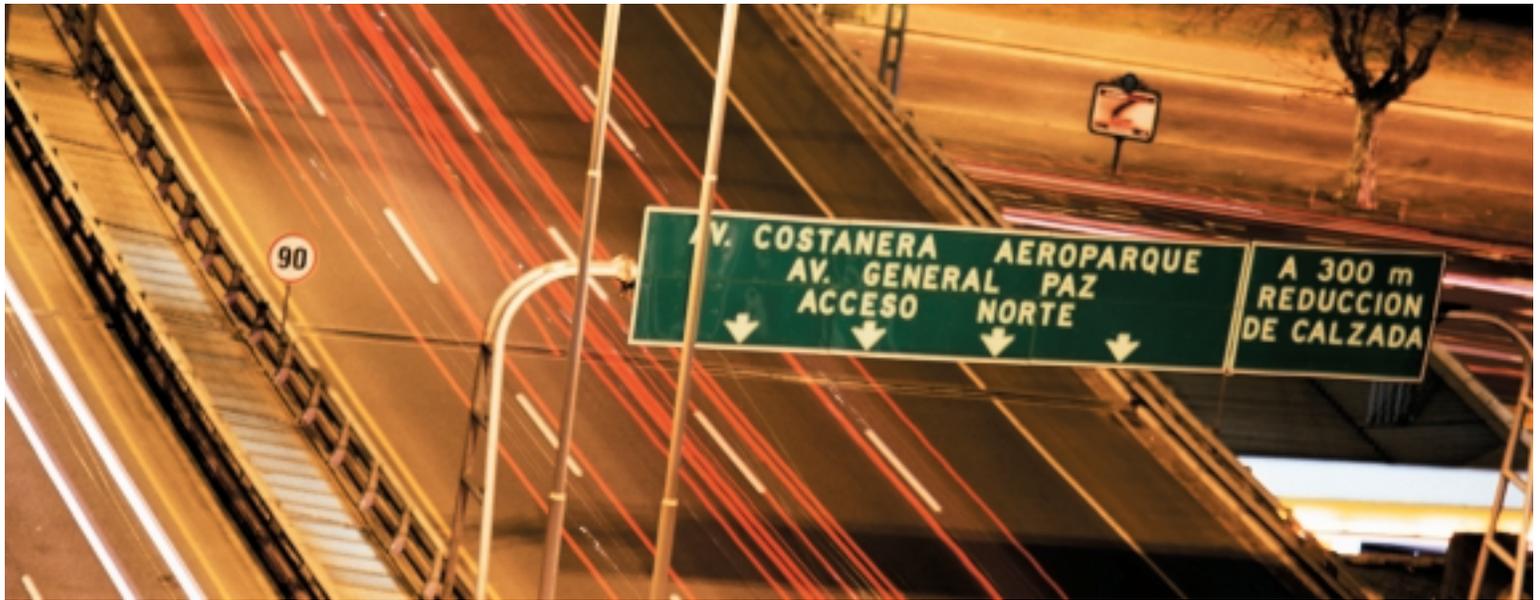


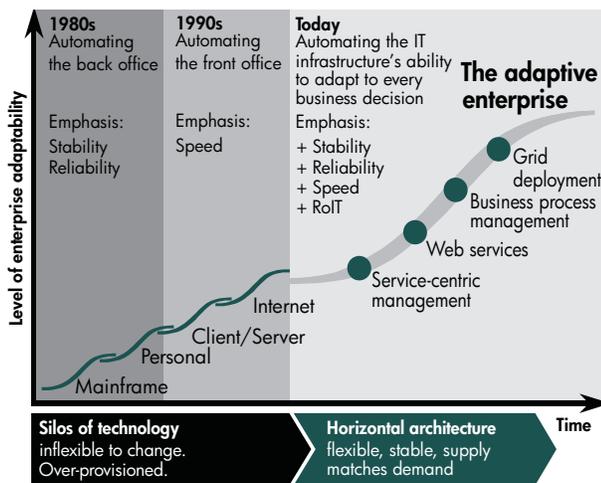


## HP StorageWorks Modular Smart Array Family

Simple, reliable and cost-effective  
storage solutions



### The role of IT in building an adaptive enterprise



In the quest to automate the back office, the emphasis in the 1980s was to ensure IT offered rock-solid stability and reliability. In the 1990s, the emphasis turned to speed, as companies began automating the front office—all the way out to partners and customers. Today, companies must create an adaptive enterprise, one that is both stable/reliable and fast/flexible, while also providing a superior return on IT investment.

### Proven innovation—HP's Adaptive Enterprise vision

In today's interconnected world, technology is a powerful asset that allows you to increase productivity, efficiency, availability, and performance. Ultimately, technology is

the entrance to new markets and higher revenue. HP offers you proven innovation to help your business thrive. We deliver more: simple, reliable technology that adapts to your changing business environment while protecting your IT investments. And, in our pursuit of excellence, we offer the HP Adaptive Enterprise vision—an integrated approach to designing, implementing, measuring, monitoring and operating IT with 100 percent quality and reliability for a superior return on your IT investment.

### Optimizing storage for an adaptive IT infrastructure

HP recognizes storage is at the foundation of an adaptive IT infrastructure, a safeguard for business information. To achieve the full impact of storage on your business you must optimize its attributes. Enter the HP StorageWorks Modular Smart Array (MSA) family, a product family leveraging our award-winning Smart Array technology. Built on industry standards to ensure compatibility, ease-of-use, and affordability this advanced family of products and services allows you to deploy reliable solutions today, while enabling future growth and change. The MSA family is comprised of three products, the Modular Smart Array 1000 (MSA1000), the Modular Smart Array 500 (MSA500), and the Modular Smart Array 30 (MSA30). Enhancing the MSA family are the HP ProLiant packaged clusters with Modular Smart Array. These products bring powerful, high-end storage capabilities and benefits to the mainstream, while maintaining the simplicity and affordability of traditional direct attach storage (DAS).

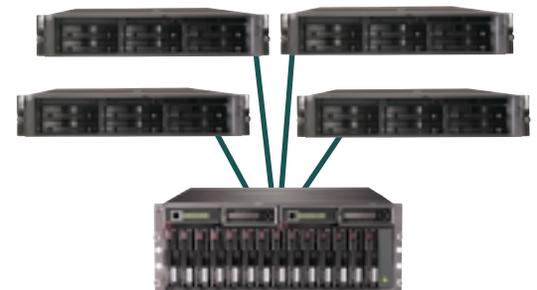
HP StorageWorks MSA products are optimized for HP ProLiant servers, combining the performance and simplicity of Smart Array with the scalability and efficiency of a network. The MSA500 and MSA1000 are available in prepackaged cluster kits that include HP ProLiant DL380 servers, providing maximum integration and simplified deployment. They are also available as part of HP ProLiant family clusters.



**MSA30 connected to HP ProLiant DL380 server via SCSI**



**MSA500 connected to two HP ProLiant DL380 servers via SCSI with multipath I/O option**



**MSA1000 connected to four HP ProLiant DL380 servers via a Fibre Channel switch with Selective Storage Presentation**

## HP StorageWorks Modular Smart Array products: simple, reliable and cost-effective

HP knows you must adapt quickly to growth and accomplish IT change seamlessly using simple, reliable, and cost-effective technologies. Customers benefit when applications, servers, storage, software, and services combine to meet IT's need for simplicity, superior reliability, and lowest cost to purchase and own. HP's broad range of product and solution offerings reflect our ability to meet stringent IT requirements, and make companies more efficient, profitable, and competitive. The HP StorageWorks Modular Smart Array (MSA) family adapts to changing environments improving the way you do business. This progressive approach streamlines operational expenses through reduced management costs, improved storage efficiency and reduced deployment times. Based on industry-leading Smart Array technology, the MSA family allows you to "hot add" drives, "hot add" servers, and "hot add" disk enclosures, enabling significant operational savings over traditional DAS, while maintaining the affordability and simplicity of Smart Array. The MSA family leads the industry with capability for seamless migration with DAS to SAN (DfS), allowing storage scalability and adaptability to your ever growing storage requirements. HP now provides comprehensive, affordable packages for the MSA family reducing ordering complexity by providing

everything needed to deploy MSA storage in one simple package. HP partners with you to provide the services and support you need to succeed.

## HP Smart Office initiative: focus on business

HP's Smart Office initiative allows SMBs to get more. An important component of Smart Office includes the availability of industry leading services designed specifically to meet the SMBs' unique IT needs, lessen computing complexity, and keep business running smoothly. And, HP is continually expanding our portfolio to enable SMB customers to get more from technology, whether they need to expand, optimize, or simply achieve better results.

With Smart Array architecture you get seamless scalability so you can expand servers/storage as needed to accommodate business needs. The simple modular design of MSA lets you effortlessly upgrade to an entry-level SAN with minimal investment and disruption to your business. The MSA product family is a superb fit for HP ProLiant servers and is ideal for smaller deployments, including smaller data centers and remote offices. This family takes your mind off technology, so you can focus on business. And, with our new solution bundle offerings, we make storage easier—easier to deploy, operate and own, and all at affordable prices.



## Choose the HP StorageWorks Modular Smart Array that's right for your business needs

Choose MSA technology when data availability is critical to business viability, performance is continually reduced due to capacity shortfalls, and when you need a cost-effective solution to manage key infrastructure components without adding staff or training. The scalable design of this family offers DfS technology, a quick and easy way to convert external storage while leveraging existing infrastructure. It creates high availability, high performance, easy to deploy solutions that don't require highly skilled storage professionals or expensive specialized training. Instead of making a large up-front investment, you buy what you need when you need it as your storage needs evolve.

Now you can tighten control of your increasingly complex storage environment with enterprise features at entry-level affordability. Each solution is designed to maximize transfer rates, reduce management costs, and drive a rapid return on investment while offering the lowest acquisition prices in the industry and the best price performance.

### HP StorageWorks MSA30

#### **Scalability and affordability**

The MSA30 is for customers who need additional capacities and high performance IO. An external storage enclosure that attaches to Smart Array controllers, it provides scalability and performance in your storage domain. The MSA30 also deploys as the storage expansion shelf for the MSA1000.

#### **Simple deployment**

- Common configuration and management as internal storage
- Familiar SCSI connectivity
- Expansion enclosure for MSA1000

#### **Lowest price point**

- The MSA30 and hard drives are the only requirement on servers with an existing Smart Array Controller and an external port to achieve a DAS solution

#### **Capacity expansion**

- With a 3U rackmount form factor and 10K Universal hard drives customers achieve maximum storage capacity per U

#### **High performance IO**

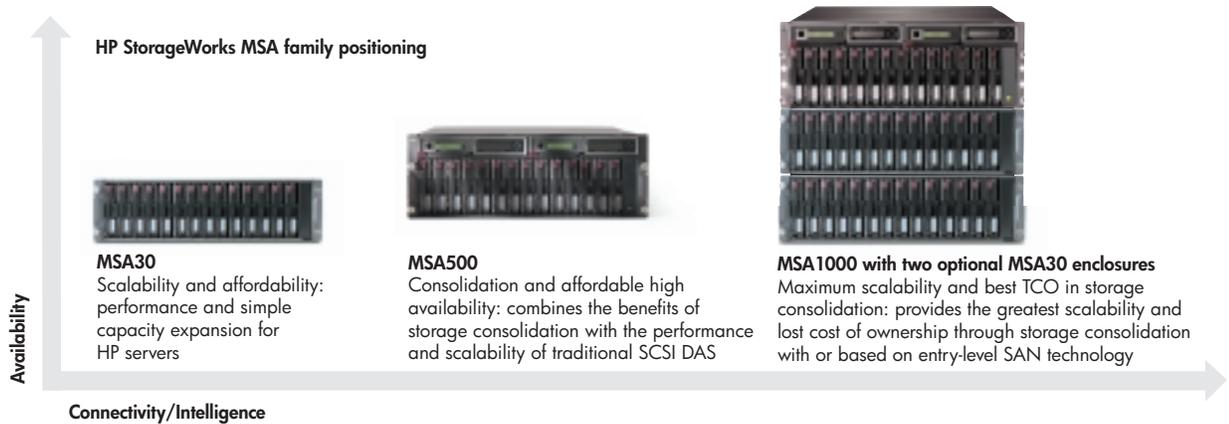
- Provides the necessary expansion of additional disk drives to support high performance applications such as database management
- Low latency direct attached solution with maximum Ultra320 SCSI performance

#### **Reliable**

- Increased uptime with redundancy of volatile components, power supplies, fans, and RAID protected disk drives

#### **Investment protection**

- Using the MSA30 as a storage expansion shelf, you can easily migrate your hardware and data from a direct attached environment to an entry-level SAN behind the MSA1000



## HP StorageWorks MSA500

### Consolidation and affordable high availability

The MSA500 is a 2 TB shared storage system that is perfect for a 2-node cluster or 4-node shared storage system. Providing high data availability at SCSI economies, it offers superior data protection and increased uptime.

### Simple deployment

- Based on industry-standard technology, configuration, and management tools
- Common Smart Array configuration and management tools
- Familiar SCSI connectivity
- Packaged kits and solutions to minimize complexity and maximize affordability

### Simplified management

- Consolidate up to 4 servers via SCSI Selective Storage Presentation
- Consolidation improves storage efficiency by maximizing storage capacity utilization and minimizing infrastructure costs

### Reliable uptime

- Controller redundancy and Smart Array Multipath Software offers full storage redundancy
- Certified with Microsoft®, Linux and NetWare clustering to meet business critical requirements

### Leverages IT investments

- Host based remote replication with HP OpenView Storage Mirroring software; provides affordable disaster tolerance
- As your environment changes and additional scalability is required, the MSA500 can be fully upgraded to the MSA1000

## HP StorageWorks MSA1000

### Maximum scalability and best TCO in storage consolidation

The MSA1000 is an entry-level SAN product. With Fibre Channel (FC) connection, it achieves storage consolidation, 'LAN-free' backup/restore, and multiple node clustering, including remote clusters. This affordable, scalable, high performance storage solution reduces the complexity and expense of SAN deployments.

### Improved data protection

- Faster backup and restore
- Redundant data paths between servers and storage
- Host based remote replication with HP OpenView Storage Mirroring software provides affordable disaster tolerance

### Simplified management

- Enhanced storage consolidation via Fibre Channel SAN Selective Storage Presentation
- High performance 2 GB Fibre Channel interface
- Consolidation offers highly efficient management from a central location
- HP OpenView software tools and HP Systems Insight Manager provide local or remote monitoring

### Dynamic growth

- Easier to expand capacity
- Simple to add servers, even to remote locations

### Investment protection

- A reasonably priced investment that lets you reduce ongoing and long-term operating costs
- MSA family DTS migration generates a high ROI through an easy, no-risk conversion, using existing tools (Array Configuration Utility and HP Systems Insight Manager)



MSA30



MSA500



MSA1000

<b>Capacity</b>	Supports up to 8 TB in 4 shelves using the Smart Array 6404 in a 12U rack space for maximum capacity footprint	14 universal drive bays come standard; when using 146 GB Universal disk drives up to 2 TB of storage is available; DAS to SAN (DiS) technology allows upgrade to MSA1000	Scales up to 6 TB with 42 Universal disk drives adding up to two MSA30 enclosures
<b>Servers supported</b>	HP ProLiant servers, HP AlphaServer platforms, HP Integrity servers and PA-RISC servers	HP ProLiant servers	HP ProLiant servers, HP AlphaServer platforms and HP Integrity servers
<b>Max server connections</b>	2	4; with single host connections 2; with redundant host connections	20; with single or redundant host connections
<b>OS support</b>	Microsoft® Windows® Server 2003, 2000, Windows NT, Linux, NetWare, HP Tru64, OpenVMS, HP-UX	Windows Server 2003, 2000, Windows NT, Linux, NetWare	Windows Server 2003, 2000, Windows NT, Linux, NetWare, Tru64, OpenVMS
<b>Host interface</b>	Ultra320 SCSI	Ultra160 SCSI	Fibre Channel 2 Gb
<b>Array controller</b>	Attaches to Smart Array controllers in HP ProLiant or Integrity servers	Single or redundant	Single or redundant
<b>RAID Levels</b>	0, 1+0, 5, ADG	0, 1+0, 5, ADG	0, 1+0, 5, ADG
<b>DAS to SAN (DiS) ready</b>	Yes	Yes	Yes
<b>Drive carrier</b>	Universal 1"	Universal 1"	Universal 1"
<b>Drive count per shelf</b>	14	14	14
<b>Expansion</b>	DAS; MSA1000 expansion shelves	No	Yes, 42 drives
<b>Upgradeability</b>	With MSA30 I/O upgrade module kits, upgrading HP StorageWorks 4300/4200 enclosures to U320 speeds is quick and easy. The MSA30 can also be deployed with the MSA1000 for capacity expansion.	Utilizes HP Universal disk drives for large investment savings and with HP's DiS technology. It converts to the MSA1000 in a snap for additional scalability and capacity, and increased availability in a SAN.	Utilizes HP Universal disk drives and HP's DiS technology to allow for fast upgrades from MSA500. For additional capacity it scales up to two additional MSA30 enclosures.

## Delivering industry-leading technology

The HP StorageWorks Modular Smart Array family delivers industry-leading technology to meet today and tomorrow's growing storage needs. These storage solutions offer investment protection with the best price performance features available for direct attach environments, clusters, and entry-level SAN environments. It is a dynamic storage family designed to maximize transfer rates, reduce management cost, and drive a rapid return on investment. And with the MSA500 and MSA1000, you have options for redundant data paths to protect against data path failure. These storage solutions offer:

- **Reliable and innovative Smart Array technology:** For 12 years customers have relied on its high availability and performance features in addition to its configuration flexibility, all with low initial investment requirements
- **Quick response to change:** Industry-standards ensure compatibility, ease-of-use, lower cost, and the highest level of integration available in the industry on an HP server

- **Simplified management through intuitive software:** System level monitoring software with HP Insight Manager, consistent configuration utilities that speed time to production, common tools across family minimizes re-training
- **Reduced complexity with common components:** Universal disk drives enable flexibility in investment protection by allowing customers to move existing disk drives from servers to the MSA1000
- **Highly available data protection:** Features redundant controllers, redundant paths, redundant power supplies and fans, Advanced Data Guarding (ADG), and pre-failure warranty on the disk drives
- **Improved operational efficiency through storage consolidation:** Bridges the gap between traditional DAS and networked storage environments and lets you extend your investment in HP Smart Array storage and HP ProLiant servers without costly fork-lift upgrades; the sharing of storage between multiple servers increases scalability, reduces management costs and improves overall storage utilization



## HP makes MSA products easy to order and deploy

HP has created packaged kits and product solution bundles for HP StorageWorks Modular Smart Array customers. Packaged Kits and Server-Storage Bundles make our “best of breed” solutions easier to order and deploy.

### MSA packaged kits

#### MSA500 Starter Kit

- MSA500
- HBAs and cables for 2 servers
- Cluster cabling and documentation

#### MSA1000 SAN Starter Kit

- MSA1000
- HBAs and cables for 2 servers
- 8-port Fabric switch

#### MSA500 High Availability Upgrade Kit

- MSA500 controller
  - 4-port module
  - 2 HBAs and cables
  - Smart Array Multipath Software
- Add this kit to the MSA500 Starter Kit or DL380 Packaged Cluster for a fully redundant 2-node cluster or 4-node shared storage system*

#### MSA1000 High Availability Upgrade Kit

- MSA1000 controller
  - MSA SAN Switch 2/8
  - HBAs and cables for 2 servers
  - HP StorageWorks SecurePath multipath software
- Combine the starter kit and a high availability kit for a complete MSA1000 SAN with dual data paths to insure uninterrupted business*

#### HP ProLiant DL380 Packaged Cluster with MSA500

- 2 HP ProLiant DL380 G3 servers
  - MSA500
  - Cabling for 2 servers
  - HBAs for server connections (hard drives not included)
- Combine the HP ProLiant DL380 Packaged Cluster with MSA500 high availability kit for fully redundant cluster with dual data paths to protect against failure*

#### HP ProLiant DL380 Packaged Cluster with MSA1000

- 2 HP ProLiant DL380 G3 servers clustered MSA1000
  - HBAs and cabling for 2 servers
  - 8-port Fabric Switch (hard drives not included)
- Combine the HP ProLiant DL380 Packaged Cluster with MSA1000 and high availability kit for fully redundant MSA1000 cluster with dual data paths to protect against failure*

## An affordable response to change

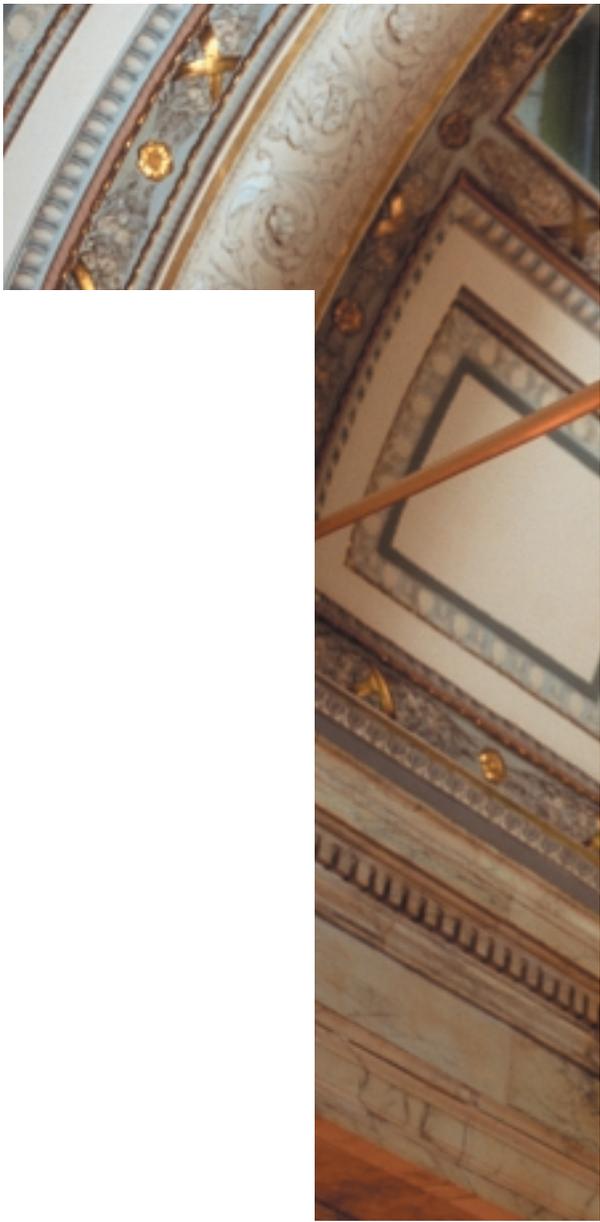
The HP StorageWorks Modular Smart Array family is an easy, efficient, and affordable response to change. MSA family technology is ideal for SMBs. Created using proven innovation and time-tested Smart Array technology, this family provides solutions for demanding and growing storage needs. And, when you choose HP, we give you more by delivering more reliability, more service and support, and more local expertise—all at a competitive price. Our leading-edge services and proven technologies help businesses optimize their storage domain to achieve higher productivity levels and greater return on IT assets.

## Stories in success

AutoTradeCenter (ATC), one of the world’s leading Internet-based automotive remarketing companies, depends on the performance, reliability, and responsiveness of its HP e-commerce infrastructure to attract and retain blue-chip clients. To accomplish this, HP developed an HP ProLiant Parallel Database Cluster with HP ProLiant servers and an HP StorageWorks MSA 1000 system. “The MSA 1000 system was less than half the price of the EMC-Dell solution, which allowed us to buy two SAN systems,” says Jorge Borbolla, Chief Information Officer, AutoTradeCenter. “It all comes down to a very attractive ROI proposition,” says Borbolla. “By maintaining an extremely reliable site based on HP solutions, we’ve seen a marked increase in revenue due to our robust HP e-commerce platform, and we’re solidifying our reputation as a technology leader.”

For more success stories on storage products and MSA1000 solutions, please visit: <http://h18006.www1.hp.com/storage/casestudies/index.html>

For success stories on HP ProLiant servers and MSA500 and MSA30 cluster solutions, please visit: <http://h18004.www1.hp.com/solutions/enterprise/highavailability/dl380/endorsements-g3.html>



[www.hp.com/msa](http://www.hp.com/msa)

© 2003 Hewlett-Packard Development Company, L.P. The information contained herein is subject to change without notice. The only warranties for HP products and services are set forth in the express warranty statements accompanying such products and services. Nothing herein should be construed as constituting an additional warranty. HP shall not be liable for technical or editorial errors or omissions contained herein. Microsoft and Windows are trademarks of Microsoft Corporation in the U.S. and/or other countries.

59822257EN, 10/2003

