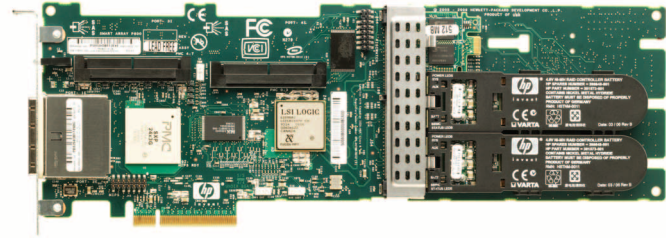


1 TB 3.5-inch SATA
hard disk drive



72 GB 3.5-inch SAS
hard disk drive



HP Smart Array P800 controller



HP ProLiant serial family

Data sheet

SAS and SATA solutions from HP offer performance, flexibility and scalability for today's growing technology environments.

Introduction

Data storage needs are expanding daily at the enterprise level, with data collection spanning e-mail, security and financial transactions. Storage options have historically been limited to separate systems based on parallel Advanced Technology Attachment (ATA), Small Computer Systems Interfaces (SCSI) or Fibre Channel disk interfaces. These are options that constrained your ability to deploy core storage technologies while adding extra cost and management. Several years ago, HP developed storage solutions with serial architectures to meet the requirements of a broad range of storage applications and to accommodate both Serial Attached SCSI (SAS) and Serial ATA (SATA) drives. This allowed customers to standardize on a single server or storage platform, dramatically simplifying the management of most storage applications. Today, HP continues to provide our customers with robust technology and more storage options.

Key features and benefits

SAS

SAS was the logical evolution of SCSI. HP developed this technology as it became apparent that parallel SCSI and parallel ATA would soon reach their technological limits:

- Connectors were too big for new dense server and storage products.
- Cabling limited airflow.
- Crosstalk over cables complicated system design and increased backplane and cabling costs.
- Increased HDD data rates posed electrical challenges when parallel I/O speed increases were attempted.

SAS storage solutions helped mitigate these issues while delivering unprecedented flexibility and scalability. They combined the long-established software advantage of SCSI with the electrical and physical connection interface of SATA. In the HP portfolio today, high-performance SAS drives drive mainstream enterprise storage applications, while lower-cost, high-capacity SATA drives are often a better choice when reliability is less crucial.

“HP’s SAS server and storage solutions provide new levels of flexibility, performance and scalability to the ProLiant server family. These capabilities, along with the density of storage available in a 2U platform, lower our TCO for storage and overall IT operating expenses and will grow with us as our company ramps. This product offers industry-leading price performance and best-of-class reliability.”

—Bethany Mayer, Mirapoint, Sunnyvale, California

Table 1
Technology comparison

	SATA	SAS	Fibre Channel arbitrated loop
Performance	Half-duplex 3.0 Gb/s	Full-duplex with link aggregation 3.0 Gb/s 6.0 Gb/s (next generation)	Full-duplex 4.0 Gb/s
Connectivity	1.5 m internal cable >8 m external cable One device (fan-out devices) No peer-to-peer	6 m internal and external cables >128 devices (16,384 maximum) Peer-to-peer	15 m external cable 127 devices Peer-to-peer
Availability	Single-port HDDs Single host	Dual-port HDDs Multi-initiator	Dual-port HDDs Multi-initiator
Driver model	Software transparent with parallel ATA	Software transparent with parallel SCSI	Software transparent with parallel SCSI

SAS benefits include:

- Dramatically simplified technology support. SAS offers a single storage system to meet a wide range of price, performance and availability requirements—with enough flexibility to adapt quickly to changing business requirements.
- Investment protection and flexibility. Because an SAS backplane can include both SATA and SAS drives, you can easily transition between technologies without upgrading your entire infrastructure.
- Robust technology. SAS Enterprise drives have the reliability and performance needed by mission-critical, hard drive-intensive applications, while SAS Midline drives provide economic reliability and performance along with the high availability required by external storage and low I/O applications.

SATA

Lower-cost SATA drives are best used with enterprise servers and bulk storage solutions that run less-critical, non-HDD-intensive applications. Typical uses include:

- Static web pages, firewalls, DNS (domain name system), and file and print server applications
- Low-cost bulk storage for reference data repositories and tape augmentation

Features

- 3 Gb/second half duplex, single port serial links
- Compatible in SAS infrastructures
- Point-to-point configuration
- Thinner cables
- Lower signal voltages
- CRC (cyclic redundancy check) added to command and data

Benefits

- High capacity with lowest acquisition cost per gigabyte
- Hot plugs for ease of maintenance
- Easy upgrade of storage devices to serial SCSI when more power is required
- Low-cost storage option in new markets such as bulk storage, reference data repositories and tape augmentation
- One-year HP warranty

Table 2
Enterprise hard disk drives

	NEW 450 GB 3.5-inch SAS 15,000 rpm	300 GB 3.5-inch SAS 15,000 rpm	146 GB 3.5-inch SAS 15,000 rpm	72 GB 3.5-inch SAS 15,000 rpm	146 GB 2.5-inch SAS 10,000 rpm	72 GB 2.5-inch SAS 10,000 rpm	72 GB 2.5-inch SAS 15,000 rpm	36 GB 2.5-inch SAS 15,000 rpm
Single-port part numbers								
Hot plug	N/A	431944-B21	375872-B21	375870-B21	431958-B21	375861-B21	431935-B21	431933-B21
Non-hot plug	N/A	431950-B21	432093-B21	432095-B21	N/A	N/A	N/A	N/A
Dual-port part numbers								
Hot plug	454232-B21	416127-B21	384854-B21	384852-B21	418367-B21	384842-B21	418371-B21	418369-B21
Non-hot plug	454234-B21	417950-B21	417855-B21	N/A	N/A	N/A	N/A	N/A
Logical capacity	450,098 MB	300,000 MB	146,815 MB	73,407 MB	146,815 MB	73,407 MB	73,407 MB	36,420 MB
Transfer rate	3.0 Gb/s	3.0 Gb/s	3.0 Gb/s	3.0 Gb/s	3.0 Gb/s	3.0 Gb/s	3.0 Gb/s	3.0 Gb/s
Seek times	Single track: 0.57 ms Average: 3.5 ms Full stroke: 11.0 ms	Single track: 0.57 ms Average: 3.5 ms Full stroke: 11.0 ms	Single track: 0.57 ms Average: 3.5 ms Full stroke: 9.0 ms	Single track: 0.57 ms Average: 3.5 ms Full stroke: 9.0 ms	Single track: 0.6 ms Average: 4.1 ms Full stroke: 8.0 ms	Single track: 0.2 ms Average: 4.0 ms Full stroke: 8.1 ms	Single track: 0.2 ms Average: 3.0 ms Full stroke: 7.0 ms	Single track: 0.2 ms Average: 3.0 ms Full stroke: 7.0 ms
Physical configuration bytes/sector	512	512	512	512	512	512	512	512
Logical blocks	879,097,968	585,937,500	286,749,488	143,374,738	286,749,488	143,374,737	143,374,737	71,132,960
Warranty	3 years	3 years	3 years	3 years	3 years	3 years	3 years	3 years

The drives above may not be available as of the release date of this brochure. For information regarding the availability of new drives, please ask your HP sales representative or visit www.hp.com.

SAS and SATA flexibility

The SAS architecture lets system designers install SAS drives, SATA drives or a mix of both in the same box. This flexibility greatly broadens the range of storage solutions available to technology managers, allowing them to choose devices based on reliability, performance and cost attributes—not interface compatibility. In addition, HP hard drives come with specific firmware enhanced for performance and integration into an HP system. All firmware is thoroughly tested to provide superb integrity, error recovery and functionality.

SAS supports three protocols to handle device communications. After power up or restart, the SAS domain goes through an initialization sequence to determine the proper protocol to communicate with a variety of devices:

- Serial Management Protocol (SMP) manages the point-to-point topology of expanders.
- Serial SCSI Protocol (SSP) allows the controller to communicate with SAS devices and existing SCSI software.
- SATA Tunneling Protocol (STP) allows SAS controllers to communicate with SATA devices.

HP hard drive portfolio

Our hard drive portfolio is now categorized into three classes of drives: Entry (ETY), Midline (MDL) and Enterprise (ENT) drives.

- Entry (ETY)—HP Entry drives are the lowest unit-cost solution for entry-level servers. Entry drives provide the best price advantage for low I/O workloads of 40 percent or less, such as boot or file and print. Drives are available in both 3.5-inch and 2.5-inch form factors and ship with a standard one-year warranty.

- Midline (MDL)—HP introduces the next generation of drives designed to meet the reliability and mass storage demanded by today's entry server and external storage environments. Midline drives are designed with economical reliability (about two times that of Entry drives) and performance for external storage, backups and archival applications. These high-capacity drives provide the lowest cost per gigabyte and the best price advantage for non-mission-critical applications with low workloads of 40 percent or less. Drives are available in 3.5-inch form factors and ship with a standard one-year warranty.
- Enterprise (ENT)—HP Enterprise drives provide the highest reliability within the hard drive portfolio—about 3.5 times that of Entry drives. Enterprise hard drives are ideal for servers and external storage running mission-critical, 100 percent workload applications that require maximum reliability and performance. This includes highly transactional applications like e-mail, ERP and CRM.

HP Smart Array controllers and host bus adapters

Using HP Smart Array controllers across multiple applications can lower the total cost of ownership of your technology infrastructure.

HP Smart Array P800

The Smart Array P800 (SA-P800) blends the proven utility and reliability of the SCSI protocol with the performance advantages of serial architecture. This makes it the highest performing controller in the HP SAS portfolio. Supported on most current-generation HP ProLiant servers, the SA-P800 is a 16-port PCI Express (PCIe) controller that provides RAID 6 (ADG) for outstanding data protection. Convenient management features include stripe size migration, RAID level migration and background initialization.

Table 3
Midline hard disk drives

	NEW 1 TB 3.5-inch SAS 7,200 rpm	NEW 750 GB 3.5-inch SAS 7,200 rpm	NEW 1 TB 3.5-inch SATA 7,200 rpm	750 GB 3.5-inch SATA 7,200 rpm	500 GB 3.5-inch SATA 7,200 rpm	250 GB 3.5-inch SATA 7,200 rpm
Single-port part numbers						
Hot plug	N/A	N/A	N/A	458930-B21	458928-B21	458926-B21
Non-hot plug	N/A	N/A	N/A	462595-B21	458941-B21	458939-B21
Dual-port part numbers						
Hot plug	461137-B21	461135-B21	454146-B21	N/A	N/A	N/A
Non-hot plug	N/A	N/A	N/A	N/A	N/A	N/A
Logical capacity	1,000,204 MB	750,156 MB	1,000,204 MB	750,156 MB	500,107 MB	250,059 MB
Transfer rate	3.0 Gb/s	3.0 Gb/s	3.0 Gb/s	3.0 Gb/s	3.0 Gb/s	3.0 Gb/s
Seek times	Single track: 0.4 ms Average: 7.4 ms Full stroke: 14.3 ms	Single track: 0.4 ms Average: 7.4 ms Full stroke: 14.3 ms	Single track: 1.0 ms Average: <8.5 ms Full stroke: 17.0 ms	Single track: 1.0 ms Average: <8.5 ms Full stroke: 17.0 ms	Single track: 1.0 ms Average: <8.5 ms Full stroke: 17.0 ms	Single track: 1.0 ms Average: <8.5 ms Full stroke: 17.0 ms
Physical configuration bytes/sector	512	512	512	512	512	512
Logical blocks	1,953,525,168	1,465,149,168	1,953,525,168	1,465,149,168	976,773,168	488,397,168
Warranty	1 year	1 year	1 year	1 year	1 year	1 year

The drives above may not be available as of the release date of this brochure. For information regarding the availability of new drives, please ask your HP sales representative or visit www.hp.com.

Table 4
Entry hard disk drives

	160 GB 3.5-inch SATA 7,200 rpm	NEW 250 GB 2.5-inch SATA 5,400 rpm	120 GB 2.5-inch SATA 5,400 rpm
Single-port part numbers			
Hot plug	458945-B21	460355-B21	458924-B21
Non-hot plug	458947-B21	460357-B21	459357-B21
Logical capacity	160,041 MB	250,059 MB	120,022 MB
Transfer rate	3 Gb/s	3 Gb/s	1.5 Gb/s
Seek times	Single track: 2.0 ms Average: <11 ms Full stroke: 23.0 ms	Single track: 1.5 ms Average: 12.0 ms Full stroke: 22.0 ms	Single track: 1.5 ms Average: 12 ms Full stroke: 22 ms
Physical configuration bytes/sector	512	512	512
Logical blocks	312,581,808	488,397,168	234,441,648
Warranty	1 year	1 year	1 year

The drives above may not be available as of the release date of this brochure. For information regarding the availability of new drives, please ask your HP sales representative or visit www.hp.com.

Performance

- Supports 3 Gb/second SAS and 1.5 Gb/second SATA
- Sixteen SAS ports, each providing control of multiple SAS/SATA devices
- Two internal (2x4) and two external (2x4) connections for faster access to server storage
- PCI Express interface with up to 2.5 Gb/second bandwidth, enabling use of high bandwidth devices such as 10 gigabit Ethernet and 10G Fibre Channel

Reliability

- RAID 6 (ADG) is standard and supports RAID 0, 1, 1+0 and 5.
- A 512 MB cache module and two nickel metal hydride batteries have up to four days of battery life.
- Recovery ROM feature for protection from ROM image corruption
- Online drive flash that speeds updating of disk drive firmware, allowing update of all SAS HDDs the next time server is rebooted

Flexibility

- Internal and external connections with expander support, combined with support for more than 100 hard drives, for unusual deployment flexibility
- Mix-and-match SAS and SATA devices to design a storage layout that reflects your organization's data priorities
- Complete support of all major operating systems
- Support for more than 100 different disk drives

HP Smart Array P600

The Smart Array P600 (SA-P600) is an eight-port SAS controller that improves the performance and reliability of HP servers. Featuring the latest SCSI technology and advanced RAID capabilities, the SA-P600 provides twice the bandwidth of a four-channel U320 array controller.

“Tri-Center’s network at the time was in total disarray—very fragmented, no cohesiveness whatsoever.”

—Brett Naninga, Superintendent Tri-Center Schools

“As we’ve worked with Tri-Center on their need for high-speed, high-availability storage, we’ve turned to the SAS solution because it gives us a higher quality storage solution that we can offer to them. The speed that we’re able to access the data prevents those waits the people don’t like when they’re accessing information today. We’ve grown to expect our data to be there when we push the button and SAS technology has allowed us to do that for Tri-Center.”

—Arlin Sorenson, President and CEO, Heartland Technology Solutions

Performance

- Supports 3 Gb/second SAS and 1.5 Gb/second SATA
- High-performance 64-bit/133 MHz PCI-X interface
- 256 MB DDR1-266 battery-backed write cache (BBWC) can be upgraded to 72-bit 512 MB BBWC
- Expander support

Reliability

- Supports RAID 0, 1, 1+0, 5 and 6 (ADG)
- Recovery ROM support
- Online spare support

Flexibility

- Drive roaming

HP Smart Array P400

The Smart Array P400 (SA-P400) is an eight-port SAS controller that supports PCI Express and is ideal for RAID 5 or RAID 6 (ADG) implementations with four drives or more.

Performance

- Support of 3 Gb/second SAS and 1.5 Gb/second SATA
- 2.5 GB x8 PCI Express host interface
- 40-bit 256 MB DDR2-533; can be upgraded with battery-backed write cache (BBWC) or to 72-bit 512 MB BBWC for RAID 6 (ADG)
- Expander support

Reliability

- Supports RAID 0, 1, 1+0, 5 and 6 (ADG)
- Recovery ROM support
- Online spare support

Flexibility

- Drive roaming

Smart Array E500

An external-connect, entry-level controller, the Smart Array E500 features PCI Express and provides RAID 0, 1 and 1+0 support. It can be upgraded with the BBWC module for RAID 5.

Performance

- Eight external ports of 3 Gb SAS
- x4 PCI Express I/O connector
- DDR2/533 memory
- 128 MB BBWC upgrade option

Reliability

- Standard RAID 0, 1, 1+0
- RAID 5 support with BBWC

Flexibility

- Supports both SAS and SATA disk drives

Smart Array E200

A high-value entry-level controller, the Smart Array E200 features PCI Express and provides RAID 0 and RAID 1 support with an upgrade path to RAID 5.

Performance

- Supports 3.0 Gb/second SAS and 1.5 Gb/second SATA
- 2.5 Gb x4 PCI Express host interface
- 128 MB DDR1-266 battery-backed write cache

Reliability

- Supports RAID 0, 1, 1+0 and 5
- Online spare support

Flexibility

- Drive roaming

Table 5
Serial controllers

	NEW SC44Ge HBA	8 Internal Port SAS HBA	Smart Array E200	Smart Array E500
Part number	416096-B21	347786-B21	E200/128 BBWC 411508-B21	E200/128 BBWC 411508-B21
Protocols supported	3.0 Gb/s SAS 1.5 Gb/s SATA	3.0 Gb/s SAS 1.5 Gb/s SATA	3.0 Gb/s SAS 1.5 Gb/s SATA	3.0 Gb/s SAS 1.5 Gb/s SATA
RAID support	0, 1	0, 1	0, 1, 1+0, 5	0, 1, 1+0, 5
Ports	8	8	8	8
Connectors (external/internal)	1x4/1x4	0/2x4	0/2	0/2
PCI-bus	X8 PCI Express	64-bit, 133 MHz PCI-X	x4 PCI Express	x4 PCI Express
PCI peak data transfer rate	2 Gb/s	1 Gb/s	1024 MB/s	1024 MB/s
Peak SAS/SATA data transfer rate	3.0 Gb/s per port SAS 1.5 Gb/s per port SATA	3.0 Gb/s per port SAS 1.5 Gb/s per port SATA	3.0 Gb/s per port SAS 1.5 Gb/s per port SATA	3.0 Gb/s per port SAS 1.5 Gb/s per port SATA
Drives supported (maximum)	28	8	8	8
Cache	N/A	N/A	128 MB BBWC	128 MB BBWC
Recovery ROM	No	No	No	No
Battery-backed write cache	No	No	Optional (on 64 MB)	Optional (on 64 MB)
Online spare support	No	No	Yes	Yes

	Smart Array P400	Smart Array P600	Smart Array P800
Part number	P400/256 405132-B21 P400/512 BBWC 411064-B21	P600/256 BBWC 337972-B21	P800/512 BBWC 381513-B21
Protocols supported	3.0 Gb/s SAS 1.5 Gb/s SATA	3.0 Gb/s SAS 1.5 Gb/s SATA	3.0 Gb/s SAS 1.5 Gb/s SATA
RAID support	0, 1, 1+0, 5, 6 (ADG)	0, 1, 1+0, 5, 6 (ADG)	0, 1, 1+0, 5, 6 (ADG)
Ports	8	8	8
Connectors (external/internal)	0/2	1/2*	2 x4/2 x4
PCI-bus	x8 PCI Express	64-bit, 133 MHz PCI-X	x8 PCI Express
PCI peak data transfer rate	2,048 MB	1,066 MB/s	2 Gb/s
Peak SAS/SATA data transfer rate	3.0 Gb/s per port SAS 1.5 Gb/s per port SATA	3.0 Gb/s per port SAS 1.5 Gb/s per port SATA	3.0 Gb/s per port
Drives supported (maximum)	18	38	108
Cache	256 MB (512 MB BBWC or BBWC upgrade)	256 MB (512 MB BBWC optional)	512 MB DDR2-533 RAM BBWC
Recovery ROM	Yes	Yes	Yes
Battery-backed write cache	Optional (on 256 MB)	Yes	Yes
Online spare support	Yes	Yes	Yes

RAID 6 (ADG)

RAID 6 provides superb drive data protection and is known for high read performance, data availability and drive capacity. With HP-patented Advanced Data Guarding, you can safely deploy large numbers of disk drives and create large storage volumes. RAID 6 also offers lower implementation costs and greater usable capacity per U than RAID 1+0, and allows for two simultaneous drive failures without downtime or data loss.

HP 8 Internal Port SAS Host Bus Adapter (HBA)

The HP 8 Internal Port SAS HBA is an ideal building block for small RAID and larger non-RAID SAS storage applications. Integrated into many HP ProLiant servers, this adapter provides up to 2.4 Gb/second maximum

bandwidth—nearly four times the speed of dual-channel U320SCSI adapters—and supports both 3.0 Gb/second SAS and 1.5 Gb/second SATA devices.

HP SC44Ge

The HP SC44Ge Host Bus Adapter (HBA) provides customers with the flexibility and speed they have come to expect from HP. It is ideal for basic RAID (0, 1) and low cost connectivity to tape and HDDs, and supports both 3 Gb SAS and 1.5 Gb SATA devices. Providing up to 2.4 Gb/s maximum bandwidth, this HBA provides nearly four times the speed of a dual channel U320SCSI adapter. Additionally, the HP SC44Ge HBA has been thoroughly tested and integrated into many HP ProLiant servers, enabling you to archive data at the latest SAS speeds available on servers utilizing PCI Express.



Direct Attach Storage SB40c storage blade supports up to six SAS or SATA universal hot plug hard disk drives and allows for a mix of SAS and SATA drives in the same enclosure at the same time.

Performance

- 1.5 Gb/second SATA interface
- 64 bit/66 MHz PCI host interface
- 64 MB of memory for use for RAID and read cache to reduce response times

Reliability

- Supports RAID 0, 1, 1+0 and 5
- Online spare support

Flexibility

- Drive roaming

Storage blades

HP StorageWorks SB40c storage blade

The StorageWorks SB40c storage blade provides a simple way to add more drive capacity to your blade servers. Its design combines the reliability and flexibility of SAS technology with the performance and manageability of an onboard SA-P400 controller.

Features

- Configured in a blade server slot on the HP BladeSystem c3000 or c7000 enclosure
- High-speed DAS (direct attached storage) connection to host server blade through an x4 PCI Express host interface
- Support for up to six SFF SAS or SATA universal hard drives
- Ability to mix and match SAS and SATA drives in the same storage blade
- Up to 876 GB (SAS) or 1.5 TB (SATA) storage capacity
- Simple online configuration and management with HP Array Configuration Utility (ACU)

External Serial Attached SCSI enclosures

HP StorageWorks 50 Modular Smart Array enclosure

The StorageWorks 50 Modular Smart Array Enclosure (MSA50) is an SAS disk drive storage enclosure. This device delivers excellent performance, availability and storage density, and lets you choose from both small form factor (SFF) SAS and SATA drives.

Features

- 1U rack height
- Support for up to ten SFF SAS or SATA universal hard disk drives
- Storage capacity of up to 720 MB per enclosure (using 72 GB 10K disk drives)
- Can be cascaded 1+1 for up to 20 spindles in a 2U configuration or 1.44 TB
- Hot plug disk drives, fans and power supplies

HP StorageWorks 60 Modular Smart Array enclosure

The StorageWorks 60 Modular Smart Array (MSA60) provides an end-to-end flexible platform in a high-capacity, 2U disk drive storage enclosure supporting 3.5-inch SAS or Serial ATA (SATA) drives. This enclosure delivers industry-leading data performance, availability, storage density and upgradeability to meet your growing storage needs.

Features

- Storage capacity of up to 3.6 TB of SAS storage or 9 TB of SATA storage per enclosure
- Can be cascaded 1+3 or up to 48 spindles in an 8U configuration or a total of 96 drives in eight enclosures
- Support for up to 12 3.5-inch SAS or SATA universal hard disk drives
- 2U rack height
- Hot plug disk drives, fans and power supplies

HP StorageWorks 70 Modular Smart Array enclosure

The StorageWorks 70 Modular Smart Array (MSA70) provides an end-to-end, flexible platform in a high-performance, 2U disk drive storage enclosure supporting 2.5-inch SAS or Serial ATA (SATA) drives. This enclosure delivers industry-leading data performance, availability, storage density and upgradeability to meet your demanding storage needs.

Features

- Storage capacity of up to 3.6 TB of SAS storage or 3 TB of SATA storage per enclosure
- Can be cascaded 1+1 or up to 50 spindles in a 4U configuration or a total of 100 drives in four enclosures
- Support for up to 25 2.5-inch SAS or SATA universal hard disk drives
- 2U rack height
- Hot plug disk drives, fans and power supplies

HP Services

HP Care Pack Services for HP BladeSystem and ProLiant servers and storage provide support for all HP-branded hardware options qualified for inclusion in your server at the time of purchase or afterwards at no additional cost. HP Care Pack Services help increase uptime and productivity with rapid-response support on a 24x7 or 13x5 basis. Both options feature same-day, four-hour onsite assistance when service issues cannot be resolved remotely. And for business-critical server and storage environments where downtime is not an option, HP offers 24x7, six-hour call-to-repair support.

Across the globe, companies rely on HP servers to reliably process their most critical business tasks. To complement the performance and reliability of HP ProLiant and BladeSystem servers, HP and its network of channel partners—the largest in the industry—provide a full set of services designed to unleash the power of your hardware and software investment. And with more than 69,000 trained HP service professionals and 70,000 channel-partner service experts worldwide, we can provide local resources, whenever and wherever you need them. Offerings include:

- A comprehensive services portfolio including technology consulting, systems integration, installation and startup services, migration support, hardware and software support, outsourcing, recovery services, and more
- Expert support for today's heterogeneous storage, SAN and NAS, data backup technologies, and multi-vendor storage products
- End-to-end services for information lifecycle management (ILM) solution planning, architecture design, implementation, integration and ongoing support
- A single point of accountability and a collaborative approach to help cut the cost and complexity of managing your HP ProLiant server, BladeSystem and storage environment, while protecting your technology investments

For more information, visit the following sites:

www.hp.com/services/bladessystemservices

www.hp.com/services/proliantservices

Why HP?

Leadership

HP has one of the world's largest and most specialized forces of consultants combined with the broadest choice of technology platforms in the industry. These come along with proven experience in designing and delivering comprehensive, end-to-end, best-in-class e-learning solutions.

Industry expertise

The HP solution is based on cost-effective industry standard technology that can be easily integrated and can scale up with the potential to support millions of users. HP provides comprehensive, end-to-end solutions including hardware, software and services.

Open standards

The HP solution is very modular and is built on open standards. This allows for a high degree of customization to fit your specific needs and requirements.

Management

HP offers unique products and solutions, proven methodology and full lifecycle service capabilities to manage your project—from business requirements to implementation.

The smartest way to invest in technology

HP Financial Services provides innovative financing and financial asset management programs to help you cost-effectively acquire, manage and ultimately retire your HP solutions.

For more information on these services, please contact your local HP representative or visit www.hp.com/go/hpfinancialservices.

For more information

For more information about HP SAS and SATA solutions, contact your local HP representative, or visit www.hp.com/go/serial.

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Technology for better business outcomes

