



# HP LeftHand P4000 SANs

## Compatibility matrix

Supported platforms .....	2
Microsoft .....	3
Windows Server 2008 .....	3
Windows Server 2003 .....	4
Windows Server 2000 .....	5
Novell .....	5
NetWare .....	5
SUSE Linux .....	5
RedHat .....	6
RedHat Enterprise Linux 5.0 .....	6
RedHat Enterprise Linux 4.0 .....	6
RedHat Enterprise Linux 3.0 .....	6
Fedora .....	7
Fedora Core .....	7
HP .....	7
HP-UX 11i .....	7
IBM .....	7
IBM AIX 5L .....	7
Sun .....	8
Solaris Enterprise System .....	8
VMware .....	8
VMware ESX .....	8
Citrix .....	8
Citrix XenServer .....	8
Apple .....	9
Apple OS X Leopard .....	9
HP LeftHand SANs Centralized Management Console .....	10
Support level definitions .....	11
For more information .....	12

# Supported platforms

	HP SAN/iQ software version and date		
	7.0 July 2007	8.0 Nov 2008	8.1 Apr 2009
HP LeftHand P4300			√
HP LeftHand P4500			√
HP LeftHand P4000 VSA <sup>(See VSA Note)</sup>			√
HP DL320S	√	√	√
HP DL380 G4	√	√	√
LeftHand NSM150	√		
LeftHand NSM160	√	√	√
LeftHand NSM200	√		
LeftHand NSM260	√	√	√
LeftHand NSM2060	√	√	√
LeftHand NSM2060 G2	√	√	√
LeftHand NSM2120	√	√	√
LeftHand NSM2120 G2	√	√	√
LeftHand NSM4150	√	√	√
LeftHand Virtual SAN Appliance (VSA) for VMware <sup>(See VSA Note)</sup>	√	√	√
IBM System x3650	√	√	√
Dell PowerEdge 2950	√	√	√

**VSA Note:** The following prerequisites are required for HP LeftHand to support your virtual SAN for production use.

- A qualified server running VMware ESX Server 3.X. Qualified servers are listed in VMware ESX Server systems compatibility guide, which can be found at <http://www.vmware.com/resources/compatibility/search.php>.
- Reserved memory based on total disk capacity, as follows:

Total capacity of all installed disks	Requires at least this much memory
< 500 GB	384 MB
500 GB to 4.5 TB	1 GB
4.5 TB to 9 TB	2 GB
9 TB to 10 TB	3 GB

- A single virtual CPU with at least 2000 MHz reserved.
- A connection to a virtual switch with at least a Gigabit network connection.
- Virtual disk(s) with 5 GB to 2 TB (2047 sectors) of space per disk located on internal disk storage, or direct attached storage that is not accessible from more than one physical server.
- The first virtual disk must be connected to SCSI address 1:0.
- All virtual disks for the VSA must be configured as independent and persistent to prevent VM snapshots from affecting them.
- The VMFS datastore for the VSA must not be shared with any other VMs.

Windows Server 2008

HP SAN/iQ software version and date

		7.0 July 2007	8.0 Nov 2008	8.1 Apr 2009
Versions	Server	4	4	4
	Server Core	4	4	4
	Hyper-V	3	3	3
	X86/x64	4	4	4
	IA64			
Software Initiators	Embedded Version 6.0 Build 6000/6001	4	4	4
HBA's	QLogic <a href="#">QLE4060C/QLE4062C</a> <sup>a</sup>	2 <sup>c</sup>	2 <sup>c</sup>	2 <sup>c</sup>
Storage Extensions	HP LeftHand SANs VSS Provider	4	4	4
	HP LeftHand SANs Multipath iSCSI (MPIO) <sup>b</sup>		4 <sup>b</sup>	4 <sup>b</sup>
	Microsoft Windows Server Backup (No VSS)	4	4	4
	Symantec (Veritas) Backup Exec 12	4	4	4
	> 2TB File Systems	3	3	3
Cluster software	Microsoft <a href="#">Clustering Services</a> (Enterprise/Datacenter )	4	4	4
Certifications	Designed for Windows	YES	YES	YES
	<a href="#">Windows Server Catalog of Tested Products</a>	YES	YES	YES
	RAID Systems/iSCSI	YES	YES	YES
Service Packs	Build 6001: Service Pack 1	4	4	4

<sup>a</sup> QLogic QLE4060/QLE4062 - BIOS 1.14, iSCSI Firmware 3.0.1.49, STOR Miniport 2.1.4.19

<sup>b</sup> HP LeftHand SANs' MPIO DSM supports multiple network interfaces only. No iSCSI HBA Initiators are supported.

<sup>c</sup> Boot from SAN support

# Windows Server 2003

## HP SAN/iQ software version and date

		7.0	8.0	8.1
		July 2007	Nov 2008	Apr 2009
Versions	Standard Server/Web/Small Business/R2	4	4	4
	Enterprise Server/Datacenter/R2	4	4	4
	x64 Architecture	4	4	4
	IA64 Architecture			
Software Initiators	<a href="#">Microsoft iSCSI Initiator 2.03 (3099)</a>	3		
	<a href="#">Microsoft iSCSI Initiator 2.04 (3273)</a>	4		
	<a href="#">Microsoft iSCSI Initiator 2.05 (3392)</a>	4		
	<a href="#">Microsoft iSCSI Initiator 2.06 (3497)</a>	4	4	4
	<a href="#">Microsoft iSCSI Initiator 2.07 (3640)</a>	4	4	4
	<a href="#">Microsoft iSCSI Initiator 2.08 (3825)</a>		4	4
HBAs	Adaptec <a href="#">7211C/7211F</a> <sup>e</sup>	2		
	Alacritech <a href="#">SEN2000</a> <sup>f</sup>	2	2	2
	emBoot <a href="#">winBoot/I Boot from SAN (MS iSCSI)</a> <sup>f</sup>	2	2	2
	QLogic <a href="#">QLA4010/QLA4010C</a> <sup>d</sup>	2		
	QLogic <a href="#">QLA4050C/QLA4052C</a> <sup>g</sup>	2	2	2
	QLogic <a href="#">QLE4060C/QLE4062C</a> <sup>h</sup>	2	2	2
Storage Extensions	HP LeftHand SANs VSS Provider	4	4	4
	HP LeftHand SANs Multipath iSCSI (MPIO) <sup>b</sup>	4	4	4
	Microsoft <a href="#">NT Backup</a>	4	4	4
	Symantec (Veritas) <a href="#">Backup Exec 10</a> <sup>i</sup>	3		
	Symantec (Veritas) <a href="#">Backup Exec 11</a> <sup>j</sup>	4	4	4
	Symantec (Veritas) <a href="#">Backup Exec 12</a>		4	4
	> 2TB File Systems	3	3	3
Boot from SAN	emBoot <a href="#">winBoot/I Boot from SAN (MS iSCSI)</a> <sup>f</sup>	2	2	2
	QLogic <a href="#">QLE4060C/QLE4062C</a> <sup>h</sup>	2	2	2
Cluster software	Microsoft <a href="#">Clustering Services</a> (Enterprise/Datacenter )	4	4	4
Certifications	Designed for Windows	YES	YES	YES
	<a href="#">Windows Server Catalog of Tested Products</a>	YES	YES	YES
	HP LeftHand SANs MPIO DSM	YES	YES	YES
	RAID Systems/iSCSI	YES	YES	YES
Service Packs	SP1 / SP2	4 – SP2	4 – SP2	4 – SP2

<sup>b</sup> HP LeftHand SANs' MPIO DSM supports multiple network interfaces only. No iSCSI HBA Initiators are supported.

<sup>d</sup> QLogic QLA4010/QLA4010C - BIOS 1.11, iSCSI Firmware 03.00.00.04, SCSI Miniport Driver 2.1.2.0

<sup>e</sup> Adaptec 7211C/7211F - iSCSI Initiator Software Version 1.2 for Windows Server 2003 - BIOS, Firmware, Drivers.

<sup>f</sup> Alacritech SEN2000 - Driver 9.0.0.129 & 7.3.0.1r3. Tested with emBoot WinBoot/I 1.5.

<sup>g</sup> QLogic QLA4050C/QLA4052C - BIOS 1.04, iSCSI Firmware 2.0.0.7, SCSI Miniport Driver 2.1.2.5

<sup>h</sup> QLogic QLA4060C/QLA4062C - BIOS 1.14, iSCSI Firmware 3.0.1.49, SCSI Miniport 2.1.4.12, STOR Miniport 2.1.4.19

<sup>i</sup> Requires [Symantec Backup Exec 10d \(10.1\) for Windows Servers Hotfix 40](#)

<sup>j</sup> Requires Symantec Backup Exec 11d (11.1) for Windows Servers Hotfix 14 [32bit](#) or [64bit](#)

## Windows Server 2000

### HP SAN/iQ software version and date

		7.0	8.0	8.1
		July 2007	Nov 2008	Apr 2009
Versions	Server / Advanced Server	2		
Software Initiators	<a href="#">Microsoft iSCSI Initiator 2.04 (3273)</a>	2		
HBA's	QLogic <a href="#">QLA4010/QLA4010C</a> <sup>d</sup>	1		
Service Packs	SP4	2		

<sup>d</sup> QLogic QLA4010/QLA4010C - BIOS 1.11, iSCSI Firmware 03.00.00.04, Miniport Driver 2.1.2.0

## Novell

### NetWare

### HP SAN/iQ software version and date

		7.0	8.0	8.1
		July 2007	Nov 2008	Apr 2009
Versions	<a href="#">NetWare 6.5</a>	2	2	2
Software Initiators	NetWare iSCSI Initiator	2	2	2
HBA's				
Cluster software	Novell Cluster Services™ 1.8	2	2	2
Certifications	YES Certified <sup>k</sup>	YES	YES	YES
Service Packs	SP6a	2	2	2
	SP7	2	2	2

<sup>k</sup> [Go to Novell's YES CERTIFIED Bulletin Search. Select Company HP LeftHand SANs and search.](#)

## SUSE Linux

### HP SAN/iQ software version and date

		7.0	8.0	8.1
		July 2007	Nov 2008	Apr 2009
Versions	<a href="#">SUSE Linux Enterprise Server 9</a>	2	2	2
	<a href="#">SUSE Linux Enterprise Server 10/10.1/10.2</a>	2	2	2
	x86 / x86-64 Architecture	2	2	2
	PPC Architecture			
Software Initiators	SUSE Native linux-iscsi (SLES9)	2	2	2
	SUSE Native Open-iSCSI (SLES10)	2	2	2
HBA's	QLogic <a href="#">QLA4010/QLA4010C</a> <sup>l</sup>	2		
	QLogic <a href="#">QLE4060C/QLE4062C</a> <sup>m</sup>	2 <sup>e</sup>	2 <sup>e</sup>	2 <sup>e</sup>
Cluster software	Novell Cluster Services™ 1.8	2	2	2
Certifications	YES Certified	YES	YES	YES

<sup>e</sup> Boot from SAN support

<sup>l</sup> QLogic QLA4010/QLA4010C - BIOS 1.11, iSCSI Firmware 03.00.00.04

<sup>m</sup> QLogic QLA4060C/QLA4062C - BIOS 1.13, iSCSI Firmware 3.0.1.24

# RedHat

## RedHat Enterprise Linux 5.0

### HP SAN/iQ software version and date

		7.0	8.0	8.1
		July 2007	Nov 2008	Apr 2009
Versions	<a href="#">RedHat Enterprise Linux 5.0</a>	2	2	2
	<a href="#">RedHat Enterprise Linux 5.1</a>	2	2	2
	<a href="#">RedHat Enterprise Linux 5.2</a>		2	2
Software Initiators	iscsi-initiator-utils-6.2.0.742	2	2	2
	iscsi-initiator-utils-6.2.0.868	2	2	2
HBA's	QLogic <a href="#">QLE4060C/QLE4062C<sup>m</sup></a>	2 <sup>c</sup>	2 <sup>c</sup>	2 <sup>c</sup>
Service Packs	GFS	2	2	2
	Cluster Services	2	2	2

<sup>c</sup> Boot from SAN support

<sup>m</sup> QLogic QLA4060C/QLA4062C - BIOS 1.13, iSCSI Firmware 3.0.1.24

## RedHat Enterprise Linux 4.0

### HP SAN/iQ software version and date

		7.0	8.0	8.1
		July 2007	Nov 2008	Apr 2009
Versions	<a href="#">RedHat Enterprise Linux AS 4.0 U4</a>	3		
	RedHat Enterprise Linux AS 4.6	3	3	3
	RedHat Enterprise Linux AS 4.7	3	3	3
Software Initiators	Linux-iscsi v4.0.3.0	3	3	3
HBA's	QLogic <a href="#">QLA4010/QLA4010C<sup>l</sup></a>	2		

<sup>l</sup> QLogic QLA4010/QLA4010C - BIOS 1.11, iSCSI Firmware 03.00.00.04

## RedHat Enterprise Linux 3.0

### HP SAN/iQ software version and date

		7.0	8.0	8.1
		July 2007	Nov 2008	Apr 2009
Versions	<a href="#">RedHat Enterprise Linux AS 3.0 U8</a>	2		
Software Initiators	Linux-iscsi v3.6.x	2		
HBA's				

# Fedora

## Fedora Core

		HP SAN/iQ software version and date		
		7.0	8.0	8.1
		July	Nov	Apr
		2007	2008	2009
Versions	Linux Fedora-Core-06 2.6.18-1.2798.fc6 x86	2	2	2
	Fedora 8	2	2	2
	Fedora 9		2	2
	Fedora 10		2	2
Software Initiators	iscsi-initiator-utils-6.2.0.747-0.0.fc6	2		
	iscsi-initiator-utils-6.2.0.865-0.2.fc8	2	2	2
	iscsi-initiator-utils-6.2.0.868-0.7.fc9		2	2
	iscsi-initiator-utils-6.2.0.870-0.1.rc1.fc10		2	2

# HP

## HP-UX 11i

		HP SAN/iQ software version and date		
		7.0	8.0	8.1
		July	Nov	Apr
		2007	2008	2009
Versions	<a href="#">HP-UX 11i v1 (PA-RISC 11.11)</a>	2	2	2
	<a href="#">HP-UX 11i v2 (PA-RISC 11.23)</a>	2	2	2
Software Initiators	HP-UX iSCSI Initiator	2	2	2
HBAs				

# IBM

## IBM AIX 5L

		HP SAN/iQ software version and date		
		7.0	8.0	8.1
		July	Nov	Apr
		2007	2008	2009
Versions	<a href="#">IBM AIX 5L Version 5.3 ML2</a>	2	2	2
Software Initiators	AIX iSCSI Initiator	2	2	2
HBAs				

# Sun

## Solaris Enterprise System

### HP SAN/iQ software version and date

		7.0 July 2007	8.0 Nov 2008	8.1 Apr 2009
Versions	<a href="#">Solaris 10</a> (SPARC)	2	2	2
Software Initiators	Solaris iSCSI Initiator	2	2	2
HBAs				
Certifications	<a href="#">Solaris Ready</a> NSM150 <sup>n</sup> /NSM160 <sup>n</sup> /NSM260 <sup>n</sup>			

<sup>n</sup> [http://www.sun.com/io\\_technologies/vendor/lefthand\\_networks\\_inc.html](http://www.sun.com/io_technologies/vendor/lefthand_networks_inc.html)

# VMware

## VMware ESX

### HP SAN/iQ software version and date

		7.0 July 2007	8.0 Nov 2008	8.1 Apr 2009
Versions	VMware ESX Server 2.5	2		
	<a href="#">VMware Infrastructure 3</a> ESX Server 3.0.1 <sup>o</sup>	2		
	<a href="#">VMware Infrastructure 3</a> ESX Server 3.0.2 <sup>o</sup>	3	3	3
	<a href="#">VMware Infrastructure 3.5</a> ESX Server 3.5 <sup>o</sup>	3	3	3
	VMware Site Recovery Manager <sup>p</sup>	3	3	3
Certifications	<a href="#">Storage / SAN Compatibility Guide for ESX Server 3.x</a> <sup>q</sup>	3	3	3

<sup>o</sup> [http://www.vmware.com/pdf/vi3\\_san\\_guide.pdf](http://www.vmware.com/pdf/vi3_san_guide.pdf)

<sup>p</sup> HP LeftHand SANs' Certified Storage Replication Adapter (SRA)

<sup>q</sup> VMware iSCSI software initiator and hardware initiator certifications

# Citrix

## Citrix XenServer

### HP SAN/iQ software version and date

		7.0 July 2007	8.0 Nov 2008	8.1 Apr 2009
Versions	<a href="#">Citrix XenServer 4.0</a>	2		
	<a href="#">Citrix XenServer 4.1</a>	2		
	<a href="#">Citrix XenServer 5.0</a>		2	2
Certifications	<a href="#">Citrix XenServer Hardware Compatibility List</a>	2 <sup>r</sup>	2	2

<sup>r</sup> Tested with 7.0 sp1



# Apple

## Apple OS X Leopard

### HP SAN/iQ software version and date

		<b>7.0</b>	<b>8.0</b>	<b>8.1</b>
		<b>July</b>	<b>Nov</b>	<b>Apr</b>
		<b>2007</b>	<b>2008</b>	<b>2009</b>
Versions	<a href="#">OS X Leopard 10.5.4</a>	2*	2	2
	<a href="#">OS X Leopard 10.5.5</a>		2	2
Certifications	<a href="#">globalSAN iSCSI Initiator 3.3.0.43</a>	2*	2	2

\* Tested with 7.0 sp1

HP LeftHand SANs Centralized Management Console

CMC supported operating systems		HP SAN/iQ software version and date		
		7.0 July 2007	8.0 Nov 2008	8.1 Apr 2009
Microsoft	Microsoft Windows XP	√	√	√
	Windows Vista	√	√	√
	Windows Server 2000	√		
	Windows Server 2003	√	√	√
	Windows Server 2008	√	√	√
Novell	SUSE Linux Enterprise 9	√		
	SUSE Linux Enterprise 10	√	√	√
RedHat	RedHat Enterprise Linux 3	√		
	RedHat Enterprise Linux 4	√	√	√
	RedHat Enterprise Linux 5	√	√	√
Fedora	Fedora Core 6	√	√	√
	Fedora 8	√	√	√
	Fedora 9		√	√
HP	HP-UX 11i v1 (11.11)	√	√	√
	HP-UX 11i v2 (11.23)	√	√	√

# Support level definitions

## Level 4

<b>Level of Support</b>	We have done all practical testing on this environment and it is a "benchmark" environment for quality and performance. We have extensive experience and documentation as well as environment experts in-house. We have the highest possible partnership arrangement with the vendor.
<b>Support Will Say</b>	You are supported. Support has in-house expertise with the OS and applications. We have the ability to answer questions, reproduce customer configurations and resolve issues. We will escalate to engineering if needed. We have a relationship with the OS vendor and can escalate if necessary.

## Level 3

<b>Level of Support</b>	We have done complete testing of the environment, including approved applications and performance testing. There may be some limited caveats, but most standard configurations are supported. We have systems and experience in-house and multiple whitepapers and application notes. We are enrolled in vendor partnership programs and pass relevant certifications.
<b>Support Will Say</b>	Support records indicate that we have done a great deal of testing and have in-house expertise. We have tested with applications and failure conditions. We have relationships with the vendor. We have equipment in house, running applications.

## Level 2

<b>Level of Support</b>	We have done testing of all SAN/iQ Feature functionality and advanced failure conditions. Most configurations should be supported. We should have a Best Practices document for this environment. We have some in-house expertise, and we have a partnership with the vendor.
<b>Support Will Say</b>	Support records indicate that we have not done a great deal of testing on this particular configuration, but we have in-house expertise with the OS. We have not tested applications or all failure conditions. We may run into problems that will need vendor assistance, but we do have a relationship with the vendor for regular support during normal business hours. We have equipment in house, but not applications running on the equipment.

## Level 1

<b>Level of Support</b>	We have not done any reliability, performance, nor exhaustive feature testing. We have little or no expertise, and we have no established relationship with the vendor. We have no reason to believe that this configuration will not work. We have seen this work in-house or at a customer site.
<b>Support Will Say</b>	Support records show that we have not done a full certification on this configuration, including performance or failure conditions. We have no reason to believe that this configuration will not work, but we also have no precedent for setting it up and may run into problems that will need vendor assistance and/or time to research in our test lab. We may have limited availability to lab equipment and may need to do troubleshooting on the Customer premises, or at the vendor site.

HP SAN/iQ Software Release Version and Date listed by support/compatibility levels.  
 HP LeftHand Support levels are defined.

## For more information

<http://www.hp.com/storage/spock>

HP StorageWorks Single Point of Connectivity Knowledge (SPOCK) is the primary portal used to obtain detailed information about supported HP StorageWorks products and configurations.

## Technology for better business outcomes

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