hp

HP StorageWorks Storage Area Network (SAN) Solutions

Delivering the storage fabric for the
HP Adaptive Enterprise Vision

hp invent

The adaptive enterprise

HP Adaptive Enterprise Offerings help your business flourish in the Information Age, giving you an adaptability advantage.

Today's extremely competitive business environment is increasingly global, increasingly fierce. The Information Age is no longer a hypothetical term, it is a reality. Information is now the primary material businesses develop and manage to stay ahead of their competition. For corporations to develop opportunities and thrive in rapidly evolving market conditions, they need a proactive approach to manage information. They must make sound business decisions while confronting extremely volatile economic conditions that threaten their viability.
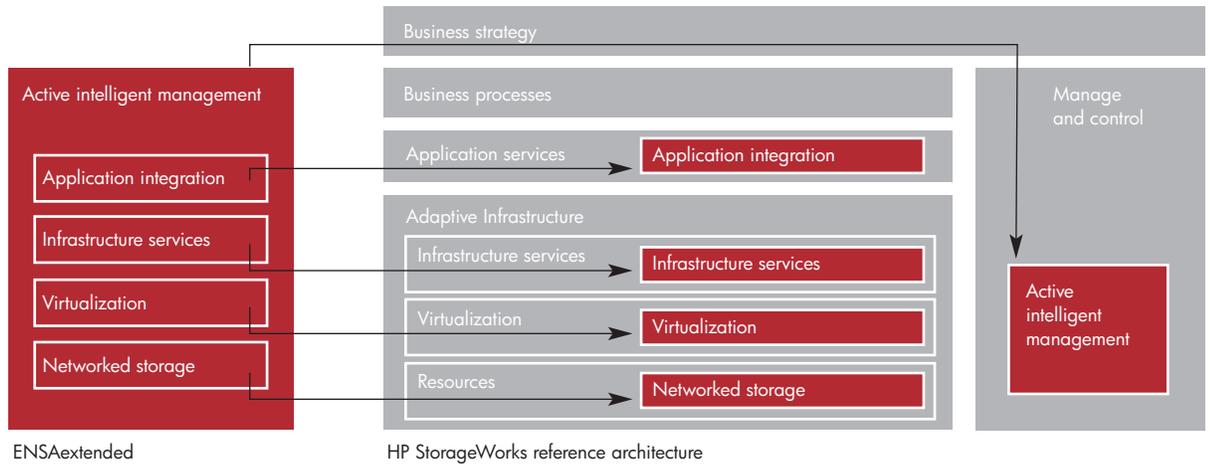
An adaptive business meets these challenges and thrives by anticipating and responding to change with speed and flexibility, while still meeting cost, quality of service, and risk management objectives. HP's Adaptive Enterprise Vision offers the ability to quickly respond to and capitalizes on change for business advantage. It's the ultimate state of fitness: business and IT perfectly synchronized.

HP Adaptive Enterprise Offerings help your business flourish in the Information Age. HP has created an architecture that can take you to a more responsive, agile environment. This architecture reduces risk and complexity, while providing real world return on investment, and the flexibility to meet continuously evolving business needs. Plus, HP partners work with you ensuring accountability and secure performance from your IT investment.

HP's innovative technologies and architectures are the key elements in creating and implementing a truly adaptive enterprise. The resulting IT infrastructure possesses a set of core capabilities to make IT more stable, efficient and adaptive. Now you can harness the unprecedented wealth of information available in the enterprise and transform it into competitive advantage. The HP StorageWorks storage area network (SAN) is an essential element of the HP Adaptive Enterprise architecture; it is the network element of the entire storage architecture, providing the network platform needed to deliver complete, open, end-to-end network storage solutions.

ENSAextended   HP StorageWorks reference architecture

HP ENSAextended: Storage solutions for the HP StorageWorks reference architecture

HP's storage strategy, ENSAextended (Enterprise Network Storage Architecture Extended), provides industry leading guidance on how to leverage storage to build an adaptive enterprise. Storage hardware infrastructure is the foundation of the ENSAextended architecture. The HP StorageWorks SAN defines the network domain of this architecture: an adaptive fabric infrastructure that is extensible, resilient, and controllable.

There are three key attributes of the adaptive fabric infrastructure storage for an adaptive enterprise—it must be controllable, resilient, and extensible.

Controllable—Automated and intelligent management capabilities enable managed storage services to deliver applications invisibly and with minimum administrative effort. ENSAextended enables the implementation of storage policies in the context of business rules, linking
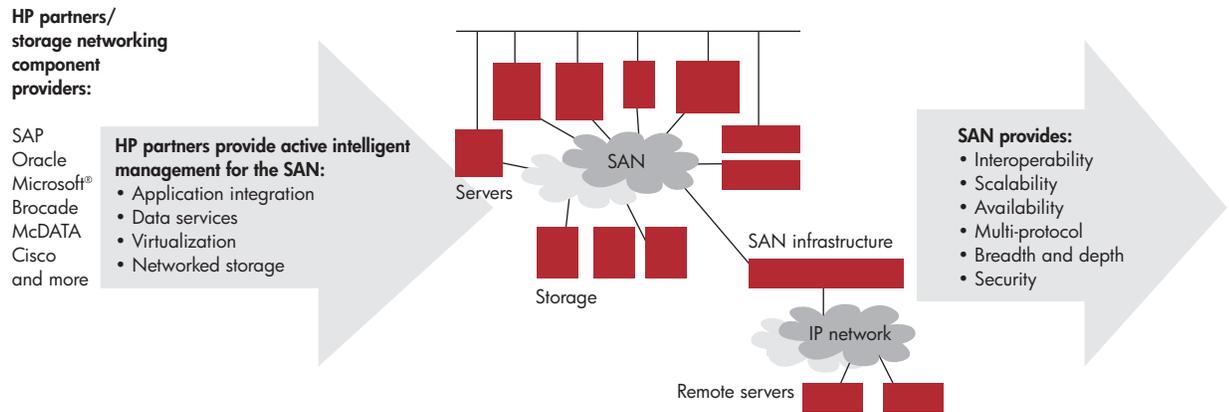
storage behavior and capabilities with the policies and practices that govern the business unit they serve.

Resilient—HP storage architectures create unmatched levels of resiliency by providing a redundant infrastructure, built with high availability components that deliver automatic failover. Such an environment has the ability to monitor and automatically heal itself, and provides the basis to deliver data to applications based on policy-driven quality of service attributes.

Extensible—Fully utilized networked storage that modularly expands for dynamic resource optimization. HP delivers network storage that is scalable in multiple dimensions including capacity, performance, availability, and management scope.

The bottom line is your storage environment must adjust quickly to your business rules and application environment. HP StorageWorks solutions provide these attributes and deliver on the advantages of an adaptive enterprise.

For the fourth straight quarter, HP holds the #1 position in the Open SAN market. Source: IDC's Worldwide Disk Storage Systems Quarterly Tracker, September 2003.

2

HP partners/ storage networking component providers:

SAP
Oracle
Microsoft®
Brocade
McDATA
Cisco
and more

HP partners provide active intelligent management for the SAN:
• Application integration
• Data services
• Virtualization
• Networked storage

Servers

SAN

Storage

SAN infrastructure

IP network

Remote servers

SAN provides:
• Interoperability
• Scalability
• Availability
• Multi-protocol
• Breadth and depth
• Security

HP StorageWorks SAN—today

The HP StorageWorks SAN is an essential element in delivering the HP Adaptive Enterprise Vision; it is the foundation of the entire storage architecture. The HP StorageWorks SAN provides the network platform or fabric needed to deliver end-to-end network storage solutions. In the fabric space, HP partners with "best in class" storage networking component providers to offer comprehensive, integrated, end-to-end network storage solutions.

HP StorageWorks SANs lead the industry and are distinguished by their unmatched levels of:

• **Interoperability**—Extensive HP testing ensures seamless, robust performance with multiple operating systems, clustering environments, and third-party devices. HP enhances its industry-leading levels of connectivity with award-winning after-sales support.

• **Scalability**—SAN architectures scale in connectivity, performance, and distance, supporting more than 1,000 total SAN ports for today and tomorrow's connectivity needs. HP SANs support extension to Internet Protocol (IP) networks, including Local Area Network (LAN), Municipal Area Network (MAN), and Wide Area Network (WAN).

• **Availability**—SANs meet the requirements of mission critical applications and environments, providing 99.999% or higher availability levels through HP StorageWorks Directors and Core switches, dual fabrics, and multi-pathing software.

• **Multi-protocol connectivity**—Superior connectivity delivers the storage resources of the SAN to computing resources in the IP network. Customers utilize existing SAN storage resources to support non-mission critical, stranded, and low-end servers through Internet SCSI (iSCSI) routers that bridge the IP network to Fibre Channel. Storage utilization improves by deploying enterprise network-attached storage (NAS) heads that use the SAN for storage (NAS/SAN fusion). Finally, SAN infrastructures extend over distances (LAN, MAN, WAN) with Fibre Channel over IP (FCIP) and dark fibre extenders for selective data migration and/or disaster recovery solutions.

• **Breadth and depth**—Three interconnect product lines deliver connectivity solutions throughout the entire enterprise: B-Series (Brocade), C-Series (Cisco), and M-Series (McDATA). These products, aided by heterogeneous storage support through HP StorageWorks Continuous Access Storage Appliance (CASA) integration, deliver a full set of hardware and software features that meet the needs of all customers, regardless of size.

• **Security**—Exceptional levels of protection through well-documented best practices and security features minimize SAN exposure to security risks and boost the protection of knowledge assets. Authentication, authorization, access control, and zoning provide added levels of network security.

3

Delivering business value

The benefits of SANs are well established in the global market. HP StorageWorks SANs provide higher availability, true scalability, and simplified management, significantly reducing your Total Cost of Ownership (TCO), and increasing your asset utilization.

Realize the benefits of networked storage in your organization through what HP calls the five c's:

- Server consolidation
- Storage consolidation
- Backup consolidation
- Management consolidation
- Technology consolidation

Technology that works

When you partner with HP, you get a fully qualified solution from a dependable source—the largest consumer IT company in the world. We've built our exceptional reputation by giving our customers quality, reliability, and security. You manage technology solutions that are simple to own, simple to buy, and simple to operate. HP StorageWorks SANs create extraordinary value:

- HP StorageWorks SANs successfully address business challenges by offering a flexible storage infrastructure that delivers seamless scalability in performance, capacity, and distance, while maintaining greater connectivity. This supports superior business agility, a critical requirement in today's dynamic business environment.

- All products undergo extensive testing in our SAN integration labs to minimize your time to implementation and your overall costs.

- HP StorageWorks SANs improve efficiency. By increasing asset utilization in an integrated environment, you manage more with fewer resources, resulting in streamlined operation and improved management.

- Higher service levels translate into increased data and application availability, and greater access. HP StorageWorks SANs go even further, delivering sustained performance to ultimately put you in the driver's seat.
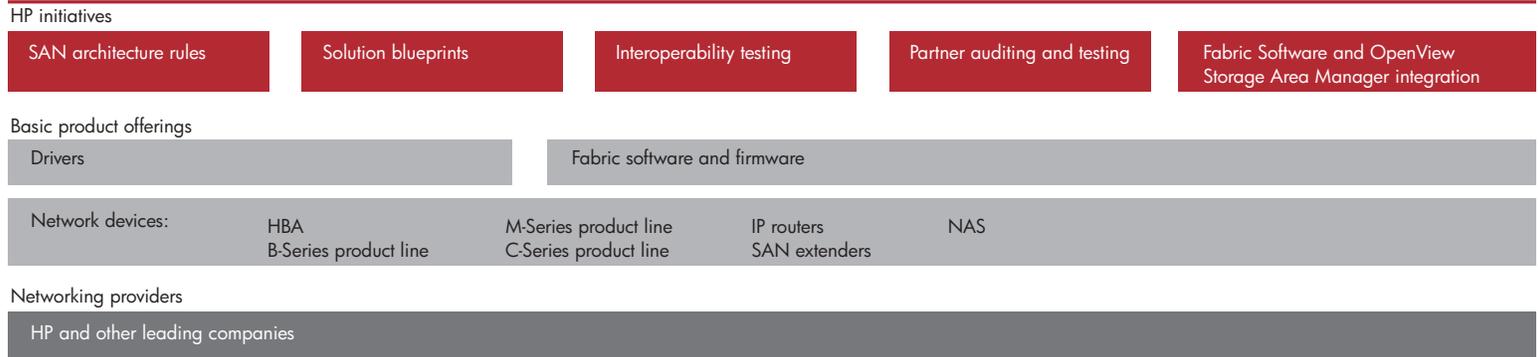
Empowering IT

An important customer experience from SAN deployments is the confirmation that SANs have an even greater impact on the overall business than direct ROI. Companies are using the increased availability, connectivity, and scalability features of SANs to create and improve their competitive advantage. For instance, companies use HP StorageWorks SAN capabilities to:

- Deliver key business initiatives more quickly, increasing business agility
- Bring new products to market faster
- Improve customer retention and loyalty in e-business implementations
- Leverage knowledge capital through expanded consistency and access in the organization

HP StorageWorks SANs empower IT divisions to contribute more to the overall business goals and success of the organization, and deliver on the strategic value of IT. The HP StorageWorks SAN provides industry leading connectivity platforms to deploy, manage, and operate today's networked storage environments. HP partners with only "best in class" storage networking component providers to offer customers complete, standards-based, open, end-to-end, integrated solutions.

"Our performance for financial reporting improved across the board since installing the HP StorageWorks SAN. In some cases, jobs that took three hours to run now finish in 90 minutes. Our HP SAN is well worth the investment."
—Stan McCreight, Senior Technical Specialist, The Dow Chemical Company

4

HP StorageWorks SAN: fabric infrastructure components

HP initiatives

SAN architecture rules	Solution blueprints	Interoperability testing	Partner auditing and testing	Fabric Software and OpenView Storage Area Manager integration

Basic product offerings

Drivers	Fabric software and firmware

Network devices:	HBA	M-Series product line	IP routers	NAS
	B-Series product line	C-Series product line	SAN extenders	

Networking providers

HP and other leading companies

The chart above presents the basic structure of the HP StorageWorks SAN solution. The foundation consists of a premium selection of "best in-class" storage networking component providers and valued partners. The next level represents HP basic product offerings of devices, drivers and software products that deliver basic functionality. The top level illustrates specific HP initiatives and programs designed to give customers additional information, services and supporting tools to get the most from their HP StorageWorks SAN.

HP StorageWorks Fabric Infrastructure for HP Adaptive Enterprise Vision

Components of the HP StorageWorks SAN infrastructure solutions work together, delivering agility, the highest ROI available, and a SAN infrastructure that meets your business needs.

Product offerings—Maximizing performance throughout your infrastructure

HP StorageWorks SANs offer users superior selections to customize the fabric environment to their unique needs and preferences. The HP StorageWorks SAN currently supports three switch product lines, giving alternatives that accommodate the entire enterprise.

For additional information on specific product offerings, please visit our web site at: **www.hp.com/go/san**

HP StorageWorks initiatives—Delivering more

In addition to basic product offerings, HP delivers a series of initiatives and programs that allow customers to realize more value from their HP StorageWorks SAN investment, including:

- SAN architecture rules published in the comprehensive HP StorageWorks SAN Design Guide. Intended to help customers design and build SANs, it illustrates how HP StorageWorks systems, storage management tools, and Fibre Channel products function in open heterogeneous SANs. To view the HP StorageWorks SAN Design Guide visit: **http://h18006.www1.hp.com/products/ storageworks/san/documentation.html**

As we advance into the future, the HP StorageWorks SAN will continue to support the vision for the HP Adaptive Enterprise.

- Solution blueprints are a diverse portfolio of plans designed to help you optimize current resources, manage multi-vendor environments, and evolve into open architectures that improve performance, efficiency, and business continuity. HP solution blueprints address business continuity issues such as data protection and disaster recovery, and IT consolidation through NAS/SAN fusion. In addition, the blueprints present open storage management and industry solutions,

HP StorageWorks Interconnect product lines

	B-Series (Brocade)	M-Series (McDATA)	C-Series (Cisco)
Enterprise class	Core Switch 2/64 and 2/64 PowerPak	Director 2/140 Director 2/64	MDS 9509 MDS 9506
Mid-range	SAN Switch 2/32 and 2/32 PowerPak	Edge Switch 2/32	MDS 9216
Entry level	SAN Switch 2/16-EL SAN Switch 2/16 and 2/16 PowerPak SAN Switch 2/8-EL and 2/8 PowerPak MSA SAN Switch 2/8	Edge Switch 2/24 Edge Switch 2/12	MDS 9140 MDS 9120

including business intelligence, finance, healthcare, life sciences, public sector, and telecom.

- Extensive interoperability testing is critical to supporting the typical corporate infrastructure's heterogeneous computing environment. Plus, HP is committed to supporting open storage configurations through the Storage Networking Industry Association's (SNIA) Open SAN Supported Solutions Forum and its documented configurations.

5

- Partner auditing and testing allows HP to leverage the expertise offered by key fabric hardware and software providers. Through collaborative efforts, we help partners make product decisions that support the current and future functionality of the HP StorageWorks SAN.

- Fabric software and HP OpenView Storage Area Manager integration ensures StorageWorks SANs

> As we advance into the future, the HP StorageWorks SAN will continue to support the vision for the HP Adaptive Enterprise.

are fully functional with HP OpenView storage management tools, and storage applications, such as HP StorageWorks Enterprise Backup Solution (EBS) and HP OpenView Storage Data Protector, for complete management solutions. The StorageWorks SAN is centrally managed and fully integrates with HP's OpenView Storage Area Manager framework, ensuring the ability to control and manage a heterogeneous fabric environment. And, HP has further strengthened the multiprotocol support of HP StorageWorks SANs by introducing a new IP storage router. With support for iSCSI and FCIP, it adds significant flexibility for customers seeking to extend SANs over LANs, MANs, and WANs.

The HP StorageWorks difference

The basic solution structure provides a series of targeted initiatives designed to optimizing customer value. HP delivers on the promise by:

Reducing risks:
- Proven solutions — continuous interoperability testing; extensive partnering and testing with vendors

Reducing complexity:
- "Right fit" storage design
- SAN architecture rules and Design Guide
- Solution blueprints for immediate deployment

Reducing costs:
- Enable maximum SAN utilization—NAS/SAN fusion; iSCSI bridging support

HP StorageWorks SAN—tomorrow

As we advance into the future, the HP StorageWorks SAN will continue to support the vision for the HP Adaptive Enterprise. The attributes that characterize ENSAextended will continue as key elements in the HP Adaptive Enterprise Vision. These attributes will grow in dimension to generate greater depth and capability as the full power of the vision unfolds. More implicitly, HP StorageWorks SAN technology developments will continue to give you a controllable, resilient, and extensible adaptive enterprise platform to facilitate an automated, policy driven storage utility.

The HP StorageWorks SAN has once again taken significant steps forward in openness and interoperability: We introduced formal support and design rules for interoperability between C-series and B-Series, and M-series and

B-series fabric products. Building on current fabric interoperability standards and previous participation in SNIA forums, the HP StorageWorks SAN moves closer toward delivering true standards-based, open connectivity in networked storage. With the introduction of our new IP storage router, we further the multiprotocol support capabilities of HP SANs.

For a copy of the HP StorageWorks SAN Design Guide visit:
http://h18006.www1.hp.com/products/storageworks/san/documentation.html

For HP StorageWorks solution blueprints visit:
www.hp.com/go/storage

For more information on HP StorageWorks SANs visit:
www.hp.com/go/san

For more information on HP Storage SAN Switch families, visit:
http://h18006.www1.hp.com/storage/saninfrastructure.html

hp®

i n v e n t