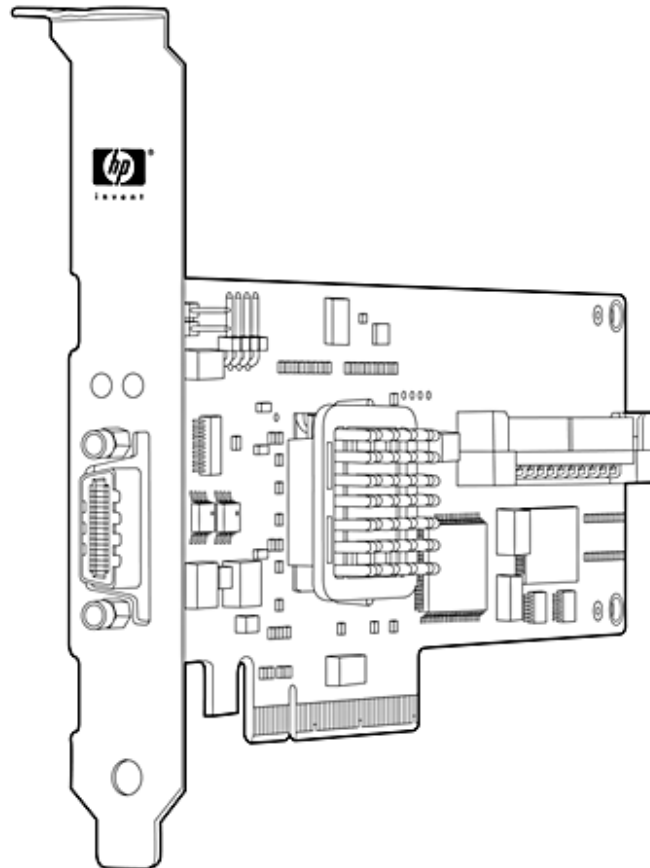# QuickSpecs

Overview

The HP SC44Ge Host Bus Adapter provides customers with the flexibility and speed they have come to expect from HP. The SC44Ge Host Bus Adapter is ideal for basic RAID (0, 1) and low cost connectivity to tape and HDDs. This adapter supports both 3G SAS and 1.5 G SATA devices. Providing up to 2 Gb/s maximum bandwidth, this HBA provides nearly four times the speed of a dual channel U320 SCSI adapters. The HP SC44Ge Host Bus Adapter has been thoroughly tested and integrated into many of the HP ProLiant and Integrity servers. The SC44Ge supports both a 1 x4 internal connection and a 1 x4 external connection.

Model

Serial Attached SCSI (SAS)	HP SC44Ge Host Bus Adapter - for ProLiant Servers	416096-B21
HBA	HP SC44Ge Host Bus Adapter - for Integrity Servers	AH303A

Standard Features

NOTE: For a brief, printer friendly data sheet that describes this product and informs you of the essential capabilities and specifications, please visit: http://h71028.www7.hp.com/ERC/downloads/4AA1-0812ENW.pdf.

Performance	Designed to be as flexible as HP servers, the HP SC44Ge Host Bus Adapter provides support for up to 8 devices (with support for even greater numbers when connected to devices with SAS expander technology). The HP adapter delivers exceptional system performance, with eight 3 Gbps SAS ports providing up to 24 Gb/s total storage bandwidth.

HP Server Integration Fully integrated and tested with most ProLiant servers and management software.

Key Features

- SAS technology delivers high performance and data bandwidth up to 3 Gbps per physical link
- Mix-and-match SAS and SATA hard drives, lets you deploy drive technology as needed to fit your computing environment (ProLiant systems only)
- Support for SAS tape products
- PCIe x8 (2.5 Gb/s bandwidth)
- PCI Express x8 capable

Ports

- Eight (8) SAS physical links distributed across 1 x4 internal SFF-8484 and 1x4 external SFF-8470 connectors
    - Provides the ability to support up to 8 devices in a RAID configuration (additional drives supported through expander technology) or 3.6TB of SAS storage when connected to an MSA70 external drive enclosure with (25) 146GB drives (HP-UX and OpenVMS only).

Performance HP's High Performance Architecture sets new boundaries for industry performance expectations!

- Transfer rate: 3 Gbps SAS, 1.5 Gb/s SATA (bandwidth per physical link)
- 24 Gbps total available bandwidth (8 physical links x 3Gbps)
- PCIe x8 (2.5 Gb/s bandwidth)

Capacity Given the increasing need for high performance and rapid capacity expansion, the SC44Ge SAS HBA with RAID offers:

- Eight 3 Gbps SAS physical links supporting up to 2 simultaneous x4 Wide SAS Ports
- Up to 3.6TB of storage per PCI slot of SAS storage when connected to an MSA70 external drive enclosure with (25) 146GB drives (HP-UX and OpenVMS only).

Fault Tolerance Keeps data available and server running while a failed drive is being replaced (ProLiant models only)

- Drive Mirroring (RAID 1): This allocates half of the drive array to data and the other half to mirrored data, providing two copies of every file.

Supported Servers ProLiant DL (rack-optimized):

- HP ProLiant DL120 G5
- HP ProLiant DL140 G2
- HP ProLiant DL140 G3
- HP ProLiant DL145 G3

Standard Features

- HP ProLiant DL160 G5
- HP ProLiant DL160 G5 Storage
- HP ProLiant DL165 G5
- HP ProLiant DL165 G5p
- HP ProLiant DL180
- HP ProLiant DL180 G5
- HP ProLiant DL185
- HP ProLiant DL185 G5 Storage
- HP ProLiant DL320 G4
- HP ProLiant DL320 G5
- HP ProLiant DL320 G5p
- HP ProLiant DL320s
  NOTE: External Tape support only
- HP ProLiant DL360 G5
- HP ProLiant DL365
- HP ProLiant DL365 G5
- HP ProLiant DL380 G5
- HP ProLiant DL380 G5 Storage
- HP ProLiant DL385 G2
- HP ProLiant DL385 G5
- HP ProLiant DL385 G5p
- HP ProLiant DL580 G4
- HP ProLiant DL580 G5
- HP ProLiant DL585 G2
- HP ProLiant DL585 G5
- HP ProLiant DL785 G5

ProLiant ML (expansion-optimized):

- HP ProLiant ML110 G4
- HP ProLiant ML110 G5
- HP ProLiant ML110 G5 Storage
- HP ProLiant ML115
- HP ProLiant ML115 G5
- HP ProLiant ML150 G3
- HP ProLiant ML150 G5
- HP ProLiant ML310 G3
- HP ProLiant ML310 G4
- HP ProLiant ML310 G5
- HP ProLiant ML310 G5p
- HP ProLiant ML350 G5
- HP ProLiant ML370 G4
- HP ProLiant ML370 G5
- HP ProLiant ML570 G4

Integrity Servers (RAID not supported. External Port connections only)

- HP Integrity Rx 2660
- HP Integrity Rx 3600
- HP Integrity Rx 6600
- HP Integrity Rx 7640
- HP Integrity Rx 8640
- HP Superdome sx2000 (PCI-e models only)

Standard Features

Supported Enclosures
- StorageWorks 50 Modular Smart Array
  - Supports one MSA50 - additional tiered enclosures are not supported
- StorageWorks 60 Modular Smart Array (only in HP-UX and OpenVMS environments with selected HP Integrity Servers only)
  - Supports 1+3 MSA60's cascaded off the single x4 port - additional tiered enclosures are not supported
- StorageWorks 70 Modular Smart Array (only in HP-UX and OpenVMS environments with selected HP Integrity Servers only)
  - Supports 1+1 MSA70's cascaded off the single x4 external port - additional tiered enclosures are not supported

Operating Systems

Microsoft Windows 2003 Standard 32 Bit
Microsoft Windows 2003 Enterprise 32 Bit
Microsoft Windows 2003 Web
Microsoft Windows 2003 SBS
Microsoft Windows 2003 Standard x64
Microsoft Windows 2003 Enterprise x64
Microsoft Windows Server 2008
SCO UnixWare 7.1.3
SCO UnixWare 7.1.4
SCO Openserver 6.0.0
HP-UX 11iv2 and 11iv3
OpenVMS V8.3-1H1
Red Hat Enterprise Linux
SUSE Linux Enterprise Server
NOTE: For more Linux OS support & certification information, please visit our the ProLiant & BladeSystem Server Linux matrix: http://h18004.www1.hp.com/products/servers/linux/hplinuxcert.html

LSI Off Line

LSI Off Line option ROM Utility

Service and Support, HP Care Pack, and Warranty Information

Warranty	The warranty for this device is 1 year parts only.

Software Product Services	Standalone telephone support Rights to new license version Media and documentation updates

Hardware Product Services	Installation services On-site maintenance (includes warranty support) Response time upgrades during the warranty period Post-warranty coverage RAID setup and performance consulting via statement of work NOTE: For additional hardware installation and maintenance information, please refer to the URL: http://www.hp.com/hps/hardware/

Warranty Upgrade Options	Response - Upgrade on-site response from next business day to same day 4 hours Coverage - Extend hours of coverage from 9 hours x 5 days to 24 hours x 7 days Duration - Select duration of coverage for a period of 1, 3, or 5 years Warranty upgrade options can come in the form of Care Packs, which are sold at the HP System level this product attaches too.

HP Care Pack Information	HP Care Pack is defined as an upgrade to the product warranty attribute, available for a specific duration and hours of coverage. Care Packs for this option are sold at the system level this option attaches too. HP Care Pack is not available for less than the product's warranty duration. HP Care Pack is available for sale anytime during the warranty period for most products, but the commencement date will be the same as the Warranty Start Date (delivery date to end user customer). Proof of purchase may be required. HP Care Pack services are prepaid. NOTE: For additional HP Care Pack (hardware & software) information, as well as orderable part numbers, please refer to the URL: http://www.hp.com/hps/carepack/

Related Options

Hard Drives

NOTE: The components of a storage subsystem (e.g. the drive, the HBA/controller, firmware, and the server backplane) should operate at the same data transfer rate or the system bandwidth will be negotiated down to an acceptable level for all components.
NOTE: Hard drives have either a one year or three year warranty; refer to the specific hard drive QuickSpecs for details.

SAS Hot Plug SFF Enterprise (ENT) Drives

HP 300GB 3G SAS 10K SFF DP ENT HDD	492620-B21
HP 146GB 3G SAS 15K SFF DP ENT HDD	504062-B21
HP 146GB 3G SAS 10K SFF DP ENT HDD	418367-B21
HP 72GB 3G SAS 15K SFF DP ENT HDD	418371-B21
HP 72GB 3G SAS 10K SFF DP ENT HDD	384842-B21

SAS Hot Plug 3.5" Enterprise (ENT) Drives

HP 450GB 3G SAS 15K 3.5" DP ENT HDD	454232-B21
HP 400GB 3G SAS 10K 3.5" DP ENT HDD	459508-B21
HP 300GB 3G SAS 15K 3.5" DP ENT HDD	416127-B21
HP 146GB 3G SAS 15K 3.5" DP ENT HDD	384854-B21
HP 72GB 3G SAS 15K 3.5" DP ENT HDD	384852-B21

Non-Hot Plug SAS 3.5" Drives

HP 450GB 3G NHP 15K 3.5" DP SAS ENT HDD	454234-B21
HP 400GB 3G NHP 10K 3.5" DP SAS ENT HDD	508232-B21
HP 300GB 3G NHP 15K 3.5" DP SAS ENT HDD	417950-B21
HP 146GB 3G NHP 15K 3.5" DP SAS ENT HDD	417855-B21

SAS Hot Plug SFF Midline (MDL) Drives

HP 500GB 6G SAS 7.2K SFF DP MDL HDD	507610-B21

SAS Hot Plug 3.5" Midline (MDL) Drives

HP 1TB 3G 7.2K 3.5" DP SAS MDL HDD	461137-B21
HP 750GB 3G 7.2K 3.5" DP SAS MDL HDD	461135-B21

SAS Hot Plug SFF Enterprise (ENT) Drives

HP 146GB 3G SAS 10K SFF SP HDD	431958-B21
HP 72GB 3G SAS 10K SFF SP HDD	375861-B21
HP 72GB 3G SAS 15K SFF SP HDD	431935-B21
HP 36GB 3G SAS 15K SFF SP HDD	431933-B21

SAS Hot Plug 3.5" Enterprise (ENT) Drives

HP 300GB 3G SAS 15K 3.5" SP HDD	431944-B21
HP 146GB 3G SAS 15K 3.5" SP HDD	375872-B21
HP 72GB 3G SAS 15K 3.5" SP HDD	375870-B21

SAS Non-Hot Plug 3.5" Enterprise (ENT) Drives

HP 300GB 3G SAS 15K NHP 3.5" DP ENT HDD	431950-B21
HP 146GB 3G SAS 15K NHP 3.5" SP HDD	432093-B21
HP 72GB 3G SAS 15K NHP 3.5" SP HDD	432095-B21

SATA Hot Plug Entry (ETY) Drives

HP 120GB 1.5G SATA 5.4K SFF ETY HDD	458924-B21

SFF SATA Non-Hot Plug Entry (ETY) Drives

HP 120GB 1.5G SATA 5.4K NHP SFF ETY HDD	459357-B21

Related Options

	3.5" SATA Hot Plug Drives	
	HP 80GB 1.5G SATA 7.2K 3.5" HDD	349237-B21
	3.5" SATA Non-Hot Plug Drives	
	HP 80GB 1.5G SATA 7.2K NHP 3.5" HDD	383410-B21

NOTE: Go to the HP Hard Drive Compatibility table for complete drive compatibility information (http://www.hp.com/products/harddiskdrives). Using hard drives in unsupported configurations will result in voiding the warranty and could result in damage to the drive and/or loss of data.
NOTE: When using the SC44Ge with SATA Hard Drives, 1.5G SATA Hard Drives are required.

Tape Storage

Tape Drives
DAT Tape Drives (Integrity support for External only)

HP StorageWorks DAT 160 SAS Internal Tape Drive	Q1587A
HP StorageWorks DAT 160 SAS External Tape Drive	Q1588A

LTO Ultrium Tape Drives

HP StorageWorks LTO-2 Ultrium 448 SAS Internal Tape Drive	DW085A
HP StorageWorks LTO-2 Ultrium 448 SAS External Tape Drive	DW086A
HP StorageWorks LTO-3 Ultrium 920 SAS Internal Tape Drive	EH847A
HP StorageWorks LTO-3 Ultrium 920 SAS External Tape Drive	EH848A
HP StorageWorks LTO-4 Ultrium 1840 SAS Internal Tape Drive	EH860A
HP StorageWorks LTO-4 Ultrium 1840 SAS External Tape Drive	EH861A

Rack-mount Tape Drive Enclosures

HP StorageWorks 1U SAS Rack-Mount Kit   AE459A
NOTE: The 1U SAS Rack-Mount Kit can support up to (2) half-height tape drives and is compatible with the DAT 160 SAS, Ultrium 448 SAS and Ultrium 920 SAS tape drives.

HP StorageWorks 3U SAS Rack-mount Kit   AG576A
NOTE: The 3U Rack-mount Kit can support up to (2) full-height or (4) half-height tape drives and compatible with multiple SAS tape drives including DAT 160 SAS, LTO-2 Ultrium 448 SAS, LTO-3 Ultrium 920 SAS, and LTO-4 Ultrium 1840 SAS tape drives.

Tape Autoloaders

HP 1/8 G2 LTO-4 Ultrium 1760 SAS Tape Autoloader	AK377A
HP StorageWorks 1/8 G2 LTO-3 Ultrium 920 SAS Autoloader	AH558A

Tape Libraries

HP StorageWorks MSL2024 1 LTO-3 Ultrium 920 SAS Drive Library	AH559A
HP StorageWorks MSL4048 1 LTO-3 Ultrium 920 SAS Drive Library	AH560A
HP StorageWorks MSL8096 2 LTO-3 Ultrium 920 SAS Drive Library	AH561A

SAS Cables for Tape Drives

2M External SAS (SFF8470) to Mini SAS (SFF8088) 1x SAS Cable   AE466A
NOTE: Use this cable to connect HP StorageWorks Ultrium SAS External Tape Drives to SAS Controllers with SAS (SFF8470) connectors.

4M External Mini SAS to Mini SAS (SFF8088) 3x/1x External Split SAS Cable   AE464A
NOTE: This split cable connects internally to SAS Hard Drive Cage (3x) and externally to the HP Storage Works 1U SAS Rack-Mount Kit (1x) with other connector going to internal SAS Controller port inside the server. Requires additional PCI slot on server for threading 1x split cable to SAS tape.

Related Options

4M External SAS (SFF8470) to Mini SAS (SFF8088) 1x SAS Cable   AE468A
NOTE: Use this cable to connect HP StorageWorks 1U SAS Rack-mount Kit to SAS Controllers with SAS (SFF8470) connectors.

2M External Mini SAS (SFF8088) to Mini SAS (SFF8088) 1x SAS Cable   AE470A
NOTE: Use this cable to connect HP StorageWorks Ultrium SAS External Tape Drives.

4M External Mini SAS (SFF8088) to Mini SAS (SFF8088) 1x SAS Cable   AE465A
NOTE: Use this cable to connect HP StorageWorks 1U SAS Rack-mount Kit.

4M External Mini SAS to Mini SAS (SFF8088) 3x/1x External Split SAS Cable   AG452A
NOTE: This split cable connects internally to SAS Hard Drive Cage (3x) and externally to the HP Storage Works 1U SAS Rack-Mount Kit (1x) with other connector going to internal SAS Controller port inside the server. Requires additional PCI slot on server for threading 1x split cable to SAS tape. Valid only for ProLiant DL360 G5 and ProLiant DL365 servers.

2M External Infiniband (SFF8470) to Mini SAS (SFF8088) 1x SAS Cable   AH587A
NOTE: Use this cable to connect HP StorageWorks 1/8 G2 SAS tape autoloaders and MSL2024/MSL4048/MSL8096 SAS tape libraries to SAS Controllers with Infiniband (SFF8470) connectors.

Technical Specifications

Dimensions (excluding bracket)	6.6 x 2.5 x 0.6 in (16.8 x 6.4 x 1.6 cm)
Disk Drive and Enclosure Protocol Support	3 Gbps SAS (Serial Attached SCSI) 1.5 Gbps SATA (Serial Advanced Technology Attachment)
Architecture	Serial Attached SCSI (SAS) Serial Advanced Technology Attachment (SATA) PCI-Express x8
SAS Connectors	1 x4 internal SFF-8484 and 1x4 external SFF-8470
Data Transfer Method	300 MB/s bandwidth (600 MB/s, full duplex) on each port for combined throughput of up to 2 Gb/s
PCIe Bus Speed	PCIe x8 (2.5 Gb/s maximum bandwidth)
Simultaneous Drive Transfer Ports	2 x4 Wide SAS Connectors (1 external only for Integrity Servers)
Port Transfer Rate	12 Gb/s per x4 Wide SAS Port (4 x 3 Gb/s)
Software upgradeable Firmware	Yes
Maximum Capacity	8.7TB of SAS storage when connected to (4) 300GB drives internal to the Server and an MSA70 external drive enclosure with (25) 300GB drives.
Memory Addressing	64-bit, supporting servers memory greater than 4 GB
Logical Drives Supported	(ProLiant only) Up to 2 Logical Volumes Up to 8 drives total in all RAID volumes 2 Drives per RAID 1 Up to 8 Drives per RAID 0
RAID Support	(ProLiant only) RAID 1 (Mirroring) RAID 0 (Striping)
Upgradeable Firmware	4-MB flashable ROM
Disk Drive and Enclosure Protocol Support	3Gb/s SAS and 1.5Gb/s SATA

Environment-friendly Products and Approach	End-of-life Management and Recycling	Hewlett-Packard offers end-of-life HP product return, trade-in, and recycling programs in many geographic areas. For trade-in information, please go to http://www.hp.com/go/green. To recycle your product, please go to: http://www.hp.com/go/green or contact your nearest HP sales office. Products returned to HP will be recycled, recovered or disposed of in a responsible manner. The EU WEEE directive (2002/95/EC) requires manufacturers to provide treatment information for each product type for use by treatment facilities. This information (product disassembly instructions) is posted on the Hewlett Packard web site at: http://www.hp.com/go/green. These instructions may be used by recyclers and other WEEE treatment facilities as well as HP OEM customers who integrate and re-sell HP equipment.

Technical Specifications