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HPE Smart Array P400 Controller - Overview

Product description
Product features
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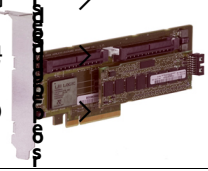
Link to drivers, firmware, software and manuals
Links to warranty information
Link to QuickSpecs

Product description



The SA P400 is a high-performance PCI Express (PCIe) RAID controller with 8 internal Serial Attached SCSI ports in a low-profile form factor, supporting up to 512MB of battery-backed write cache (BBWC) and RAID Level 6 (ADG)

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Product features

Feature	Description
The SmartArray advantage	HPE's innovative design and integration work within 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 product. The HPE Smart Array family brings an unparalleled return on investment. • Data compatibility Data compatibility with past and future generations of Serial Smart Array controllers allows for simple and easy upgrades any time needs for higher performance, capacity, and availability increase. • 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 HPE server storage. • Universal hard drive A universal hard drive is used across multiple HPE ProLiant servers, disk enclosures and storage systems. With compatibility across many enterprise platforms, user is 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 Pre-Failure Warranty means Systems 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 HPE Support Center or refer to user's HPE Server documentation.
Key features	• Seamless upgrades from past generations and upgrades to next generation HPE high performance and high capacity Serial Attached SCSI Smart Array controllers. • 3G SAS technology delivers high performance and data bandwidth up to 300 MB/s per physical link and contains full compatibility with 1.5G SATA technology. • x8 2.5G PCI Express host interface technology delivers high performance and data bandwidth up to 2 GB/s maximum bandwidth. • Modular, easy-to-upgrade design lets user to optimize performance by upgrading from 40-bit 256MB cache to 72-bit 512MB battery-backed write cache (BBWC). • Addition of the battery backed cache upgrade enables BBWC, RAID 6 with ADG, array expansion, logical drive extension, RAID migration, and stripe size migration. • Mix-and-match SAS and SATA hard drives, lets user to deploy drive technology as needed to fit user's computing environment. • Software consistency among all Smart Array family products: Array Configuration Utility (ACU), Option ROM Configuration for Arrays (ORCA), Systems Insight Manager, Array Diagnostic Utility (ADU) and SmartStart. • Support for up to 2TB in a single logical drive. • Low-profile PCI Express form factor - ships with a full size bracket for deployment in either a low-profile or full sized slot.
Online management features	• Online array expansion (with BBWC upgrade) • Online logical drive extension (with BBWC upgrade) • Online RAID level migration (with BBWC upgrade) • Online strip size migration (with BBWC upgrade) • Mirror splitting and recombining • Unlimited global online spare assignment • User selectable expand and rebuild priority • User selectable RAID level and stripe size • User selectable read and write cache sizes
Ports	Eight (8) SAS physical links distributed across 2 internal x4 wide port connectors.
Performance	HPE's High Performance Architecture sets new boundaries of industry performance expectations! • 3G SAS (300 MB/s bandwidth per physical link) • x8 3G SAS physical links (compatible with 1.5G SATA) • 256MB 40-bit wide DDR2-533 MHz cache upgradeable to 512MB 72-bit wide DDR2-533 MHz battery-backed cache provides up to 4.2 GB/s maximum bandwidth. • x8 2.5G PCI Express host interface provides 2 GB/s maximum bandwidth • 440 PowerPC Processor • Read ahead caching • Write-back caching (with battery-backed write cache upgrade)
Capacity	Given the increasing need for high performance and rapid capacity expansion, the SA-P400 offers: • Up to 3TB of total storage with 6 x 500GB SATA HDD • Up to 1.3TB of total storage with 18 x 72GB SFF SAS HDD
Availability	Provides increased server uptime by providing advanced storage functionality: • Online RAID level migration (between any RAID level) • Online stripe size migration • Online array expansion • Online logical drive extension • Online drive firmware upgrade • Unlimited 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 HPE detects possible hard disk failure before it occurs, allowing replacement of the hard drive before a real 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.
Fault tolerance	Keeps data available and server running while a failed drive is being replaced; several fault tolerance configurations are supported including: • **RAID 6 with ADG** (Advanced Data Guarding): This is the highest level of fault tolerance. It allocates two sets of parity data across drives and allows simultaneous write operations. This level of fault tolerance can withstand two simultaneous drive failures without downtime or data loss. • **RAID 5** (Distributed Data Guarding): This allocates one set of parity data across drives and allows simultaneous write operations. This level of fault tolerance can withstand a single drive failure without downtime or data loss. • **RAID 1, 1+0** (Drive Mirroring): This allocates half of the drive array to data and the other half to mirrored data, providing two copies of every file. It is a high-performance RAID.
Fault recovery	Minimizes downtime, reconstructs data, and facilitates a quick recovery from drive failure • Recovery ROM: This feature protects the user from a firmware image corruption by storing a redundant copy of the firmware image. If the active firmware image becomes corrupt, the controller will use the redundant firmware image and continue operating. • On-Line Spares: There is no limit to the number of spare drives that can be installed prior to drive failure. If a failure occurs, recovery begins with an On-Line Spare and data is reconstructed automatically. • DRAM ECC detects and corrects data bit errors.

Top Related Products
HPE Smart Array P400 Controller

Feature	Description
	• Battery-backed write cache upgrade provides for up to two days of battery power for data cache retention. The data backup duration could be extended anytime the server's auxiliary power is available during system power down.
Ease of use	Consistency and Upgradeability make the Smart Array family unique in the industry: • GUI based configuration, management and diagnostic software tools • Common data format between generations of products • Data migration between servers and external StorageWorks Modular Smart Array enclosures
Servers	For up to date compatibility, visit the Smart Array RAID Controllers Support Matrix webpage. Click to access the complete Smart Array P400 Controller compatibility and support information .
Warranty	The warranty for this device is 3-years parts only. **Pre-Failure Warranty**: Drives attached to the Smart Array Controller and monitored under Insight Manager are supported by a Pre-Failure (replacement) Warranty. For complete details, consult the HPE Support Center or refer to user's HPE Server Documentation.

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Software overview

Operating Systems Support

Feature	Description
Operating Systems	• HPUX 11i v2 • HPUX 11i v3 • Microsoft Windows 2000 Server • Microsoft Windows 2000 Advanced Server • Microsoft Windows 2003 / R2 Standard Edition • Microsoft Windows 2003 / R2 Enterprise Edition • Microsoft Windows 2003 / R2 Standard x64 Edition • Microsoft Windows 2003 / R2 Enterprise x64 Edition • Microsoft Windows 2003 / R2 SBS • Novell Open Enterprise Server, NetWare 6.5 SP5 • Red Hat Enterprise Linux 3 (AMD64/EM64T) • Red Hat Enterprise Linux 3 (x86) • Red Hat Enterprise Linux 4 (AMD64/EM64T) • Red Hat Enterprise Linux 4 (x86) • SUSE LINUX Enterprise Server 9 (AMD64/EM64T) • SUSE LINUX Enterprise Server 9 (x86) • SCO OpenServer 5.0.7, 6 • SCO UnixWare 7.1.3, 7.1.4 • Solaris 10 • VMWare ESX 3.0

Software Suite

Feature	Description
All Smart Array products share a common set of configuration, management and diagnostic tools, including Array Configuration Utility, Array Diagnostic Utility (ADU), and Systems 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 HPE server storage.	
Systems Insight Manager	• Powerful server and server options/storage manager tool • Monitors over 1200 system wide parameters • Configuration/Diagnostic Utilities
HPE Array Configuration Utility (ACU)	• Powerful Web based configuration utility for all Smart Array controllers • Provides a graphical view of HPE drive array configurations • Allows for management of multiple arrays over a secure internet connection from anywhere in the world • Easy to use Wizards for configuration • Runs offline for all supported Operating Systems (OS) and runs online for Windows and Linux. For online configuration of NetWare, use CPQONLIN
HPE Option ROM Configuration for Arrays (ORCA)	• A simple method for managing logical drives during system power up by pressing F8 during POST • Allows the ability to create arrays, logical drives, and assign an online spare drive • Allows the ability to view and delete logical drives • Allows the ability to select the boot controller • For advanced array configurations use ACU
HPE Array Diagnostic Utility (ADU)	• In depth diagnostic and reporting utility for all Smart Array controllers • Runs offline for all supported Operating Systems, and runs online for Windows and Linux

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Link to driver, firmware, software and manuals

Click here to access the HPE Support Center for driver, firmware, software and manuals .

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Links to warranty information

Click here for detailed information regarding worldwide limited warranty and technical support .

Click here to check warranty status .

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Link to QuickSpecs

Information for this Overview is taken from the product QuickSpecs. To access the complete QuickSpecs for this product, select the desired link from the following list:

- Click here to access the HPE Smart Array P400 Controller Worldwide QuickSpecs in html format .
- Click here to access the HPE Smart Array P400 Controller Worldwide QuickSpecs in .pdf format .
- Click here to access the QuickSpecs homepage, which provides access to the QuickSpecs for other regions/countries .

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