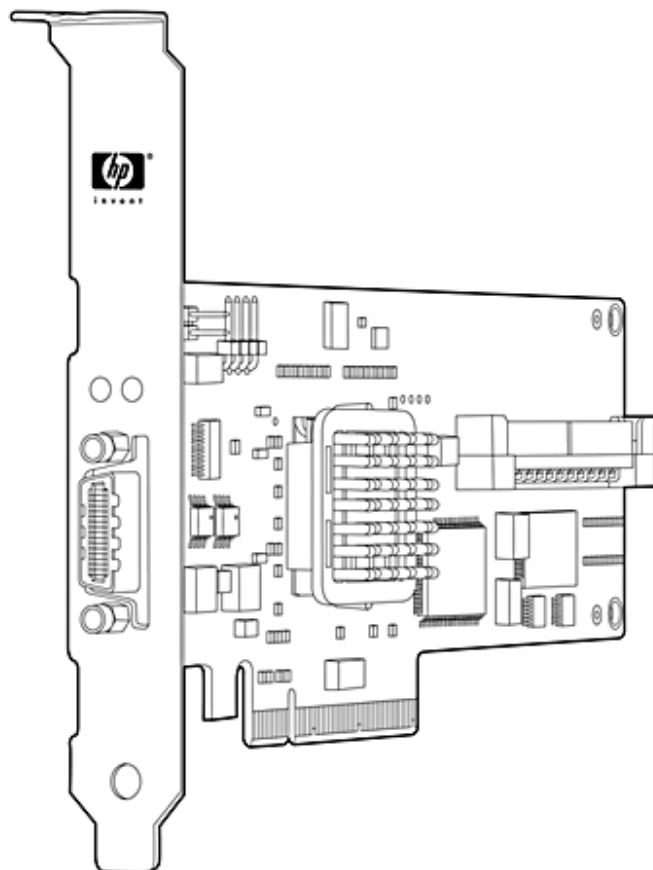


### Overview

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.



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### Model

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

416096-B21  
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

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**NOTE:** This is a list of supported servers. Some may be discontinued.

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#### 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>

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#### LSI Off Line

LSI Off Line option ROM Utility

### Service and Support, HP Care Pack, and Warranty Information

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

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

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**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/>

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**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.

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**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

**NOTE:** This is a list of supported options. Some may be discontinued.

#### 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](http://www.hp.com/products/harddiskdrives) 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<br><b>NOTE:</b> Use this cable to connect HP StorageWorks 1U SAS Rack-mount Kit to SAS Controllers with SAS (SFF8470) connectors.   | AE468A |
| 2M External Mini SAS (SFF8088) to Mini SAS (SFF8088) 1x SAS Cable<br><b>NOTE:</b> Use this cable to connect HP StorageWorks Ultrium SAS External Tape Drives.  | AE470A |
| 4M External Mini SAS (SFF8088) to Mini SAS (SFF8088) 1x SAS Cable<br><b>NOTE:</b> Use this cable to connect HP StorageWorks 1U SAS Rack-mount Kit.   | AE465A |
| 4M External Mini SAS to Mini SAS (SFF8088) 3x/1x External Split SAS Cable<br><b>NOTE:</b> 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. | AG452A |
| 2M External Infiniband (SFF8470) to Mini SAS (SFF8088) 1x SAS Cable<br><b>NOTE:</b> 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.  | AH587A |

### Technical Specifications

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

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|   |   |   |
|---|---|---|
| <b>Environment-friendly Products and Approach</b> | <b>End-of-life Management and Recycling</b> | 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 <a href="http://www.hp.com/go/green">http://www.hp.com/go/green</a> . To recycle your product, please go to: <a href="http://www.hp.com/go/green">http://www.hp.com/go/green</a> 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*

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For hard drives, 1 GB = 1 billion bytes. Actual formatted capacity is less.