 6.

**Table 6. Default iSCSI Port IPv4 Addresses on MD36x0i Storage Arrays**

| Controller/port | IPv4 address | Subnet mask | Port # |
| --- | --- | --- | --- |
| Controller 0, Port 0 | 192.168.130.101 | 255.255.255.0 | 3260 |
| Controller 0, Port 1 | 192.168.131.101 | 255.255.255.0 | 3260 |
| Controller 1, Port 0 | 192.168.130.102 | 255.255.255.0 | 3260 |
| Controller 1, Port 1 | 192.168.131.102 | 255.255.255.0 | 3260 |

# Default IPv4 settings for iSCSI ports on Dell EMC PowerVault MD32x0i storage array

**Table 7. Default iSCSI Port IPv4 Addresses on Dell EMC PowerVault MD32x0i Storage Arrays**

| Controller/Port | IPv4 address | Subnet mask | Port # |
|---|---|---|---|
| Controller 0, Port 0 | 192.168.130.101 | 255.255.255.0 | 3260 |
| Controller 0, Port 1 | 192.168.131.101 | 255.255.255.0 | 3260 |
| Controller 0, Port 2 | 192.168.132.101 | 255.255.255.0 | 3260 |
| Controller 0, Port 3 | 192.168.133.101 | 255.255.255.0 | 3260 |
| Controller 1, Port 0 | 192.168.130.102 | 255.255.255.0 | 3260 |
| Controller 1, Port 1 | 192.168.131.102 | 255.255.255.0 | 3260 |
| Controller 1, Port 2 | 192.168.132.102 | 255.255.255.0 | 3260 |
| Controller 1, Port 3 | 192.168.133.102 | 255.255.255.0 | 3260 |

# Supported RAID controller firmware and NVSRAM

ⓘ NOTE:

- Dell EMC recommends that you collect support information before performing any firmware upgrade.
- Drivers and firmware released only by Dell EMC are supported. For the latest driver and firmware that is releases, see the downloads section at **Dell.com/support**.

**Table 8. Latest RAID controller firmware and NVSRAM versions**

| Software | Version |
| --- | --- |
| RAID controller firmware | 08.20.24.60 |
| RAID controller NVSRAM | N26X0-820890-008 for Dell EMC PowerVault MD32xx and MD32xxi(SAS and 1 Gbps iSCSI storage arrays)<br>N26X0-820890-908 for Dell EMC PowerVault<br><br>N26X0-820890-908 for Dell EMC PowerVault MD36xxi and MD36xxf (10 Gbps iSCSI and Fibre Channel storage arrays) |

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# Supported SAS host bus adapters

Go to **Dell.com/support** to download the latest supported version of the 6 Gbps SAS HBA firmware and drivers for your specific server hardware platform.

**Table 9. Supported SAS HBAs**

| Vendor | Model | Notes |
|---|---|---|
| Dell EMC | 6 Gbps SAS HBA | This HBA is not supported in 13th generation Dell EMC PowerEdge servers. |
| Dell EMC | 12 Gbps SAS HBA | This HBA is only supported in13th generation Dell EMC PowerEdge servers. |

ⓘ **NOTE: Dell EMC 12 Gbps SAS HBA auto negotiates to 6 Gbps speeds when connected to a Dell EMC PowerVault MD32xx series SAS array.**

# Supported iSCSI software initiators

**Table 10. Supported iSCSI initiators**

| Operating System | SW initiator vendor | SW initiator version | Notes |
| --- | --- | --- | --- |
| Windows Server OS | Microsoft | RTM or later | Included with OS |
| Red Hat Enterprise Linux | Red Hat | RTM or later | Included with OS |
| SUSE Linux Enterprise Server | SUSE | RTM or later | Included with OS |
| VMware vSphere | VMware | RTM or later | Included with OS |
| Citrix XenServer | Citrix | RTM or later | Included with OS |

ⓘ **NOTE: For more information about OS support, refer to the Supported operating systems section of this document.**

# Supported protocol offload adapters

Standard Gigabit and 10 Gigabit Ethernet adapters are supported when used with supported software iSCSI initiators. Hosts must have a standards compliant iSCSI initiator to access MD Series storage. Initiator support is provided by the initiator or operating system vendor. Dell EMC PowerVault does not support Converged Network Adapters (CNA) in Converged mode. Although PowerVault does not endorse or support initiators directly, this support matrix provides some useful configuration information for common initiators.

Dell EMC's PowerVault MD Series Arrays work with any RFC 3720 iSCSI compliant initiators. The initiator must support all mandatory iSCSI features (IPSec is not required). This information is subject to change without notice. Dell EMC is not responsible for any errors in this information. Hardware initiators are not supported by Dell EMC.

Also, ensure that you read the initiator documentation and release notes from the particular vendors, and the Dell EMC PowerVault MD Series release notes for up-to-date configuration recommendations.

# Fibre Channel SFP+ Transceiver support

**Table 11. Supported Fibre Channel SFP+ transceivers**

| Description | Manufacturer | Mfr. Part number |
|---|---|---|
| 8G FC SFP+ | JDSU | PLRXPL-VC-SH4-23-N |
| 8G FC SFP+ | Finisar | FTLF8528P2BCV-LS |
| 8G FC SFP+ | Avago | AFBR-57D7APZ |

# Supported physical disks

ⓘ **NOTE: Only the physical disk drives with a Dell EMC part number listed in Table 12 are supported.**

For the latest available physical disk drive firmware, refer to the Dell EMC PowerVault MD3200/MD3600/MD3660i/MD3660f *Drivers and Downloads* section on **Dell EMC.com/support**.

**Table 12. Supported physical disk drive models**

| Dell EMC P/N | Form Factor | Model | Capacity | Speed | Vendor | SED | Firmware |
|---|---|---|---|---|---|---|---|
| X1MCH | 2.5" | LB150S | 149 GB | SSD | Pliant (SanDisk) | No | D012 |
| 6R5R8 | 2.5" | LB206M | 200 GB | SSD | Pliant (SanDisk) | No | D339 |
| 8C38W | 2.5" | LB406M | 400 GB | SSD | Pliant (SanDisk) | No | D339 |
| DPF1J | 2.5" | LB806M | 800 GB | SSD | Pliant (SanDisk) | No | D339 |
| D3K4J | 2.5" | LB406R | 400 GB | SSD | Pliant (SanDisk) | No | D339 |
| 5Y05N | 2.5" | LB806R | 800 GB | SSD | Pliant (SanDisk) | No | D339 |
| F06P1 | 2.5" | LB1606R | 1.6 TB | SSD | Pliant (SanDisk) | No | D339 |
| TPWNJ | 2.5" | LB206S | 200 GB | SSD | Pliant (SanDisk) | No | D339 |
| 8NW1H | 2.5" | LB406S | 400 GB | SSD | Pliant (SanDisk) | No | D339 |
| 2XR0K | 2.5" | LT0200MO | 200 GB | SSD | SanDisk | No | D416 |
| C06VX | 2.5" | LT0400MO | 400 GB | SSD | SanDisk | No | D416 |
| 989R8 | 2.5" | LT0800MO | 800 GB | SSD | SanDisk | No | D416 |
| JDTGX | 2.5" | LT1600MO | 1.6 TB | SSD | SanDisk | No | D416 |
| J19XM | 2.5" | LT0800RO | 800 GB | SSD | SanDisk | No | D416 |
| 2M61G | 2.5" | LT1600RO | 1.6 TB | SSD | SanDisk | No | D416 |
| M7KYX | 2.5" | LT0200WM | 200 GB | SSD | SanDisk | No | D416 |
| T2TPF | 2.5" | LT0400WM | 400 GB | SSD | SanDisk | No | D416 |
| FHFNJ | 2.5" | LT0800WM | 800 GB | SSD | SanDisk | No | D416 |
| MFC6G | 2.5" | MZILS400HEGR0D3 | 400 GB | SSD | Samsung | No | DWL7 |
| HF06W | 2.5" | MZILS800HEHP0D3 | 800 GB | SSD | Samsung | No | DWL7 |
| W5PP5 | 2.5" | MZILS1T6HEJH0D3 | 1.6 TB | SSD | Samsung | No | DWL7 |
| 8RC8K | 2.5" | MZILS3T2HMLH0D3 | 3.2 TB | SSD | Samsung | No | DWL7 |
| 8Y64H | 2.5" | MZILS480HEGR0D3 | 480 GB | SSD | Samsung | No | DSL7 |
| 7FNRX | 2.5" | MZILS960HEHP0D3 | 960 GB | SSD | Samsung | No | DSL7 |
| 086DD | 2.5" | MZILS1T9HEJH0D3 | 1.92 TB | SSD | Samsung | No | DSL7 |

| JR1HP | 2.5" | MZILS3T8HMLH0D3 | 3.84 TB | SSD | Samsung | No | DSL7 |
|-------|------|------------------|---------|-----|---------|-----|------|
| R1ND2 | 2.5" | MZILT960HAHQ0D3 | 960 GB | SSD | Samsung | No | DSF4 |
| F0VFY | 2.5" | MZILT1T9HAJQ0D3 | 1.92 TB | SSD | Samsung | No | DSF4 |
| X8F87 | 2.5" | MZILT3T8HALS0D3 | 3.84 TB | SSD | Samsung | No | DSF4 |
| D9NCK | 2.5" | MZILT800HAHQ0D3 | 800 GB | SSD | Samsung | No | DSF4 |
| DR0HX | 2.5" | MZILT1T6HAJQ0D3 | 1.6 TB | SSD | Samsung | No | DSF4 |
| 5H9RV | 2.5" | MZILT3T2HALS0D3 | 3.2 TB | SSD | Samsung | No | DSF4 |
| 6K55X | 2.5" | MK2001GRZB | 200 GB | SSD | Toshiba | No | A008 |
| R2PJ7 | 2.5" | MK4001GRZB | 400 GB | SSD | Toshiba | No | A008 |
| K41XJ | 2.5" | PX02SMF020 | 200 GB | SSD | Toshiba | No | A3B3 |
| HKK8C | 2.5" | PX02SMF040 | 400 GB | SSD | Toshiba | No | A3B3 |
| TC2MH | 2.5" | PX02SMF080 | 800 GB | SSD | Toshiba | No | A3B3 |
| G4V45 | 2.5" | PX02SMB160 | 1.6 TB | SSD | Toshiba | No | A3B3 |
| CV6W8 | 2.5" | PX02SSF020 | 200 GB | SSD | Toshiba | No | A4B3 |
| 2H9WV | 2.5" | PX02SSF040 | 400 GB | SSD | Toshiba | No | A4B3 |
| PG19T | 2.5" | PX02SSB080 | 800 GB | SSD | Toshiba | No | A4B3 |
| N9PTK | 2.5" | PX03SNF080 | 800 GB | SSD | Toshiba | No | A5B3 |
| 0MXR2 | 2.5" | PX03SNB160 | 1.6 TB | SSD | Toshiba | No | A5B3 |
| GM5R3 | 2.5" | PX04SMB040 | 400 GB | SSD | Toshiba | No | AM07 |
| M91TJ | 2.5" | PX04SMB080 | 800 GB | SSD | Toshiba | No | AM07 |
| 77K16 | 2.5" | PX04SMB160 | 1.6 TB | SSD | Toshiba | No | AM07 |
| 63GYR | 2.5" | PX04SMB320 | 3.2 TB | SSD | Toshiba | No | AM07 |
| N5Y85 | 2.5" | PX04SVB048 | 480 GB | SSD | Toshiba | No | AM07 |
| YYC10 | 2.5" | PX04SVB096 | 960 GB | SSD | Toshiba | No | AM07 |
| 4XC39 | 2.5" | PX04SVB192 | 1.92 TB | SSD | Toshiba | No | AM07 |
| GYMY9 | 2.5" | PX04SVB384 | 3.84 TB | SSD | Toshiba | No | AM07 |
| 06VJ7 | 2.5" | PX04SRB048 | 480 GB | SSD | Toshiba | No | AM07 |
| 4KG4X | 2.5" | PX04SRB096 | 960 GB | SSD | Toshiba | No | AM07 |
| R87FK | 2.5" | PX04SRB192 | 1.92 TB | SSD | Toshiba | No | AM07 |
| M09K5 | 2.5" | PX04SRB384 | 3.84 TB | SSD | Toshiba | No | AM07 |
| HPNDJ | 2.5" | PX04SHB020 | 200 GB | SSD | Toshiba | No | AM07 |
| YT53C | 2.5" | PX04SHB040 | 400 GB | SSD | Toshiba | No | AM07 |
| RVCY3 | 2.5" | PX04SHB080 | 800 GB | SSD | Toshiba | No | AM07 |
| Y9VX5 | 2.5" | PX04SHB160 | 1.6 TB | SSD | Toshiba | No | AM07 |
| 43PCJ | 2.5" | PX05SVB048Y | 480 GB | SSD | Toshiba | No | AS0C |
| 503M7 | 2.5" | PX05SVB096Y | 960 GB | SSD | Toshiba | No | AS0C |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| V0K7V | 2.5" | PX05SVB192Y | 1.92 TB | SSD | Toshiba | No | AS0C |
| 3DDFT | 2.5" | PX05SVB384Y | 3.84 TB | SSD | Toshiba | No | AS0C |
| JGXK2 | 2.5" | PX05SRB048Y | 480 GB | SSD | Toshiba | No | AS0C |
| MWGK7 | 2.5" | PX05SRB096Y | 960 GB | SSD | Toshiba | No | AS0C |
| 0FYFW | 2.5" | PX05SRB192Y | 1.92 TB | SSD | Toshiba | No | AS0C |
| XCRDV | 2.5" | PX05SRB384Y | 3.84 TB | SSD | Toshiba | No | AS0C |
| 5VHHG | 2.5" | PX05SMB040Y | 400 GB | SSD | Toshiba | No | AS0C |
| CN3JH | 2.5" | PX05SMB080Y | 800 GB | SSD | Toshiba | No | AS0C |
| GVTYD | 2.5" | PX05SMB160Y | 1.6 TB | SSD | Toshiba | No | AS0C |
| R1YFC | 2.5" | PX05SMB320Y | 3.2 TB | SSD | Toshiba | No | AS0C |
| X143K | 2.5" | MBD2147RC | 146 GB | 10 K | Fujitsu | No | D80A |
| U706K | 2.5" | MBD2300RC | 300 GB | 10 K | Fujitsu | No | D80A |
| R727K | 2.5" | MBE2073RC | 73 GB | 15 K | Fujitsu | No | D906 |
| W328K | 2.5" | MBE2147RC | 146 GB | 15 K | Fujitsu | No | D906 |
| T6TWN | 2.5" | HUC101212CSS600 | 1.2 TB | 10 K | HGST | No | U5E2 |
| K9VCF | 2.5" | HUC101830CSS204 | 300 GB | 10 K | HGST | No | FJ34 |
| 10DR3 | 2.5" | HUC101860CSS204 | 600 GB | 10 K | HGST | No | FJ34 |
| 87GNY | 2.5" | HUC101812CSS204 | 1.2 TB | 10 K | HGST | No | FJ34 |
| RF9T8 | 2.5" | HUC101818CS4204 | 1.8 TB | 10 K | HGST | No | FK23 |
| VTHDD | 2.5" | HUC101818CS4204 | 1.8 TB | 10 K | HGST | No | FK23 |
| RDKH0 | 2.5" | HUC101830CSS204 | 300 GB | 10 K | HGST | No | FJ34 |
| P6GJX | 2.5" | HUC101860CSS204 | 600 GB | 10 K | HGST | No | FJ34 |
| 9XNF6 | 2.5" | HUC101812CSS204 | 1.2 TB | 10 K | HGST | No | FJ34 |
| 5VNKK | 2.5" | HUC101830CSS200 | 300 GB | 10 K | HGST | No | FU29 |
| 6DWVP | 2.5" | HUC101860CSS200 | 600 GB | 10 K | HGST | No | FU29 |
| 0KV02 | 2.5" | HUC101812CSS200 | 1.2 TB | 10 K | HGST | No | FU29 |
| 851GV | 2.5" | HUC156030CSS204 | 300 GB | 15 K | HGST | No | EJ24 |
| 4J5P1 | 2.5" | HUC156060CSS204 | 600 GB | 15 K | HGST | No | EJ24 |
| 0N0T4 | 2.5" | HUC156030CSS204 | 300 GB | 15 K | HGST | No | EJ24 |
| TRCN6 | 2.5" | HUC156060CSS204 | 600 GB | 15 K | HGST | No | EJ24 |
| 1P08J | 2.5" | HUC156030CSS200 | 300 GB | 15 K | HGST | No | EU29 |
| 5PNGD | 2.5" | HUC156060CSS200 | 600 GB | 15 K | HGST | No | EU29 |
| T855K | 2.5" | HUC103014CSS600 | 146 GB | 10 K | Hitachi | No | J516 |
| U709K | 2.5" | HUC103030CSS600 | 300 GB | 10 K | Hitachi | No | J516 |
| YJ0GR | 2.5" | HUC106030CSS600 | 300 GB | 10 K | Hitachi | No | A440 |
| 8WP8W | 2.5" | HUC106060CSS600 | 600 GB | 10 K | Hitachi | No | A440 |

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|---|---|---|---|---|---|---|---|
| CXF82 | 2.5" | HUC109030CSS600 | 300 GB | 10 K | Hitachi | No | N440 |
| G76RF | 2.5" | HUC109060CSS600 | 600 GB | 10 K | Hitachi | No | N440 |
| H5WGN | 2.5" | HUC109090CSS600 | 900 GB | 10 K | Hitachi | No | N440 |
| R730K | 2.5" | HUC151473CSS600 | 73 GB | 15 K | Hitachi | No | K774 |
| W330K | 2.5" | HUC151414CSS600 | 146 GB | 15 K | Hitachi | No | K774 |
| 745GC | 2.5" | ST9300605SS | 300 GB | 10 K | Seagate | No | CS0C |
| R72NV | 2.5" | ST9600205SS | 600 GB | 10 K | Seagate | No | CS0C |
| 8JRN4 | 2.5" | ST9900805SS | 900 GB | 10 K | Seagate | No | CS0C |
| XRRVX | 2.5" | ST9900605SS | 900 GB | 10 K | Seagate | Yes | CSFB |
| 7T0DW | 2.5" | ST9600204SS | 600 GB | 10 K | Seagate | No | FM0C |
| 8MP93 | 2.5" | ST9600104SS | 600 GB | 10 K | Seagate | Yes | FMF5 |
| X160K | 2.5" | ST9146803SS | 146 GB | 10 K | Seagate | No | FS66 |
| T871K | 2.5" | ST9300603SS | 300 GB | 10 K | Seagate | No | FS66 |
| 148J7 | 2.5" | ST9300503SS | 300 GB | 10 K | Seagate | Yes | FSF9 |
| PGHJG | 2.5" | ST300MM0006 | 300 GB | 10 K | Seagate | No | LS0C |
| 7YX58 | 2.5" | ST600MM0006 | 600 GB | 10 K | Seagate | No | LS0C |
| 2RR9T | 2.5" | ST900MM0006 | 900 GB | 10 K | Seagate | No | LS0C |
| TNX32 | 2.5" | ST900MM0036 | 900 GB | 10 K | Seagate | Yes | LSF7 |
| 3P3DF | 2.5" | ST900MM0007 | 900 GB | 10 K | Seagate | No | IS06 |
| RMCP3 | 2.5" | ST1200MM0007 | 1.2 TB | 10 K | Seagate | No | IS06 |
| 4RYFR | 2.5" | ST1200MM0027 | 1.2 TB | 10 K | Seagate | Yes | ISF5 |
| W345K | 2.5" | ST973452SS | 73 GB | 15 K | Seagate | No | HT66 |
| X162K | 2.5" | ST9146852SS | 146 GB | 15 K | Seagate | No | HT66 |
| 89TH4 | 2.5" | ST9146752SS | 146 GB | 15 K | Seagate | Yes | HTF6 |
| YJ2KH | 2.5" | ST300MM0088 | 300 GB | 15 K | Seagate | No | TT31 |
| R95FV | 2.5" | ST600MM0088 | 600 GB | 15 K | Seagate | No | TT31 |
| WXPCX | 2.5" | ST1200MM0088 | 1.2 TB | 15 K | Seagate | No | TT31 |
| NCT9F | 2.5" | ST300MP0026 | 300 GB | 15 K | Seagate | No | KT37 |
| FPW68 | 2.5" | ST600MP0036 | 600 GB | 15 K | Seagate | No | KT37 |
| XTH17 | 2.5" | ST900MP0026 | 900 GB | 15 K | Seagate | No | KT37 |
| N9WXC | 2.5" | ST900MP0126 | 900 GB | 15 K | Seagate | Yes | KSC6 |
| RT8MY | 2.5" | DL900MP0136 | 900 GB | 15 K | Seagate | No | KT55 |
| V2KWT | 2.5" | ST1200MM0108 | 1.2 TB | 10 K | Seagate | Yes | TSC9 |
| 43N12 | 2.5" | ST1800MM0018 | 1.8 TB | 10 K | Seagate | No | TS27 |
| WHR0G | 2.5" | ST1800MM0078 | 1.8 TB | 10 K | Seagate | Yes | TSE1 |
| VJ7CD | 2.5" | ST1800MM0168 | 1.8 TB | 10 K | Seagate | No | 2S24 |

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|---|---|---|---|---|---|---|---|
| 2M5JK | 2.5" | ST300MM0078 | 300 GB | 10 K | Seagate | No | BS04 |
| D1F14 | 2.5" | ST600MM0238 | 600 GB | 10 K | Seagate | No | BS04 |
| FR6W6 | 2.5" | ST1200MM0198 | 1.2 TB | 10 K | Seagate | No | UT71 |
| RVDCJ | 2.5" | ST1800MM0198 | 1.8 TB | 10 K | Seagate | No | 2T51 |
| JY57X | 2.5" | DL1800MM0159 | 1.8 TB | 10 K | Seagate | No | ST51 |
| XXTRP | 2.5" | ST600MM0069 | 600 GB | 10 K | Seagate | No | ST31 |
| G2G54 | 2.5" | ST1200MM0099 | 1.2 TB | 10 K | Seagate | No | ST31 |
| DMP3R | 2.5" | ST1200MM0069 | 1.2 TB | 10 K | Seagate | Yes | SSC1 |
| 7FJW4 | 2.5" | ST300MP0005 | 300 GB | 15 K | Seagate | No | VT33 |
| 4HGTJ | 2.5" | ST600MP0005 | 600 GB | 15 K | Seagate | No | VT33 |
| 4X0XG | 2.5" | ST600MP0025 | 600 GB | 15 K | Seagate | Yes | VSC6 |
| 61XPF | 2.5" | ST9146853SS | 146 GB | 15 K | Seagate | No | YS0D |
| H8DVC | 2.5" | ST9300653SS | 300 GB | 15 K | Seagate | No | YS0D |
| 81N2C | 2.5" | ST9300453SS | 300 GB | 15 K | Seagate | Yes | YSFD |
| 55RMX | 2.5" | ST91000640SS | 1 TB | 7.2 K | Seagate | No | AS0D |
| 9W5WV | 2.5" | ST9500620SS | 500 GB | 7.2 K | Seagate | No | AS0D |
| XKGH0 | 2.5" | ST91000642SS | 1 TB | 7.2 K | Seagate | Yes | ASFE |
| R734K | 2.5" | ST9500430SS | 500 GB | 7.2 K | Seagate | No | DS67 |
| NV0G9 | 2.5" | ST9500431SS | 500 GB | 7.2 K | Seagate | Yes | DSF4 |
| XY986 | 2.5" | ST2000NX0273 | 2 TB | 7.2 K | Seagate | No | NS29 |
| 56M6W | 2.5" | ST1000NX0453 | 1 TB | 7.2 K | Seagate | No | NS02 |
| FVX7C | 2.5" | ST2000NX0433 | 2 TB | 7.2 K | Seagate | No | NS02 |
| Y6W8N | 2.5" | ST2000NX0453 | 2 TB | 7.2 K | Seagate | Yes | NSF1 |
| D4N7V | 2.5" | ST1000NX0473 | 1 TB | 7.2 K | Seagate | No | NT31 |
| TMVN7 | 2.5" | ST2000NX0463 | 2 TB | 7.2 K | Seagate | No | NT31 |
| 740Y7 | 2.5" | MBF2300RC | 300 GB | 10 K | Toshiba | No | DA0B |
| 5R6CX | 2.5" | MBF2600RC | 600 GB | 10 K | Toshiba | No | DA0B |
| MTV7G | 2.5" | AL13SEB300 | 300 GB | 10 K | Toshiba | No | DE11 |
| 5TFDD | 2.5" | AL13SEB600 | 600 GB | 10 K | Toshiba | No | DE11 |
| RC34W | 2.5" | AL13SEB900 | 900 GB | 10 K | Toshiba | No | DE11 |
| GP3FR | 2.5" | AL14SEB18EQ | 1.8 TB | 10 K | Toshiba | No | DN03 |
| 2TRM4 | 2.5" | AL14SEB18EQY | 1.8 TB | 10 K | Toshiba | No | EB02 |
| 3NKW7 | 2.5" | AL14SEB030N | 300 GB | 10 K | Toshiba | No | DM06 |
| 453KG | 2.5" | AL14SEB060N | 600 GB | 10 K | Toshiba | No | DM06 |
| N9VVV | 2.5" | AL14SEB090N | 900 GB | 10 K | Toshiba | No | DM06 |
| 89D42 | 2.5" | AL14SEB120N | 1.2 TB | 10 K | Toshiba | No | DM06 |

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|---|---|---|---|---|---|---|---|
| KT5V6 | 2.5" | AL14SEB030N | 300 GB | 10 K | Toshiba | No | DH01 |
| GTYCR | 2.5" | AL14SEB060N | 600 GB | 10 K | Toshiba | No | DH01 |
| R0MWH | 2.5" | AL14SEB120N | 1.2 TB | 10 K | Toshiba | No | DH01 |
| FF02R | 2.5" | AL14SEB030NY | 300 GB | 10 K | Toshiba | No | EA04 |
| G3MWJ | 2.5" | AL14SEB060NY | 600 GB | 10 K | Toshiba | No | EA04 |
| 3K30N | 2.5" | AL14SEB120NY | 1.2 TB | 10 K | Toshiba | No | EA04 |
| 6DFD8 | 2.5" | MK1401GRRB | 146 GB | 15 K | Toshiba | No | DB08 |
| NWH7V | 2.5" | MK3001GRRB | 300 GB | 15 K | Toshiba | No | DB08 |
| 4GN49 | 2.5" | AL13SXB300N | 300 GB | 15 K | Toshiba | No | DF0B |
| 990FD | 2.5" | AL13SXB600N | 600 GB | 15 K | Toshiba | No | DF0B |
| 0RVDT | 2.5" | AL13SXB30EN | 300 GB | 15 K | Toshiba | No | DK05 |
| DYDW0 | 2.5" | AL13SXB60EN | 600 GB | 15 K | Toshiba | No | DK05 |
| YFKXK | 2.5" | AL13SXB30ENY | 300 GB | 15 K | Toshiba | No | EC02 |
| GK6JN | 2.5" | AL13SXB60ENY | 600 GB | 15 K | Toshiba | No | EC02 |
| 377CF | 2.5" | AL14SXB30ENY | 300 GB | 15 K | Toshiba | No | EE05 |
| 1W7HC | 2.5" | AL14SXB60ENY | 600 GB | 15 K | Toshiba | No | EE05 |
| YKT0W | 2.5" | AL14SXB90ENY | 900 GB | 15 K | Toshiba | No | EE05 |
| GWFRY | 2.5" | AL15SEB030NY | 300 GB | 10 K | Toshiba | No | EF03 |
| 4WX8Y | 2.5" | AL15SEB060NY | 600 GB | 10 K | Toshiba | No | EF03 |
| 01M0D | 2.5" | AL15SEB120NY | 1.2 TB | 10 K | Toshiba | No | EF03 |
| 0WRRF | 2.5" | AL15SEB18EQY | 1.8 TB | 10 K | Toshiba | No | EF03 |
| X79H3 | 2.5" | WD3000BKHG | 300 GB | 10 K | Western Digital | No | D1VD |
| C5R62 | 2.5" | WD6000BKHG | 600 GB | 10 K | Western Digital | No | D1VD |
| CWHNN | 2.5" | WD3001BKHG | 300 GB | 10 K | Western Digital | No | D1S6 |
| 96G91 | 2.5" | WD6001BKHG | 600 GB | 10 K | Western Digital | No | D1S6 |
| 4X1DR | 2.5" | WD9001BKHG | 900 GB | 10 K | Western Digital | No | D1S6 |
| F9KW8 | 2.5" | WD3002BKTG | 300 GB | 10 K | Western Digital | No | D1P3 |
| V1TX2 | 2.5" | WD6002BKTG | 600 GB | 10 K | Western Digital | No | D1P3 |
| 99NCV | 2.5" | WD9002BKTG | 900 GB | 10 K | Western Digital | No | D1P3 |
| WTJVY | 3.5" | HUS724020ALS640 | 2 TB | 7.2 K | HGST | No | W350 |
| MY58D | 3.5" | HUS724030ALS640 | 3 TB | 7.2 K | HGST | No | W350 |
| 7J9RN | 3.5" | HUS724040ALS640 | 4 TB | 7.2 K | HGST | No | W350 |
| XP99D | 3.5" | HUS726020ALS214 | 2 TB | 7.2 K | HGST | No | KJ03 |
| TX8WW | 3.5" | HUS726040ALS214 | 4 TB | 7.2 K | HGST | No | KJ03 |
| VH6FW | 3.5" | HUS726020ALS210 | 2 TB | 7.2 K | HGST | No | KU27 |
| X4FKY | 3.5" | HUS726040ALS210 | 4 TB | 7.2 K | HGST | No | KU27 |

| PYM8J | 3.5" | HUS726060AL5214 | 6 TB | 7.2 K | HGST | No | KK34 |
|---|---|---|---|---|---|---|---|
| 43V7V | 3.5" | HUH728080AL5204 | 8 TB | 7.2 K | HGST | No | GK23 |
| KRDKK | 3.5" | HUH721008AL5200 | 8 TB | 7.2 K | HGST | No | LS14 |
| 07FPR | 3.5" | HUH721010AL5200 | 10 TB | 7.2 K | HGST | No | LS14 |
| X150K | 3.5" | HUS156030VLS600 | 300 GB | 15 K* | Hitachi | No | E820 |
| T857K | 3.5" | HUS156045VLS600 | 450 GB | 15 K* | Hitachi | No | E820 |
| W348K | 3.5" | HUS156060VLS600 | 600 GB | 15 K* | Hitachi | No | E820 |
| VYRKH | 3.5" | HUS723020ALS640 | 2 TB | 7.2 K | Hitachi | No | M440 |
| CWJ92 | 3.5" | HUS723030ALS640 | 3 TB | 7.2 K | Hitachi | No | M440 |
| R752K | 3.5" | ST3600002SS | 600 GB | 10 K* | Seagate | No | ER66 |
| M525M | 3.5" | ST3300657SS | 300 GB | 15 K* | Seagate | No | ES68 |
| H995N | 3.5" | ST3450857SS | 450 GB | 15 K* | Seagate | No | ES68 |
| J762N | 3.5" | ST3600057SS | 600 GB | 15 K* | Seagate | No | ES68 |
| D32VD | 3.5" | ST3450757SS | 450 GB | 15 K* | Seagate | Yes | ESF7 |
| 5XTFH | 3.5" | ST3600957SS | 600 GB | 15 K* | Seagate | Yes | ESF7 |
| U717K | 3.5" | ST3500414SS | 500 GB | 7.2 K | Seagate | No | KS6B |
| U738K | 3.5" | ST31000424SS | 1 TB | 7.2 K | Seagate | No | KS6B |
| R755K | 3.5" | ST32000444SS | 2 TB | 7.2 K | Seagate | No | KS6B |
| X164K | 3.5" | ST31000425SS | 1 TB | 7.2 K | Seagate | Yes | KSF4 |
| W350K | 3.5" | ST32000445SS | 2 TB | 7.2 K | Seagate | Yes | KSF4 |
| 6VNCJ | 3.5" | ST500NM0001 | 500 GB | 7.2 K | Seagate | No | PS0B |
| 740YX | 3.5" | ST1000NM0001 | 1 TB | 7.2 K | Seagate | No | PS0B |
| 67TMT | 3.5" | ST2000NM0001 | 2 TB | 7.2 K | Seagate | No | PS0B |
| 02DK1 | 3.5" | ST2000NM0041 | 2 TB | 7.2 K | Seagate | Yes | PSF9 |
| 1D9NN | 3.5" | ST32000645SS | 2 TB | 7.2 K | Seagate | No | RS17 |
| 91K8T | 3.5" | ST33000650SS | 3 TB | 7.2 K | Seagate | No | RS17 |
| 698PM | 3.5" | ST33000652SS | 3 TB | 7.2 K | Seagate | Yes | RSFF |
| FNW88 | 3.5" | ST1000NM0023 | 1 TB | 7.2 K | Seagate | No | GS15 |
| 1P7DP | 3.5" | ST2000NM0023 | 2 TB | 7.2 K | Seagate | No | GS15 |
| 55H49 | 3.5" | ST3000NM0023 | 3 TB | 7.2 K | Seagate | No | GS15 |
| 529FG | 3.5" | ST4000NM0023 | 4 TB | 7.2 K | Seagate | No | GS15 |
| 6P85J | 3.5" | ST4000NM0063 | 4 TB | 7.2 K | Seagate | Yes | GSFB |
| NWCCG | 3.5" | ST6000NM0034 | 6 TB | 7.2 K | Seagate | No | MS2E |
| PRNR6 | 3.5" | ST6000NM0034 | 6 TB | 7.2 K | Seagate | No | MS85 |
| GWD7D | 3.5" | ST1000NM0005 | 1 TB | 7.2 K | Seagate | No | MS06 |
| R7FKF | 3.5" | ST2000NM0005 | 2 TB | 7.2 K | Seagate | No | MS06 |

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|---|---|---|---|---|---|---|---|
| XWM1W | 3.5" | ST4000NM0005 | 4 TB | 7.2 K | Seagate | No | MS06 |
| DGNTV | 3.5" | ST1000NM0045 | 1 TB | 7.2 K | Seagate | No | DS04 |
| K7VW5 | 3.5" | ST2000NM0045 | 2 TB | 7.2 K | Seagate | No | DS04 |
| YXG4K | 3.5" | ST4000NM0025 | 4 TB | 7.2 K | Seagate | No | DS04 |
| RHVWG | 3.5" | ST6000NM0095 | 6 TB | 7.2 K | Seagate | No | DS23 |
| FCHXF | 3.5" | ST4000NM0135 | 4 TB | 7.2 K | Seagate | Yes | DSF2 |
| H0R8N | 3.5" | ST1000NM0085 | 1 TB | 7.2 K | Seagate | No | DT31 |
| 7RCGV | 3.5" | ST2000NM0155 | 2 TB | 7.2 K | Seagate | No | DT31 |
| 5JH5X | 3.5" | ST4000NM0295 | 4 TB | 7.2 K | Seagate | No | DT31 |
| GKWHP | 3.5" | ST8000NM0075 | 8 TB | 7.2 K | Seagate | No | PS26 |
| PDFHC | 3.5" | ST8000NM0135 | 8 TB | 7.2 K | Seagate | Yes | PSE4 |
| M40TH | 3.5" | ST8000NM0185 | 8 TB | 7.2 K | Seagate | No | PT51 |
| YF87J | 3.5" | ST10000NM0256 | 10 TB | 7.2 K | Seagate | No | TT54 |
| GPP3G | 3.5" | MG03SCA100 | 1 TB | 7.2 K | Toshiba | No | DG09 |
| 829T8 | 3.5" | MG03SCA200 | 2 TB | 7.2 K | Toshiba | No | DG09 |
| 14X4H | 3.5" | MG03SCA300 | 3 TB | 7.2 K | Toshiba | No | DG09 |
| 12GYY | 3.5" | MG03SCA400 | 4 TB | 7.2 K | Toshiba | No | DG09 |
| 7KXJR | 3.5" | MK1001TRKB | 1 TB | 7.2 K* | Toshiba | No | DCAD |
| WDC07 | 3.5" | MK2001TRKB | 2 TB | 7.2 K* | Toshiba | No | DCAD |
| GDM8H | 3.5" | MG04SCA20EN | 2 TB | 7.2 K | Toshiba | No | DS07 |
| 0F9W8 | 3.5" | MG04SCA40EN | 4 TB | 7.2 K | Toshiba | No | DS07 |
| 3PRF0 | 3.5" | MG04SCA60EE | 6 TB | 7.2 K | Toshiba | No | DR07 |
| HHX14 | 3.5" | MG04SCA20ENY | 2 TB | 7.2 K | Toshiba | No | EG03 |
| 1MVTT | 3.5" | MG04SCA40ENY | 4 TB | 7.2 K | Toshiba | No | EG03 |
| M7D8Y | 3.5" | MG04SCA20EN | 2 TB | 7.2 K | Toshiba | No | DJ01 |
| HNX0W | 3.5" | MG04SCA40EN | 4 TB | 7.2 K | Toshiba | No | DJ01 |
| 0V8G9 | 3.5" | WD1000FYYG | 1 TB | 7.2 K | Western Digital | No | D1BH |
| YY34F | 3.5" | WD2000FYYG | 2 TB | 7.2 K | Western Digital | No | D1BH |
| 440RW | 3.5" | WD1001FYYG | 1 TB | 7.2 K | Western Digital | No | D1R7 |
| 37MGT | 3.5" | WD2001FYYG | 2 TB | 7.2 K | Western Digital | No | D1R7 |
| DPTW9 | 3.5" | WD3001FYYG | 3 TB | 7.2 K | Western Digital | No | D1R7 |
| 202V7 | 3.5" | WD4001FYYG | 4 TB | 7.2 K | Western Digital | No | D1R7 |

ⓘ **NOTE:**

- 3.5" 15 K RPM drives, 3.5" 10 K RPM drives, and 3.5" 7.2 K RPM utility drives marked with (*) are not supported on Dell EMC PowerVault MD dense arrays such as Dell EMC PowerVault MD3260, MD3260i, MD3660i, and MD3660f.
- The MD32/MD36 series arrays can utilize 12 GBps HDD or SSD, but will negotiate to a speed of 6 GBps.
- Encrypted SSD drives (SED-SSD) and 4 Kn Sector drives are not supported on the MD32/MD36 series arrays.

# Supported expansion enclosures

Dell EMC PowerVault MD 3x60 Series Dense Storage Arrays support a maximum of 180 physical disk drive slots (with premium feature activation). For a system without premium feature activation, the physical disk drive slots limit is 120. The additional slot support can only be provided by up to two Dell EMC PowerVault MD3060e expansion enclosures.

Table 13. Expansion enclosures supported on dense (4U) storage arrays

| Enclosure model | Minimum firmware version |
| --- | --- |
| Dell PowerVault MD3060e | 03.9F |

Dell EMC PowerVault MD32xx/36xx series storage arrays support a maximum of 192 physical disk drive slots (with premium feature activation). For a system without premium feature activation, the physical disk drive limit is 120. You can provide the additional slots with up to 15 MD1200 expansion enclosures, seven MD1220 expansion enclosures, or a combination of both. When you use a combination of expansion enclosures, the total number of physical disk drive slots in the system cannot exceed 192.

Table 14. Expansion enclosures supported on non-dense (2U) storage arrays

| Enclosure model | Minimum firmware version |
| --- | --- |
| Dell PowerVault MD1200 | 1.06 |
| Dell PowerVault MD1220 | 1.06 |

ⓘ NOTE: Attaching a 4U (dense) expansion enclosure to a 2U (non-dense) RAID storage array is not supported. Alternately, you cannot attach a 2U expansion enclosure to a 4U RAID storage array. All EMMs in an expansion stack must be at the same firmware level.

# Supported management software

The Dell EMC PowerVault MD Storage software is composed of the Modular Disk Storage Manager (MDSM) and the Modular Disk Configuration utility (MDCU). These management utilities are available on the resource DVD provided with your system and online at Dell.com/support. The Dell EMC PowerVault MD storage software is supported on all operating systems and guest operating systems listed in the Error! Reference source not found. section. The management station must meet the following minimum requirements:

- 5 GB of free disk space
- For MDSM and MDCU, a graphical user interface (GUI) is required

The Dell EMC PowerVault MD-Series resource DVD and other supported management software details are shown in the following tables:

**Table 15. Supported management software (Windows)**

| Software component | Version | Notes |
| --- | --- | --- |
| Dell EMC PowerVault MD32/36 Series Storage Arrays resource DVD | 6.5.0.1 | |
| Modular Disk Storage Manager | 11.25.0306.0026 | |
| Modular Disk Configuration utility | 2.1.0.68 | Supported on iSCSI only |
| Dell EMC PowerVault MD32/36 series hardware provider VDS/VSS Providers* | D1.20.0G06.0004/S1.20.0G06.0004 | Dell EMC is discontinuing support of the VSS and VDS hardware providers. For information about deprecation, see the *Dell EMC MD Series Storage Arrays Information Update.* |
| Dell EMC PowerVault MD Storage Array vCenter plug-in | See Supported management software (VMware vCenter plug-in). | |
| Dell EMC PowerVault MD Storage Array VASA Provider (iSCSI and Fibre Channel only) | See Supported management software (VASA provider support). | Supported on:<br>• Windows Server 2008 R2 SP1(64-bit version only)<br>• Windows Server 2012<br>• Windows Server 2012 R2 |
| Dell EMC PowerVault MD Storage Array Storage Replication Adapter (SRA) (Fibre Channel only) | See Supported management software (Storage Replication Adapter Support). | |

\* Maximum number of concurrent back ups supported while using the hardware provider VSS provider with clustered shared volumes is two.

**Table 16. Supported management software (Linux)**

| Software Component | Version | Notes |
|---|---|---|
| Dell EMC PowerVault MD Series Dense Storage Arrays resource DVD | 6.5.0.1 | |
| Modular Disk Storage Manager | 11.25.0A06.0026 | |
| Modular Disk Configuration utility | 2.1.0.68 | Supported with iSCSI storage arrays only. |

**Table 17. Supported management software (VMware vCenter plug-in)**

| vCenter plug-in version | VMware version supported | Notes |
|---|---|---|
| 3 | All protocols:<br><br>• vSphere 6.5<br>• vSphere 6.0<br>• vSphere 5.5 U2 | This is compatible only with firmware 08.20.11.60 or later. The Host to Storage Wizard that is used to automatically discover the HBA WWNs is not supported after VMware vCenter server 6.0 Update2 Build 3620759 or on any of the VMware vCenter server 6.5 releases. |
| 2.7 | All protocols:<br><br>• vSphere 5.5<br>• vSphere 5.1 | This is compatible only with firmware 7.84.56.60 or later. |

**Table 18. Supported management software (VASA provider support)**

| VASA version | VMware supported version | Notes |
|---|---|---|
| 5.5 | vSphere Client 5.5/6.0/6.5 vCenter Server 5.5/6.0/6.5 Site Recovery Manager (SRM) 5.1 or later | Supported on 08.20.05.60 firmware or later. |

ⓘ NOTE: Supported on Fibre Channel and iSCSI arrays only.

**Table 19. Supported management software (Storage Replication Adapter Support)**

| SRA Version | VMware version supported | Notes |
|---|---|---|
| 5.6 | vSphere Client 5.1/ 5.5/6.0/6.5 vCenter Server 5.0/5.1/5.5 Site Recovery Manager (SRM) 5.1/5.5/6.0/6.1 | This is compatible only with firmware 08.20.11.60 or later. |
| 5.5 | vSphere Client 5.1/5.5 vCenter Server 5.1 Site Recovery Manager (SRM) 5.1/5.5 | For more information, see the MD Storage Array VMware Storage Replication Adapter 5.0 Installation and Configuration Guide. |

ⓘ NOTE: Supported on Fibre Channel and iSCSI arrays only.

# Supported operating systems

Where clustering is supported by the operating system, it is also supported on the Dell EMC PowerVault MD3200, MD3200i, MD3600i, MD3600f, MD3260, MD3260i, MD3660i, and MD3660f series storage arrays, subject to the following limitations:

**Windows Server 2008 R2 - Windows Server 2016**:

- Maximum iSCSI nodes are 16
- Maximum SAS nodes is 4
- Maximum FC nodes is 16

**Table 20. Dell EMC PowerVault MD-Series operating system support**

| Operating system | SAS host server | iSCSI host server | Management station | Fibre Channel host server | Notes & required hotfixes |
|---|---|---|---|---|---|
| **Windows Server 2016*** | | | | | |
| Standard server (core and desktop experience) | Yes | Yes | Yes | Yes | The Microsoft MPIO feature musts installed prior to installing the Module Disk Storage Manager (MDSM) located on the resource DVD available on Dell.com/support. Failure to do so will require MDSM to be installed a second time. |
| Data center server (core and desktop experience) | Yes | Yes | Yes | Yes | The Microsoft MPIO feature musts installed prior to installing the Module Disk Storage Manager (MDSM) located on the resource DVD available on Dell.com/support. Failure to do so will require MDSM to be installed a second time. |
| **Windows Server 2012 R2 (U1)*** | | | | | |
| Standard server and core | Yes | Yes | Yes | Yes | KB2966870 |
| Data center server and core | Yes | Yes | Yes | Yes | KB2966870 |
| Foundation server and core | Yes | Yes | Yes | Yes | KB2966870 |
| **Windows Server 2008 R2 SP1*** | | | | | |
| Windows 2008 R2 SP1 Enterprise and Core | Yes | Yes | Yes | Yes | KB2522766 KB2637197 |
| Windows 2008 R2 SP1 Data center and Core | Yes | Yes | Yes | Yes | KB2522766 KB2637197 |
| Windows 2008 R2 SP1 Foundation and Core | Yes | Yes | Yes | Yes | KB2522766 KB2637197 |
| Windows 2008 R2 SP1 Web and Core | | | Yes | | KB2522766 KB2637197 |
| Windows 2008 Storage Server R2 SP1 all editions | Yes | Yes | Yes | Yes | KB2522766 KB2637197 |

| Operating system | SAS host server | iSCSI host server | Management station | Fibre Channel host server | Notes & required hotfixes |
|---|---|---|---|---|---|
| Windows 2008 R2 SP1 HPC Server | Yes | Yes | Yes | Yes | KB2522766 KB2637197 |
| **Red Hat Enterprise Linux (RHEL)** | | | | | |
| Red Hat Enterprise Linux 7.3 (x64 only) | Yes | Yes | Yes | Yes | Basic Server install (Minimum) |
| Red Hat Enterprise Linux 7.2 (x64 only) | Yes | Yes | Yes | Yes | Basic Server install (Minimum) |
| Red Hat Enterprise Linux 7.1 (x64 only) | Yes | Yes | Yes | Yes | Basic Server install (Minimum) The Linux sg driver has been disabled by default in RHEL 7.1 and is required for in-band management. To workaround this, manually issue modprobe sg or add it to an init script. After the driver is loaded, in-band management will be available. For more information about this issue, refer to RHEL 7.1 Release Notes, issue BZ#1186462. |
| Red Hat Enterprise Linux 7 (x64 only) | Yes | Yes | Yes | Yes | Basic Server install (Minimum) |
| Red Hat Enterprise Linux 6.9 (x64 only) | Yes | Yes | Yes | Yes | Basic Server install (Minimum) |
| Red Hat Enterprise Linux 6.8 (x64 only) | Yes | Yes | Yes | Yes | Basic Server install (Minimum) |
| Red Hat Enterprise Linux 6.7 (x64 only) | Yes | Yes | Yes | Yes | Basic Server install (Minimum) |
| Red Hat Enterprise Linux 6.6 (x64 only) | Yes | Yes | Yes | Yes | Basic Server install (Minimum) |
| Red Hat Enterprise Linux 6.5 (x64 only) | Yes | Yes | Yes | Yes | Basic Server install (Minimum) |
| **SUSE Linux Enterprise Server (SLES)** | | | | | |
| SUSE® Linux Enterprise Server 12.2 (x64 only) | Yes | Yes | Yes | Yes | |
| SUSE® Linux Enterprise Server 12.1 (x64 only) | Yes | Yes | Yes | Yes | |
| SUSE® Linux Enterprise Server 12 (x64 only) | Yes | Yes | Yes | Yes | |
| SUSE® Linux Enterprise Server 11.4(x64 only) | Yes | Yes | Yes | Yes | |
| **Virtualization Hosts / Hypervisors\*\*** | | | | | |
| VMware vSphere 6.5 | Yes | Yes | | Yes | • For supported array firmware versions, see VMware https://www.vmware.com/resources/compatibility/search.php?cc=www&client=VMware_Site&entqr=0&ud=1&num=20&output=xml_no_dtd&proxystylesheet=VMware_gsa_Site&site=VMware_Site&ie=UTF-8&oe=UTF-8&q=hcl&x=4&y=4 |

| Operating system | SAS host server | iSCSI host server | Management station | Fibre Channel host server | Notes & required hotfixes |
|---|---|---|---|---|---|
| | | | | | • Direct attached iSCSI connection is not supported with VMware vSphere<br>• Supported path policies: MRU<br>• RR |
| VMware vSphere 6.0 (U1, U2, U3) | Yes | Yes | | Yes | • For supported array firmware versions, see VMware https://www.vmware.com/resources/compatibility/search.php?cc=www&client=VMware_Site&entqr=0&ud=1&num=20&output=xml_no_dtd&proxystylesheet=VMware_gsa_Site&site=VMware_Site&ie=UTF-8&oe=UTF-8&q=hcl&x=4&y=4<br>• Direct attached iSCSI connection is not supported with VMware vSphere<br>• Supported path policies: MRU<br>• RR |
| VMware vSphere 5.5 (U3) | Yes | Yes | | Yes | • For supported array firmware versions, see VMware https://www.vmware.com/resources/compatibility/search.php?cc=www&client=VMware_Site&entqr=0&ud=1&num=20&output=xml_no_dtd&proxystylesheet=VMware_gsa_Site&site=VMware_Site&ie=UTF-8&oe=UTF-8&q=hcl&x=4&y=4<br>• Direct attached iSCSI connection is not supported with VMware vSphere<br>• Supported path policies: MRU<br>• RR |
| VMware vSphere 5.1 (U3) | Yes | Yes | | | • For supported array firmware versions, see VMware https://www.vmware.com/resources/compatibility/search.php?cc=www&client=VMware_Site&entqr=0&ud=1&num=20&output=xml_no_dtd&proxystylesheet=VMware_gsa_Site&site=VMware_Site&ie=UTF-8&oe=UTF-8&q=hcl&x=4&y=4<br>• Direct attached iSCSI connection is not supported with VMware vSphere<br>• Supported path policies: MRU<br>• RR |
| Citrix XenServer | Yes | Yes | | Yes | For supported XS releases see http://hcl.xensource.com/ |
| Microsoft Hyper-V Server 2016 | Yes | Yes | Yes | Yes | |
| Microsoft Hyper-V Server 2012 R2 | Yes | Yes | Yes | Yes | |
| Microsoft Hyper-V Server 2008 R2 SP1 | Yes | Yes | Yes | Yes | |
| Windows Server 2008 R2 SP1 with Hyper-V | Yes | Yes | Yes | Yes | |

**Windows Desktop operating systems**

| Operating system | SAS host server | iSCSI host server | Management station | Fibre Channel host server | Notes & required hotfixes |
|---|---|---|---|---|---|
| Windows 10 (x64 only) Pro Enterprise | | | Yes | | |
| Windows 8.1 (x64 only) Pro Enterprise | | | Yes | | |
| Windows 8 (x64 only) Pro Enterprise | | | Yes | | |
| Windows 7 ( x86, x64) | | | Yes | | |

ⓘ **NOTE:**

- Core editions Windows servers can only manage storage arrays by using the SMcli client.
- The VMware Hardware Compatibility List only shows support for RAID controller firmware version *07.84*. However, this indicates support for all firmware versions 07.84.xx.xx or later.

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# Windows ODX support

The MD32XX or MD36XX Series Storage Arrays support Windows ODX for Windows Server 2012 or later.

> ⓘ NOTE: ODX is disabled by default and must be enabled using a SMcli command. For more information, refer to the *Dell EMC PowerVault MD 32XX/34XX/36XX/38XX Series Storage Arrays CLI Guide* on Dell.com/support.

# ALUA support on supported host operating systems

The following operating systems supported by your MD Series storage arrays support ALUA natively. Configuration steps are not required to enable ALUA on these operating systems.

- Microsoft Windows 2008 R2 SP1 and later
- Microsoft Windows 2012 R2 and later
- Microsoft Windows 2016 and later
- Red Hat Enterprise Linux 6.5 and later
- SUSE Linux Enterprise Server 11.4 and later
- VMware vSphere ESXi 5.1 and later

For more information about the ALUA configuration, see the *MD Series Administrator's Guide* available at **Dell.com/support**.

# Supported device mapper software

**Table 21. Supported device mapper software**

| Operating system | Component | Supported version |
|---|---|---|
| SUSE Linux Enterprise Server 12.2 | Native | Native |
| SUSE Linux Enterprise Server 12.1 | Native | Native |
| SUSE Linux Enterprise Server 12 | Native | Native |
| SUSE Linux Enterprise Server 11.4 | Native | Native |
| Red Hat Enterprise Linux 7.4 | Native | Native |
| Red Hat Enterprise Linux 7.3 | Native | Native |
| Red Hat Enterprise Linux 7.2 | Native | Native |
| Red Hat Enterprise Linux 7.1 | Native | Native |
| Red Hat Enterprise Linux 7 | Native | Native |
| Red Hat Enterprise Linux 6.9 | Native | Native |
| Red Hat Enterprise Linux 6.8 | Native | Native |
| Red Hat Enterprise Linux 6.7 | Native | Native |
| Red Hat Enterprise Linux 6.5 | Native | Native |

# Supported Fibre Channel host bus adapters

**Table 22. Supported Fibre Channel HBAs**

| Host bus adapter name | Fabric configuration | Direct-attach configuration |
|---|---|---|
| QLogic* | | |
| QLE2660/62 | Yes | Yes |
| QLE2560/62 | Yes | Yes |
| QLE2460/62/64 | Yes | Yes |
| QLE220** | Yes | Yes |
| QME2662 | Yes | Yes |
| QME2572 | Yes | Yes |
| QME2472 | Yes | Yes |
| Emulex* | | |
| LPe16000/2 | Yes | |
| LPe12000/2 | Yes | Yes |
| LPe 11002 | Yes | Yes |
| LPe 1150 | Yes | Yes |
| LPe 1105-M4 | Yes | Yes |
| LPe 1205-M | Yes | Yes |
| LPe 16002-M | Yes | Yes |
| Brocade* | | |
| BR815/BR825 | Yes | Yes |

* See Required Timeout Settings for Fibre Channel host bus adapters for required timeout settings by manufacturer.

# Required timeout settings for Fibre Channel host bus adapters

This table lists required timeout settings for all Dell EMC-supported Fibre Channel (FC) HBAs, by manufacturer and OS. Ensure that any FC HBA connected to your MD36xxf storage array has these timeout values set as listed in Table 23.

Use one of these manufacturer utilities to set these values on your HBA:

- Brocade command line utility (BCU)
- Emulex HBAnyware or OneCommand Manager
- QLogic SANsurfer FC HBA Manager

**Table 23. Fibre Channel HBA timeout values (by manufacturer)**

| HBA manufacturer | Timeout parameter | Required value (in seconds) |
|---|---|---|
| | **QLogic** | |
| Windows Server 2008 R2 SP1 | LinkDownTimeout | 10 |
| | PortDownRetryCount | 10 |
| Linux only | qlport_down_retry | 10 |
| | **Emulex** | |
| Windows only | LinkTimeout | 10 |
| | NodeTimeout | 10 |
| Linux only | lpfc_devloss_tmo | 10 |
| | **Brocade** | |
| Windows and Linux | pathtov | 10 |

# Supported Fibre Channel switches

Supported only on Fibre Channel storage arrays running the most current RAID firmware versions.

**Table 24. Supported Fibre Channel Switches**

| Switches | Description |
| --- | --- |
| | **Brocade** |
| 200E | Brocade 4 Gb 16-port FC switch |
| 4100 | Brocade 4 Gb 32-port FC switch |
| 4100 | Brocade 4 Gb 64-port FC switch |
| 4900 | Brocade 4 Gb 64-port FC switch |
| 4900 | Brocade 4 Gb 64-port FC switch |
| 5000 | Brocade 4 Gb 32-port FC switch |
| 5000 | Brocade 4 Gb 32-port FC switch |
| 300 | Brocade 8 Gb 24-port FC switch |
| 5100 | Brocade 8 Gb 40-port FC switch |
| 5300 | Brocade 8 Gb 80-port FC switch |
| 6505 | Brocade 16 Gb 24-port FC switch |
| 6510 | Brocade 16 Gb 48-port FC switch |
| DCX & DCX-4S | Director class switch chassis |
| DCX8510-4 | Director class switch chassis |
| DCX8510-8 | Director class switch chassis |
| FC8-48 | 48-port 8 Gb FC blade module for DCX and DCX8510 chassis |
| FC8-32 | 32-port 8 Gb FC blade module for DCX and DCX8510 chassis |
| FC8-16 | 16-port 8 Gb FC blade module for DCX and DCX8510 chassis |
| FC16-32 | 32-port 16 Gb FC blade module for DCX8510 chassis |
| FC16-48 | 48-port 16 Gb FC blade module for DCX8510 chassis |
| | **Dell EMC** |
| Dell EMC PowerConnect B-DCX-4S | Dell EMC PowerConnect Director class switch chassis |
| Dell EMC PowerConnect DCX8510-4 | Director class switch chassis |
| Dell EMC PowerConnect DCX8510-8 | Director class switch chassis |
| Dell EMC Networking S5000 | 48-port unified switch |
| FC8-48 | 48-port 8 Gb FC blade module |

| Switches | Description |
| --- | --- |
| FC8-16 | 16-port 8 Gb FC blade module |
| FC16-32 | 32-port 16 Gb FC blade module |
| FC16-48 | 48-port 16 Gb FC blade module |
| | **Cisco** |
| Nexus 5548UP | 8 Gbps 48-port FC switch |
| Nexus 5596UP | 8 Gbps 96-port FC switch |
| Nexus 5010 | 8 Gbps FC switch |
| Nexus 5020 | 8 Gbps FC switch |
| 9148 | 8 Gbps 48-port FC switch |
| 9506 | 8 Gbps 192-port FC switch |
| 9509 | 8 Gbps 48-port FC switch |
| 9513 | 8 Gbps 528-port FC switch |
| 9710 | Director class switch chassis |

# Supported Dell EMC M1000e Fibre Channel IOMs

**Table 25. Supported Fibre Channel I/O modules**

| Fibre Channels IOMs | Firmware | Description |
|---|---|---|
| M6505 | FOS 7.0.1 | Brocade 16 Gb 24-port FCs witch module |
| M5424 | FOS 6.4.1a | 24-port 8 Gb or 4 Gb FC blade switch module |
| | FOS 6.4.2 | |
| | FOS 7.0.1 | |
| M5424-N | FOS 6.4.1a | 24-port 8 Gb or 4 Gb FC SAN module |
| | FOS 7.0.1 | |
| FC8PT | | 16-port 8 Gb FC pass-through module |

# Tested Brocade, Cisco, and QLogic Fibre Channel routers

**Table 26. Supported Fibre Channel routers**

| FCIP routers | Description |
| --- | --- |
| **Brocade** | |
| 7500 | Brocade 7500 Extension switch |
| 7800 | Brocade 7800 Extension switch |
| **Cisco** | |
| 9216i | MDS 9216i Multilayer Fabric Switch |
| **QLogic** | |
| 6142 | SANbox 6142 |