



# Storage/SAN Compatibility Guide

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## Introduction

VMware ESX software has been tested and deployed in a variety of storage network environments. This guide describes the storage devices currently tested by VMware and its storage partners.

ESX, ESXi Embedded and ESXi Installable are equivalent products from a storage compatibility perspective. In this guide we only explicitly list ESX compatibility information. If a product is listed as supported for ESX, the product is also supported for ESXi Embedded and ESXi Installable corresponding versions.

Note: ESXi does not support Boot From SAN (Fiber Channel or iSCSI), for all products.

If you are having a technical issue with 3rd party HW/SW and it is not found on this list, please refer to our 3rd Party HW/SW support policy at <http://www.vmware.com/support/policies/ThirdParty.html>.

VMware works closely with each of its OEMs to drive towards mutual support of ESX at the time of announcement. Due to different product release cycles, levels of testing, and OEM agreements, not all OEM devices will be supported at the general availability date of a new version of ESX. We recommend contacting the OEM vendor for the best information on when their device is planned to be certified with Virtual Infrastructure.

For further details about array firmware, storage product configurations and best practices, please contact the storage vendor.

NOTE: The use of an external enclosure, or JBOD connected to a supported SAS/SCSI controller in a supported server is supported, as long as there is no disk sharing among multiple servers or SAS/SCSI cards.

This SAN HCL lists storage devices starting with ESX 3.0.x onwards. It does not include older ESX 2.5.x or earlier versions listed in [http://www.vmware.com/pdf/esx\\_SAN\\_guide.pdf](http://www.vmware.com/pdf/esx_SAN_guide.pdf).

Please contact your storage vendors if you do not find devices certified in the SAN HCL list.

### Windows Clustering (MSCS) with ESX 3.0.x

Windows Clustering refers Cluster Services in Windows 2003 and 2000 in a shared disk configuration between two virtual machines or a virtual machine and a physical system. Such clustering is certified only with a subset of arrays listed in this guide.

### Windows Clustering (MSCS) with ESX 3.0.x

Below table shows the supported list of Windows OS, FC HBA speed and drivers.

**Table 2.** Microsoft Cluster Service (MSCS) with ESX

ESX Version	Windows OS	FC HBA Speed	Supported FC drivers
ESX Server 3.0	2000 SP4	2G	Default 2G
	2003 RTM	2G	
ESX Server 3.0.1	2000 SP4	2G	Rollback 2G
	2003 RTM	2G	Qlogic 7.04.00 Emulex 7.1.14
ESX Server 3.0.1 patches: ESX-2066306 ESX-3199476	2000 SP4	2G	Rollback 2G
	2003 RTM	2G	Qlogic 7.04.00 Emulex 7.1.14
	2003 SP1 <sup>1</sup>	2G	
ESX Server 3.0.2	2003 R2 <sup>1</sup>	2G	
	2000 SP4	2G&4G	Default unified 2G&4G
	2003 RTM	2G&4G	Qlogic: 7.07.04.2vmw Emulex: 7.3.2_vmw4
	2003 SP1 <sup>1</sup>	2G&4G	
	2003 R2 <sup>1</sup>	2G&4G	
ESX Server 3.0.3	2003 SP2	2G&4G	
	2003 SP2 64bit <sup>2</sup>	4G	Qlogic: 7.07.04.02.3vmw Emulex: 7.3.2_vmw4_1
	2000 SP4	2G&4G	Default unified 2G&4G
ESX Server 3.0.3	2003 RTM	2G&4G	Qlogic: 7.07.04.01.3vmw Emulex: 7.3.2_vmw10
	2003 SP1	2G&4G	
	2003 R2	2G&4G	
	2003 SP2	2G&4G	
	2003 SP2 64bit	4G	Qlogic: 7.07.04.01.3vmw Emulex: 7.3.2_vmw10

  

ESX Version	Windows OS	FC HBA Speed	Supported FC drivers
<sup>1</sup> Requires Microsoft hotfix KB <a href="http://support.microsoft.com/kb/911030">http://support.microsoft.com/kb/911030</a> .			
<sup>2</sup> Requires ESX Server 3.0.2 with Patch ESX-1003524 (build 81860 or later).			

### Windows Clustering (MSCS) with ESX 3.5.x

MSCS is supported with ESX 3.5 with both 32 bit and 64 bit VMs running Windows 2003. Only 4Gb HBAs are supported with MSCS and ESX 3.5. Before installing VMware ESX 3.5 software with your storage array, please examine the lists on the following pages to find out whether your array and configuration are supported. Please refer to your storage vendor for more information and configuration details. a subset of arrays listed in this guide. It is supported with ESX 3.5 with both 32 bit and 64 bit VMs running Windows 2003. Before installing VMware ESX 3.5 software with your storage array, please examine the lists on the following pages to find out whether your array and configuration are supported. Please refer to your storage vendor for more information and configuration details.

### Windows Clustering (MSCS) with ESX 4.0

#### 1. Virtual SCSI adapter and Windows OS supported

- LSI Logic Parallel for Windows Server 2000 SP4
- LSI Logic Parallel for Windows Server 2003 RTM (x86 and x64) up to and including SP2
- LSI Logic SAS for Windows Server 2008 (x86 and x64) up to SP1

#### 2. Only 4Gb Qlogic and Emulex Fibre Channel HBAs are supported.

The driver versions supported are as follows:

qla2xxx-400.821.kl.38vmw

qla4xxx-400.5.01.00.vml

lpfc820-400.2.0.30.49vmw

### **PSA Plug-ins with ESX 4.x**

Array operating modes and path selection behavior are supported through the Pluggable Storage Architecture (PSA) framework. Storage partners may (1) provide their own Multi-Pathing Plug-ins (MPP), (2) use Storage Array Type Plug-ins (SATP) and Path Selection Plug-ins (PSP) offered by VMware's Native Multi-pathing (NMP) or (3) provide their own SATP and PSP.

The plug-ins supported with a storage array are noted in the 'Mode' and 'Recommended Path Policy' columns of the 'Model/Release Details' page.

With native multipathing (NMP), clustering is not supported when the path policy is set to round robin. Please see "Setup for Failover Clustering and Microsoft Cluster Services" for limitations on MSCS support with PSA.

### **Fibre Channel SANs**

For Fibre Channel SANs, if listed, VMware supports the following configuration, unless footnoted otherwise:

- \* Basic Connectivity - The ability of ESX hosts to recognize and interoperate with the storage array. This configuration does not allow for multipathing or any type of failover.
- \* Multipathing - The ability of ESX hosts to handle multiple paths to the same storage device.
- \* HBA Failover - In this configuration, the ESX host is equipped with multiple HBAs connecting to one or more SAN switches. The server is robust to HBA and switch failure only.
- \* Storage Port Failover - In this configuration, the ESX host is attached to multiple storage ports and is robust to storage port failures.
- \* Boot from SAN - In this configuration, the ESX host boots from a LUN stored on the SAN rather than a local disk.
- \* Direct Connect - In this configuration, the ESX host is directly connected to the array (that is, no switch between HBA and the array). Clustering is not supported in this configuration.

**NOTE:** Windows Clustering (MSCS) support applies to Windows 2000 SP4, Windows 2003 RTM, SP 1, R2 and SP 2. For ESX version requirements for these operating systems in cluster environment, please refer to <http://kb.vmware.com/kb/2021>. Clustering is supported only with a limited set of HBAs; please refer to the I/O Compatibility Guide ([http://www.vmware.com/pdf/vi3\\_io\\_guide.pdf](http://www.vmware.com/pdf/vi3_io_guide.pdf)) for the list of HBAs not supported with Windows Clustering.

**NOTE:** MSCS is not supported, unless footnoted.

**NOTE:** MSCS is not supported for Direct Connect.

**NOTE:** Only footnoted storage arrays are supported with Brocade 415 and 425 HBAs.

**NOTE:** Unless otherwise footnoted, all fibre channel arrays are supported with both 2Gb and 4Gb FC HBAs on ESX

**NOTE:** For ESX 3.5 U2 onwards unless otherwise footnoted, all fibre channel arrays are supported with 2Gb, 4Gb and 8Gb FC HBAs on ESX.

**NOTE:** For devices with external SAN storage support, please refer to Storage Virtualization Device (SVD).

**NOTE:** Unless otherwise noted, all fibre channel storage products are supported in a boot from SAN configuration.

**NOTE:** Support for 8G FC arrays is limited to up to 4Gbps speed only. End-to-end connectivity at 8Gbps FC speed is not supported with 8G FC arrays.

### **Storage Virtualization Device (SVD)**

VMware supports Storage Virtualization Devices (SVD) with ESX 3.0.2 or later and ESX 4.0.

- \* Backend storage arrays must be listed on both the ESX Storage/SAN Compatibility Guide and the SVD Vendor supported list. Back-end array and the SVD are both required to be certified with the same ESX release.
- \* Do not share the same LUN of the backend storage array between SVD and any other host.
- \* Only devices that are listed with Array Type SVD are allowed to connect to external Fibre Channel SAN storages.
- \* Only Fibre Channel protocol from SVD device to ESX is supported.

### **Storage Arrays supported with FCoE CNAs**

Fibre Channel Over Ethernet Converged (FCoE) Network Adapters (CNAs) can be concurrently connected to Fibre Channel Fabrics and Ethernet networks, through FCoE capable switches. Certified Fibre Channel arrays will be listed soon. Only the Fibre Channel arrays that will be listed with this array type are certified to work and supported with FCoE CNAs. CNAs are not yet supported to connect with iSCSI and NFS storage arrays.

### **Network Attached Storage**

The following Linux distributions support network attached storage

#### ESX 3.x

- \* Red Hat Enterprise Linux 5 NFS Server (Update 2).
- \* Red Hat Enterprise Linux 3 NFS Server (Update 5).
- \* Fedora Core 4 NFS Server (2.6.12-1.1456\_FC4.9550smp).
- \* Fedora Core 6 NFS Server (2.6.18-1.2798.fc6 #1 SMP) for ESX 3.5 only.

#### ESX 4.0

Fedora Core 8 NFS Server

**NOTE:** Windows Clustering (MSCS) is not supported with NAS.

### **iSCSI**

VMware supports connections to iSCSI arrays using either the software initiator in the kernel or a hardware initiator (iSCSI HBA). Please refer to the I/O Compatibility Guide for a list of hardware initiators that can be used with ESX.

The following maximums are in place when using iSCSI arrays with ESX hosts:

- \* Number of HBAs - software (1); hardware (1 dual port or 2 single port)
- \* Maximum number of targets - both software and hardware initiator (64)
- \* Number of LUNs both software and hardware initiator (254)
- \* Number of paths to storage - software (4); hardware (8)

For iSCSI storage with the software initiator over a supported NIC, if listed, VMware supports the following configuration, unless footnoted otherwise:

- \* iSCSI Base Connectivity - The ability of an ESX host to recognize the target and interoperate with it.
- \* SP failover - In this configuration the ESX host is attached to multiple ports and is robust to storage port failover
- \* NIC failover for software initiator - If the Ethernet adapters are teamed and one fails, the other one takes over. Both adapters must be connected to the same physical switch and be on the same subnet (both NICs and iSCSI storage ports).

For iSCSI storage with hardware initiators, if listed, VMware supports the following configuration, unless footnoted otherwise:

- \* iSCSI Base Connectivity - The ability of an ESX host to recognize the target over an iSCSI HBA and interoperate with it.

- \* SP failover - In this configuration, ESX host is attached to multiple ports over an iSCSI HBA and is robust to storage port failover.
- \* Boot from iSCSI - In this configuration, ESX hosts boot from the target iSCSI array rather than from a local disk.
- \* iSCSI hardware initiator failover - The ESX host is equipped with multiple hardware initiators and is robust to hardware initiator failover.

**NOTE:** Windows Clustering is not supported with iSCSI.

**NOTE:** Software initiated iSCSI is supported fully in ESX 3.0 and later releases. Hardware initiated iSCSI is supported in experimental mode only in ESX 3.0. It is supported fully in ESX 3.0.1 with iSCSI arrays that have been qualified/certified for use with the hardware initiators.

## SAS Arrays

For SAS Arrays, if listed, VMware supports the following configuration, unless footnoted otherwise:

- \* Basic Connectivity - The ability of ESX hosts to recognize and interoperate with the storage array. This configuration does not allow for multipathing, any type of failover, or sharing of LUNs between multiple hosts.
- \* Direct Connect - In this configuration, the ESX host is directly connected to the array (that is, no switch between HBA and the array). Windows Clustering is not supported in this configuration.
- \* LUN sharing - The ability of multiple ESX hosts to share the same LUN.
- \* Multipathing - The ability of ESX hosts to handle multiple paths to the same storage device.
- \* HBA Failover - In this configuration, the ESX host is equipped with multiple HBAs connecting directly to the array. The server is robust to HBA failure only.
- \* Storage Port Failover - In this configuration, the ESX host is attached to multiple storage ports on the same array and is robust to storage port failures.
- \* Boot from SAS - SAS boot is supported unless explicitly stated in a footnote for a specific array.

## Maximum Storage Specifications Supported

The following system and virtual machine maximums are supported for ESX hosts:

Maximum LUNs per system: 256 (128 during install)

Maximum HBAs per system: 16 ports (4 quad port cards, 8 dual port cards, etc.)

Maximum virtual HBAs per virtual machine: 4

Maximum targets per virtual HBA: 15

Maximum virtual disks per Windows virtual machine: 60

Maximum virtual disks per Linux virtual machine: 60

Maximum number of VMFS file systems per server: 256

Maximum disk space per VMFS: 2TB \* # of extents

Maximum file size per VMFS-3 file: Default max file size for VMFS 3 is 256GB (block size of 1MB). This can be configured to a block size of 8MB which will allow a 2TB file.

Maximum number of files per VMFS-3: Supports enough files to hold the maximum number of VMs per VMFS volume supported by ESX 3.0 (typically greater than 30,000 files)

Maximum number of paths per LUN: 32

Maximum number of total paths: 1024

Maximum number of targets per HBA: 15

Minimum VMFS 3 volume size: 1.1 GB

## Third-Party Software

Third party backup, replication, and snapshot software is certified and supported by the providers of the software. The ESX 2.5 guide at [http://www.vmware.com/pdf/esx25\\_san\\_cfg.pdf](http://www.vmware.com/pdf/esx25_san_cfg.pdf) shows the list of software that was supported with ESX 2.5. Please contact your SAN vendors regarding their plans to support ESX 3.x. As vendors certify software, we will create a list of certified software for ESX 3.x.

## Storage Array Device and Model Information

The detailed lists show actual vendor devices that are either physically tested or are similar to the devices tested by VMware or VMware partners. VMware provides support only for the devices that are listed in this document

### Fibre Channel Array (FC)

#### HP

MSA1000		Product ID: MSA VOLUME		Vendor ID: HP	
Supported Releases	Mode	Recommended Path Policy	Firmware	Device Driver	Configuration
ESX 3.5 U4	Active/Active	Fixed	7.0	N/A	FC Switched
ESX 3.5 U3, 3.5 U2, 3.5 U1, 3.5	Active/Active	Fixed	7.0	lpfc_740 ver. elx_7.4.0.13, qla2300_707_vmw ver. 7.08-vm32	FC Switched

MSA1000		Product ID: MSA1000 VOLUME		Vendor ID: COMPAQ	
Supported Releases	Mode	Recommended Path Policy	Firmware	Device Driver	Configuration
ESX 3.0.3 <sup>1, 2</sup>	Active/Passive	MRU	4.xx	lpfcdd_732 ver. 7.3.2_vmw10, qla2x00_707 ver. 7.07.04.01.3vmw	FC Switched
ESX 3.0.2 U1 <sup>3, 1, a</sup> , 3.0.2 <sup>3, 1, a</sup>	Active/Passive	MRU	4.xx	lpfcdd_732 ver. 7.3.2_vmw4, qla2x00_707 ver. 7.07.04.2vmw	FC Switched
ESX 3.0.1 <sup>3, 1, a</sup>	Active/Passive	MRU	4.xx	lpfcdd_732 ver. 7.3.2_vmw2, qla2x00_707 ver. 7.07.04.01	FC Switched
ESX 3.0 <sup>3, 1, a</sup>	Active/Passive	MRU	4.xx	N/A	FC Switched

**Notes:**

1. These are active/passive versions, FW 4.xx (MSA1000)
2. MSCS is supported.
3. MSCS supported with 2Gb HBAs using Qlogic 7.04.00 and Emulex 7.1.14 drivers only.

**VMware Knowledge Base Documents:**

- a. For more details, see <http://kb.vmware.com/kb/1560391>

<b>MSA1500</b>		<b>Product ID: MSA VOLUME</b>		<b>Vendor ID: HP</b>	
<b>Supported Releases</b>	<b>Mode</b>	<b>Recommended Path Policy</b>	<b>Firmware</b>	<b>Device Driver</b>	<b>Configuration</b>
ESX 3.5 U4	Active/Active	Fixed	7.0	N/A	FC Switched
ESX 3.5 U3, 3.5 U2, 3.5 U1, 3.5	Active/Active	Fixed	7.0	lpfc_740 ver. elx_7.4.0.13, qla2300_707_vmw ver. 7.08-vm32	FC Switched
ESX 3.0.3	Active/Active	Fixed	6.86	lpfcdd_732 ver. 7.3.2_vmw10, qla2x00_707 ver. 7.07.04.01.3vmw	FC Switched
ESX 3.0.2 U1, 3.0.2	Active/Active	Fixed	6.86	lpfcdd_732 ver. 7.3.2_vmw4, qla2x00_707 ver. 7.07.04.2vmw	FC Switched
ESX 3.0.1, 3.0	Active/Active	Fixed	6.86	N/A	FC Switched

<b>MSA1500</b>		<b>Product ID: MSA1000 VOLUME</b>		<b>Vendor ID: COMPAQ</b>	
<b>Supported Releases</b>	<b>Mode</b>	<b>Recommended Path Policy</b>	<b>Firmware</b>	<b>Device Driver</b>	<b>Configuration</b>
ESX 3.5 U3, 3.5 U2, 3.5 U1, 3.5	Active/Passive	MRU	5.xx	lpfc_740 ver. elx_7.4.0.13, qla2300_707_vmw ver. 7.08-vm32	FC Switched
ESX 3.0.3 <sup>1, 2</sup>	Active/Passive	MRU	5.xx	lpfcdd_732 ver. 7.3.2_vmw10, qla2x00_707 ver. 7.07.04.01.3vmw	FC Switched
ESX 3.0.2 U1 <sup>1, 2</sup> , 3.0.2 <sup>1, 2</sup>	Active/Passive	MRU	5.xx	lpfcdd_732 ver. 7.3.2_vmw4, qla2x00_707 ver. 7.07.04.2vmw	FC Switched
ESX 3.0.1 <sup>3, 1, 2, a</sup>	Active/Passive	MRU	5.xx	lpfcdd_732 ver. 7.3.2_vmw2, qla2x00_707 ver. 7.07.04.01	FC Switched
ESX 3.0 <sup>3, 1, 2, a</sup>	Active/Passive	MRU	5.xx	N/A	FC Switched

**Notes:**

1. MSCS supported with Windows 2000 SP4 Only.
2. MSCS Supported with active/passive version, FW 5.xx.
3. MSCS supported with 2Gb HBAs using Qlogic 7.04.00 and Emulex 7.1.14 drivers only.

**VMware Knowledge Base Documents:**

- a. For more details, see <http://kb.vmware.com/kb/1560391>

<b>MSA2012fc</b>		<b>Product ID: MSA2012fc</b>		<b>Vendor ID: HP</b>	
<b>Supported Releases</b>	<b>Mode</b>	<b>Recommended Path Policy</b>	<b>Firmware</b>	<b>Device Driver</b>	<b>Configuration</b>
ESX 3.5 U4	Active/Active	Fixed	J200P19	N/A	FC Switched
ESX 3.5 U3, 3.5 U2, 3.5 U1, 3.5	Active/Active	Fixed	J200P19	lpfc_740 ver. elx_7.4.0.13, qla2300_707_vmw ver. 7.08-vm32	FC Switched
ESX 3.0.3	Active/Active	Fixed	J200P19	lpfcdd_732 ver. 7.3.2_vmw10, qla2x00_707 ver. 7.07.04.01.3vmw	FC Switched
ESX 3.0.2 U1, 3.0.2	Active/Active	Fixed	J200P19	lpfcdd_732 ver. 7.3.2_vmw4, qla2x00_707 ver. 7.07.04.2vmw	FC Switched
ESX 3.0.1	Active/Active	Fixed	J200P19	lpfcdd_732 ver. 7.3.2_vmw2, qla2x00_707 ver. 7.07.04.01	FC Switched

<b>MSA2212fc</b>		<b>Product ID: MSA2212fc</b>		<b>Vendor ID: HP</b>	
<b>Supported Releases</b>	<b>Mode</b>	<b>Recommended Path Policy</b>	<b>Firmware</b>	<b>Device Driver</b>	<b>Configuration</b>
ESX 3.5 U4	Active/Active	Fixed	J200P19	N/A	FC Switched
ESX 3.5 U3, 3.5 U2, 3.5 U1, 3.5	Active/Active	Fixed	J200P19	lpfc_740 ver. elx_7.4.0.13, qla2300_707_vmw ver. 7.08-vm32	FC Switched
ESX 3.0.3	Active/Active	Fixed	J200P19	lpfcdd_732 ver. 7.3.2_vmw10, qla2x00_707 ver. 7.07.04.01.3vmw	FC Switched
ESX 3.0.2 U1, 3.0.2	Active/Active	Fixed	J200P19	lpfcdd_732 ver. 7.3.2_vmw4, qla2x00_707 ver. 7.07.04.2vmw	FC Switched
ESX 3.0.1	Active/Active	Fixed	J200P19	lpfcdd_732 ver. 7.3.2_vmw2, qla2x00_707 ver. 7.07.04.01	FC Switched

<b>MSA2312fc</b>		<b>Product ID: MSA2312fc</b>		<b>Vendor ID: HP</b>	
<b>Supported Releases</b>	<b>Mode</b>	<b>Recommended Path Policy</b>	<b>Firmware</b>	<b>Device Driver</b>	<b>Configuration</b>
ESX 4.0	VMW_SATP_ALUA	VMW_PSP_MRU	M110R21	lpfc820 ver. 8.2.0.30.49vmw, qla2xxx ver. 821.k1.38vmw	FC Switched
ESX 3.5 U4, 3.5 U3, 3.5 U2, 3.5 U1	Active/Active	Fixed	M100R18	N/A	FC Direct Attached

<b>MSA2312fc</b>		<b>Product ID: MSA2312fc</b>		<b>Vendor ID: HP</b>	
<b>Supported Releases</b>	<b>Mode</b>	<b>Recommended Path Policy</b>	<b>Firmware</b>	<b>Device Driver</b>	<b>Configuration</b>
ESX 3.5 <sup>1, 2</sup>	Active/Active	Fixed	M100R18	lpfc_740 ver. elx_7.4.0.13, qla2300_707_vmw ver. 7.08- vm32	FC Direct Attached
ESX 3.0.3, 3.0.2 U1, 3.0.2, 3.0.1	Active/Active	Fixed	M100R07	N/A	FC Switched
ESX 3.0	Active/Active	Fixed	M100R07	lpfcdd_732 ver. 7.3.2_vmw1, qla2300_707_vmw ver. 7.7.4.1vmw	FC Switched
ESX 3.5 U4, 3.5 U3, 3.5 U2, 3.5 U1, 3.5	Active/Active	Fixed	M100R06	N/A	FC Switched

**Notes:**

1. Requires February patch (build 77234) or later for ESX Server 3.5
2. Requires February 2008 patch (build 77234) or later for ESX Server 3.5

<b>MSA2324fc</b>		<b>Product ID: MSA2324fc</b>		<b>Vendor ID: HP</b>	
<b>Supported Releases</b>	<b>Mode</b>	<b>Recommended Path Policy</b>	<b>Firmware</b>	<b>Device Driver</b>	<b>Configuration</b>
ESX 4.0	VMW_SATP_ALUA	VMW_PSP_MRU	M110R21	lpfc820 ver. 8.2.0.30.49vmw, qla2xxx ver. 821.k1.38vmw	FC Switched
ESX 3.5 U4, 3.5 U3, 3.5 U2, 3.5 U1	Active/Active	Fixed	M100R18	N/A	FC Direct Attached
ESX 3.5 <sup>1</sup>	Active/Active	Fixed	M100R18	lpfc_740 ver. elx_7.4.0.13, qla2300_707_vmw ver. 7.08- vm32	FC Direct Attached
ESX 3.0.3, 3.0.2 U1, 3.0.2, 3.0.1, 3.0	Active/Active	Fixed	M100R07	N/A	FC Switched
ESX 3.5 U4, 3.5 U3, 3.5 U2, 3.5 U1	Active/Active	Fixed	M100R06	N/A	FC Switched
ESX 3.5	Active/Active	Fixed	M100R06	lpfc_740 ver. elx_7.4.0.13, qla2300_707_vmw ver. 7.08- vm32	FC Switched

**Notes:**

1. Requires February 2008 patch (build 77234) or later for ESX Server 3.5

## iSCSI Array (iSCSI)

### HP

<b>MSA1510i</b>		<b>Product ID: MSA1510i VOLUME</b>		<b>Vendor ID: HP</b>	
<b>Supported Releases</b>	<b>Mode</b>	<b>Recommended Path Policy</b>	<b>Firmware</b>	<b>Device Driver</b>	<b>Configuration</b>
ESX 3.5 U4 <sup>1, 2, 3</sup>	N/A	N/A	2.02.	N/A	SW iSCSI
ESX 3.5 U4 <sup>1, 2, 3</sup> , 3.5 U3 <sup>1, 2, 3</sup> , 3.5 U2 <sup>1, 2, 3</sup> , 3.5 U1 <sup>1, 2, 3</sup> , 3.0.3 <sup>1, 2, 3</sup> , 3.0.2 U1 <sup>1, 2, 3</sup> , 3.0.2 <sup>1, 2, 3</sup> , 3.0.1 <sup>1, 2, 4, 3</sup>	N/A	N/A	2.02	N/A	SW iSCSI

**Notes:**

1. Support for Windows guest operating system only.
2. Single Controller only.
3. iSCSI software initiator SP failover is not supported.
4. Requires patches with release dates up to November 3rd 2007 or later.

<b>MSA2012i</b>		<b>Product ID: MSA2012i</b>		<b>Vendor ID: HP</b>	
<b>Supported Releases</b>	<b>Mode</b>	<b>Recommended Path Policy</b>	<b>Firmware</b>	<b>Device Driver</b>	<b>Configuration</b>
ESX 3.5 U4, 3.5 U3, 3.5 U2, 3.5 U1, 3.5, 3.0.3, 3.0.2 U1, 3.0.2, 3.0.1 <sup>1</sup>	Active/Active	Fixed	J210R10	N/A	SW iSCSI

**Notes:**

1. Requires patches with release dates up to November 3rd 2007 or later.

<b>MSA2312i</b>		<b>Product ID: MSA2312i</b>		<b>Vendor ID: HP</b>	
<b>Supported Releases</b>	<b>Mode</b>	<b>Recommended Path Policy</b>	<b>Firmware</b>	<b>Device Driver</b>	<b>Configuration</b>
ESX 3.5 U4	Active/Active	Fixed	M110R16	qla4022 ver. 3.30	HW iSCSI
ESX 3.5 U4	Active/Active	Fixed	M110R16	N/A	SW iSCSI
ESX 3.5 U3	Active/Active	Fixed	M110R16	qla4022 ver. 3.30	HW iSCSI
ESX 3.5 U3	Active/Active	Fixed	M110R16	N/A	SW iSCSI

**MSA2324i****Product ID: MSA2324i****Vendor ID: HP**

<b>Supported Releases</b>	<b>Mode</b>	<b>Recommended Path Policy</b>	<b>Firmware</b>	<b>Device Driver</b>	<b>Configuration</b>
ESX 3.5 U4	Active/Active	Fixed	M110R16	qla4022 ver. 3.30	HW iSCSI
ESX 3.5 U4	Active/Active	Fixed	M110R16	N/A	SW iSCSI
ESX 3.5 U3	Active/Active	Fixed	M110R16	qla4022 ver. 3.30	HW iSCSI
ESX 3.5 U3	Active/Active	Fixed	M110R16	N/A	SW iSCSI

## SAS

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### HP

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<b>MSA2012sa</b>		<b>Product ID: MSA2012sa</b>		<b>Vendor ID: HP</b>	
<b>Supported Releases</b>	<b>Mode</b>	<b>Recommended Path Policy</b>	<b>Firmware</b>	<b>Device Driver</b>	<b>Configuration</b>
ESX 3.5 U4 <sup>1, 2</sup> , 3.5 U3 <sup>1, 2</sup> , 3.5 U2 <sup>1, 2</sup>	Active/Active	Fixed	J300R20	N/A	SAS Direct Attach
ESX 4.0	VMW_SATP_ALUA	VMW_PSP_MRU	J300P11	N/A	SAS Direct Attach
ESX 3.5 U4 <sup>3, 4</sup> , 3.5 U3 <sup>3, 4</sup>	Active/Active	Fixed	J300P10	N/A	SAS Switched

**Notes:**

1. HP Shared SAS supported with MSA2012sa Storage Array Controller and HP SC08GE HBA using mptscsi\_2xx drivers.
2. Shared VMFS support across two or more ESX Server hosts requires MSA2012sa firmware version J300P03 or higher.
3. Support for Virtual LSILogic Only
4. Supported with HP P700m only

<b>MSA2312sa</b>		<b>Product ID: MSA2312sa</b>		<b>Vendor ID: HP</b>	
<b>Supported Releases</b>	<b>Mode</b>	<b>Recommended Path Policy</b>	<b>Firmware</b>	<b>Device Driver</b>	<b>Configuration</b>
ESX 3.5 U4 <sup>1, 2</sup> , 3.5 U3 <sup>1, 2</sup>	Active/Active	Fixed	MR110R19	mptscsi_2xx ver. 2.06.48.17	SAS Direct Attach
ESX 3.5 U4 <sup>3, 1, 4</sup> , 3.5 U3 <sup>3, 1, 4</sup>	Active/Active	Fixed	MR110R16	hpsa ver. 2.4.66.84vm	SAS Switched

**Notes:**

1. Boot from SAN is not supported.
2. Supported with HP SC08GE SAS HBA.
3. Support for Virtual LSILogic Only
4. Supported with HP P700m only

<b>MSA2324sa</b>		<b>Product ID: MSA2324sa</b>		<b>Vendor ID: HP</b>	
<b>Supported Releases</b>	<b>Mode</b>	<b>Recommended Path Policy</b>	<b>Firmware</b>	<b>Device Driver</b>	<b>Configuration</b>
ESX 3.5 U4 <sup>1, 2</sup> , 3.5 U3 <sup>1, 2</sup>	Active/Active	Fixed	MR110R19	mptscsi_2xx ver. 2.06.48.17	SAS Direct Attach
ESX 3.5 U4 <sup>3, 1, 4</sup> , 3.5 U3 <sup>3, 1, 4</sup>	Active/Active	Fixed	MR110R16	hpsa ver. 2.4.66.84vm	SAS Switched

**MSA2324sa**

**Product ID: MSA2324sa**

**Vendor ID: HP**

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**Notes:**

1. Boot from SAN is not supported.
2. Supported with HP SC08GE SAS HBA.
3. Support for Virtual LSILogic Only
4. Supported with HP P700m only

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