

Dell™ PowerVault™ MD3000i Support Matrix

This document provides information on supported software and hardware for Dell PowerVault MD3000i storage solution.



NOTE: Only drivers and firmware released by Dell are supported. For the latest driver and firmware releases, see the Downloads section at support.dell.com.

How to Differentiate Between First- and Second-Generation System Software

Information in this support matrix is divided into two distinct environments: first-generation MD3000i firmware and second-generation MD3000i firmware. Second-generation firmware enables a new feature set with optimized functionality, including support for RAID 6, greater than 2TB virtual disk capacity, and SMART battery support.

To determine your firmware level:

- 1 From a management station, connect to the MD3000i using MD Storage Manager.
- 2 Select the **Support** tab.
- 3 Click on **Storage Array Profile** and look for the firmware version.
If the version is 06.xx.xx.xx: The firmware is first-generation.
If the version is 07.xx.xx.xx: The firmware is second-generation.

To determine your MD Storage Manager version:

- 1 From MD Storage Manager, select the **Support** tab.
- 2 Click on **About Modular Disk Storage Manager**.
If the version is 02.xx.xx.xx: The firmware is first-generation.
If the version is 03.xx.xx.xx: The firmware is second-generation.

Dell PowerVault MD3000i Rules

Table 1. Networking and Connectivity

Rules	First Gen.	Second Gen.
A dedicated IP SAN is highly recommended for iSCSI data transmission. Management traffic can be isolated on a separate management network.	√	√
Hosts can connect to an iSCSI storage array using a Layer 2 (switched) or Layer 3 (routed) network switches.	√	√

Rules	First Gen.	Second Gen.
Although a 100-Mbps host NIC is supported, 1-Gbps NICs are highly recommended for iSCSI data transfer and enhanced I/O performance.	√	√
The management Ethernet part of the RAID controller module must be connected to a switch port that is configured to use Auto-Negotiate	√	√
The link rate of 10Mb is not supported for iSCSI data transmission.	√	√
10/100 Mb NIC connections are supported on the MD3000i management ports. A 100-Mbps management link is recommended.	√	√
When using multiple (NICs) in the same server, up to four NICs per host are supported to one MD3000i array. If multiple NICs are installed, it is recommended that different subnets be used for management and iSCSI data links.	√	√
NIC teaming is only supported with VMware ESX server and Citrix XenServer Dell Edition.	√	√
Dell recommends that you enable your switch Spanning Tree setting to Port Fast when using with the MD3000i iSCSI ports and host server ethernet ports. (The Port Fast setting allows switch ports to be in a faster forwarding state, allowing network traffic iSCSI login sessions to be established with minimum wait time.)	√	√
Ethernet switch ports that are connected to host server ethernet ports and MD3000i iSCSI ports may be set to support standard frames (MTU=1500) or Jumbo Frames (MTU=9000). For Jumbo Frame support Server NIC Host ports, MD3000i iSCSI ports and <u>all</u> intermediate network ports must have Jumbo Frame support enabled	√	√
Cat 5/e or better ethernet cables are required for use with the MD3000i	√	√
DHCPv6 is not supported.	√	√
Both IPv4 and IPv6 are supported on the iSCSI data ports.	√	√
For routable addresses, the IPv6 Router is required to advertise with only 64bit prefix lengths.	√	√
The management ports only support IPv4.	√	
The management ports support both IPv4 and IPv6.		√

Rules	First Gen.	Second Gen.
IPv6 is supported with homogenous Microsoft Windows 2008 environments only.	√	
IPv6 should be disabled on Linux targets that do not support it to prevent login failure.		√
If using IPv6, all hosts connected to the MD3000i should support IPv6 with the MD3000i	√	√
Only one type of iSCSI initiator can be used in a host system. For example, if the Broadcom NetXtreme II 5709 iSCSI Initiator is used, then all the iSCSI initiators in the system must be Broadcom NetXtreme II 5709 iSCSI Initiators and the software initiator must not be used with other NICs in the system.	√	√

Table 2. Environment

Rules	First Gen.	Second Gen.
A server can connect to a maximum of three MD3000i storage arrays.	√	√
A maximum of 16 physical host servers can be attached to the storage array.	√	√
A maximum of 32 virtual host servers can be attached to the storage array (note: running the iSCSI initiator at the hypervisor level counts as a single host even if the storage is shared by all guest OSes)		√
The MD3000i supports up to eight nodes in Microsoft® Windows Server® 2003 Cluster environment and up to sixteen nodes in Microsoft Windows Server 2008 Cluster environment.	√	√
Connecting an MD3000i and an MD3000 to the same host is not supported.	√	

Table 3. Considerations

Rules	First Gen.	Second Gen.
When using the Microsoft or Linux iSCSI Initiator, IQN identification must be used.	√	√
When using the Microsoft or Linux iSCSI Initiator, all NICs in the same host will use the same iSCSI name. The name will identify the host and the NICs will not be identifiable.	√	√
Dell MPP drivers are required for multi-path support (refer to Table 10). Linux open framework dm-mpp (multi-path) drivers are not supported with the MD3000i.	√	√
Only the Dell Linux MPP multi-path driver should be loaded on a Linux host server**	√	√
MD3000 and MD3200 series supported on a single Linux host**		√
Microsoft “dynamic disks” are not supported by the Microsoft iSCSI Initiator under Windows 2003. Windows 2008 native iSCSI Initiator supports dynamic disks.	√	√
Up to two Dell PowerVault MD1000 expansion enclosures can be attached to the MD3000i for a total of 45 SAS and/or SATA physical disks.	√	√
Attached MD1000 expansion enclosures must be set to unified mode.	√	√
Virtual disk failover requires a dual-controller configuration and at least one iSCSI session to each controller.	√	√
Link failover requires at least two iSCSI connections established to the controller.	√	√
The enclosure can contain a mixture of SAS and SATA II physical disks.	√	√
SAS and SATA disks cannot be mixed in a disk group.	√	√
A hot spare for a disk group must be a physical disk of equal or greater size than any of the member disks.	√	√
The hot spare for a disk group with SAS physical disks must be a SAS disk.	√	√
The hot spare for a disk group with SATA physical disks must be a SATA disk.	√	√
When using out-of-band management with SMcli by specifying the RAID Controller management port IP addresses on the 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	√	√

Rules	First Gen.	Second Gen.
owning RAID Controller Module to complete. Where applicable it is a best practice to specify both management port IP addresses on the SMcli invocation: "SMcli 192.168.128.101 192.168.128.102 -c".		
Maximum virtual disk size cannot exceed 2 Terabytes.	√	
Each virtual disk is limited to a maximum of 30 physical disks.	√	
Virtual disk size can exceed 2TB and is limited by the type of RAID group, number of drives in the RAID group and the size of the drives (Up to 45 disks can be used in RAID 0 and 44 disks in RAID 10. RAID 5 and RAID 6 are limited to a maximum of 30 disks).		√
The use of disk labels is recommended while mounting LUNs on linux operating systems.	√	√
Disk Groups can be migrated between a Dell PowerVault MD3000 and a Dell PowerVault MD3000i by following the appropriate Disk Group migration procedure*		√
Refer to MD3xxx series coexistence compatibility matrix if you wish to use the MD3000 with the MD3000i or the MD3200 series of arrays.		√

*Refer to Disk Group Migration section of the MDSM User's Guide

** For 2nd Gen arrays, refer to coexistence whitepaper for supporting MD3000i and MD3200 series products on a single host.

Statement of Support

When the MD3000i is connected to non-Dell supplied networking components or servers, Dell Technical Support will provide "best effort" technical assistance in troubleshooting those components. For any additional support, users will be referred to the provider of the non-Dell supplied equipment.

Supported Operating Systems

Table 4. Supported Operating Systems for iSCSI Host Servers

Operating System	First Gen.	Second Gen.	Required Hotfixes
Dell PowerVault Data MD3000i Support Matrix		5	

Operating System	First Gen.	Second Gen.	Required Hotfixes
Microsoft® Windows Server® 2003 32-bit Standard and Enterprise SP1	√		KB950903 and KB943545 provide required storport driver updates
Microsoft® Windows Server® 2003 32-bit Standard and Enterprise R2 and SP2	√	√	KB950903 and KB943545 provide required storport driver updates
Microsoft Windows Server 2003 Standard and Enterprise x64 Edition SP1	√		KB950903 and KB943545 provide required storport driver updates
Microsoft Windows Server 2003 Standard and Enterprise x64 Edition R2 and SP2	√	√	KB950903 and KB943545 provide required storport driver updates
Microsoft Windows Storage Server 2003 SP1	√		KB950903 and KB943545 provide required storport driver updates
Microsoft Windows Storage Server 2003 R2	√	√	KB950903 and KB943545 provide required storport driver updates
Microsoft Windows Server 2008 SP1, SP2 32-bit Standard and Enterprise	√	√	
Microsoft Windows Server 2008 SP1, SP2 x64 Standard and Enterprise	√	√	
Microsoft Windows Server 2008 SP1, SP2 DataCenter edition	√	√	
Microsoft Windows Server 2008 SP1, SP2 Server Core Standard and Enterprise	√	√	
Microsoft Windows Server 2008 R2 x64 Standard and Enterprise		√	
Microsoft Windows Server 2008 R2 DataCenter edition		√	
Microsoft Windows Server 2008 R2 Server Core Standard and Enterprise		√	
Windows Server 2008 supporting Hyper-V	√	√	KB950050 needed. Microsoft Hyper-V Server 2008 and Microsoft Hyper-V Server 2008 R2 are not supported.
Windows Server 2008 R2 supporting Hyper-V		√	Microsoft Hyper-V Server 2008 and Microsoft Hyper-V

Operating System	First Gen.	Second Gen.	Required Hotfixes
			Server 2008 R2 are not supported.
Windows Server 2008-R2-SP1 supporting Hyper-V		√	Microsoft Hyper-V Server 2008, Microsoft Hyper-V Server 2008 R2 and Microsoft Hyper-V Server 2008-R2-SP1 are not supported.
VMware ESX 3.5 and VMware ESX 3i version 3.5	√	√	
VMware ESX 4.0 and 4.1		√	
Citrix XenServer Dell Edition 4.1	√		
Citrix XenServer Dell Edition 5.0	√	√	Multipathing not supported
Citrix XenServer Dell Edition 5.5		√	
Red Hat Enterprise Linux V4.0 Update 4, Update 5, Update 6, (AS, ES, WS), 32 bit and 64 bit (2.6 kernel; No XEN support)	√		
Red Hat Enterprise Linux V4.0 Update 7, Update 8 (AS, ES, WS), 32 bit and 64 bit (2.6 kernel; No XEN support)		√	
Red Hat Enterprise Linux V5.0, V5.0 Update 1 and V5.0 Update 3 (AS, ES, WS), 32 bit and 64 bit (2.6 kernel; No XEN support)	√		
Red Hat Enterprise Linux V5.0 Update 2, Update 3, Update 4, Update 5 (AS, ES, WS), 32 bit and 64 bit (2.6 kernel; No XEN support)		√	
SUSE® Linux Enterprise Server V9.0 x64 Service Pack 2 and Service Pack 3 (2.6 kernel; No XEN support)	√		
SUSE® Linux Enterprise Server V9.0 x64 Service Pack 4 (2.6 kernel; No XEN support)	√	√	
SUSE Linux Enterprise Server V10.0 x64 Service Pack 1 (2.6 kernel; No XEN support)	√		
SUSE Linux Enterprise Server V10.0 x64 Service Pack 2, Service		√	

Operating System	First Gen.	Second Gen.	Required Hotfixes
Pack 3 (2.6 kernel; No XEN support)			
SUSE Linux Enterprise Server V11 and V11 SP1 x64 (2.6 kernel; No XEN support)		√	
XEN kernel not supported	√	√	
Microsoft Windows 7 (management station only, no I/O)		√	
Microsoft Windows Vista® (management station only, no I/O)	√	√	
Microsoft Windows XP Professional SP2 (management station only, no I/O)	√	√	

Supported iSCSI Initiators

Table 5. Supported iSCSI Initiators (Only Software Initiators are Supported)

Operating System	First Gen.	Second Gen.	Required Patches (available on the MD3000i Resource CD)
Microsoft iSCSI Initiator	2.08	2.08	(available from www.microsoft.com)
Microsoft Windows Server 2008 iSCSI Initiator	built in	built in	
VMware ESX Server iSCSI Initiator	built in	built in	
Citrix XenServer Dell Edition open iSCSI Initiator	built in	built in	
Red Hat Enterprise Linux V4.0 (AS, ES, WS), 32 bit and 64-bit	built in	built in	iscsi_sfnet-4.0.1.11.3e - ldkms.noarch.rpm (RHEL v4 U4 only)
Red Hat Enterprise Linux V5.0 (AS, ES, WS), 32 bit and 64-bit	built in	built in	
SUSE Linux Enterprise Server V11.0	built in	built in	
SUSE Linux Enterprise Server V10.0	built in	built in	

Operating System	First Gen.	Second Gen.	Required Patches (available on the MD3000i Resource CD)
SUSE Linux Enterprise Server V9.0	built in	built in	scsi_mod-sles9sp3-dkms.noarch.rpm (SUSE v9 SP3 only) iscsi-88.31.2_sles9sp31dkms.noarch.rpm (SUSE v9 SP3 only)

Supported Network Components

Ethernet Controllers

Any industry standard 10/100/1000 Ethernet controller that conforms to IEEE 802.3ab, 802.3ac, or 802.3u is compatible with the MD3000i. To maximize available bandwidth to the MD3000i, 1000 Mb/s controllers for I/O paths and 100 Mb/s controllers for out-of-band management paths are highly recommended.

Table 6. Ethernet Adapters supporting iSCSI Offload*

Network Adapter	First Gen.	Second Gen.
Broadcom NetXtreme II 5708c	✓	✓
Broadcom NetXtreme II 5709		✓
Broadcom NetXtreme II 57710		✓
Broadcom NetXtreme II 57711		✓

* Please update to latest drivers from support.dell.com prior to using for iSCSI offload

Ethernet Switches

Any industry standard 100/1000 managed or unmanaged Ethernet switch is compatible with the MD3000i. To maximize available bandwidth to the MD3000i, 1000 Mb/s switches for I/O paths and 100 Mb/s switches for out-of-band management paths are recommended.



NOTE: Dell PowerConnect 5324 is not supported on MD3000i for use with the iSCSI host ports.

Host Server Support

The MD3000i is compatible with any industry standard server. For servers to connect to the MD3000i they must be running the supported iSCSI initiator, operating system, network components, and the Dell MPIO or MPP driver.

Supported Expansion Enclosures

The MD3000i supports up to two MD1000 expansion enclosures.

Table 7. PowerVault MD3000i RAID Controller

Expansion Enclosure	Current Firmware Revision	Notes
MD1000	A04	Firmware revisions prior to A03 are not compatible with the MD3000i and must be updated prior to attachment.

Supported Physical Disks



NOTE: Only Dell-provided physical disks are supported. Physical disks not purchased from Dell will be marked as uncertified and will not be usable. Refer to the MD3000i Drivers and Downloads section for the latest available physical disk firmware.



NOTE: The Dell PowerVault does not support Fujitsu SATA and Maxtor physical disks.

Table 8. Supported Physical Disks for PowerVault MD3000i Systems

Drive	Model Number
Fujitsu (AL9LX) SAS 73 GB 15K RPM	MAX3073RC
Fujitsu (AL9LX) SAS 146 GB 15K RPM	MAX3147RC

Drive	Model Number
Fujitsu (AL10LX) SAS 73 GB 15K RPM	MBA3073RC
Fujitsu (AL10LX) SAS 146 GB 15K RPM	MBA3147RC
Fujitsu (AL10LX) SAS 300 GB 15K RPM	MBA3300RC
Hitachi (Ultrastar 15K147) SAS 73 GB 15K RPM	HUS151473VLS300
Hitachi (Ultrastar 15K147) SAS 146 GB 15K RPM	HUS151414VLS300
Hitachi (Ultrastar 15K300) SAS 73 GB 15K RPM	HUS153073VLS300
Hitachi (Ultrastar 15K300) SAS 146 GB 15K RPM	HUS153014VLS300
Hitachi (Ultrastar 15K300) SAS 300 GB 15K RPM	HUS153030VLS300
Hitachi (Ultrastar 15K450) SAS 300 GB 15K RPM	HUS154530VLS300
Hitachi (Ultrastar 15K450) SAS 450 GB 15K RPM	HUS154545VLS300
Hitachi SAS 300GB 15K RPM	HUS156030VLS600
Hitachi SAS 450GB 15K RPM	HUS156045VLS600
Hitachi SAS 600GB 15K RPM	HUS156060VLS600
Seagate (15K.5) SAS 73 GB 15K RPM	ST373454SS
Seagate (15K.5) SAS 146 GB 15K RPM	ST3146854SS
Seagate (15K.5) SAS 73 GB 15K RPM	ST373455SS
Seagate (15K.5) SAS 146GB 15K RPM	ST3146855SS
Seagate (15K.5) SAS 300GB 15K RPM	ST3300655SS
Seagate (15K.6) SAS 146GB 15K RPM	ST3146356SS
Seagate (15K.6) SAS 300GB 15K RPM	ST3300656SS
Seagate (15K.6) SAS 450GB 15K RPM	ST3450856SS
Seagate (Cheetah 15K.7) SAS 146GB 15K RPM	ST3300657SS-H
Seagate (Cheetah 15K.7) SAS 300GB 15K RPM	ST3300657SS
Seagate (Cheetah 15K.7) SAS 450GB 15K RPM	ST3450857SS
Seagate (Cheetah 15K.7) SAS 600GB 15K RPM	ST3600057SS
Seagate (T10) SAS 73 GB 10K Performance	ST373355SS
Seagate (T10) SAS 146 GB 10K Performance	ST3146755SS
Seagate (T10) SAS 300 GB 10K Performance	ST3300555SS
Seagate (TNS) SAS 400 GB 10K RPM	ST3400755SS
Seagate (Cheetah NS 10K.2) SAS 600GB 10K RPM	ST3600002SS
Hitachi (Ultrastar A7K1000) SATA 500 GB 7.2K RPM	HUA721050KLA330
Hitachi (Ultrastar A7K1000) SATA 750 GB 7.2K RPM	HUA721075KLA330
Hitachi (Ultrastar A7K1000) SATA 1 TB 7.2K RPM	HUA721010KLA330
Hitachi (Ultrastar A7K2000) SATA 2TB 7.2K RPM	HUA722020ALA330

Drive	Model Number
Hitachi (Deskstar 7K500) SATA 500 GB 7.2K RPM	HDS725050KLA360
Seagate (Barracuda ES.1) SATA 500 GB 7.2K RPM	ST3500630NS
Seagate (Barracuda ES.1) SATA 750 GB 7.2K RPM	ST3750640NS
Seagate (Barracuda ES.2) SAS 500 GB 7.2K RPM	ST3500620SS
Seagate (Barracuda ES.2) SAS 750 GB 7.2K RPM	ST3750630SS
Seagate (Barracuda ES.2) SAS 1TB 7.2K RPM	ST31000640SS
Seagate (Barracuda ES.2) SATA 500 GB 7.2K RPM	ST3500320NS
Seagate (Barracuda ES.2) SATA 750 GB 7.2K RPM	ST3750330NS
Seagate (Barracuda ES.2) SATA 1 TB 7.2K RPM	ST31000340NS
Seagate (Constellation ES) SAS 500GB 7.2K RPM	ST3500414SS
Seagate (Constellation ES) SAS 1TB 7.2K RPM	ST31000424SS
Seagate (Constellation ES) SAS 2TB 7.2K RPM	ST32000444SS
Seagate (Constellation ES) SATA 500GB 7.2K RPM	ST3500514NS
Seagate (Constellation ES) SATA 1TB 7.2K RPM	ST31000524NS
Seagate (Constellation ES) SATA 2TB 7.2K RPM	ST32000644NS
Western Digital (RE1) SATA 500 GB 7.2K RPM	WD500YS-18MPB1 ²
Western Digital (RE2) SATA 500 GB 7.2K RPM	WD5001ABYS-18YNA0
Western Digital (GP250RE2) SATA 1 TB 5.4K RPM	WD1000FYPS-18ZKB0
Western Digital (XL320RE) SATA 500 GB 7.2K RPM	WD5002ABYS-18B1B0
Western Digital (XL333RE) SATA 750GB 7.2K RPM	WD7502ABYS-18A6B0
Western Digital (XL333RE) SATA 1TB 7.2K RPM	WD1002FBYS-18A6B0
Western Digital (EP500M) SATA 2TB 5.4K RPM	WD2002FYPS-18U1B0
Western Digital (EP500M) SATA 2TB 5.4K RPM	WD2002FYPS-18W3B0
Western Digital (EX500M) SATA 2TB 7.2K RPM	WD2003FYYS-18W0B0
Western Digital (EX500M) SATA 1TB 7.2K RPM	WD1003FBYX-18Y7B0
Western Digital (EX500S) SATA 500GB 7.2K RPM	WD5003ABYX-18WERA0

¹ WD2500YS-18SHB1 and WD2500YS-18SHB0 can be upgraded via firmware to reach the same level as WD2500YS-18SHB2

² WD500YS-18MPB0 can be upgraded via firmware to reach the same level as WD500YS-18MPB1

Supported Management Software for Windows

Table 9. Management Software Supported with the MD3000i (Windows servers)

Software	First Gen.	Second Gen.	Notes
MD3000i Resource CD	1.2.153, A04	2.2.0.18, A11	
Dell Modular Disk Storage Manager	02.71.G6.07	03.35.G6.79	Component of Resource CD. This version also supports management of the MD3000.
Dell OpenManage™ Management Station	5.4	6.4	x86 only.
Dell Modular Disk Storage Manager VDS/VSS Hardware Provider	09.71.G6.02	10.60.G6.01	Available on Resource CD. KB931300 required before use*
MPIO driver	01.02.36.19	01.03.0306.409	Multipath software—installed during MDSM host or typical installation.
VMware vCenter plugin	N/A	2.1	Download plugin executable from Dell driver support web site. For 32 bit Windows, download and install SMIA-vCenter-WS32-01.00.3650.0007.exe. For 64 bit Windows, download and install SMIA-vCenter-WSX64-01.00.3650.0007.exe. Supported VMware versions are ESX 4.1, 4.1i, 4.0, and 3.5.

*Refer to VDS/VSS readme on the resource CD for installation and usage details

Supported Management Software for Linux

Table 10. Management Software Supported with the MD3000i (Linux servers)

Software	First Gen.	Second Gen.	Notes
MD3000i Resource CD	1.2.153, A04	2.2.0.18, A11	
Dell Modular Disk Storage Manager (Linux)	02.70.G6.10	03.35.G6.50	Component of MD3000i Resource CD. This version also supports management

Software	First Gen.	Second Gen.	Notes
			of the MD3000.
MPP driver	09.01.B6.75 ¹ 09.00.A6.01 ² 09.01.C6.06 ³	09.03.0B06.0234 ¹ 09.03.0C06.0452.2 ³	Multipath software; installed from MD3000i Resource CD

¹ For RHEL4, and SLES9

² For RHEL3

³ For SLES10, SLES11 and RHEL5



NOTE: The Dell PowerVault MD3000i does not support Device-Mapper Multipath for Linux based solutions.

Supported Languages

The Dell PowerVault MD Storage Manager is available in the following languages: English, Simplified Chinese, Japanese, French, German and Spanish.

Supported MD3000i Controller Firmware and NVSRAM

Table 11. Supported Controller Firmware and NVSRAM



NOTE: It is advisable to gather support information before performing any firmware upgrade. This can be performed from the support tab of the MD Storage manager

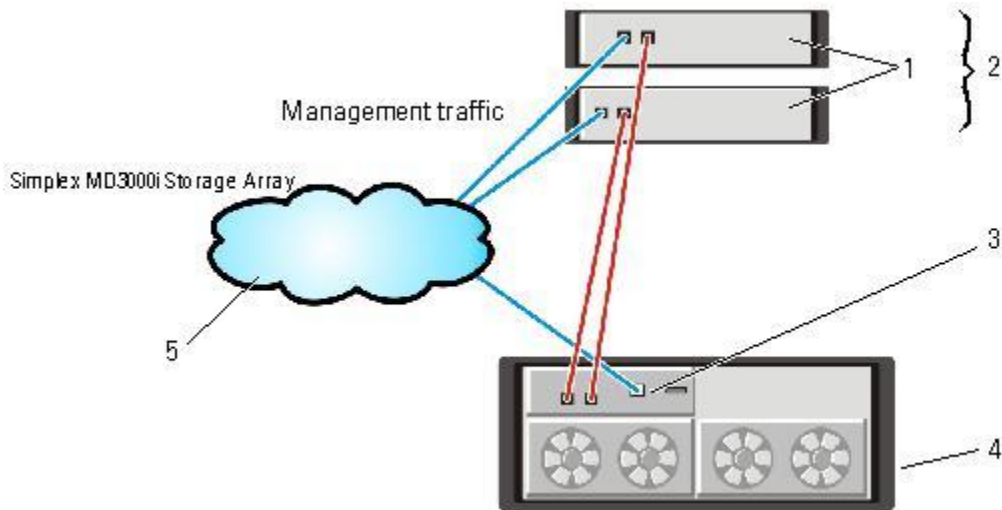
Software	First Generation	Second Generation	Notes
MD3000i Firmware	06.70.17.60, A03	07.35.39.64, A13	
Duplex Controller NVSRAM	N133X-670890-001	N1532-735890-005	Duplex NVSRAM for MD3000i configured with two controllers
Simplex Controller NVSRAM	N1532-670890-901	N1532-735890-905	Simplex NVSRAM for MD3000i configured with a single controller

Supported Enterprise Solutions

Solution	Web Address	Notes
Oracle Database Solution	www.dell.com/10g	Refer to the Tested and Validated Configurations sub-heading
SQL Database Solution	www.dell.com/sql	Refer to the Tested and Validated Configurations sub-heading
High Availability Clustering on Windows	www.dell.com/ha	Refer to the Dell Cluster Configuration Support Matrices
High Availability Clustering on Red Hat Linux	www.dell.com/ha	Refer to the Dell Cluster Configuration Support Matrices
VMware Virtualization Solution	www.dell.com/vmware	Refer to the Resources sub-heading for white papers and support documents related to iSCSI and the MD3000i
XenServer Virtualization Solution	www.dell.com/xenserver	Refer to the Citrix XenServer Dell Edition Solution Guide for reference configuration information
Windows Server 2008 Virtualization Solution	www.dell.com/hyper-v	Refer to <i>Windows 2008 Hyper-V Dell Edition Solution Guide</i> for reference configuration information
Exchange Server Solution	www.dell.com/exchange	Refer to the ESRP Articles for the MD3000i ESRP article

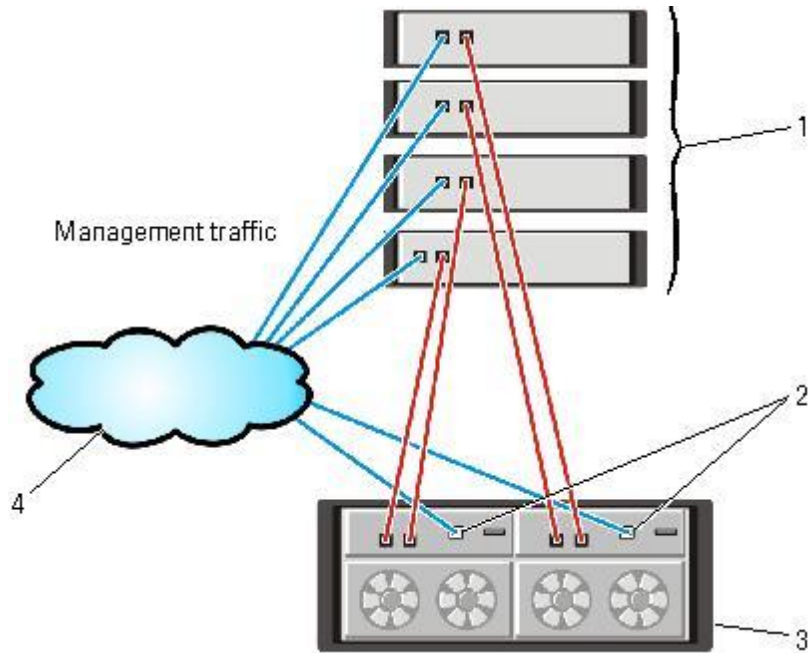
Supported Configurations

Figure 1. One or Two Direct-Attached Servers (or Two-Node Cluster), Single-Path Data, Single Controller (Simplex)



- | | | | | | |
|---|--|---|--------------------------------------|---|--------------------------|
| 1 | standalone (one or two) host server | 2 | two-node cluster | 3 | Ethernet management port |
| 4 | MD3000i RAID Enclosure (single controller) | 5 | corporate, public or private network | | |

Figure 2. Up to Four Direct-Attached Servers, Single-Path Data, Dual Controllers (Duplex)

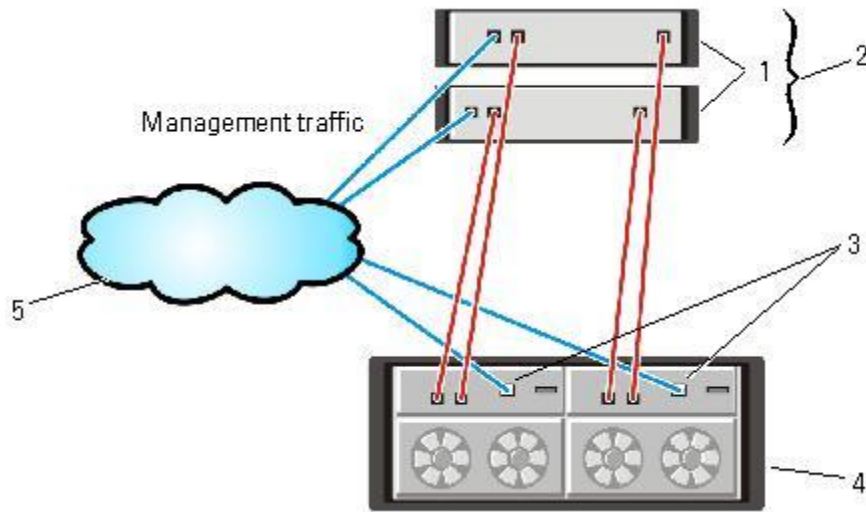


- 1 standalone (up to four) host server
- 2 Ethernet management port
- 3 MD3000i RAID Enclosure (dual controllers)
- 4 corporate, public or private network

Dual Path Data Configuration

In Figure 3, up to two servers are directly attached to the MD3000i RAID controller module. If the host server has a second Ethernet connection to the array, it can be attached to the iSCSI ports on the array's second controller. This configuration provides improved availability by allowing two separate physical paths for each host, which ensures full redundancy if one of the paths fail.

Figure 3. One or Two Direct-Attached Servers (or Two-Node Cluster), Dual-Path Data, Dual Controllers (Duplex)



- | | | | | | |
|---|--|---|--------------------------------------|---|--------------------------|
| 1 | standalone (one or two) host server | 2 | two-node cluster | 3 | Ethernet management port |
| 4 | MD3000i RAID Enclosure (single controller) | 5 | corporate, public or private network | | |

Network-Attached Solutions

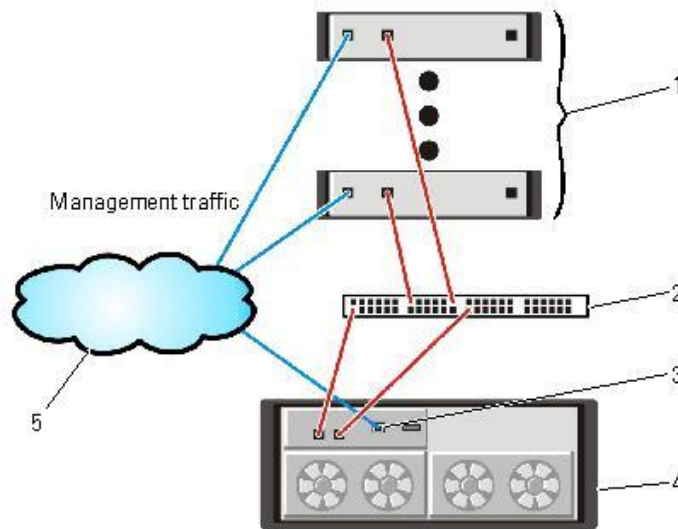
You can also cable your host servers to the MD3000i RAID controller iSCSI ports through an industry-standard 1 GB Ethernet switch. By using an Ethernet switch, the MD3000i RAID controller can support up to 16 hosts simultaneously with multiple connections per session. This solution supports either single-path or dual-path data configurations, as well as either single or dual controller modules.

Figure 4 shows how up to 16 standalone servers can be attached (via multiple sessions) to a single MD3000i RAID controller module through a network. Hosts that have a second Ethernet connection to the network allow two separate physical paths for each host, which ensures full redundancy if one of the paths fail. Figure 5 shows how the same number of hosts can be similarly attached to a dual MD3000i RAID controller. In Figure 5 for SAN configurations the servers can be configured to form clusters:

- Microsoft Windows Server 2003 cluster supports up to 8 nodes
- Microsoft Windows Server 2008 supports up to 16 nodes

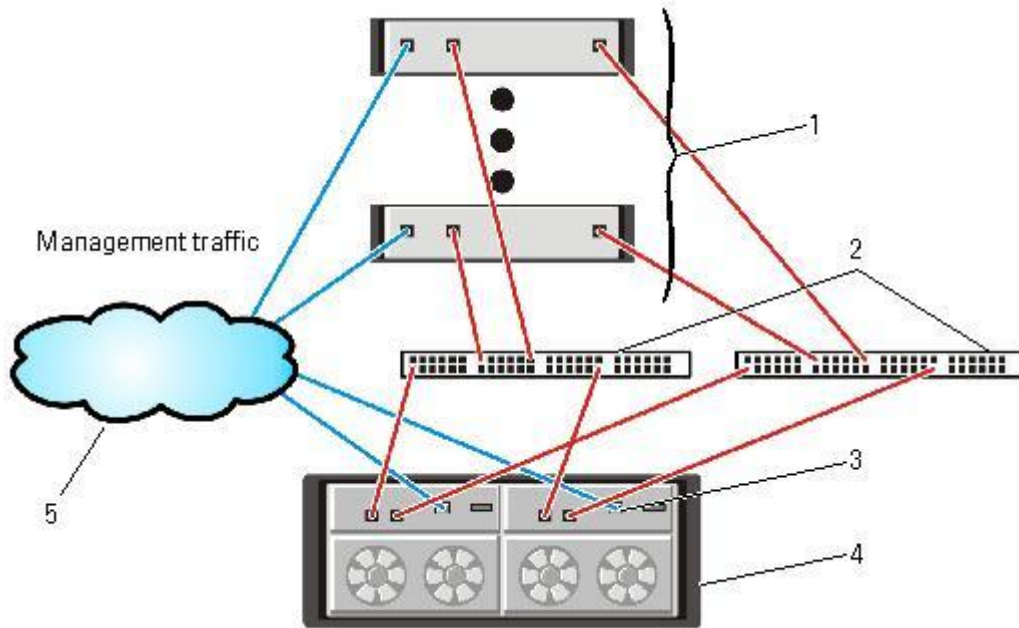
Any combination of clusters and standalone servers can be used to access the MD3000i.

Figure 4. Up to 16 SAN-Configured Servers, Single-Path Data, Single Controller (Simplex)



- | | | | | | |
|---|--|---|--------------------------------------|---|--------------------------|
| 1 | up to 16 standalone host servers | 2 | IP SAN (Gigabit Ethernet switch) | 3 | Ethernet management port |
| 4 | MD3000i RAID Enclosure (single controller) | 5 | corporate, public or private network | | |

Figure 5. Up to 16 Dual SAN-Configured Servers, Dual-Path Data, Dual Controllers (Duplex)



- | | | |
|---|--|-----------------------------------|
| <p>1 up to 16 standalone host servers, up to 8-node Windows 2003 clusters, up to 16-node Windows 2008 clusters, or a combination of multiple clusters and non-clustered servers</p> | <p>2 IP SAN (dual Gigabit Ethernet switches)</p> | <p>3 Ethernet management port</p> |
| <p>4 MD3000i RAID Enclosure (dual controllers)</p> | <p>5 corporate, public or private network</p> | |

Supported Expansion Enclosure Cabling Configurations

Figure 6. Proper Cabling of Expansion Enclosures in a Single-Controller Configuration

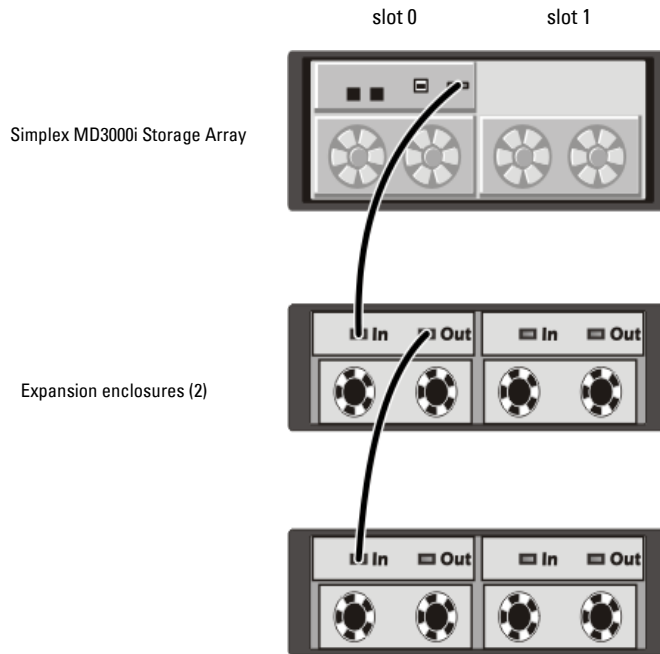
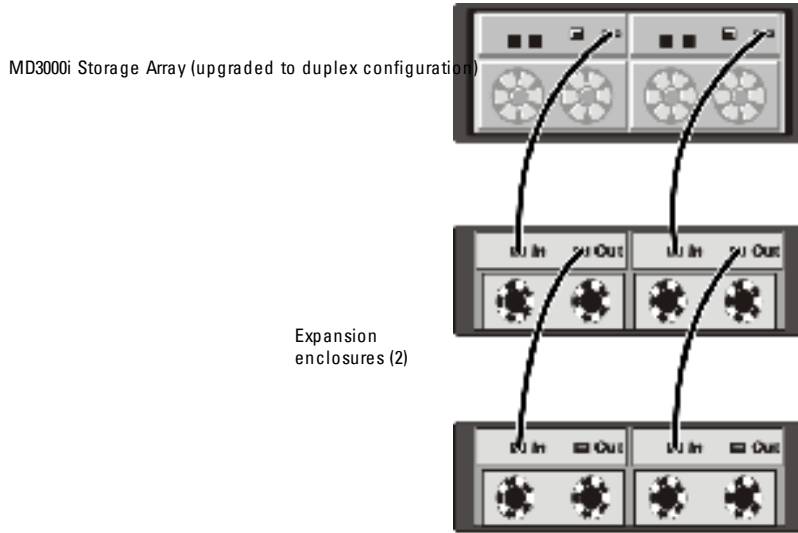


Figure 7. Proper Cabling of Expansion Enclosures in a Dual-Controller Configuration



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