QuickSpecs

Compaq *Smart Array* 221 Controller

Models

Smart Array 221 Controller

388099-B21

Key Product Features

- Low cost, entry-level array controller
- Wide Ultra2 SCSI
- Single channel
- Up to 12 drives supported
- Pre-Failure warranty
- Upgrade path to higher capacity PCI array controllers
- Online spares support
- Auto rebuild of failed drives
- Software integration with Array Configuration Utility and Compaq Insight Manager

Overview

The Smart Array 221 brings exceptional performance, data availability and entry-level server costs to customers that once believed that reliable data protection had to be expensive.

The SA-221 is Compaq's second entry-level class array controller, replacing the SMART-2SL, built on seven generations of array controller design and integration for Compaq servers.

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 through 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 higher performance, capacity and availability. Unlike competitive products, successive generations of Smart Array products understand the data format of other Smart Array controllers.

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

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 includes: 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 Warranty means that CIM not only tells you when a drive is going bad, but allows you to

replace failing drives before they actually fail.

Note: 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..

Target Environments

The Smart Array 221 controller offers investment protection for branch offices and businesses that can't afford to leave their data unprotected, or that depend on software-based RAID products.

Small/Medium Business: Server environments with fewer clients and businesses with tight budgets can now afford the protection and recovery benefits of hardware array controller technology.

Branch Office/Offsite Workgroups: With the highest price/performance ratio in the industry, business can now afford to protect data at branch offices and workgroups with a true hardware-based array controller. Because data is compatible between the SA-221 and SA-3200 array controller, upgrading to the next generation array controller is seamless.

Entry-Level Array Technology: For businesses without previous RAID protection or experience with array technology, the Compaq SA-221 controller is easy to purchase, easy to set up and easy to maintain.

Standard Features

Fault Prevention Features

Allows detection of possible failures before they occur, allowing preventive action to be taken.

S.M.A.R.T.: Self Monitoring Analysis and Reporting Technology first developed at Compaq detects possible hard disk failures, before they occur, allowing Compaq to replace the failed component before the actual failure occurs.

Drive Parameter Tracking: Monitors over 15 drive operational parameters, predicting failures, and notifying administrator of possible failures.

Dynamic Sector Repairing: Scans hard drives and automatically remaps bad sectors, ensuring data integrity in the background during server idle time.

Environment Parameter Tracking: Monitors fan and cabinet temperature of *ProLiant* Storage System/U family of products.

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.

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.

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.

Performance

32-bit Bus-Master Host Interface: 32-bit PCI bus-master technology delivers maximum data burst performance, transferring information directly to system memory.

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

Wide Ultra2 SCSI: This single channel controller provides for a maximum of 15 drives3 per server slot with a total controller bandwidth of 80 MB/s.

Note: The *ProLiant* Storage System Model UE will support up to 12 external hard disk drives—most *ProLiant* servers support fewer than 15 internal hard disk drives.

Data Distribution: Data is distributed across multiple drives, optimizing drive efficiency and performance.

ECC Protected Read Cache: 6 MB of ECC protected read cache memory dramatically reduces wait times for read-intensive applications.

Software Components

Compaq Smart Array software makes setup, storage management, configuration and trouble shooting a breeze. Compaq storage servers and 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 and storage installation tools

Compaq *SanWorks* 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.
- **Online Volume Growth:** Enables easy, non-disruptive growth for Windows 2000 volumes with zero downtime.
- **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 2000 or Windows NT 4.0 SP3, IE 3.02, 32 MB memory, and 30 MB

disk space.

Specifications

Protocol	Wide Ultra2 SCSI
Electrical Interface	Low Voltage Differential
Drives Supported	Up to a maximum of 15 Wide Ultra2 SCSI3 or Wide-Ultra SCSI-33 drives
	Note: The *ProLiant* Storage System Model UE will support up to 12 external hard disk drives—most *ProLiant* servers support fewer than 15 internal hard disk drives.
Data Transfer Method	32-bit PCI bus-master
Maximum Transfer Rate on System Bus (peak)	133 MB/s
Total Channel Transfer Rate	80 MB/s
Software Upgradable Firmware	Yes
Cache Memory	6 MB of ECC protected read cache
Logical Drives Supported	32
Operating Systems Supported	Microsoft NT 3.51, 4.0, and later Novell NetWare 3.20, 4.11, 5 SCO OpenServer 5 UnixWare 2.1, 7.1 IBM OS/2 Warp Server Family Banyan Vines 6.x, 7.x, 8.x

Reliability Features

Distributed Data Guarding (RAID 5)	Yes
Drive Mirroring (RAID 1, 1+0)	Yes
Drive Striping (RAID 0)	Yes
Automatic Data Recovery	Yes

Kit Contents

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

Warranty

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

Minimum: One-year, on-site limited warranty

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

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

Options

Software	**Compaq SANWorks Virtual Replicator**	
	Note: For additional Virtual Replicator ordering information, refer to http://www.compaq.com/products/StorageWorks/swvr/ swvrorderinfo.html..	
	License & Media (CD-ROM)	191802-B21
	License Only	388932-B21
	Upgrade License & Media (CD-ROM)	135438-B21
	Upgrade License Only	135439-B21
Hard Drives	Note: 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..	
	Wide Ultra2 SCSI Drives – Hot Plug	
	18.2-GB Ultra2 SCSI Drive (1 in (2.54 cm))	388144-B21
	9.1-GB Ultra2 SCSI 10,000 rpm Drive (1 in (2.54 cm))	328939-B21
	9.1-GB Ultra 2 SCSI Drive (1 in (2.54 cm))	349514-B21
	4.3-GB Ultra2 SCSI 10,000 rpm Drive	328938-B21
	4.3-GB Ultra 2 SCSI Drive	349513-B21
	Wide Ultra2 SCSI Drives – Non-Hot Plug	
	18.2-GB Ultra2 SCSI 10,000 rpm Drive (1.6 in (4.06 cm))	328943-B21
	18.2-GB Ultra2 SCSI Drive (1 in (2.54 cm))	388143-B21
	9.1-GB Ultra2 SCSI 10,000 rpm Drive (1 in (2.54 cm))	328942-B21
	9.1-GB Ultra 2 SCSI Drive (1 in (2.54 cm))	349526-B21
	4.3-GB Ultra2 SCSI 10,000 rpm Drive	328941-B21
	4.3-GB Ultra 2 SCSI Drive	349525-B21
	Wide-Ultra SCSI-3 Drives – Hot Plug	
	36.4-GB Wide-Ultra SCSI-3 Drive (1.6 in (4.06 cm))	400740-B21
	18.2-GB Wide-Ultra SCSI-3 Drive (1 in (2.54 cm))	400739-B21
	18.2-GB Wide-Ultra SCSI-3 10,000 rpm Drive (1.6 in (4.06 cm))	336358-B21
	18.2-GB Wide-Ultra SCSI-3 Drive (1.6 in (4.06 cm))	313756-B21
	9.1-GB Wide-Ultra SCSI-3 10,000 rpm Drive (1 in (2.54 cm))	336357-B21
	9.1-GB Wide-Ultra SCSI-3 Drive (1 in (2.54 cm))	313706-B21
	4.3-GB Ultra2 SCSI 10,000 rpm Drive	336356-B21
	4.3-GB Wide-Ultra SCSI-3 Drive (1 in (2.54 cm))	272577-001
	Wide-Ultra SCSI-3 Drives – Non-Hot Plug	
	18.2-GB Wide-Ultra SCSI-3 10,000 rpm Drive (1.6 in (4.06 cm))	336370-B21
	9.1-GB Wide-Ultra SCSI-3 10,000 rpm Drive (1 in (2.54 cm))	336369-B21

	9.1-GB Wide-Ultra SCSI-3 Drive (1 in (2.54 cm))	339509-B21
	4.3-GB Ultra2 SCSI 10,000 rpm Drive	336368-B21
	4.3-GB Wide-Ultra SCSI-3 Drive (1 in (2.54 cm))	339506-B21
ProLiant **Storage System/U Family**	*ProLiant* Storage System Model UE (Single bus, Tower)	348710-B21
	ProLiant Storage System Model UE (Single bus, Rack)	348700-B21
	ProLiant Storage System Model U2 (Dual Bus, Tower)	304110-B22
	ProLiant Storage System Model U2 (Dual Bus, Rack)	304100-B22
	Recovery Server Option	304117-B21
	Redundant Power Supply Option	224206-001