

MODELS

Smart Array 3100ES Controller 295570-B21

High-performance, Hot Plug PCI, three channel intelligent array controller using the new innovative PCI Extended SCSI Bus Connector

Three Wide-Ultra SCSI-3 channels provide up to 120 MB/s throughput (40 MB/s per channel).

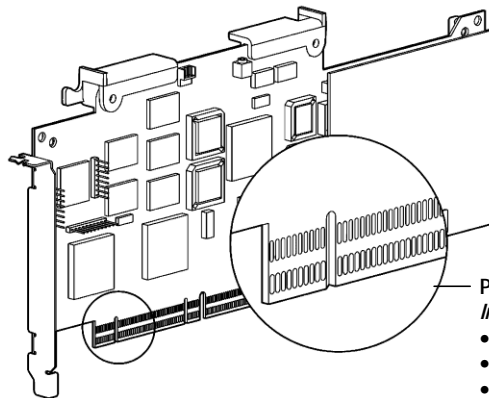
64-MB¹ ECC-protected and battery-backed removable read/write cache

Configuration flexibility and intelligent storage management to ensure continuous high-performance access to network data

Note: This controller can only be used with systems that support the new PCI Extended SCSI Bus Connector: PL 6000/7000 Xeon™ Servers.

Overview

The Smart Array 3100ES Controller is a Compaq innovation for Hot Plug Redundancy of Array Controllers design based on field-proven SMART-2 array architecture. Three Wide-Ultra SCSI-3 channels are provided to match the three SCSI drive banks in the ProLiant 6000 and 7000 Systems (Xeon versions only). Using the new Extended SCSI PCI Bus Connector, the Smart Array 3100ES Controller enhances PCI hot plug by distributing the three SCSI channels through the new PCI hot plug Extended SCSI connector resulting in a "cable free" controller environment. PCI Hot Plug operation is greatly enhanced by this new cableless design.



PCI Extended SCSI Bus Connector - *NEW Industry Innovation!*

- Cable free controller environment
- New failover redundancy
- Unique PCI hot plug array controller replacement

The Smart Array Advantage

Compaq's innovative design and integration work for the Smart Array family of products adds customer value that is unmatched in the industry. Large scale use of Smart Array products facilitates a much lower cost of ownership than many competitive server storage products. The Compaq Smart Array family brings unparalleled return on invested dollars due to these product family benefits:

Data Compatibility between all models of Smart Array Controllers means customers can upgrade from other models of Smart Array products to get to higher performance, capacity and availability. Unlike competitive products, successive generations of Smart Array products understand the data format of other Smart Array controllers².

Consistent Configuration and Management Tools. All Smart Array products utilize a standard set of management and utility software. These tools consistently lower the cost of ownership by reducing training and technical expertise necessary to install and maintain the Compaq server storage. Configuration, management and diagnostic software tools include: Array Configuration Utility, Array Diagnostic Utility, Compaq Insight Manager (CIM), and Compaq SmartStart.

Snapshots and Storage Pools. Compaq delivers the next step towards the Enterprise Network Storage Architecture vision with support for StorageWorks Virtual Replicator. With this optional software, users can: instantly create "snapshots" of production data to reduce backup and restore windows from hours to minutes, pool storage for quick response to changing storage capacity needs, create "virtual volumes" of up to 1 terabyte and enjoy policy-based automation to simplify system data and storage management.

Pre-Failure Warranty³ means that CIM not only tells you when a drive is going bad, but allows you to replace failing drives before they actually fail.

Server Management

On-Line Capacity Expansion: Simplifies storage management by allowing on-line capacity expansion, eliminating the need to shut down the server while adding storage.

Logical Drive Capacity Extension: Allows the user to increase the size of existing logical drives.

Array Configuration Utility: *Simplifies* array configuration and facilitates on-line capacity expansion via a graphical user interface (GUI).

Array Performance Monitor: Monitors key parameters (with Compaq Insight Manager) and provides information for proactive system planning.

Drive & Array Movement: The users can move (detach & attach) drives in any order on the same controller (drive movement) or add a configured drive array to another controller (array movement), and maintain configuration information. This feature requires the system to be powered down, and there must not be any failed drives or active spare drives in the array.

Performance

Host Interface: 32-bit bus-master technology delivers maximum data performance, transferring information directly to system memory at rates up to 133 MB per second (PCI); enhanced command interface reduces command latency and maximizes transfer rates.

Intelligent Array Engines: Processing tasks are divided between two engines. Working simultaneously, one engine generates fault tolerance information and manages data flow, while the other prepares and sorts array storage commands.

3 Channels: Three Wide-Ultra SCSI-3 channels provide over 218 GB of high-availability Fault Tolerant storage within the ProLiant 6000 and 7000 models.

Enhanced Array Accelerator: 64-MB ECC protected and battery backed removable read/write cache module² maximizes I/O performance without sacrificing data integrity. Prediction of sequential operations and retrieval of data prior to a request further enhances performance.

Data Distribution/Accessibility: Data is distributed across multiple drives (up to 18), optimizing drive efficiency and performance. Multiple commands and requests for information are processed simultaneously across drives with Tagged Command Queuing, contributing to an overall performance of up to 40 percent faster than other SCSI implementations.

Higher Availability

Online storage management tools saves you training and administration costs: Online RAID Level Migration, Online Capacity Expansion, Logical Drive Capacity Extension, Global Online Spares, Pre-Failure Warranty³.

Failover Controller Redundancy: Supports redundant controller boards for higher data availability. You can hot plug a redundant SA-3100ES controller without bringing down the server.

Fault Tolerance

Keeps data available and server running while a failed drive is being replaced; several fault tolerance configurations are supported including:

Distributed Data Guarding (RAID 5): Allocates parity data across multiple drives and allows simultaneous write operations.

Data Guarding (RAID 4): Writes parity data to a single, dedicated parity drive.

Drive Mirroring (RAID 1, 0+1): Allocates half of the drive array to data and the other half to mirrored data, providing two copies of every file.

Fault Recovery

Minimizes downtime and facilitates a quick recovery from component failures.

On-Line Spares: Up to four spare drives can be installed prior to drive failure. If a failure occurs, recovery begins with an On-Line spare and data is reconstructed automatically.

Array Accelerator: Onboard, battery backed cache memory protects data in the event of a controller, server or power failure. This daughter board is uniquely removable from the array in the unlikely event of a controller failure—saving critical user data for up to four days.

Hot Pluggable Drive Support

Hard disk drives can be removed or added without powering down the server.

Storage Capacity

Three Wide-Ultra SCSI-3 channels allow support for up to 12 1.6" drives or 18 1" drives on a single controller in the ProLiant 6000 and 7000 servers. Maximum capacity: (12) 1.6" 36.4 GB drives = 436.8 GB of storage; (18) 1" 18.2 GB drives = 327.6 GB of storage.

SOFTWARE COMPONENTS

Compaq Smart Array software makes setup, storage management, configuration and trouble shooting a breeze. Compaq Smart Array products utilize a single, consistent set of utility software for storage and RAID management. This consistency across the Smart Array product line reduces the cost of ownership by reducing training and technical expertise necessary to install and maintain your Compaq server storage solution.

Array Configuration Utility & Array Diagnostic Utility

- Powerful configuration and diagnostic utilities for all Smart Array controllers
- Provides a graphical view of Compaq drive array configurations
- Easy to use Wizards for configuration
- Runs online on NT 4.0 and NetWare

Compaq Insight Manager

- Powerful server and server options/storage monitoring tool
- Monitors over 1200 different server parameters

SmartStart

- Simple to use server/storage installation tools

Compaq StorageWorks Virtual Replicator (sold separately)

- **Snapshot Back Up and Restore:** Instantly create "snapshots" of production data to reduce backup and restore windows from hours to minutes.
- **Storage Pools:** For quick response to changing storage capacity needs, create "virtual volumes" of up to 1 terabyte and enjoy policy-based automation to simplify system data and storage administration.
- **System requirements:** Windows NT 4.0 SP3, IE 3.02, 32-MB memory, and 30-MB disk space

SPECIFICATIONS

Protocols	Wide-Ultra SCSI-3
SCSI Electrical Interface	Single-ended
Drives Supported	Up to 18-1" or 12-1.6" Wide-Ultra SCSI-3 hard drives
Data Transfer Method	32-bit PCI bus-master
Maximum Transfer Rate on System Bus (peak)	133 MB/s
Simultaneous Drive Transfer Channels	Three
Total Channel Transfer Rate	120 MB/s; 40 MB/s per channel
Software Upgradable Firmware	Yes
Read/Write Cache	64-MB ¹ ECC protected, battery backed read/write cache built on Compaq's uniquely removable daughter board technology
Logical Drives Supported	32
Reliability Features	
Distributed Data Guarding (RAID 5)	Yes
Data Guarding (RAID 4)	Yes
Drive Mirroring (RAID 1, 0+1)	Yes
Drive Striping (RAID 0)	Yes
Automatic Data Recovery	Yes
Redundant Controller Option	Yes

Kit Contents

Controller, warranty card, support software CD, installation guide, quick install poster and Compaq Systems Reference Library CD

Warranty

Maximum: The remaining warranty of the Compaq server product in which it is installed (to a maximum three-year limited warranty²)

Minimum: One-year, on-site limited warranty²

Pre-Failure Warranty²: Drives attached to the Smart Array Controller and monitored under Compaq Insight Manager are supported by a Pre-Failure (replacement) Warranty.

OPTIONS

SCSI Hard Drives⁴

36.4-GB Pluggable Wide-Ultra SCSI-3 Hard Drive (1.6")	400740-B21
18.2-GB Pluggable Wide-Ultra SCSI-3 Hard Drive (1")	400739-B21
18.2-GB Pluggable Wide-Ultra SCSI-3 10,000 rpm Hard Drive (1.6")	336358-B21
9.1-GB Pluggable Wide-Ultra SCSI-3 10,000 rpm Hard Drive (1")	336357-B21
9.1-GB Pluggable Wide-Ultra SCSI-3 Hard Drive (1")	313706-B21
4.3-GB Pluggable Wide-Ultra SCSI-3 Hard Drive (1")	272577-001
4.3-GB Pluggable Wide-Ultra SCSI-3 10,000 Hard Drive	336356-B21

Software

Compaq StorageWorks Virtual Replicator

License & Media (CD-ROM)	388931-B21
License Only	388932-B21
Upgrade License & Media (CD-ROM)	135438-B21
Upgrade License Only	135439-B21

¹ 56 MB useable for Read/Write cache, 8 MB used for transfer buffer and scripts memory.

² Certain restrictions and exclusions apply. Consult the Compaq Customer Support Center at 1-800-345-1518 for details.

³ Pre-Failure Warranty is available on all Compaq Prosignia and Compaq ProLiant servers using Compaq Insight Manager 2.1 or higher, and covers Pentium® Pro processors, ECC memory and server hard drives (except the 535 MB Fast-SCSI-2 hard drive) using Compaq IDA, IDA-2, Compaq SMART SCSI Array Controllers, Compaq SMART-2 Array Controllers or Compaq Smart Array Controllers. Certain restrictions and exclusions apply. Consult the Compaq Customer Support Center for details.

⁴ For complete compatibility information, refer to the Compaq SCSI Hard Drive Compatibility table located at <http://www.compaq.com/products/storageworks/hdd/appinfo.html>. Using hard drives in unsupported configurations will result in voiding of the warranty and could result in damage to the drive and/or loss of data.