QuickSpecs

Overview

Models

238633-B21
238633-291 (Japan)

Feature List:

- High Performance PCI-X Architecture
- High Capacity
- Two Ultra 3 SCSI channels support up to 28 drives
- Modular battery-backed cache design
- 128 MB battery-backed write cache
- 256 MB cache upgrade available

Introduction

The Smart Array 5312 (SA-5312) high-performance, dual channel Ultra3, PCI-X array controller provides reliable data protection for ProLiant™ servers and offers flexibility thanks to an innovative modular design. The SA-5312 controller raises the standard to higher performance levels with several enhancements including enhanced memory architecture and RAID engine.

Designed and tested with industry-standard ProLiant Servers for greater reliability, this controller is ideal for the distributed workgroup server or centralized departmental server, and like other Smart Array controllers, the SA-5312 offers complete data compatibility with previous generations' Smart Array controllers for easy data migration and upgradability.

What's New

Updated option support list, maximum storage support.

Key Features

- **Modular**, easy-to-upgrade design lets you optimize performance as needed, from 128-MB to 256-MB battery-backed cache.
- **High-performance**, Fifth generation architecture offers the new hardware RAID engine, and a new performance memory architecture for increased performance over previous generation controllers.
- **Recovery ROM** protects against a ROM failure or corruption.
- **Ultra3 SCSI** technology delivers high performance and data bandwidth up to 160 MB/s bandwidth per channel.
- **Dual Channels** provide the ability to support up to 28 drives or 4.1TB (28 x 146.8 GB Ultra320 1" Hard Drives).
- **Mix-and-match** LVD SCSI compatibility protects your investments and lets you deploy drives as needed.
- **Battery-backed Cache** protects cached data in the event of a power outage, server failure or controller failure, and redundant, replaceable batteries take that protection even further.
- **64-bit, 133 MHz PCI-X** interface boosts bandwidth above 1GB/s burst transfer rate over PCI-X bus.
- **64-bit memory addressing** supports servers with greater than 4 GB of memory.
- **Online Management Features:** Online Capacity Expansion, Online RAID Level Migration, Online Stripe Size Migration, Online Spares (Global), User Selectable Read/Write cache, User Selectable Expand and Rebuild Priority

The Smart Array Advantage

HP's innovative design and integration work of the Smart Array family of products creates customer value that is unmatched in the industry. Use of Smart Array products across multiple applications results in a much lower Total Cost of Ownership (TCO) than any other server storage RAID products. The HP Smart Array family brings an unparalleled return on investment through:

Data Compatibility among all models of Smart Array controllers allows simple and easy upgrades any time needs for higher performance, capacity, and availability increase. Even successive generations of Smart Array controllers understand the data format of other Smart Array Controllers.

Consistent Configuration and Management Tools. All Smart Array products utilize a standard set of management and utility software. These tools minimize Total Cost of Ownership (TCO) by reducing training requirements and technical expertise necessary to install and maintain the ProLiant server storage.

Universal Hard Drive form factor is for use across multiple ProLiant servers, disk enclosures and storage systems. With compatibility across many enterprise platforms, you are free to deploy and re-deploy these drives to quickly deliver increased storage capacity, migrate data between systems, and easily manage spare drives.

Pre-Failure Warranty means Insight Manager™ not only reports when a drive is going to fail but allows replacement of failing drives prior to actual failure. For complete details, consult the HP Support Center or refer to your ProLiant Server documentation.

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Overview

Software Suite

All Smart Array products share a common set of configuration, management and diagnostic tools, including Array Configuration Utility (ACU-XE), Array Diagnostic Utility (ADU), and Insight Manager. This software consistency of tools reduces the cost of training for each successive generation of product and takes much of the guesswork out of troubleshooting field problems. These tools lower the total cost of ownership by reducing training and technical expertise necessary to install and maintain the HP server storage.

Insight Manager
- Powerful server and server options/storage manager tool
- Monitors over 1200 server parameters

Configuration/Diagnostic Utilities
- Array Configuration Utility (ACU-XE)
- Powerful configuration utility for all Smart Array controllers
- Provides a graphical view of HP drive array configurations
- Easy to use Wizards for configuration
- Array Diagnostic Utility (ADU)
- Powerful diagnostic utility for all Smart Array controllers
- Options ROM Configuration Capability
- Rapid configuration upon initial install of the OS

Compatibility

Servers

For up to date compatibility, please see the following URL for complete Smart Array 5312 compatibility and support information.

http://www.hp.com/products/smartarray

NOTE: The SA-5312 is not supported in 5 volt PCI slots

Operating Systems

Microsoft® Windows NT® 4.0, 2000 **
Novell® NetWare® 4.2, 5.x **
Linux®

Product Highlights

Data Compatibility	Data compatibility among all models of Smart Array Controllers means customers can instantly upgrade their 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 controllers, providing investment protection for your HP storage solution.

Affordable

HP's new high-performance architecture sets new boundaries of industry performance expectations!
- Wide Ultra3 SCSI (160 MB/s bandwidth) per channel
- High-performance 64-bit architecture
- New performance memory architecture providing tri-directional data flow for improved performance
- 64-bit, 133-MHz PCI-X bus (1-GB/s bandwidth)

Capacity

- Given the need rapid capacity expansion, the SA-5312:
- Two Ultra3 SCSI channels support up to 28 disk drives
- Up to 4.1TB of storage per PCI slot

Availability

Provides increased server uptime by providing advanced storage functionality:
- Online RAID Level Migration (between any RAID level)
- Online Capacity Expansion
- Logical Drive Capacity Extension
- Global Online Spare
- Pre-Failure Warranty

Fault Prevention

The following features offer 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 HP detects possible hard disk failure before it occurs, allowing replacement of the component before failure occurs.
- Drive Parameter Tracking monitors drive operational parameters, predicting failure and notifying the administrator.
- Dynamic Sector Repairing continually performs background surface scans on the hard disk drives during inactive periods and automatically re-maps bad sectors, ensuring data integrity.
- Smart Array Cache Tracking monitors integrity of controller cache, allowing pre-failure preventative maintenance.
- Environment Tracking for External Storage System monitors

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): This allocates parity data across multiple drives and allows simultaneous write operations. It is recommended for up to 14 Hard drives.
- **Drive Mirroring** (RAID 1, 1+0): It allocates half of the drive array to data and the other half to mirrored data, providing two copies of every file. It is a fast performance RAID.

Fault Recovery

Minimizes downtime, reconstructs data, and facilitates a quick recovery from drive failure
- **Recovery ROM**: Provides a unique redundancy feature that protects from a ROM failure. A new version of firmware can be flashed to the ROM while the controller maintains the last know working version of firmware. If the firmware becomes corrupt, the controller will revert back to the previous version of firmware and continue operating. This reduces the risk of flashing firmware to the controller.
- **On-Line Spares**: Up to two 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.
- **ECC-Protected Cache Memory**: Removable, battery-backed cache memory protects data, up to four days, in the event of power failure, server hardware failure or controller failure. In addition, HP provides an exclusive design that includes redundant and replaceable batteries for greater cache protection.

Ease of Use

Consistency and Upgradability make the Smart Array family unique in the industry:
- GUI based configuration, management and diagnostic software tools
- Common data formatting between generations of products
- Data migration between servers and external storage enclosures

Service and Support, HP Care Pack and Warranty Information

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

For additional hardware installation and maintenance information, please refer to the URL listed below:
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

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.

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.

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/

Components

The following brick level options/components do not have individual HP Care Pack Services. These items will be included in product HP Care Pack Services into which they are installed.

Disk Drives	Tape Drives	CD/DVD ROM	SCSI Hubs in SBBs	Adapters
Bus Converters	Backplane RAID Controllers	Power Supplies	Cabling	Fans

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HP Smart Array 5312 Controller

Options

Controller Upgrade Options	256 MB Battery-Backed Cache Module	254786-B21
	NOTE: This 256 MB Battery-Backed Cache Module supports the Smart Array 5300 series controllers, MSA 1000 and the Smart Array Cluster Storage	

Software	StorageWorks™ Virtual Replicator by HP	
	License & Media (CD-ROM)	388931-B21
	License Only	388932-B21

Disk Drive Enclosures	StorageWorks Enclosure 4314T	190210-001
	StorageWorks Enclosure 4314T (Int'l)	190210-B31
	StorageWorks Enclosure 4314T (Japan)	190210-291
	StorageWorks Enclosure 4314R	190209-001
	StorageWorks Enclosure 4314R (Int'l)	190209-B31
	StorageWorks Enclosure 4314R (Japan)	190209-291
	StorageWorks Enclosure 4354R	190211-001
	StorageWorks Enclosure 4354R (Int'l)	190211-B31
	StorageWorks Enclosure 4354R (Japan)	190211-291

Hard Drives	**Wide Ultra3 SCSI Universal Drives – Hot Plug**	
	36.4-GB Wide Ultra3 SCSI 15,000 rpm Drive (1")	232916-B22
	18.2-GB Wide Ultra3 SCSI 15,000 rpm Drive (1")	188122-B21
	9.1-GB Wide Ultra3 SCSI 15,000 rpm Drive (1")	188120-B21
	72.8-GB Wide Ultra3 SCSI 10,000 rpm Drive (1")	232432-B22
	36.4-GB Wide Ultra3 SCSI 10,000 rpm Drive (1")	176496-B22
	18.2-GB Wide Ultra3 SCSI 10,000 rpm Drive (1")	142673-B22
	9.1-GB Wide Ultra3 SCSI 10,000 rpm Drive (1")	142671-B22
	36-GB Wide Ultra3 SCSI 10,000 rpm Drives (1"), 10 pack	232617-B21
	18-GB Wide Ultra3 SCSI 10,000 rpm Drives (1"), 10 pack	202352-B21
	Ultra320 Universal Drives – Hot Plug	
	36.4GB 10,000 rpm, U320 Universal Hard Drive, 1"	286713-B22
	72.8GB 10,000 rpm, U320 Universal Hard Drive, 1"	286714-B22
	146.8GB 10,000 rpm, U320 Universal Hard Drive, 1"	286716-B22
	18.2GB 15,000 rpm, U320 Universal Hard Drive, 1"	286775-B22
	36.4GB 15,000 rpm, U320 Universal Hard Drive, 1"	286776-B22
	72.8GB 15,000 rpm, U320 Universal Hard Drive, 1"	286778-B22
	NOTE: This is a list of supported hard disk drives (note that some drives may be discontinued).	
	NOTE: For complete compatibility information, refer to the SCSI Hard Drive Compatibility table located at: http://www.compaq.com/products/servers/proliantstorage/drives-enclosures/docs/index.html	

Universal Hot Plug Tape Drives	AIT 100 GB, Hot Plug (Carbon)	249161-B21
	AIT 50 GB, Hot Plug (Carbon)	215487-B21
	AIT 35 GB, LVD Hot Plug (Carbon)	216886-B21
	20/40-GB DAT, Hot Plug (Carbon)	215488-B21

Technical Specifications

Electrical Interface	LVD (Low Voltage Differential)
Protocol Support	Wide Ultra3 SCSI (160 MB/s per channel)
SCSI Ports	2 external/2 internal shared
Drives Supported	Up to 28 drives
Maximum Capacity	4.1 TB (28 drives x 146.8 GB Ultra320)
PCI	PCI-X and 3.3 volt PCI compatibility only NOTE: The SA-5312 is not supported in 5 volt PCI slots.
PCI Bus Speed	64-bit, 133-MHz PCI-X (1 GB/s maximum bandwidth)
Logical Drives	Up to 32 logical drives
RAID Support	RAID 5 (Distributed Data Guarding)
	RAID 1+ 0 (Striping & Mirroring)
	RAID 0 (Striping)
Cache Memory	128 MB Read/Write (256-MB module upgrade available)
	ECC protection, battery-backed, and removable
Cache Batteries	Up to 4 days of redundant battery life (72hrs. for the 256-MB module) removable for easy replacement
Upgradable Firmware	2-MB flashable ROM
Disk Drive and Enclosure Protocol Support	Ultra3 & Ultra2
Memory Addressing	64-bit, supporting servers memory greater than 4 GB
Dimensions (HxWxD)	18.375 x 8.25 x 4 in/46.67 x 20.95 x 10.16 cm
Weight	Smart Array 5312 3.26 lb/1.48 kg

Family Information

	Smart Array 5312	Smart Array 5300
Stripe Set Migration	Yes	Yes
RAID Level Migration	Yes	Yes
Redundant Controllers	No	No
Online Spare Support	Yes	Yes
Capacity Extension	Yes	Yes
SAN Access Module	No	Yes
PCI Bus	64-bit, 133-MHz PCI-X	64-bit, 66-MHz