

hp StorageWorks

SAN Product Support Tables for the SAN Design Reference Guide

This document contains six updated tables from the *SAN Design Reference Guide*. Refer to:

<http://h18000.www1.hp.com/products/storageworks/san/documentation.html>

for the latest version of the guide, and information about SAN Fabric configuration rules using the switches listed below.

The tables in this document list storage system support for the Enterprise Virtual Array using VCS 2.002, EMA/ESA12000, EMA16000, MA/RA8000, and MA6000 products using ACS 8.7 and 8.6, the MSA1000 using FW 2.38, and the RA4100/4000 products using FW 2.60. Refer to the appropriate tables for support information specific to each storage system type.

- Table 1 and Table 2 list the supported switch models and versions for each SAN fabric type.
- Table 3 (VCS/ACS) and Table 4 (MSA/RA4100/4000) replicate Table 13 and Table 22 from the *SAN Design Reference Guide* respectively, with the addition of the required HBA driver and firmware revisions, and when applicable, multi-path driver revisions.
- Table 5 summarizes SAN attachment information for HP NAS products.
- Table 6 provides a list of the HP SAN supported platforms and operating systems for each storage system type.
- ACS 8.7, 8.6, and VCS 2.002 are supported with all applicable patches.
NOTE: BL20P and BL40P servers require a minimum of ACS 8.7-1.
NOTE: BL20P and BL40P servers are only supported on Infrastructure Product Line switches.
- Support is provided for SAN Fabrics consisting exclusively of the Fibre Channel switches listed in Table 1, 'Infrastructure Product Line, Supported Core and SAN Switches', or exclusively of the switches listed in Table 2, 'High Availability Fabric Product Line, Supported Director and Edge Switches'. Intermixing of the switches in Table 1 and Table 2 in the same SAN or in the same Fabric is not supported at this time.
- For information about support for SAN fabrics using both HP branded and Compaq branded storage products, refer to the *SAN Design Reference Guide*.

Table 1: Infrastructure Product Line, Supported Core and SAN Switches

HP Switch Model	Compaq StorageWorks Switch Model	Switch FW
N/A	FC-AL Switch Note: Supported for RA4000/RA4100 Storage Only	G12
Brocade 2400 Brocade 2800 SurestoreFC Switch 6164 (64 ISL Ports) Surestore FC Switch 6164 (32 ISL Ports)	SAN Switch 8 SAN Switch 8-EL SAN Switch 16 SAN Switch 16-EL SAN Switch Integrated/32 SAN Switch Integrated/64	v2.6.0h
Surestore FC 1Gb/2Gb Switch 16B Surestore FC 1Gb/2Gb Switch 8B Surestore FC 1Gb/2Gb Entry Switch 8B	SAN Switch 2/8-EL, 2/8 power pak SAN Switch 2/16-EL, 2/16 power pak SAN Switch 2/16	v3.0.2k
hp StorageWorks SAN switch 2/32, 2/32 power pak hp StorageWorks core switch 2/64, 2/64 power pak		V4.0.2b

Table 2: High Availability Fabric Product Line, Supported Director and Edge Switches

HP Switch Model	Compaq StorageWorks Switch Model	Switch FW	Management Software
N/A	McDATA ED-5000	04.00.00 Note: This FW stream is specific to the ED-5000	StorageWorks ha-fabric manager (hafm) 06.03.01 build 5
N/A	McDATA ES-3016 McDATA ES-3032	04.01.02 build 4	
Surestore FC64	SAN Director 64	04.01.02 build 4	
hp StorageWorks edge switch 2/16		04.01.02 build 4	
hp StorageWorks edge switch 2/24			
hp StorageWorks edge switch 2/32			
hp StorageWorks director 2/64			
hp StorageWorks director 2/140			

IMPORTANT: Refer to Table 1 and Table 2 for the list of supported switch models and versions.

Table 3: SAN Support Updates to the *Heterogeneous Open SAN Design Reference Guide*, Table 13 Platform/Storage System SAN Attachment Summary – with HBA Drivers and Firmware Revisions for VCS 2.002, ACS 8.7 and 8.6

Platform or Operating System	Platform HBA SAN Attachment	HBA Driver & Firmware Revision (Minimum)	Multi-Path Support	Enterprise Virtual Array (VCS 2.002) SAN Attachment	EMA/ESA12000, EMA16000, MA/RA8000, MA6000 (ACS 8.7, 8.6) SAN Attachment
HP-UX 11.0 MC/ServiceGuard Version A.11.13 or later	A6685A HSC	Native 11.00.10 or later PHKL_23939 or later	Secure Path 3.0a SP1	F-Port Operating System Parameter: HP-UX	F-Port using FABRIC topology Transparent or Multiple-Bus Failover SCSI-2 Mode Command Console LUN Enabled or Disabled SCSI-3 Mode Command Console LUN Disabled Connection name O/S parameter: HP_VSA (Multiple-Bus, SCSI-3) HP (Transparent, SCSI-2 or SCSI-3)
	A6795A PCI	Native 11.00.10 or later PHKL_23939 or later			
	A5158A PCI	Native 11.00.10 or later PHKL_23939 or later			

**Table 3: SAN Support Updates to the *Heterogeneous Open SAN Design Reference Guide*, Table 13
Platform/Storage System SAN Attachment Summary – with HBA Drivers and Firmware Revisions for
VCS 2.002, ACS 8.7 and 8.6 (Continued)**

Platform or Operating System	Platform HBA SAN Attachment	HBA Driver & Firmware Revision (Minimum)	Multi-Path Support	Enterprise Virtual Array (VCS 2.002) SAN Attachment	EMA/ESA12000, EMA16000, MA/RA8000, MA6000 (ACS 8.7, 8.6) SAN Attachment
HP-UX 11i (1.0) MC/ServiceGuard Version A.11.13 or later	A6685A HSC	Native 11.11.09 or later PHKL_23626 or later	Secure Path 3.0a SP1	F-Port Operating System Parameter: HP-UX	F-Port using FABRIC topology Transparent or Multiple-Bus Failover SCSI-2 Mode Command Console LUN Enabled or Disabled SCSI-3 Mode Command Console LUN Disabled Connection name O/S parameter: HP_VSA (Multiple-Bus, SCSI-3) HP (Transparent, SCSI-2 or SCSI-3)
	A6795A PCI	Native 11.11.09 or later PHKL_23626 or later			
	A5158A PCI	Native 11.11.09 or later PHKL_23626 or later			
HP-UX 11i, 11.0 MC/ServiceGuard Version A.11.13 or later (ACS only)	L-Port (QuickLoop) Note: Table 1 switches only A6685A A6795A A5158A	See above as listed per HBA number for each O/S version	Not Supported	Not Supported	L-Port (Quickloop) using LOOP_HARD topology Note: Table 1 Switches Only Transparent Failover Only SCSI-2 Mode Command Console LUN Enabled or Disabled Connection name O/S parameter: HP
OpenVMS Clusters 7.2-2 Fibre_SCSI- V0200 7.3 Fibre_SCSI-V0300 7.3-1	KGPSA-BC 380574-001 KGPSA-CA 168794-B21 KGPSA-DA 261329-B21 FCA2354	Native FW: 3.20x7 Native FW: 3.82a1 Native FW: 3.82a1	Native	F-Port Operating System Parameter: VMS Unit Identifier Required	F-Port using FABRIC topology Multiple-Bus Failover SCSI-3 Mode Connection name O/S parameter: VMS Unit Identifier required
Tru64 UNIX 4.0F Patch Kit 7, 4.0G TruCluster Software Products Version 1.6 (ACS only)	KGPSA-BC 380574-001 KGPSA-CA 168794-B21	Native FW: 3.20x7 Native v2.02 FW: 3.82a1	N/A	Not Supported	F-Port using FABRIC topology Transparent Failover SCSI-2 Mode Command Console LUN Enabled or Disabled Connection name O/S parameter: TRU64_UNIX

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VCS 2.002, ACS 8.7 and 8.6 (Continued)**

Platform or Operating System	Platform HBA SAN Attachment	HBA Driver & Firmware Revision (Minimum)	Multi-Path Support	Enterprise Virtual Array (VCS 2.002) SAN Attachment	EMA/ESA12000, EMA16000, MA/RA8000, MA6000 (ACS 8.7, 8.6) SAN Attachment
Tru64 UNIX 5.1 Patch Kit 5 + ERP* (Early Release Patch) 5.1A Patch Kit 3 + ERP* 5.1B TruCluster Server Version 5.1, 5.1A, 5.1B	KGPSA-BC 380574-001	Native FW: 3.20x7	Native	F-Port Operating System Parameter: Tru64 UNIX	F-Port using FABRIC topology Transparent or Multiple-Bus Failover Mode SCSI-2 Mode Command Console LUN Enabled or Disabled or SCSI-3 Mode Connection name O/S parameter type: TRU64_UNIX
	KGPSA-CA 168794-B21	Native FW: 3.82a1			
	KGPSA-DA 261329-B21 FCA2354	Native FW: 3.82a1			
IBM AIX 4.3.3, 5.1 HACMP 4.4.1 ES	197819-B21 SWIA1-PD	1.5.19.0 Note: Transparent Failover	Not Supported	Not Supported	F-Port using FABRIC topology Transparent Failover or Multiple-Bus Failover SCSI-2 Mode Command Console LUN Enabled or Disabled or SCSI-3 Mode Connection name O/S parameter: AIX_Cambex
		1.5.19.1 Multiple-Bus Failover	Secure Path 2.0c	F-Port Operating System Parameter: IBM AIX	
Red Hat Linux 7.1, 7.2, Advanced Server 2.1 (ProLiant x86) Lifekeeper Clusters Red Hat Linux 7.1 (Alpha) SuSE Linux 7.2 (ProLiant x86) SuSE Linux 7.1(Alpha) SuSE SLES 7 (ProLiant x86) Lifekeeper Clusters	167433-B21 (ACS only) HSV single path: FCA2214 281541-B21 Note: ProLiant x86 only	6.0.1c (167433-B21) 6.0.2 BIOS 1.29 (281241-B21) Firmware loaded from driver	Not Supported	F-Port Operating System Parameter: "Unknown" Single path support only. Note: Lifekeeper Clusters not supported. Note: Alpha-based servers not supported.	F-Port using FABRIC topology Transparent Failover SCSI-3 Mode Connection name O/S parameter: SUN
Red Hat Advanced Server 2.1 (ProLiant x86)	BL20P uses FC mezzanine card BL40P uses FCA2214	BL20P driver is 6.0.2 BL40P driver is 6.0.2	None, single path support only.	F-Port Operating System Parameter: "Unknown" Single path support only. Note: Lifekeeper Clusters not supported.	F-Port using FABRIC topology Transparent Failover SCSI-3 Mode Connection name O/S parameter: SUN

* The ERP is required in configurations where Enterprise Virtual Arrays attach to the Tru64 UNIX host.

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Platform/Storage System SAN Attachment Summary – with HBA Drivers and Firmware Revisions for
VCS 2.002, ACS 8.7 and 8.6 (Continued)**

Platform or Operating System	Platform HBA SAN Attachment	HBA Driver & Firmware Revision (Minimum)	Multi-Path Support	Enterprise Virtual Array (VCS 2.002) SAN Attachment	EMA/ESA12000, EMA16000, MA/RA8000, MA6000 (ACS 8.7, 8.6) SAN Attachment
Microsoft Windows 2000 Server, Advanced Server, SP2, SP3 Windows NT 4.0 SP6a MSCS	KGPSA-BC 380574-001	W2K: 5-4.82a14 NT: 4-4.82a14 FW: 3.20x7	Secure Path 3.1a SP1 (ACS only) 4.0 (VCS & ACS) Note: BL20P supported with SP 4.0a BL40P supported with SP 4.0, SP 4.0a	F-Port Operating System Parameter: Microsoft Windows	F-Port using FABRIC topology Transparent or Multiple-Bus Failover SCSI-2 Mode Command Console LUN Disabled SCSI-3 Mode (recommended) Connection name O/S parameter: WINNT
	KGPSA-CB 176479-B21	W2K: 5-4.82a14 NT: 4-4.82a14 FW: 3.82a1			
	FCA2355 308540-B21	Boot Bios: 1.61a2 Note: BL40P driver is 4.82a14			
	FCA2101 245299-B21 Note: BL40P uses FCA2101,				
	BL20P uses PC mezzanine card	BL20P driver is 8.2.0.72 (Boot Bios 1.33)			
Microsoft Windows 2000 Datacenter MSCS	KGPSA-CB 176479-B21	W2K: 5-4.81a9 NT: 4-4.81a9 FW: 3.82a1 Boot Bios: 1.60a5	Secure Path 3.1SR1, 4.0	F-Port Operating System Parameter: Microsoft Windows	F-Port using FABRIC topology Transparent or Multiple-Bus Failover SCSI-2 Mode Command Console LUN Disabled SCSI-3 Mode (recommended) Connection name O/S parameter: WINNT
	FCA2101 245299-B21				
	FCA2355 308540-B21				

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Platform/Storage System SAN Attachment Summary – with HBA Drivers and Firmware Revisions for
VCS 2.002, ACS 8.7 and 8.6 (Continued)**

Platform or Operating System	Platform HBA SAN Attachment	HBA Driver & Firmware Revision (Minimum)	Multi-Path Support	Enterprise Virtual Array (VCS 2.002) SAN Attachment	EMA/ESA12000, EMA16000, MA/RA8000, MA6000 (ACS 8.7, 8.6) SAN Attachment
Novell NetWare 4.2 (ACS), 5.1, 6.0 5.1 with Clusters 1.01 6.0 with Clusters 1.06	FL-Port 120186-B21 (64-bit)	CPQFC.HAM v2.5.2	Secure Path 3.0b (5.1, 6.0) (ACS)	Not Supported	F-Port using FABRIC topology Transparent (4.2, 5.1, 6.0) or Multiple-Bus Failover (5.1, 6.0) SCSI-2 Mode Command Console LUN Enabled or Disabled or SCSI-3 Mode Connection name O/S parameter: NETWARE
	FL-Port 223180-B21 (32-bit)				
	FCA2210 281540-B21	QL2300.HAM v6.50s BIOS v1.29	Single Path only (5.1, 6.0)	F-Port Operating System Parameter: Microsoft Windows	Not Supported
Sun Solaris 2.6 (32-bit) Sun Solaris 7, 8, 9 (32/64-bit) Sun Solaris 8, 9 (64-bit cPCI) Sun Clusters v2.2 w/ 2.6, 7, 8 Veritas Clusters 3.5	380575-001 (32-bit Sbus) (ACS only)	2.5.9.03 FW: 13.3.7	Secure Path 2.1d (ACS only)	F-Port Operating System Parameter: Sun Solaris	F-Port using FABRIC topology Transparent or Multiple-Bus Failover SCSI-2 Mode Command Console LUN Enabled or Disabled or SCSI-3 Mode Connection name O/S parameter: SUN
	123503-001 (64-bit Sbus)	2.5.9.03 FW: 13.3.7			
	380576-001 (32-bit PCI)	2.5.9.03 FW: 3.0.3			
	254457-B21 (64-bit cPCI) FC2257C	3.26 FCODE: 1.18.5	Secure Path 3.0a (ACS and VCS)		
	Note: Solaris 8 only				
	254456-B21 (PCI) FCA2257P	3.26 FCODE: 1.18.5			
	254458-B21 (Sbus) FCA2257S	3.26 FCODE: 1.18.3			

IMPORTANT: Refer to Table 1 for the list of supported switch models and versions.

Table 4: SAN Support Updates to the *Heterogeneous Open SAN Design Reference Guide*, Table 4-10 Platform/Storage System SAN Attachment Summary – with HBA Drivers and Firmware Revisions for MSA1000 and RA4100/4000

Platform or Operating System Storage System in ()	Platform HBA SAN Attachment	HBA Driver & Firmware Revision (Minimum)	Multi-Path Support	MSA1000 (FW: 2.38) SAN Attachment	RA4100, RA4000 (FW: 2.60) SAN Attachment Table 1 switches only.
Red Hat Linux v7.2, Advanced Server 2.1, SuSE SLES 7, Lifekeeper Clusters	F-Port FCA2214 281541-B21	v6.0.2	N/A	F-Port	See below
Red Hat Linux 7.0, 7.1 SuSE Linux 7.1	FL-Port 120186-B21 223180-B21	v1.3.6	N/A	See above	FL-Port to SAN Switch
Microsoft Windows 2000 , Advanced Server SP3 Microsoft Windows NT 4.0 SP6a MSCS	F-Port FCA-2101	W2K: v5-4.82a14 NT: v4-4.82a14 FW: 3.82a1 BIOS: 1.61a2	Secure Path 3.1b	F-Port to SAN Switch	See below
Microsoft Windows 2000 SP1 Microsoft Windows NT 4.0 SP6a MSCS	FL-Port 120186-B21 223180-B21	W2K: v5.12.16.69 NT: v4.28.16.69	Compaq Redundancy Manager v1.30a Secure Path 3.1a	See above	FL-Port to SAN Switch or to an FC-AL Switch cascaded to a SAN Switch
Novell Netware 5.1, 6.0 Clusters 1.01, 1.06	F-Port FCA2210 281540-B21	v6.50S	Secure Path v3.0c Workgroup Edition	F-Port	See below
	FL-Port 120186-B21 223180-B21	CPQFC.HAM v2.5.2	Secure Path v3.0b Workgroup Edition	See above	FL-Port to SAN Switch or to an FC-AL Switch cascaded to a SAN Switch

Table 5: NAS SAN Windows 2000 Attachment Summary – with HBA Drivers and Firmware Revisions

NAS Server Description	HBA SAN Attachment	HBA Driver & Firmware Revision (Minimum)	Multi-Path Support	Storage Array
StorageWorks NAS b3000 V2	KGPSA-BC (2Gb) 380574-001 F-Port	Driver: 4.82a9 Firmware: 3.82a1 Bios: v1.60a5	Secure Path 4.0 Workgroup	Modular Storage Array 1000 FW 2.38 F-Port to SAN Switch
		Driver: 4.81a9 Firmware: 3.90a7 Bios: v1.60a5	AutoPath 2.00.01	hp virtual array (VA)
StorageWorks NAS e7000	KGPSA-BC (2 Gb) 380574-001 F-Port	Driver: 4.82a9 Firmware: 3.82a1 Bios: v1.60a5	Secure Path 4.0 Workgroup	Modular Storage Array 1000 FW 2.38 F-Port to SAN Switch
		Driver: 4.81a9 Firmware: 3.82a1 Bios: v1.60a5	Secure Path 4.0	Enterprise Virtual Array (VCS 2.002) F-Port O/S Parameter: Microsoft Windows
		Driver: 4.81a9 Firmware: 3.90a7 Bios: v1.60a7	AutoPath 2.00.01	hp virtual array (VA)
		Driver: 4.81a9 Firmware: 3.90a7 Bios: v1.60a7	AutoPath 2.00.01	Storage Array XP
		Driver: 4.81a9 Firmware: 3.82a1 Bios: v1.60a5	Secure Path 3.1a SP1, 4.0	Modular Array Systems (ACS 8.6, 8.7) F-Port using FABRIC topology Transparent or Multiple-Bus Failover SCSI-2 Mode Command Console LUN Disabled SCSI-3 Mode (recommended) O/S parameter: WINNT

IMPORTANT: Refer to Table 3 and Table 4 for specific O/S and Cluster support levels for each storage product, including supported O/S versions and required patch levels and service packs.

Table 6: SAN Storage System Supported Hardware Platforms and Operating System

Operating System and Hardware Platforms	Enterprise Virtual Array VCS 2.002	MA6000, RA/MA8000, ESA/EMA12000, EMA16000 ACS 8.7F, L, S	MSA1000 FW: 2.38	RA4100 RA4000 FW: 2.60
HP-UX Multi-Path MC/ServiceGuard Clusters (ACS only)	A-Class rp2300, rp24xx B-Class B2000, B3000 C-Class C3000, C3650, C3700 J-Class J5600, J6000, J6700 K-Class 2xx, 3xx, 4xx, 5xx L-Class rp5430, rp5450, rp5470 N-Class rp7400, rp7410 HP 9000 rp2300, rp24xx, rp54xx, rp74xx, rp8400 SuperDome	A-Class rp2300, rp24xx B-Class B2000, B3000 C-Class C3000, C3650, C3700 J-Class J5600, J6000, J6700 K-Class 2xx, 3xx, 4xx, 5xx L-Class rp5430, rp5450, rp5470 N-Class rp7400, rp7410 HP 9000 rp2300, rp24xx, rp54xx, rp74xx, rp8400 SuperDome	Not Supported	Not Supported
OpenVMS Multi-Path Clusters	DS10, DS10L, DS20E, DS25, ES40, ES45, ES47, ES80, GS60, GS60E, GS80, GS140, GS160, GS320, GS1280 800, 1200, AS4x00, A8x00	Alpha Servers 800, 1000A, 1200, AS4x00, A8x00, DS10, DS10L, DS20, DS20E, DS25, ES40, ES45, ES47, ES80, and GS Series	Not Supported	Not Supported
Tru64 Unix TruClusters	DS10, DS10L, DS20E, DS25, ES40, ES45, ES47, ES80, GS60, GS60E, GS80, GS140, GS160, GS320, GS1280 800, 1200, AS4x00, A8x00	Alpha Servers 800, 1000A, 1200, AS4x00, A8x00, DS10, DS10L, DS20, DS20E, DS25, ES40, ES45, ES47, ES80, and GS Series	Not Supported	Not Supported
IBM AIX Multi-Path	P270, P610, P620, P640, P660, P680, P690, F50, F80, H70, H80, M80, S70, S7A, S80 Note: P690 is supported without hot swap or EEH functionality	P270, P610, P620, P640, P660, P680, P690, F50, F80, H70, H80, M80, S70, S7A, S80 Note: P690 is supported without hot swap or EEH functionality	Not Supported	Not Supported
Caldera Linux	Not Supported	ProLiant x86 Servers	Not Supported	Not Supported
Red Hat Linux	ProLiant x86 Servers, BL20P, BL40P Note: Single Path only	ProLiant x86 Servers, Alpha Server DS10, DS10L, DS20, DS20E, ES40	Support with RH 7.2, AS 2.1 BL20P not supported	Supported
SuSE Linux	ProLiant x86 Servers, BL20P, BL40P Note: Single Path only	ProLiant x86 Servers, Alpha Server DS10, DS10L, DS20, DS20E, ES40	Not Supported	Supported
SuSE SLES	ProLiant x86 Servers, BL20P, BL40P Note: Single Path only	ProLiant x86 Servers	Supported BL20P not supported	Not Supported
Microsoft Windows 2000, Windows NT Multi-Path, MSCS	Intel and ProLiant x86 Servers	Intel and ProLiant x86 Servers	Supported	Supported
Microsoft Windows 2000, Multi-Path, MSCS	BL20P, BL40P	BL20P, BL40P	BL40P with EMULEX Supported	Supported
Novell Netware Multi-Path, Clusters	Intel and ProLiant x86 Servers Note: Single Path only	Intel and ProLiant x86 Servers	Not Supported	Supported

Table 6: SAN Storage System Supported Hardware Platforms and Operating System (Continued)

Operating System and Hardware Platforms	Enterprise Virtual Array VCS 2.002	MA6000, RA/MA8000, ESA/EMA12000, EMA16000 ACS 8.7F, L, S	MSA1000 FW: 2.38	RA4100 RA4000 FW: 2.60
Sun Solaris Multi-Path Sun Clusters Veritas Clusters	4u Architecture: 220, 420, 450, 3000, 3500, 4500, R10K SunFire models: 3800, 4800, 4810, 6800	4u architecture all models Sunfire 3800, 4800, 4810, 6800	Not Supported	Not Supported