IBM TotalStorage™ Enterprise Storage Server™

Attachment Support Matrix

CONTENTS

This edition is dated April 23, 2002 and replaces the edition dated December 19, 2001.

INTRODUCTION

The IBM TotalStorage Enterprise Storage Server (ESS) is supported in the environments shown in this document. The sales representative and/or customer are responsible for ensuring that the specific host system configuration used (i.e. server model, operating system level and host adapter combination) is a valid and supported configuration by the server manufacturer.

If the configuration desired is not represented in the information in this listing, an IBM RPQ must be submitted and approved before IBM support for that configuration can be provided. The process for submission of an RPQ varies by geography. Contact your local IBM storage specialist for details.

Throughout this document, this symbol -- @ -- indicates that the associated vendor has announced that they no longer provide support for this level of their operating system. If problems are encountered when such a level is being used, you may be required to update your system to a supported level before problem determination can take place.

This list of software supporting IBM ESS is compiled by IBM based on publicly available information and testing which we have conducted. It is provided for the reader's guidance only. While IBM tests the ESS with many software products listed herein, we neither warrant nor guarantee the accuracy of this publication.

This PDF document is updated on a frequent basis; get the latest version from:
http://www.storage.ibm.com/hardsoft/products/ess/supserver.htm

What's New for April 23, 2002

This document has been updated with support for the items listed below. Unless stated otherwise, these items require ESS LIC level 1.5.2, or later, which has a planned availability of May 17, 2002.

Servers
- Compaq AlphaServer models GS80, GS160, and GS320
- IBM pSeries 670 (IBM 7040 Model 671)

Operating Systems, Path Management, and Clustering
- Tru64 UNIX 5.1A with TruCluster 5.1A
- NetWare 6.0 with Cluster Services 1.6
- VERITAS Volume Manager 3.2 and VERITAS Cluster Server 2.0 (Sun servers)
- z/OS Version 1 Release 3

Adapters
- Emulex LP9002L (Intel servers – NetWare)
- Qlogic QLA2310F (Intel servers – NetWare)

SAN Fabric
- IBM 2109 Model F16 (Compaq AlphaServer servers)
- IBM 3534 Model F08 (Compaq AlphaServer, HP, IBM pSeries, Intel (Linux and Windows) and Sun servers)
- Fibre Channel / FICON intermix on INRANGE FC/9000 and McDATA ED-6064

Other
- Boot device support for IBM pSeries and RS/6000
- Copy services and CLI support for Tru64 UNIX
- SDD and CLI for HP-UX 11i
- PPRC supported configurations and support for channel extender and DWDM products

For convenience, Tables 1 and 2 below summarize Open Systems support for supported standard and clustered environments. However, please use the individual platform support pages for a more complete reference of O/S and host adapter restrictions.

Table 1: Supported Open System Platform Environments (non-clustered)

Platform	RS/6000 AIX, AIX-SP 4.2.1 4.3.1 4.3.2 4.3.3[1] 5.1	Intel-based Windows NT 4.0 EE Windows 2000 AS	SUN Solaris 2.6 7 8	HP HP-UX[2] 10.20 11.0 11i	Compaq OpenVMS 6.2-1 H3 7.1-2 7.2-1 7.3 Tru64 UNIX 4.0D, 4.0E, 4.0F, 4.0G, 5.0A, 5.1, 5.1A	Intel-based NetWare[3] 4.11 4.2 5.0 5.1	NUMA-Q[4] DYNIX/ptx 4.4.7 4.4.8 4.4.9 4.5.1 sp3	NUMA-Q DYNIX/ptx 4.5.1 sp3 4.5.2 4.5.3 4.6.1 4.4.10	Intel-based Linux Red Hat 7.1 SuSE 7.2
ESS F & E	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SCSI	Yes	Yes	Yes	Yes	Yes	Yes	No	No	RPQ
SDG	Yes	Yes	Yes	Yes	No	No	No	No	No
FC # 3019	No	No	No	No	No	No	Yes[5]	No	No
FC Direct	Yes	Yes	Yes	Yes	Yes[6]	Yes	Yes[7]	Yes	Yes
FC Switched[8]	Yes	Yes	Yes	Yes	Yes	Yes	Yes[9]	Yes[10]	Yes
Recommended multi-path optimization	SDD	SDD	SDD or VERITAS Volume Mgr. + DMP	SDD or PVLINKS	Tru64 UNIX	None	ptx[11]	ptx	None

[1] AIX Version 4.3.3 is required for Fibre Channel support.

[2] For Fibre or SDD support, HP-UX must be at rev. 11.0 (32 / 64 bit).

[3] For Fibre Channel support, Novell NetWare must be at revision 4.2, or later.

[4] Supported via RPQ only.

[5] Interim Fibre (Fibre to SCSI bridge) support with FC # 3019 only thru the end of 2001.

[6] OpenVMS is not supported with Fibre.

[7] FC direct support with 4.5.1 sp3 only.

[8] Cascaded switches are supported in configurations up to 24 max switches for IBM 2109, up to 16 max switches for McDATA, 4 max switches for INRANGE, with a maximum of three inter-switch hops for any path. Two hops recommended for normal operation with the third hop reserved for backup paths.

[9] Cascaded switches are supported in configurations up to 2 max switches, and a maximum of one inter-switch hop.

[10] Cascaded switches are supported in configurations up to 4 max switches, and a maximum of one inter-switch hop.

[11] 4.4.7, 4.4.8 and 4.4.9 require ptx/IBM-ESS V1.1.0 as a minimum level for ESS support.

Table 2: Supported Open Systems Cluster Environments

	RS/6000 SP AIX-SP W/PSSP + RVSD 3.1.1 3.2.0 3.4	RS/6000 AIX and HACMP 4.3.1 4.4.0 4.4.1	Intel-based NT 4.0 EE w/MSCS Win2K AS w/Cluster Service	Solaris • 2.6 VERITAS Volume Mgr. 3.1, 3.2 w/DMP VERITAS Cluster Server 1.1.2, 1.3, 2.0 • 7 VERITAS Volume Mgr. 3.1, 3.2 w/DMP VERITAS Cluster Server 1.1.2, 1.3 , 2.0 • 8 VERITAS Volume Mgr. 3.1.1, 3.2 w/DMP VERITAS Cluster Server 1.3, 2.0	HP[12] HP-UX 11.0 MC/Service Guard 11.05/11.09 11i MC/Service Guard 11i	Compaq OpenVMS 7.1-2 7.2-1 7.3 Tru64 UNIX 5.0A, 5.1, 5.1ATruCluster 5.0A, 5.1, 5.1A	Intel-based NetWare 4.2 Standby Server NetWare 5.0 Cluster Services 1.00, 1.01 NetWare 5.1 Cluster Services 1.01	NUMA-Q[13] DYNIX/ptx 4.4.7 4.4.8 4.4.9 4.5.1 sp3 ptx/CLUSTERS	NUMA-Q DYNIX/ptx 4.5.1 sp3 4.5.2 4.5.3 4.6.1 4.4.10 ptx/CLUSTERS
ESS F & E	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SCSI	Yes	Yes	Yes	Yes[14]	Yes	Yes	Yes	No	No
SDG	Yes	Yes	Yes	Yes	No	No	No	No	No
FC # 3019	No	No	No	No	No	No	No	Yes[15]	No
FC Direct	Yes	Yes	Yes	Yes	Yes	Yes[16]	Yes	Yes[17]	Yes
FC Switched[18]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes[19]	Yes[20]
Recommended multi-path optimization	SDD	SDD	SDD	VERITAS DMP	HP-UX PVLINKS	Tru64 UNIX	None	ptx[21]	ptx

- IBM development plans are subject to change or withdrawal at any time without prior notice.
- Always use the most recent version of O/S and all current service pack updates whenever possible.

[12] Support for HP-UX clustered environments is limited to K, L, N, and V class only.

[13] Supported via the NSBO (Non-Standard Business Opportunities) process only which is NUMA-Qs RPQ process.

[14] Veritas Cluster Server 2.0 is not supported in SCSI environments

[15] Interim Fibre (Fibre to SCSI bridge) supported with FC 3019 only thru the end of 2001.

[16] Open VMS is not supported with Fibre.

[17] FC direct support with 4.5.1 sp3 only.

[18] Cascaded switches are supported in configurations up to 24 max switches for IBM 2109, up to 16 max switches for McDATA, 4 max switches for INRANGE, with a maximum of three inter-switch hops for any path. Two hops recommended for normal operation with the third hop reserved for backup paths.

[19] Cascaded switches are supported in configurations up to 2 max switches, and a maximum of one inter-switch hop.

[20] Cascaded switches are supported in configurations up to 4 max switches, and a maximum of one inter-switch hop.

[21] 4.4.7, 4.4.8 and 4.4.9 require ptx/IBM-ESS V1.1.0 as a minimum level for ESS support.

BOOT SUPPORT

IBM generally supports the use of the ESS as a boot device in the environments and configurations listed below. Boot device support for all other configurations and environments is supported via RPQ only.

IBM pSeries, RS/6000, and RS/6000 SP

The ESS is supported as a boot device on pSeries, RS/6000, and RS/6000 SP servers that support Fibre Channel boot capability.

This support requires ESS LIC level 1.4.0, or later, and Fibre Channel attachment via the following ESS host adapters:

- Fibre Channel / FICON (long wave) Host Adapter (feature number 3021)
- Fibre Channel (short wave) Host Adapter (feature number 3022)
- Fibre Channel / FICON (short wave) Host Adapter (feature number 3023)

The server requires ibm2105.rte, version 32.6.100.7 or above (refer to lslpp output). SDD is not currently supported, nor should it be installed, in conjunction with boot device support.

IBM recommends mirroring of the root volume group (rootvg) so a single ESS is not solely responsible for the base functionality and reliability of the operating system.

Contact your IBM pSeries Specialist or IBM Business Partner for a current list of pSeries, RS/6000, and RS/6000 SP servers that support Fibre Channel boot capability and the server hardware and software prerequisites for this support.

Compaq AlphaServer

The ESS is supported as a boot device on Compaq AlphaServer servers running Tru64 UNIX 5.0A and 5.1.

This support requires ESS LIC level 1.3.3, or later, and is supported on SCSI and Fibre Channel configurations.

For additional information, please refer to the *ESS Host Systems Attachment Guide* (SC26-7296)
http://ssddom02.storage.ibm.com/disk/ess/documentation.html

IBM SUBSYSTEM DEVICE DRIVER (SDD)

The IBM Subsystem Device Driver (SDD) has superseded the IBM Data Path Optimizer (DPO) AIX (5648-B58) and Windows NT (5639-F97) software offerings for all ESS customers. For SDD prerequisites and current SDD code levels, please refer to the following web site: http://www.ibm.com/storage/support/techsup/swtechsup.nsf/support/sddupdates

The Subsystem Device Driver, (formerly Data Path Optimizer) may operate under different modes/configurations:

Concurrent Data Access Mode - A total system configuration where simultaneous access to data on a common LUN by more than one host is controlled by system application software, such as Oracle Parallel Server, or file access software that has the ability to deal with access conflicts. The LUN is not involved in access resolution.

Non-concurrent Data Access Mode - A system configuration where there is no inherent system software control of simultaneous access to the data on a common LUN by more than one host. Therefore access conflicts must be controlled at the LUN level by a hardware locking facility such as SCSI Reserve/Release.

The terms Single Path and Multi-Path when used in this document refer to the path configuration between ESS and a host system as viewed from the ESS.

S-Path - means a single path from all hosts and adapters to the ESS. That is, there is only one channel path from all the adapters in each host server, which connects to the LUN, such as a single SCSI channel. While this configuration does not provide full redundancy and adapter fail-over, SDD would still work in this environment to provide ESS concurrent microcode loads for uptime while maintenance is being applied.

M-Path - means there are multiple I/O-paths to each LUN in the ESS. That is, there is more than one I/O channel path to each LUN. This would typically be done for adapter/channel redundancy and fail-over purposes. SDD works in this environment to provide adapter fail-over as well as concurrent ESS microcode loads for uptime while maintenance is being applied.

The Subsystem Device Driver is currently supported in the following environments:

Table 3a: SDD Support Matrix, Non-clustered Environments

	RS/6000 and RS/6000 SP AIX	Intel-based Servers Windows NT 4.0 EE Windows 2000 AS	SUN Solaris 2.6, 7, 8	HP HP-UX 11.0, 11i [22]
SDD - Concurrent	Yes	Yes	Yes	Yes
SDD - Non-Concurrent	Yes	N/A	N/A	N/A
SCSI S-Path	Yes	Yes	Yes	Yes
SCSI M-Path	Yes	Yes	Yes	Yes
FC S-Path	No	No	No	No
FC M-Path	Yes	Yes	Yes	Yes
SDG	No	No	No	No

[22] SDD for HP-UX 11i is supported for Fibre Channel configurations only. This support requires ESS LIC level 1.5.2, or later.

Table 3b: SDD Support Matrix, Clustered Environments

	RS/6000 SP AIX-SP PSSP or RVSD	RS/6000 AIX HACMP	Intel-based Servers Windows NT 4.0 EE w/MSCS	Intel-based Servers Windows 2000 AS w/Cluster Service
SDD - Concurrent	Yes	Yes	Yes	Yes
SDD - Non-Concurrent	Yes	Yes	Yes	Yes
SCSI S-Path	Yes	Yes	Yes	Yes
SCSI M-Path	Yes	Yes	Yes	Yes
FC S-Path	No	No	No	No
FC M-Path	Yes	Yes	Yes	Yes
SDG	No	No	No	No

ESS AND SOFTWARE APPLICATIONS

Testing is in progress with ESS and a number of software products under various system configurations. Such activities include:

Microsoft Certification

The ESS is on the Microsoft Hardware Compatibility Listing (HCL). See Microsoft's web site at: http://www.microsoft.com/hcl/default.asp. Under search for the following products, put IBM. Under search in the following types, choose Cluster, Cluster/Multi-cluster device, Cluster/DataCenter 2-node, Cluster/DataCenter 4-node, Cluster/RAID System, Storage/RAID System or System/Server DataCenter.

Novell Certification

Novell certification has been achieved with NetWare 5.0 and NetWare 5.1. For more information, see Novell's web site at: http://www.novell.com

SAP

ESS and SAP testing has been completed on S/390 systems. Open system testing is underway. See the following url for ESS and SAP white paper references: http://www.storage.ibm.com/hardsoft/diskdrls/technology.htm

Oracle

ESS Copy Services are listed with the Oracle Storage Compatibility Program, see: http://www.oracle.com/ip/deploy/database/storage/index.html?vendors.html and http://www.storage.ibm.com/hardsoft/disk/oracle7-17news.htm

BMC

On September 24, 2001, BMC Software announced support for the IBM ESS through BMC's storage management solution, Application-Centric Storage Management® (ACSM). With PATROL for IBM ESS, you can analyze IBM ESS configurations, compare their performance against your expectations, and locate areas that may need reconfiguring, see: http://www.bmc.com/products/document/00040298/09003201805414f4.html

Tivoli

IBM Tivoli® Data Protection for Enterprise Storage Server™ (ESS) Databases, a high-performance backup recovery solution provides online backup for DB2® and exploits the IBM ESS disk subsystem with its new "FlashCopy" function. The online backup solution virtually eliminates backup-related performance impacts, downtime, and user disruption on the production host. This solution is also available for Oracle databases. See Software Announcement 201-351 dated November 27, 2001.

The IBM Tivoli Data Protection for Enterprise Storage Server Databases publication is available in HTML and PDF formats on the Tivoli Web site at: http://www.tivoli.com/support/documents. For more information see: http://www.tivoli.com/products/index/data_protect_ess/index.html

Command-Line Interface (CLI)

The CLI enables open systems hosts to invoke and manage FlashCopy and PPRC functions through batch processes and scripts. The CLI provides commands to query the status of ESS volumes and to execute copy services tasks that were previously created within the IBM TotalStorage Enterprise Storage Server Specialist.

The CLI is provided with the ESS at no additional charge and is supported on the following operating systems:

- AIX 4.2.1, 4.3.1, 4.3.2, 4.3.3, and 5.1
- HP-UX 10.20, 11.00, and 11i [23]
- NetWare 4.2 and 5.1
- ptx 4.4.7, 4.4.8, 4.4.9,4.4.10, 4.5.1, 4.5.2, 4.5.3, and 4.6.1[24]
- Red Hat Linux 7.1
- Solaris 2.6, 7, and 8
- SuSE Linux 7.2
- Tru64 UNIX 4.0F, 4.0G, 5.1, 5.1A [25]
- Windows NT 4.0
- Windows 2000

Refer to *IBM TotalStorage Enterprise Storage Server Copy Services Command Line-Interface User's Guide* (SC26 - 7449) for additional information. This guide can be found at http://ssddom02.storage.ibm.com/disk/ess/documentation.html

FlashCopy

FlashCopy provides a near instantaneous copy of data to help minimize the downtime needed for data backup. FlashCopy creates a physical point-in-time copy of data and makes it possible to immediately access both the source and target copies. By creating an "instant" copy, FlashCopy enables applications using either the source or the target to operate with only a minimal interruption to perform the FlashCopy. FlashCopy is an optional feature on the ESS.

Extended Remote Copy (XRC)

XRC helps support business continuance by maintaining a copy of data asynchronously at a remote location (at unlimited distances). It is a combined hardware and software solution that offers data integrity and data availability in a disaster recovery, workload movement, and disk migration environment. XRC is an optional feature on the ESS and is supported in the zSeries and S/390 environments only.

Peer-to-Peer Remote Copy (PPRC)

PPRC is a hardware-based business continuance solution that provides real-time mirroring of logical volumes within an ESS or to another ESS. PPRC is an optional feature on the ESS.

IBM supports the use of PPRC in the following modes. Refer to Table 4b for ESS model support and LIC prerequisites.

[23] CLI support for HP-UX 11i requires ESS LIC level 1.5.2, or later.
[24] CLI support for ptx 4.4.7, 4.4.8, and 4.4.9 is available via RPQ only.
[25] CLI support for Tru64 UNIX requires ESS LIC level 1.5.2, or later.

PPRC Synchronous mode

PPRC synchronous mode can be used for real-time data mirroring. In this mode, updates made on the primary ESS (local site) are synchronously shadowed to a secondary ESS (remote site).

Since this is a synchronous operation, the distance between the primary and secondary ESS will affect the application response time. Therefore, when operating in this mode, PPRC has a standard maximum supported distance of 103 km between the primary and secondary ESS.

PPRC synchronous mode can be used at distances beyond 103 km with prior approval from IBM. Approval can be requested by submitting a Request for Price Quotation (RPQ). The RPQ should include information on distance between sites, the channel extension technology, the type of telecom line, the amount of network bandwidth, the ESS capacity, and a general description of the workload.

Long Distance Data Copy / Migration

PPRC can be used for long distance data copy or migration of static volumes. Static volumes are volumes that do not have write I/O activity while the PPRC copy of data from the primary to the secondary is in progress.

Since there is no write I/O activity while the PPRC data copy is in progress, the distance between the primary and secondary ESS will not affect application response time. Therefore, when operating in this mode, PPRC can be used with much greater distances between the primary and secondary ESS (as compared to PPRC synchronous mode).

Distances beyond 103 km will require the use of channel extension technology, and the channel extender vendor will determine the maximum distance supported. The vendor should be contacted for their distance capability, line quality requirements, and WAN attachment capabilities.

PPRC Extended Distance (PPRC-XD)

PPRC-XD is a non-synchronous long distance copy option suitable for data migration and periodic offsite backup.

With a non-synchronous operation, the distance between the primary and secondary ESS will have only a minimal effect on the application response time. Therefore, PPRC-XD can operate at very long distances.

Distances beyond 103 km will require the use of channel extension technology, and the channel extender vendor will determine the maximum distance supported. The vendor should be contacted for their distance capability, line quality requirements, and WAN attachment capabilities.

Note: When operating in PPRC-XD mode, the ESS primary and secondary does not transition to full synchronous mode. This can result in a "fuzzy copy" at the remote site since application dependent writes are not assured to be applied on the secondary ESS in the same sequence as they were written to the primary ESS. Various methods are available to obtain a consistent copy; refer to the following IBM Redbook for additional information:

- IBM TotalStorage Enterprise Storage Server: PPRC Extended Distance (SG24-6568)

Table 4a: ESS Model and LIC Prerequisites for PPRC

	ESS Models E10 and E20 (Minimum ESS LIC level)	**ESS Models F10 and F20 (Minimum ESS LIC level)**
PPRC synchronous	1.3.0	1.3.0
PPRC long distance data copy / migration (static volumes)	Not supported	1.5.0
PPRC-XD	Not supported	1.5.2 [26]

[26] In the IBM iSeries and AS/400 environment, PPRC-XD is supported OS/400 Version 5 Release 1, or later.

PPRC Channel Extension, DWDM, and Network Connectivity Options

IBM supports the use of the following products with PPRC:

- ESCON directors
- Channel extenders
  - CNT UltraNet Storage Director
  - INRANGE 9801 Storage Networking System
- DWDMs (Dense Wave Division Multiplexers)
  - Cisco ONS 15540
  - IBM 2029 Fiber Saver
  - Nortel Networks OPTera Metro 5300

Refer to Tables 4b and 4c for supported configurations and ESS LIC prerequisites. Additionally, the product vendors should also be consulted regarding hardware and software prerequisites when using their products in an ESS PPRC configuration.

When using PPRC with channel extenders, IBM supports the use of PPRC over all the network technologies that are currently supported by the channel extender products, including Fibre Channel, Ethernet/IP, ATM-OC3, and T1/T3. Evaluation, qualification, approval, and support of PPRC configurations using channel extender products are the sole responsibility of the channel extender vendor. The vendor should be contacted for their distance capability, line quality requirements, and WAN attachment capabilities.

Table 4b: PPRC and Channel Extender Support

	CNT UltraNet Storage Director	**INRANGE 9801 Storage Networking System**
PPRC synchronous	1.5.2	1.3.0
PPRC long distance data copy / migration (static volumes)	1.5.2	1.5.0
PPRC-XD	1.5.2	1.5.2

Table 4c: PPRC and DWDM Support

	IBM 2029 Fiber Saver	**Cisco ONS 15540**	**Nortel Networks OPTera Metro 5300**
PPRC (synchronous)	1.3.0	1.3.4.41	1.3.4.41
PPRC long distance data copy / migration (static volumes)	1.5.0	1.5.0	1.5.0
PPRC-XD	1.5.2	1.5.2	1.5.2

SAN Fabric Products

Product information, including features, specifications, and hardware and software prerequisites is available at:

IBM: www.ibm.com/storage/ibmsan/products/sanfabric.html

INRANGE: www.inrange.com/ibm/

McDATA: www.mcdata.com/ibm/

The ESS supports Fibre Channel / FICON intermix on the INRANGE FC/9000 Fibre Channel Director (IBM 2042 Models 001 and 128) and the McDATA ED-6064 Enterprise Fibre Channel Director (IBM 2032 Model 064). With intermix, both FCP (Fibre Channel Protocol) and FICON upper level protocols can be supported within the same director when deployed independently by port. Cascading of directors is not currently supported with Fibre Channel / FICON intermix.

Fibre Channel / FICON intermix support requires ESS LIC level 1.5.2, or later. Implementation details and operational information for using intermix are available at the INRANGE and McDATA websites.

Host Adapters

Any configuration with multiple FC host adapters from different manufacturers must be looked at carefully. Multiple I/O drivers installed in a single O/S environment may conflict, even between different models from the same manufacturer. Mostly this affects older models of host adapters, as manufacturers are trying to eliminate conflicts in new products. Also, no single host adapter can be configured with more than one I/O driver. Thus, if a host adapter has a different I/O driver for each different type of peripheral, (such as disk and tape) you must choose one and only one driver for that particular host adapter. This may result in forcing you to configure more host adapters, (one for each peripheral type) than otherwise might be done, but this may also provide improved performance.

All Fibre Channel host adapters should be configured to run in "Class-3" mode.

Part of any configuration planning exercise should be a visit to the web pages and support documentation for any host adapters. Most host adapters have a number of variable parameters that must be selected via jumpers, switches or a configuration utility to configure the adapter for the specific environment in which it will be working. Performance optimization is also part of host adapter configuration and the factory defaults may not be right for your installation. Be sure that you have the latest version of I/O driver for your host adapter and O/S environment too by consulting the web pages. Some web sites are listed below:

QLogic: http://www.qlogic.com/support/oem_detail_all.asp?oemid=22

Emulex: http://www.emulex.com/ts/dds.html

JNI: http://www.jni.com/OEM/oem.cfm?ID=4

NUMA-Q: Consult ptx/IBM-ESS Release Notes received with the product.

SCSI

Servers	Operating Systems	Host Adapters	Fabric Support

AlphaServer
• 800
• 1200
• 2100
• 4000, 4000A
• 4100
• 8200, 8400
• DS10, DS20, DS20E
• ES40
• GS60, GS60E, GS140
	OpenVMS
	• 6.2-1 H3
	• 7.1-2, 7.2-1
	• 7.3
	
	Tru64 UNIX
	• 4.0D, 4.0E
	• 4.0F, 4.0G
	  • ASE 1.6
	• 5.0A
	  • TruCluster 5.0A
	• 5.1
	  • TruCluster 5.1
	• 5.1A [28]
	  • TruCluster 5.1A [28]
		Storage Works
		• KZPBA-CB
			N/A

Fibre Channel[29]

Servers	Operating Systems	Host Adapters	Fabric Support

AlphaServer
• 800
• 1200
• 2100
• 4000, 4000A
• 4100
• 8200, 8400
• DS10, DS20, DS20E
• ES40
• GS60, GS60E, GS140
• GS80, GS160, GS320 [28]
	Tru64 UNIX
	• 4.0F, 4.0G
	  • ASE 1.6
	• 5.0A
	  • TruCluster 5.0A
	• 5.1
	  • TruCluster 5.1
	• 5.1A [28]
	  • TruCluster 5.1A [28]
		Storage Works
		• KGPSA-BC
		• KGPSA-CA
			IBM
			• 2109 F16
			• 2109 Models S08 and S16
			• 3534 Model F08 [28]

[27] Copy services for Tru64 UNIX are supported on the ESS Models F10 and F20 and require ESS LIC level 1.5.2, or later.

[28] Supported on the ESS Models F10 and F20 and requires ESS LIC level 1.5.2, or later.

[29] Fibre channel support requires ESS LIC Level 1.3.3.27, or later.

SCSI

Servers	Operating Systems	Host Adapters	Fabric Support
AviiON • 4900 • 5000	DG/UX • 4.2	Adaptec • AHA-2944UW • AHA-4944W	N/A

Fibre Channel

Servers	Operating Systems	Host Adapters	Fabric Support
Not Supported			

SCSI

Servers	Operating Systems	Host Adapters	Fabric Support

HP 9000 Enterprise Servers
• D-Class
• E-Class
• G-Class
• H-Class
• I-Class
• K-Class
• L-Class
• N-Class
• T-Class
• V-Class
• Enterprise Parallel Servers
	HP-UX
	• 10.20[30]
	• 11.00
	  • MC/ServiceGuard 11.05/09[31]
	  • PVLINKS
	• 11i
	  • MC/ServiceGuard 11i
	  • PVLINKS
		Hewlett-Packard
		• A2969A[32]
		• A4107A
		• A4800A[33]
		• A5159A[34]
		• 28696A
			N/A

Fibre Channel[35]

Servers	Operating Systems	Host Adapters	Fabric Support[36]

HP 9000 Enterprise Servers
• D-Class
• K-Class
• L-Class
• N-Class
• V-Class
	HP-UX
	• 11.00
	  • MC/ServiceGuard 11.05/09[37]
	  • PVLINKS
	• 11i
	  • MC/ServiceGuard 11i
	  • PVLINKS
		Hewlett-Packard
		• A3591B
		• A3404A[38]
		• A5158A[39]
		• A6684A[40]
		• A6685A[41]
			IBM
			• 2109 Models S08 and S16
			• 2109 Model F16
			• 3534 Model F08 [42]
			
			McDATA
			• ED-5000 (2032-001)
			• ED-6064 (2032-064)
			• ES-3016 (2031-016)
			• ES-3032 (2031-032)
			
			INRANGE[43]
			• FC9000 (2042-001)
			• FC9000-128 (2042-128)

[30] SDD does not support HP-UX revision 10.20.

[31] Supported on K, L, N, and V class only.

[32] Supported on the K class only.

[33] Supported on N and L class only.

[34] Firmware level 3636, or later is recommended for use with the 28696A adapter.

[35] Minimum level supporting fibre channel attachment is ESS LIC Level 1.3.0, or later.

[36] The A5158A adapter is required for fibre channel switched fabric support.

[37] Supported on K, L, N, and V class only.

[38] FW 38.22 or above.

[39] Supported on K, L, N and V class only. HP-UX patch PHKL_22759 or its superseded patch must be installed.

[40] Supported on D Class only, Driver level 11.00.07.

[41] Supported on K Class only, Driver level 11.00.07.

[42] The IBM 3534 Model F08 is supported on the ESS Models F10 and F20 and requires ESS LIC level 1.5.2, or later.

[43] ESS level for INRANGE support must be at ESS LIC Level 1.3.2.50, or later or ESS LIC Level 1.3.3.27, or later.

SCSI

Servers	Operating Systems	Host Adapters	Fabric Support
9406 Advanced Series • 300, 310, 320 • 500, 510, 530 9406 • 620, 640, 650, • 720, 730, 740 • S20, S30, S40 iSeries • 820, 830, 840 • SB2, SB3	OS/400 • V3R1, V3R2, V3R6, V3R7 • V4R1, V4R2, V4R3, V4R4 • V4R5 • V5R1	IBM AS/400 • FC 6501	N/A

Fibre Channel

Servers	Operating Systems	Host Adapters	Fabric Support
iSeries • 270, 820, 830, 840	OS/400 • V5R1	IBM AS/400 • FC2766 (short wave)	IBM • 3534 1RU • 2109 S08/S16 in QuickLoop mode

SCSI

Servers	Operating Systems	Host Adapters	Fabric Support
Not Supported			

Fibre Channel

Servers	Operating Systems	Host Adapters	Fabric Support
2000 • E100 • E200 • E320 • E400 • E410 • xSeries 430	DYNIX/ptx[44] • 4.4.7 • 4.4.8 • 4.4.9 • 4.5.1 with service pack 3 • 4.5.2 • 4.5.3 • 4.6.1 • 4.4.10[45]	IBM NUMA-Q • IOC-0210-54	IBM • 2109 Models S08 and S16

All supported configurations require ESS LIC Level 1.2.1, or later.

[44] Dynix 4.4.7, 4.4.8 and 4.4.9 support for Fibre Channel is available via RPQ (NSBO) only. These versions can only address the entire storage using the first 8 LSS i.e. 0-7. They must have driver ptx/IBM-ESS v1.1.0 for ESS support as a minimum level.

[45] Dynix 4.4.10 requires ESS LIC Level 1.4.0, or later.

SCSI

Servers	Operating Systems	Host Adapters	Fabric Support
7012 • G40 • 397 7013 • J30, J40, J50 • S70, S70 Advanced (S7A) • 590, 591, 595, 59H 7015 • R20, R24, R30, R40, R50 • S70, S70 Advanced (S7A) • 99J, 99K 7017 • S70, S70 Advanced (S7A) • S80 7024 • E20, E30 7025 • F30, F40, F50, F80 • H70 7026 • H10, H50, H70, H80 • M80 7040 • 671 [46] • 681 [47] 7043 • 270 7044 • 170, 270 pSeries • 610 (7028-6C1) • 610 (7028-6E1) • 620 (7025 6F1/6F0) • 640 (7026 B80) • 660 (7026 6H1/6H0) • 660 (7026 6M1) • 670 (7040 671) [46] • 680 (7017 S85) • 690 (7040-681) [47]	AIX • 4.2.1 • 4.3.1, 4.3.2, 4.3.3 • 5.1 HACMP [48] • 4.2.2 • 4.3.1 • 4.4.0 • 4.4.1	IBM RS/6000 • FC 2412 • FC 6204 • FC 6207	N/A

[46] The pSeries 670 requires ESS LIC level 1.5.1, or later.

[47] The pSeries 690 requires ESS LIC Level 1.4.0, or later.

[48] Insure that all current PTFs are installed on HACMP and reference Table 4 for supported HACMP levels.

Fibre Channel [49]

Servers	Operating Systems	Host Adapters	Fabric Support
7013 • S70, S70 Advanced (S7A) 7015 • S70, S70 Advanced (S7A) 7017 • S70[50], S70 Advanced (S7A), S80 7025 • F50, F80 • H70 7026 • H50, H70, H80 • M80 7040 • 671 [51] • 681 [52] 7043 • 270 7044 • 170 • 270 pSeries • 610 (7028-6C1) • 610 (7028-6E1) • 620 (7025 6F1/6F0) • 640 (7026 B80) • 660 (7026 6H1/6H0) • 660 (7026 6M1) • 670 (7040 671) [51] • 680 (7017 S85) • 690 (7040-681)[52]	AIX • 4.3.3 • 5.1 HACMP[53] • 4.3.1 • 4.4.0 • 4.4.1	IBM RS/6000 • FC 6227[54] • Code 3.22A1 • FC 6228 • Code 3.82A1	IBM • 2103 Model H07[55] • 2109 Models S08 and S16 • 2109 Model F16 • 3534 Model F08 [56] McDATA • ED-5000 (2032-001) • ED-6064 (2032-064) • ES-3016 (2031-016) • ES-3032 (2031-032) INRANGE[57] • FC9000 (2042-001) • FC9000-128 (2042-128)

[49] Native Fibre Channel requires ESS LIC Level 1.2.0, or later.

[50] The S70 only supports 6227 (not 6228).

[51] The pSeries 670 support requires ESS LIC level 1.5.1, or later.

[52] The pSeries 690 requires AIX 5.1C with ESS LIC Level 1.4.0, or later.

[53] Insure that all current PTFs are installed on HACMP and reference Table 4 for supported HACMP levels.

[54] FC 6227 announced as withdrawn on September 4, 2001 with effective date of December 3, 2001.

[55] The IBM 2103 is supported for distance solutions only. Multiple initiators or targets on the same loop are not supported.

[56] The IBM 3534 Model F08 is supported on the ESS Models F10 and F20 and requires ESS LIC level 1.5.2, or later.

[57] For INRANGE support the ESS must be at ESS LIC Level 1.3.2.50, or later or ESS LIC Level 1.3.3.27, or later.

Table 4: RS/6000 AIX/HACMP Support Matrix (use all current PTFs)

AIX/HACMP Levels

Hardware/Software Options	AIX 4.2.1 HACMP 4.2.2	AIX 4.3.3 HACMP 4.2.2	AIX 4.3.3 HACMP 4.3.1	AIX 4.3.3 HACMP 4.4.0	AIX 5.1 HACMP 4.4.0[58]	AIX 5.1 & 4.3.3 HACMP 4.4.1[59]
ESS E10-E20	SCSI only	SCSI only	SCSI + FC	SCSI + FC	SCSI + FC	SCSI + FC
ESS F10-F20	Not Supported	Not Supported	SCSI + FC	SCSI + FC	SCSI + FC	SCSI + FC
Fabric Switch 2109-S08/S16	Not Supported	Not Supported	Yes	Yes	Yes	Yes
ED5000	Not Supported	Not Supported	Yes	Yes	Yes	Yes
ED6064, 3032, 3016	Not Supported	Not Supported	Yes	Yes	Yes	Yes
FC9000, FC9000-128	Not Supported	Not Supported	Yes	Yes	Yes	Yes
SDG 2108-G07	Not Supported	Not Supported	Yes	Yes	No	No
SDD	Not Supported	Not Supported	Yes	Yes	Yes	Yes[60]

Note: SDD does NOT support the SDG, (2108 –G07).

[58] HACMP can only run on 32-bit AIX kernels. Even if the hardware is capable of supporting 64-bit kernels, it must be bosboot'd with a 32-bit kernel. Currently Version 4.4.0 only supports HAS and CRM.

[59] HACMP can only run on 32-bit AIX kernels. Even if the hardware is capable of supporting 64-bit kernels, it must be bosboot'd with a 32-bit kernel. Currently Version 4.4.0 only supports HAS and CRM.

[60] RS/6000 SP requires AIX 5.1C with ESS LIC Level 1.4.0.

SCSI

Servers	Operating Systems	Host Adapters	Fabric Support

9076 Models 2xx, 3xx, 4xx, 50x, 55x, and T70 with the following nodes:
 	
Micro Channel
• FC 2002 - 62MHz Thin Node
• FC 2003 - 66MHz Thin Node
• FC 2004 - 66MHz Thin Node 2
• FC 2005 - 77MHz Wide Node
• FC 2006 - 604 High Node
• FC 2007 - 135MHz Wide Node
• FC 2008 - 120MHz Thin Node
• FC 2009 - 604E High Node
• FC 2022 - 160MHz Thin Node
 	
PCI
• FC 2050 - 332 MHz SMP Single Thin Node
• FC 2051 - 332 MHz SMP Wide Node
• FC 2052 – POWER3 SMP Thin Node
• FC 2053 – POWER3 SMP Wide Node
• FC 2054 – POWER3 SMP High Node
• FC 2055 - SP Expansion I/O Unit
• FC 2056 – POWER3 375MHz SMP Thin Node
• FC 2057 – POWER3 375MHz SMP Wide Node
• FC 2058 – POWER3 375MHz SMP High Node
	AIX-SP
	• 4.2.1
	• 4.3.1, 4.3.2, 4.3.3
	• 5.1C[61]
	
	PSSP
	•
	• 3.1, 3.1.1, 3.2
	
	For SDD Support the following is required:
	
	AIX 4.3.3[62]
	• PSSP 3.1.1
	  • GPFS 1.2
	  • SDD 1.2.1.3
	• PSSP 3.2
	  • GPFS 1.3 or 1.4
	  • SDD 1.2.1.3
		IBM RS/6000
		• FC 2412
		• FC 6204
		• FC 6207
		• FC 6209
			N/A

[61] Requires ESS LIC Level 1.4.0.

[62] For SDD support AIX 4.3.3 must be at Service Level 8 with APAR 1Y17902 and 1Y18070, or later, PSSP 3.2 PTF 10, or later, PSSP 3.1.1 PTF 18, or later, ESS Host scripts for AIX IBM2105.rte at 32.6.100.6, or later. **Important Read** "IBM Subsystem Device Driver Installation and User's Guide" and RVSD readme before using RVSD with SDD. SCSI Adapters FC 6204, 6207 & 6209 are only supported. Use ESS LIC Level 1.3.2.50, or later.

Fibre Channel [63]

Servers	Operating Systems	Host Adapters	Fabric Support

9076 Models 2xx, 3xx, 4xx, 50x, 55x, and T70 with the following PCI nodes:
• FC 2050 - 332 MHz SMP Single Thin Node
• FC 2051 - 332 MHz SMP Wide Node
• FC 2052 – POWER3 SMP Thin Node
• FC 2053 – POWER3 SMP Wide Node
• FC 2054 – POWER3 SMP High Node
• FC 2055 - SP Expansion I/O Unit
• FC 2056 – POWER3 375MHz SMP Thin Node
• FC 2057 – POWER3 375MHz SMP Wide Node
• FC 2058 – POWER3 375MHz SMP High Node
	AIX-SP[64]
	• 4.3.3
	• 5.1C[65]
	
	PSSP
	• 3.1.1, 3.2, 3.4
	
	RVSD
	• 3.2
	  • GPFS 1.3
	
	For SDD Support the following is required:
	
	AIX 4.3.3[66]
	• PSSP 3.1.1
	  • GPFS 1.2
	  • SDD 1.2.1.3
	• PSSP 3.2
	  • GPFS 1.3 or 1.4
	  • SDD 1.2.1.3
	
	AIX 5.1C
	• PSSP 3.4 + PTF 1
	  • GPFS 1.5
	  • SDD 1.3.1.1
		IBM RS/6000
		• FC 6227
		  • Code 3.22A1
		• FC 6228
		  • Code 3.82A1
			IBM
			• 2103 Model H07[67]
			• 2109 Models S08 and S16
			• 2109 Model F16
			• 3534 Model F08 [68]
			
			McDATA
			• ED-5000 (2032-001)
			• ED-6064 (2032-064)
			• ES-3016 (2031-016)
			• ES-3032 (2031-032)
			
			INRANGE[69]
			• FC9000 (2042-001)
			• FC9000-128 (2042-128)

[63] Native Fibre Channel requires ESS LIC Level 1.2.0, or later

[64] Insure that all PTFs are installed and reference Table 5 for supported software levels.

[65] Requires ESS LIC Level 1.4.0.

[66] For SDD support AIX 4.3.3 must be at Service Level 8 with APAR 1Y17902 and 1Y18070, or later, PSSP 3.2 PTF 10, or later, PSSP 3.1.1 PTF 18, or later, ESS Host scripts for AIX IBM2105.rte at 32.6.100.6, or later. **Important Read** "IBM Subsystem Device Driver Installation and User's Guide" and RVSD readme before using RVSD with SDD. Use ESS LIC Level 1.3.2.50, or later.

[67] The IBM 2103 is supported for distance solutions only. Multiple initiators or targets on the same loop are not supported.

[68] The IBM 3534 Model F08 is supported on the ESS Models F10 and F20 and requires ESS LIC level 1.5.2, or later.

[69] For INRANGE support the ESS level must be at ESS LIC Level 1.3.2.50, or later or ESS LIC Level 1.3.3.27, or later.

Table 5: RS/6000 SP AIX/PSSP & RVSD Support Matrix (use all current PTFs)

AIX/PSSP Levels[70]

Hardware/Software Options	AIX 4.3.2 PSSP & RVSD 3.1.0 GPFS 1.2	AIX 4.3.3 PSSP & RVSD 3.1.1 GPFS 1.2	AIX 4.3.3 PSSP & RVSD 3.2.0 GPFS 1.3	AIX 4.3.3 PSSP & RVSD 3.2.0 GPFS 1.4
ESS E10-E20-F10-F20	SCSI only	SCSI + FC	SCSI + FC	SCSI + FC
Fabric Switch 2109 S08/S16	Not Supported	Yes	Yes	Yes
ED5000	Not Supported	Yes	Yes	Yes
ED6064, 3032, 3016	Not Supported	Yes	Yes	Yes
FC9000, FC9000-128	Not Supported	Yes	Yes	Yes
SDG 2108-G07	Not Supported	Yes	Yes	Yes
SDD 1.2.0	Not Supported	Not Supported	Not Supported	Not Supported
SDD 1.2.1.3	Not Supported	Supported	Supported	Supported
Oracle Parallel Server	Not supported	Yes	Yes	Yes

Notes: SDD does NOT support the SDG, (2108-G07). SDD is not needed if Oracle Parallel Server is installed.
Use Table 4 in the RS/6000 section for HACMP support under RS/6000 SP.

[70] For SDD support AIX 4.3.3 must be at Service Level 8 with APAR 1Y17902 and 1Y18070, or later, PSSP 32 PTF 10, or later, PSSP 3.1.1 PTF 18, or later, ESS Host scripts for AIX IBM2105.rte at 32.6.100.6, or later. **Important Read** "IBM Subsystem Device Driver Installation and User's Guide" and RVSD readme before using RVSD with SDD. Use ESS LIC Level 1.3.2.50, or later.

ESCON

Servers	Operating Systems[71]	Host Adapters	Fabric Support
zSeries z900 • IBM 2064 - all models **S/390 Parallel Enterprise Server** • IBM 9672 Generation 3 - all models • IBM 9672 Generation 4 - all models • IBM 9672 Generation 5 - all models • IBM 9672 Generation 6 - all models **ES/9000** • IBM 9021 - all models • IBM 9121 - all models • IBM 9221 - all models **ES/3090** • IBM 3090 - all models **S/390 Multiprise 3000 Enterprise Server** • IBM 7060 - all models **S/390 Multiprise 2000 Enterprise Server** • IBM 2003 - all models	**z/OS** • Version 1 Release 1 • Version 1 Release 2 • Version 1 Release 3 **OS/390** • Version 1 Release 3 @ • Version 2 Release 4 @ • Version 2 Release 5 @ • Version 2 Release 6 @ • Version 2 Release 7 @ • Version 2 Release 8 • Version 2 Release 9 • Version 2 Release 10 **z/VM** • Version 3 Release 1 • Version 4 Release 1 • Version 4 Release 2 **VM/ESA** • Version 2 Release 2 @ • Version 2 Release 3 @ • Version 2 Release 4 **VSE/ESA** • Version 2 Release 1 @ • Version 2 Release 2 @ • Version 2 Release 3 @ • Version 2 Release 4 • Version 2 Release 5 • Version 2 Release 6 [72] **Transaction Processing Facility (TPF)** [73] • Version 4 Release 1 **Linux for S/390** [74] • SuSE Linux Enterprise Server for S/390 • Turbolinux Server 6 for zSeries and S/390	All ESCON host adapter features offered on the Servers are supported	**IBM** • 9032 Model 002 • 9032 Model 003 • 9032 Model 005

[71] Consult with your IBM Storage Specialist to obtain operating system PTF Information.

[72] VSAM support for up to 32760 cylinders is targeted for 1Q02. Support requires ESS LIC Level 1.5.0.

[73] PPRC and FlashCopy are supported on the ESS Models F10 and F20 and require ESS LIC level 1.5.0 or later. XRC is not supported in the TPF environment.

[74] XRC, PPRC, and FlashCopy are not currently supported in the Linux for S/390 environment.

FICON[75]

Servers	Operating Systems[76]	Host Adapters	Fabric Support
zSeries z900 • IBM 2064 - all models **S/390 Parallel Enterprise Server** • IBM 9672 Generation 5 - all models • IBM 9672 Generation 6 - all models	**z/OS** • Version 1 Release 1 • Version 1 Release 2 • Version 1 Release 3 **OS/390** • Version 2 Release 8 • Version 2 Release 9 • Version 2 Release 10 **z/VM** • Version 3 Release 1 • Version 4 Release 1 • Version 4 Release 2 **VM/ESA** • Version 2 Release 3 @ • Version 2 Release 4 **VSE/ESA** • Version 2 Release 3 • Version 2 Release 4 • Version 2 Release 5 • Version 2 Release 6 [77] **Transaction Processing Facility (TPF)** [78] • Version 4 Release 1	**zSeries** • FC 2315 • FC 2318 • FC 2319 • FC 2320 **S/390** • FC 2314 • FC 2316	McDATA[79] • ED-5000 (2032-001) • ED-6064 (2032-064) INRANGE[80] • FC9000 (2042-001) • FC9000-128 (2042-128)

[75] This support is available on the ESS Models F10 & F20 and requires ESS LIC Level 1.4.0, or later.

[76] Consult with your IBM Storage Specialist to obtain operating system PTF information.

[77] VSAM support for up to 32760 cylinders is targeted for 1Q02. Support requires ESS LIC Level 1.5.0.

[78] PPRC and FlashCopy are supported on the ESS Models F10 and F20 and require ESS LIC level 1.5.0 or later. XRC is not supported in the TPF environment.

[79] McDATA microcode level for FICON support is 3.2 for ED-5000 and 1.2.2 for ED-6064.

[80] INRANGE package level for FICON support is 2.1.5 for FC9000 and FC9000-128.

Fibre Channel [81]

Servers	Operating Systems	Host Adapters	Fabric Support
Pentium Pro or later processors • 200 MHz processor or faster • 128 MB memory or greater • Excludes IBM Netfinity 3000 and IBM PC Server 325	Red Hat Linux • 7.1 SuSE Linux • 7.2	QLogic • QLA2300F	IBM • 2109 Models S08 and S16 • 2109 Model F16 • 3534 Model F08 [82] McDATA • ED-5000 (2032-001) • ED-6064 (2032-064) • ES-3016 (2031-016) • ES-3032 (2031-032) INRANGE[83] • FC9000 (2042-001) • FC9000-128 (2042-128)

[81] Linux is supported on the ESS Models F10 and F20 only and requires ESS LIC Level 1.5.0, or later. Also requires Linux kernel level 2.4.9.

[82] The IBM 3534 Model F08 is supported on the ESS Models F10 and F20 and requires ESS LIC level 1.5.2, or later.

[83] Requires INRANGE package level 3.0.1.

SCSI

Servers	Operating Systems	Host Adapters	Fabric Support

Pentium Pro or later processors
• 200 MHz processor or faster
• 128 MB memory or greater
	Microsoft Windows NT[85]
	• Server 4.0
	• Server 4.0, Enterprise Edition
	  • MSCS
	Microsoft Windows 2000 [86]
	• Server
	• Advanced Server
	  • Cluster Server
		Adaptec
		• AHA-2944UW
		IBM Netfinity/xSeries
		• P/N 08L6517 [87]
		• P/N 59H3900
		QLogic
		• QLA1041
		Symbios
		• SYM8751D
			N/A

[84] IBM Server Proven see: http://www.pc.ibm.com/us/compat/storage/smatrix.html

[85] Support for NT with MSCS requires ESS LIC Level 1.3.0, or later.

[86] Microsoft Windows 2000 support requires ESS LIC Level 1.2.0, or later. MS clustering support with SDD requires ESS LIC Level 1.4.0, or later.

[87] P/N 08L6517 contains an incorrect cable for ESS attachment. Order FC 9701, (10M) or FC 9702, (20M) SCSI cable to use with this host adapter and ESS.

Fibre Channel[88]

Servers	Operating Systems	Host Adapters	Fabric Support

Pentium Pro or later processors
• 200 MHz processor or faster
• 128 MB memory or greater
• Excludes IBM Netfinity 3000 and IBM PC Server 325
	Microsoft Windows NT[89]
	• Server 4.0
	• Server 4.0, Enterprise Edition
	  • MSCS[90]
	Microsoft Windows 2000[91]
	• Server
	• Advanced Server
	  • Cluster Server
		IBM Netfinity/xSeries
		• P/N 01K7297
		• P/N 00N6881
		QLogic
		• QLA2100F
		• QLA2200F[92]
		Emulex [93]
		• LP7000E
		• LP8000
			IBM
			• 2103 Model H07[94]
			• 2109 Models S08 and S16
			•
			• 2109 Model F16[95]
			• 3534 Model F08 [96]
			• 3534 Model IRU
			McDATA
			• ED-5000 (2032-001)[97]
			• ED-6064 (2032-064)
			• ES-3016 (2031-016)
			• ES-3032 (2031-032)
			INRANGE[98]
			• FC9000 (2042-001)
			• FC9000-128 (2042-128)

[88] Native Fibre Channel requires ESS LIC Level 1.2.0, or later.

[89] Support for NT with MSCS requires ESS LIC Level 1.3.0, or later.

[90] If the QLogic QLA2100F or the Netfinity 01K7297 is used to build the cluster, revision 6.17 driver is required.

[91] Microsoft Windows 2000 support requires ESS LIC Level 1.2.0, or later. MS clustering support requires ESS LIC Level 1.3.0, or later without SDD and ESS LIC Level 1.4.0 with SDD. MS clustering with SDD is not supported with the QLA2100F adapter.

[92] The I/O drivers supported are 7.05.02 for non-clustered environments with Windows 2000 and 8.00.08 for clustered environments with Windows 2000 and for NT. Use Bios 1.61 for both drivers. (see QLogic web site to obtain the drivers). Do not use newer revisions.

[93] If Emulex adapters are used with the McDATA ED-5000; then non-switched configurations are not supported. Additionally for Fibre Channel via the SAN Data Gateway, the ED-5000 is only supported on the Emulex adapters.

[94] The IBM 2103 and 3534IRU are supported for distance solutions only. Multiple initiators or targets on the same loop are not supported.

[95] ESS also supports QLA2300F and LP9002 host bus adapters with Windows NT 4.0 SP 6a and Windows 2000 SP 2 with the 2109-F16.

[96] The IBM 3534 Model F08 is supported on the ESS Models F10 and F20 and requires ESS LIC level 1.5.2, or later.

[97] The McDATA ED-5000 in native FC configurations requires the LP7000E, LP8000 or the QLA2200F. QLA2100F is not supported with McDATA.

[98] INRANGE requires adapters QLA2200F or LP8000. INRANGE support must be at ESS LIC Level 1.3.2.50, or later or ESS LIC Level 1.3.3.27, or later.

SCSI

Servers	Operating Systems	Host Adapters	Fabric Support

Pentium Pro or later processors
• 200 MHz processor or faster
• 128 MB memory or greater
	Novell NetWare[99]
	• 4.11@
	• 4.2
	  • Standby Server
	• 5.0
	  • Cluster Service s1.00
	  • Cluster Services 1.01
	• 5.1
	  • Cluster Services 1.01
	• 6.0 [100]
		Adaptec
		• AHA-2944UW
		
		IBM Netfinity/xSeries
		• P/N 08L6517 [101]
		• P/N 59H3900
		
		QLogic
		• QLA1041
			N/A

Fibre Channel[102]

Servers	Operating Systems	Host Adapters	Fabric Support

Pentium Pro or later processors
• 200 MHz processor or faster
• 128 MB memory or greater
• Excludes IBM Netfinity 3000 and IBM PC Server 325
	Novell NetWare
	• 4.2
	  • Standby Server
	• 5.0
	  • Cluster Services 1.00
	  • Cluster Services 1.01
	• 5.1
	  • Cluster Services 1.01
	• 6.0 [100]
	  • Cluster Services 1.6
		Emulex
		• LP9002L [103]
		
		IBM Netfinity/xSeries
		• P/N 01K7297
		• P/N 00N6881
		
		QLogic
		• QLA2100F
		• QLA2200F
		• QLA2310F, QLA2320FL [104]
			IBM
			• 2103 Model H07[105]
			• 2109 Models S08 and S16 (P/N 2109S08 and 2109S16)
			• P/N 3534IRU
			• 2109-F16[106]
			
			McDATA[107]
			• ED-5000 (2032-001)
			• ED-6064 (2032-064)
			• ES-3016 (2031-016)
			• ES-3032 (2031-032)
			
			INRANGE[108]
			• FC9000 (2042-001)
			• FC9000-128 (2042-128)

[99] Novell clustering support requires ESS LIC Level 1.2.0, or later.

[100] NetWare 6.0, including Cluster Services 1.6, is supported on the ESS Models F10 and F20 and requires ESS LIC level 1.5.2, or later.

[101] P/N 08L6517 contains an incorrect cable for ESS attachment. Order FC 9701, (10M) or FC 9702, (20M) SCSI cable to use with this host adapter and ESS.

[102] Support for Fibre Channel requires ESS LIC Level 1.3.0, or later.

[103] The LP9002L is supported on the ESS Models F10 and F20 and requires ESS LIC level 1.5.2, or later. Support is limited to direct attach configurations only.

[104] The QLA2310F and QLA2310FL are supported on the ESS Models F10 and F20 and require ESS LIC level 1.5.2, or later.

[105] The IBM 2103 and 3534IRU are supported for distance solutions only. Multiple initiators or targets on the same loop are not supported.

[106] The 2109-F16 is supported with NetWare 5.1 and the QLA2200F with device driver 5.40X only.

[107] McDATA support is available via RPQ only.

[108] Support based on NetWare 5.1 only and requires INRANGE package level 3.0.1 with ESS LIC Level 1.5.0.

SCSI

Servers	Operating Systems	Host Adapters	Fabric Support
Origin Servers • 200 • 2100 • 2200 • 2400 • 2800	IRIX • 6.5.9 and above	Adaptec • AHA-2944UW	N/A

Fibre Channel

Servers	Operating Systems	Host Adapters	Fabric Support
Origin Servers • 200 • 2100 • 2200 • 2400 • 2800	IRIX • 6.5.9 and above	QLogic • QLA2200F	IBM[110] • 2109 Models S08 and S16 McDATA[111] • ED-6064 (2032-064)

[109] RPQ support only.

[110] Cascaded switches are not supported.

[111] Firmware level requirement is 1.2.0

SCSI

Servers	Operating Systems	Host Adapters	Fabric Support

Enterprise
• 220R, 250, 420R,450 (PCI only)
• 3000, 4000, 5000, 6000
• 3500, 4500, 5500, 6500
• 10000
 	
SPARCcenter
• 2000, 2000E (S-Bus only)
 	
SPARCserver
• 1000, 1000E (S-Bus only)
 	
Ultra
• 1, 2, 5, 10
• 20, 30, 60, 80 (PCI only)
 	
Netra
• 1125
	Solaris
	• 2.5.1
	• 2.6
	  • VERITAS Volume Manager 3.1, 3.2 w/DMP
	  • VERITAS Cluster Server 1.1.2, 1.3
	• 7
	  • VERITAS Volume Manager 3.1, 3.2 w/DMP
	  • VERITAS Cluster Server 1.1.2, 1.3
	• 8
	  • VERITAS Volume Manager. 3.1.1, 3.2 w/DMP
	  • VERITAS Cluster Server 1.3
		Sun
		• X1062A
		• X1065A
		• X6541A (PCI)
			N/A

Fibre Channel

Servers	Operating Systems	Host Adapters	Fabric Support

Enterprise
• 220R, 250, 420R, 450 (PCI only)
• 3000, 4000, 5000, 6000
• 3500, 4500, 5500, 6500
• 10000
 	
SPARCcenter
• 2000, 2000E (Sbus only)
 	
SPARCserver
• 1000, 1000E (Sbus only)
 	
Ultra
• 1,2, 5, 10
• 20, 30, 60, 80 (PCI only)
 	
Netra
• 1125
	Solaris[112]
	• 2.6
	  • VERITAS Volume Manager. 3.1, 3.2 w/DMP
	  • VERITAS Cluster Server 1.1.2, 1.3, 2.0
	• 7
	  • VERITAS Volume Manager 3.1, 3.2 w/DMP
	  • VERITAS Cluster Server 1.1.2, 1.3, 2.0
	• 8
	  • VERITAS Volume Manager 3.1.1, 3.2 w/DMP
	  • VERITAS Cluster Server 1.3, 2.0
		JNI
		• FC64-1063 (Sbus)
		• FCI-1063 (PCI)
		• FCE-1473 (Sbus) [113]
		• FCE-6460 (PCI) [113]
		
		Emulex
		• LP8000 (PCI)[114]
		• LP8000S (Sbus)[115]
		
		QLogic
		• QLA2200F[116]
			IBM
			• 2103 Model H07[117]
			• 2109 Models S08 and S16
			• 2109 Model F16
			• 3534 Model F08 [118]
			
			McDATA
			• ED 5000 (2032-001)
			• ED-6064 (2032-064)
			• ES-3016 (2031-016)
			• ES-3032 (2031-032)
			
			INRANGE[119]
			• FC9000 (2042-001)
			• FC9000-128 (2042-128)

[112] Support for VERITAS Volume Manager on ESS is limited to Solaris 7 on ESS prior to the G3 release. For ESS with LIC level code 1.3.0 and higher support for VERITAS Volume Manager is extended to Solaris 2.6, and 7. In clustered environments, use VERITAS Cluster Manager and Volume Manager with DMP and not SDD.

[113] JNI FCE-1473 and FCE-6460 are supported via RPQ only.

[114] Requires Solaris version 7 or 8, when used with SDD (known problems exist between the Emulex driver, SDD and Solaris 2.6).

[115] Support for LP8000S on ESS is with Solaris 2.6 and 8, driver version 4.20k and firmware 3.81a1 on ESS LIC Level 1.5.0 and higher.

[116] QLA2200F is supported with driver 3.16.

[117] The IBM 2103 is supported for distance solutions only. Multiple initiators or targets on the same loop are not supported.

[118] The IBM 3534 Model F08 is supported on the ESS Models F10 and F20 and requires ESS LIC level 1.5.2, or later.

[119] INRANGE support must be at ESS LIC Level 1.3.2.50, or later or ESS LIC Level 1.3.3.27, or later.

NETWORK ATTACHED STORAGE (NAS)

NAS Servers[120]	Fabric Support
NAS 300G • 5196 Model G00 • 5196 Model G01 • 5196 Model G25 • 5196 Model G26	IBM • 2109 Models S08 and S16 McDATA • ED-5000 (2032-001) INRANGE • FC9000 (2042-001)

[120] NAS support must be at ESS LIC Level 1.3.2.49, or later.

Note: When using any 3rd party products with ESS, (such as host adapters, hubs, switches and management software) be sure and consult the manufacturer's documentation or web pages for appropriate configuration information to insure the product is properly set up for your system.

SCSI Host Adapters

Adapter	Description	Cable
Adaptec AHA-2944UW	PCI-to-Ultra Wide Differential SCSI Host Adapter	9701 or 9702
Adaptec AHA-4944W	Quad Channel PCI-to-Fast and Wide Differential SCSI Host Adapter	9701 or 9702
Hewlett-Packard A4800A	Fast/Wide Ultra Differential SCSI-2 (PCI)	9709 or 9710
Hewlett-Packard A4107A	Fast/Wide Differential SCSI-2 (HP-HSC)	9703 or 9704
Hewlett-Packard A2969A	20 MB Fast/Wide Differential SCSI-2 (HP-HSC)	9703 or 9704
Hewlett-Packard A5159A	Dual Port Fast/Wide Differential SCSI-2 (PCI)	9707 or 9708
Hewlett-Packard 28696A	Fast/Wide Differential SCSI-2 (HP-PB)	9703 or 9704
IBM AS/400 FC 6501	Tape/Disk Device Controller	9705 or 9706
IBM Netfinity P/N 59H3900	3449 Adapter Card	9701 or 9702
IBM Netfinity P/N 08L6517	Adapter card + cable + terminator	9701 or 9702
IBM RS/6000 FC 2412	Enhanced SCSI-2 Differential Fast/Wide Adapter/A	9703 or 9704
IBM RS/6000 FC 6204	PCI Universal Differential Ultra SCSI Adapter	9701 or 9702
IBM RS/6000 FC 6207	PCI Differential Ultra SCSI Adapter	9701 or 9702
IBM RS/6000 FC 6209	PCI SCSI-2 Fast/Wide Differential Adapter	9703 or 9704
QLogic QLA1041	PCI-to-Ultra SCSI Host Adapter	9701 or 9702
Storage Works KZPBA-CB	Ultra SCSI Differential Adapter (PCI)	9701 or 9702
Sun X1062A	SCSI-2 Fast/Wide Differential (SBus)	9701 or 9702
Sun X1065A	Ultra SCSI (SBus)	9701 or 9702
Sun X6541A	Ultra SCSI-2, Fast/Wide Differential Dual Channel (PCI)	9707 or 9708
Symbios SYM8751D	PCI-to-Fast/Ultra Wide Differential SCSI Host Adapter	9701 or 9702

Fibre Channel Host Adapters

Adapter	Description	Cable
Emulex LP7000E	LightPulse Fibre Channel PCI Host Bus Adapter (32-bit)	9701 or 9702 (with SDG)
Emulex LP8000	LightPulse 1 Gb/s Fibre Channel PCI Host Bus Adapter (64-bit)	9701 or 9702 (with SDG)
Emulex LP8000S	LightPulse 1 Gb/s Fibre Channel SBus Host Bus Adapter (64-bit)	--
Emulex LP9002L	LightPulse 2 Gb/s Fibre Channel PCI Host Adapter	--
Hewlett-Packard A3591B	1062 Mbps Fibre Channel Adapter (HP-HSC)	--
Hewlett-Packard A3404A	1063 Mbps Fibre Channel K Class Adapter (HP-HSC)	--
Hewlett-Packard A5158A	PCI Tachlite Fibre Channel Adapter	--
Hewlett-Packard A6684A	HSC Tachlite Fibre Channel Adapter (D Class)	--
Hewlett-Packard A6685A	HSC Tachlite Fibre Channel Adapter (K Class)	--
IBM Netfinity P/N 01K7297	Netfinity PCI Fibre Channel Adapter	9701 or 9702 (with SDG)
IBM Netfinity P/N 00N6881	Netfinity FAStT Host Adapter	--
IBM NUMA-Q IOC-0210-54	Fibre Channel PCI Adapter	9701 or 9702 (w FC #3019)
IBM RS/6000 FC 6227	Gigabit Fibre Channel Adapter for PCI Bus	9701 or 9702 (with SDG)
IBM RS/6000 FC 6228	Gigabit Fibre Channel Adapter 64-Bit for PCI Bus	--
JNI FC64-1063-N	FibreStar 64-Bit SBus Fibre Channel Host Bus Adapter	9701 or 9702 (with SDG)
JNI FCI-1063-N	FibreStar 32-Bit PCI-to-Fibre Channel Host Bus Adapter	9701 or 9702 (with SDG)
QLogic QLA2100F	64-Bit PCI-to-Fibre Channel Adapter	9701 or 9702 (with SDG)
QLogic QLA2200F QLA2200F/33, QLA2200F/66	64-Bit PCI-to-Fibre Channel Adapter (33Mhz or 66 MHz)	--
QLogic QLA2300F	64-Bit PCI-to-Fibre Channel Adapter (66MHz)	--
Qlogic QLA2310F, QLA2320FL	2Gb Fibre Channel 64-bit PCI-X Host Bus Adapter	--
Storage Works KGPSA-BC	PCI to Fibre Channel Adapter	--

Fibre Channel Fabric Components[121]

Component	Description
IBM 2103 Model H07	IBM Fibre Channel Storage Hub
IBM 2109 Models S08 and S16 (P/N 2109S08 / 2109S16)	IBM SAN Fibre Channel Switch
IBM 2109 Model F16	IBM SAN Fibre Channel Switch (1 or 2 Gb)
IBM 3534 Model 1RU (P/N 35341RU)	IBM SAN Fibre Channel Managed Hub
IBM 3534 Model F08 (P/N 3534F08)	IBM SAN Switch
McDATA ED-5000	IBM 2032-001 Fibre Channel Director
McDATA ED-6064	IBM 2032-064 Fibre Channel Director 64 ports
McDATA ES-3016	IBM 2031-016 Fibre Channel Switch 16 ports
McDATA ES-3032	IBM 2031-032 Fibre Channel Switch 32 ports
INRANGE FC 9000	IBM 2042-001 Fibre Channel Director 64 ports
INRANGE FC 9000-128	IBM 2042-128 Fibre Channel Director 128 ports

SCSI Host Attachment Cables

Specify Feature	Optional Feature[122]	Description	Cable Length	IBM P/N (ESS)	IBM P/N (VSS)
9701	2801	Ultra SCSI	10 meters	34L7136	05J7336
9702	2802	Ultra SCSI	20 meters	34L7137	05J7337
9703	2803	SCSI-2 Fast/Wide	10 meters	34L7136 with 50G0460 (interposer)	05J7336 with 50G0460 (interposer)
9704	2804	SCSI-2 Fast/Wide	20 meters	34L7137 with 50G0460 (interposer)	05J7337 with 50G0460 (interposer)
9705	2805	SCSI-2 Fast/Wide (AS/400)	10 meters	34L7134	05J7281
9706	2806	SCSI-2 Fast/Wide (AS/400)	20 meters	34L7135	05J7282
9707	2807	SCSI-2 Fast/Wide (Sun PCI/HP PCI dual port)	10 meters	34L7138	09L2766
9708	2808	SCSI-2 Fast/Wide (Sun PCI/HP PCI dual port)	20 meters	34L7139	09L2769
9709	2809	SCSI-2 Fast/Wide (HP single port)	10 meters	34L7140	09L3521
9710	2810	SCSI-2 Fast/Wide (HP single port)	20 meters	34L7141	09L3524

[121] FICON and FCP intermix are currently not supported on the same Director or ESS adapter.

[122] The 28xx optional features (priced) are only available on the ESS

ESS Host Adapters and Host Attachment Cables

Feature	Description	Models	LIC Level	Cable
3002	SCSI Host Adapter	Exx/Fxx	1.0.0	See SCSI Host Attachment Cables Table
3011	Standard ESCON Host Adapter	Exx/Fxx	1.0.0	Not Provided
3012	Enhanced ESCON Host Adapter	Fxx	1.4.0	Not Provided
3019	Fibre Channel (interim NUMA-Q) Host Adapter	Exx/Fxx	1.1.0	Includes 20 meter Ultra SCSI cable (FC 9702)
3020	Fibre Channel (interim) Host Adapter	Exx/Fxx	1.1.0	Includes 20 meter Ultra SCSI cable (FC 9702)
3021	Fibre Channel / FICON (long wave) Host Adapter	Fxx	1.4.0	Includes 31 meter 9 micron cable (SC/SC)
3022	Fibre Channel (short wave) Host Adapter	Exx/Fxx	1.2.0	Includes 31 meter 50 micron cable (SC/SC)
3023	Fibre Channel / FICON (short wave) Host Adapter	Fxx	1.4.0	Includes 31 meter 50 micron cable (SC/SC)

Fibre Channel Support via IBM TotalStorage SAN Data Gateway

ESS Interim Fibre Channel attachment to storage area networks or host systems was initially provided through the IBM 2108 Storage Area Network (SAN) Data Gateway, Model G07. Native fibre channel support is now available and the SAN Data Gateway is no longer needed.

For further information on the IBM TotalStorage SAN Data Gateway, please refer to the following web site: http://www.ibm.com/storage/SANGateway

The 2109 must be configured to operate in QuickLoop mode ONLY for the HP platform with the SDG. Other platforms can use the SDG in conjunction with the 2109 in normal switch mode.

Fibre Channel (via SAN Data Gateway) – Not Supported

Servers
Not Supported • Compaq Servers • Data General Servers • AS/400 and iSeries Servers • SGI Servers

Fibre Channel (via SAN Data Gateway) – Conditional Support[123]

Servers
Conditional Support • Hewlett-Packard Servers

Fibre Channel (via NUMA-Q Fibre Channel to SCSI Bridge) #3019

Servers	Operating Systems	Host Adapters	Fabric Support
2000 • E100 • E200 • E320 • E400 • E410 • xSeries 430	DYNIX/ptx[124] • 4.4.7 • 4.4.8 • 4.4.9 • 4.5.1 with service pack 3 • 4.5.2 • 4.5.3	IBM NUMA-Q • IOC-0210-54	IBM • 2109 Models S08 and S16[125]

[123] Conditional support: Contact your Storage Specialist and reference web site: http://www.storage.ibm.com/hardsoft/products/sangateway/support.htm

[124] Dynix 4.4.7, 4.4.8 and 4.4.9 support for interim Fibre Channel FC # 3019 is available via RPQ (NSBO) only. They must have driver ptx/IBM-ESS v1.1.0 for ESS support as a minimum level. This interim Fibre Channel is supported thru the end of 2001, customers must convert from ESS interim Fibre to native Fibre channel.

[125] Non-switched configurations are not supported.

Fibre Channel (RS/6000 via SAN Data Gateway)[126]

Servers	Operating Systems	Host Adapters	Fabric Support
7013 • S70, S7A (S70 Advanced) 7015 • S70, S7A (S70 Advanced) 7017 • S70, S7A (S70 Advanced) • S80 7025 • F50, F80 • H70 7026 • H50, H70, H80 • M80	AIX • 4.3.3 HACMP[127] • 4.3.1 • 4.4.0	IBM RS/6000 • FC 6227 • Code 3.22A0	IBM • 2103 Model H07[128] • 2109 Models S08 and S16[129] McDATA • ED-5000 (2032-001)[130]

ESS and SAN Data Gateway for RS/6000 Servers: Supported configurations

	ESS Model E10 / E20 (ESS LIC Level 6d, 6e, 6f)	ESS Models E10 / E20 (ESS LIC Level 6g or greater)	ESS Models F10 / F20 (ESS LIC Level 6g or greater)
SDG with FC #2204 or #2205 (FC-AL Short Wave Fibre Channel ports)			
AIX 4.3.3	Yes	Yes	Yes
IBM 2103 Hub	Yes	Yes	Yes
IBM 2109 Switch	No	No	No
McDATA ED-5000 Switch	No	No	No
HACMP 4.3.1	Yes	No	No
IBM 2103 Hub	Yes	No	No
IBM 2109 Switch	No	No	No
McDATA ED-5000 Switch	No	No	No

[126] See table below for additional details on ESS and SAN Data Gateway supported configurations and planned availability dates. For information on prerequisites and limitations, please refer to the following SAN Data Gateway Web page at: www.storage.ibm.com/hardsoft/products/sangateway/support.htm

[127] Insure that all current PTFs are installed on HACMP and reference Table 4 for supported HACMP levels.

[128] The IBM 2103 is supported for distance solutions only. Multiple initiators or targets on the same loop are not supported.

[129] IBM 2109 support with the SAN Data Gateway requires ESS Fibre Channel (interim) Host Adapter (FC #3020).

[130] McDATA ED-5000 support with the SAN Data Gateway requires ESS Fibre Channel (interim) Host Adapter (FC #3020).

	ESS Model E10 / E20 (ESS LIC Level 6d, 6e, 6f)	ESS Models E10 / E20 (ESS LIC Level 6g or greater)	ESS Models F10 / F20 (ESS LIC Level 6g or greater)
SDG with FC #2214 or #2313 (Short Wave Fibre Channel ports)			
AIX 4.3.3	No	Yes	Yes
IBM 2103 Hub	No	Yes	Yes
IBM 2109 Switch	No	Yes	Yes
McDATA ED-5000 Switch	No	Yes	Yes
HACMP 4.3.1/4.4.0	No	Yes	Yes
IBM 2103 Hub	No	Yes	Yes
IBM 2109 Switch	No	Yes	Yes
McDATA ED-5000 Switch	No	Yes	Yes

Fibre Channel (RS/6000 SP via SAN Data Gateway)

Servers	Operating Systems	Host Adapters	Fabric Support
9076 Models 2xx, 3xx, 4xx, 50x, 55x, and T70 with the following PCI nodes: • FC 2050 - 332 MHz SMP Single Thin Node • FC 2051 - 332 MHz SMP Wide Node • FC 2052 – POWER3 SMP Thin Node • FC 2053 – POWER3 SMP Wide Node • FC 2054 – POWER3 SMP High Node • FC 2055 - SP Expansion I/O Unit • FC 2056 – POWER3 375MHz SMP Thin Node • FC 2057 – POWER3 375MHz SMP Wide Node	AIX-SP • 4.3.3 PSSP • 3.1.1	IBM RS/6000 • FC 6227 • Code 3.22A0	IBM • 2103 Model H07[131] • 2109 Models S08 and S16[132] McDATA • ED-5000 (2032-001) [133]

[131] The IBM 2103 is supported for distance solutions only. Multiple initiators or targets on the same loop are not supported.

[132] IBM 2109 support with the SAN Data Gateway requires Fibre Channel (interim) Host Adapter (FC #3020)

[133] McDATA ED-5000 support with the SAN Data Gateway requires ESS Fibre Channel (interim) Host Adapter (FC #3020)

ESS and SAN Data Gateway for RS/6000 SP Servers: Supported configurations

	ESS Model E10 / E20 (ESS LIC Level 6d, 6e, 6f)	ESS Models E10 / E20 (ESS LIC Level 6g or greater)	ESS Models F10 / F20 (ESS LIC Level 6g or greater)
SDG with FC #2204 or #2205 (FC-AL Short Wave Fibre Channel ports)			
AIX 4.3.3	Yes	Yes	Yes
IBM 2103 Hub	Yes	Yes	Yes
IBM 2109 Switch	No	No	No
McDATA ED-5000 Switch	No	No	No
HACMP 4.3.1	Yes	No	No
IBM 2103 Hub	Yes	No	No
IBM 2109 Switch	No	No	No
McDATA ED-5000 Switch	No	No	No
PSSP 3.1.1 (w/ RVSD & GPFS)	Yes	Yes	Yes
IBM 2103 Hub	Yes	Yes	Yes
IBM 2109 Switch	No	No	No
McDATA ED-5000 Switch	No	No	No
SDG with FC #2214 or #2313 (Short Wave Fibre Channel ports)			
AIX 4.3.3	No	Yes	Yes
IBM 2103 Hub	No	Yes	Yes
IBM 2109 Switch	No	Yes	Yes
McDATA ED-5000 Switch	No	Yes	Yes
HACMP 4.3.1/4.4.0	No	Yes	Yes
IBM 2103 Hub	No	Yes	Yes
IBM 2109 Switch	No	No	No
McDATA ED-5000 Switch	No	No	No
PSSP 3.1.1 (w/ RVSD & GPFS)	No	Yes	Yes
IBM 2103 Hub	No	Yes	Yes
IBM 2109 Switch	No	Yes	Yes

Fibre Channel (Intel-based Windows Servers via SAN Data Gateway)[134]

Servers	Operating Systems	Host Adapters	Fabric Support
Pentium Pro or later processors • 200 MHz processor or faster • 128 MB memory or greater • Excludes IBM Netfinity 3000 and IBM PC Server 325	Microsoft Windows NT • Server 4.0 • Server 4.0, Enterprise Edition	IBM Netfinity/xSeries • P/N 01K7297 QLogic • QLA2100F Emulex [135] • LP7000E • LP8000	IBM • 2103 Model H07 [136] • 2109 Models S08 and S16 (P/N 2109S08 and 2109S16) • P/N 3534IRU McDATA • ED-5000 (2032-001)

ESS and SAN Data Gateway for Intel-based Windows Servers: Supported configurations

	ESS Model E10 / E20 (ESS LIC Level 6d, 6e, 6f)	ESS Models E10 / E20 (ESS LIC Level 6g or greater)	ESS Models F10 / F20 (ESS LIC Level 6g or greater)
SDG with FC #2204 or #2205 (FC-AL Short Wave Fibre Channel ports)			
Windows NT 4.0	Yes	Yes	Yes
IBM 2103 Hub	Yes	Yes	Yes
IBM 2109 Switch	Yes	No	No
SDG with FC #2214 or #2313 (Short Wave Fibre Channel ports)			
Windows NT 4.0	No	Yes	Yes
IBM 2103 Hub	No	Yes	Yes
IBM 2109 Switch	No	Yes	Yes
Windows NT 4.0 & Emulex	No	Yes	Yes
McDATA ED-5000	No	Yes	Yes

[134] See table below for additional details on ESS and SAN Data Gateway supported configurations.

[135] If Emulex adapters are used with the McDATA ED-5000; non-switched configurations are not supported. Additionally for Fibre Channel via the SAN Data Gateway, the ED-5000 is only supported on the Emulex adapters.

[136] The IBM 2103 and 3534IRU are supported for distance solutions only. Multiple initiators or targets on the same loop are not supported.

Fibre Channel (Sun via SAN Data Gateway)[137]

Servers	Operating Systems	Host Adapters	Fabric Support
Enterprise • 450 (PCI only) • 3000, 4000, 5000, 6000 • 3500, 4500, 5500, 6500 • 10000 Ultra • 30, 60 (PCI only)	Solaris • Solaris 2.6	JNI • FC64-1063 (SBus) • FCI-1063 (PCI) • Dvr. 2.5.9, or later QLogic • QLA2100F Emulex • LP8000 • Dvr. 4.0,2d or later	IBM • 2103 Model H07 [138] • 2109 Models S08 and S16 McDATA • ED-5000 (2032-001) [139]

ESS and SAN Data Gateway for Sun Servers: Supported configurations

	ESS Model E10 / E20 (ESS LIC Level 6d, 6e, 6f)	ESS Models E10 / E20 (ESS LIC Level 6g or greater)	ESS Models F10 / F20 (ESS LIC Level 6g or greater)
SDG with FC #2204 or #2205 (FC-AL Short Wave Fibre Channel ports)			
Solaris 2.6 & JNI FC64-1063-N	Yes	Yes	Yes
IBM 2103 Hub	Yes	Yes	Yes
IBM 2109 Switch	Yes	No	No
Solaris 2.6 & QLA2100F	Yes	Yes	Yes
IBM 2103 Hub	Yes	Yes	Yes
IBM 2109 Switch	No	No	No
SDG with FC #2214 or #2313 (Short Wave Fibre Channel ports)			
Solaris 2.6 & JNI FC64-1063-N	No	Yes	Yes
IBM 2103 Hub	No	Yes	Yes
IBM 2109 Switch	No	Yes	Yes
McDATA ED-5000	No	Yes	Yes
Solaris 2.6 & JNI FCI-1063-N	No	No	No
McDATA ED-5000	No	Yes	Yes
Solaris 2.6 & QLA2100F	No	Yes	Yes
IBM 2103 Hub	No	Yes	Yes
IBM 2109 Switch	No	Yes	Yes

[137] See table below for additional details on ESS and SAN Data Gateway supported configurations.

[138] The IBM 2103 is supported for distance solutions only. Multiple initiators or targets on the same loop are not supported.

[139] The McDATA ED-5000 is not supported on the QLogic QLA2100F.