

Overview

The HP StorageWorks 1510i Modular Smart Array is an iSCSI based 2U controller shelf that connects to both enterprise-class SCSI and Serial ATA (SATA) disk enclosures. (HP recommends SCSI drives for intensive heavy I/O requirements while SATA drives should be used in archived, "near on-line" disk-to-disk backup configurations). This combination provides customers with a low cost, high capacity storage solution. This solution has been designed as a hardware foundation for which future solutions can be designed and implemented for investment protection. The MSA1510i with up-to-eight attached SATA enclosures can provide the customer with up to 64 TB (using 750 GB SATA disk drives) of capacity*. If the business requires SCSI reliability, then attach up-to-four SCSI enclosures for a raw capacity of 16.8 TB (using 300 GB SCSI disks).

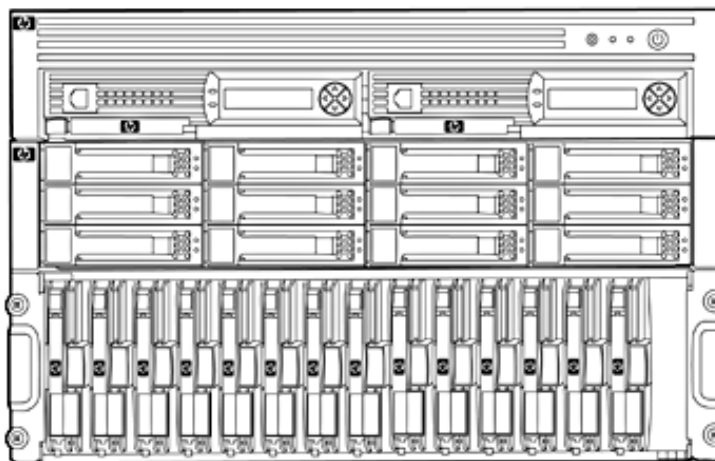
The MSA1510i provide two 1 Gigabit Ethernet interfaces. To attain maximum performance the MSA1510i should be connected only to a 1000base-T network.

By utilizing existing SCSI drive enclosures and MSA1000 controller technology and integrating the use of low cost SATA hard drives and enclosures, the MSA1510i lowers the total cost of ownership and extends the customers hardware investments into the future. With lower cost of ownership, customers can now take advantage of tiered storage capabilities matching up data with appropriate levels of performance, availability and cost of data storage. The result is lower overall cost without giving up the needs of business applications.

The MSA1510i is a member of the HP StorageWorks Modular Smart Array family, delivering industry-leading technology to meet today's demanding and growing storage needs. These storage solutions offer the best price performance features for direct attach environments and entry-level and mid-range SAN environments. Each solution is designed to maximize transfer rates, reduce management costs, while driving rapid return on investment.

The MSA1510i can be remotely managed by using management tools such as HP Insight Manager and the HP Storage Management Utility. The MSA1510i is positioned for users looking for flexible, scalable and easy to manage storage solution.

*maximum available storage capacity depends on the RAID level being implemented, and is based on maximum number of LUNs (32) and maximum LUN size (2 TB)



MSA1510i (shown with optional second controller, MSA30 SCSI enclosure and MSA20 SATA enclosure)

Overview

What's New

- Support for 750GB SATA 7200 rpm drive*
- Support for VMware (single controller only)
- Support for 300GB 15K SCSI hard drive for enhanced performance
- Support for Microsoft Windows 2003 R2 on HP ProLiant servers
- Support for Microsoft Windows 2003 X64 on HP ProLiant servers
- Support for Microsoft Windows 2003 64 bit for HP Integrity servers w/Intel Itanium processor
- Support for HP ProLiant G5 servers
- Support for "path failover" with HP NC370T and NC380T multi-function Gigabit server adapters
- Support for "hot-plug" for MSA20 and MSA30 enclosures
- Support for Routers

*when using 750GB SATA HDD behind a MSA1510i, the maximum capacity available is 64 TB, maximum available storage capacity depends on the RAID level being implemented, and is based on maximum number of LUNs (32) and maximum LUN size (2 TB)

Models

HP StorageWorks	MSA1510i 2U iSCSI Controller Shelf	AD537A
MSA1510i Modular Smart Array	Includes (1)-controller, (1) iSCSI Ethernet module (with 2 Ethernet ports) , (1)- dual channel SCSI I/O module, (2)110/120 VAC US/Canada power cables, (2) power cables to connect to a PDU in a rack, redundant fans, redundant power supplies, universal rack-mounting kit, MSA1510i support CD and documentation, serial cable. NOTE: cables, disk enclosures and hard drives are ordered separately Unit ships with 110/120 VAC US/Canada power cables only, country specific power cables must be ordered separately	
	HP StorageWorks MSA 1510i redundant controller	AD539A
	HP StorageWorks MSA 1510i Ethernet iSCSI module, (with 2 Ethernet ports)	AD538A
	HP StorageWorks Dual Channel SCSI I/O Module (1 ships with base unit, 3 more can be added)	AA988A
	Mini bundle - MSA1510i + MSA30 SCSI enclosure NOTE: The MSA30 enclosure in this bundle is a single bus model	AD593A
	Mini bundle - MSA1510i + MSA20 SATA enclosure	AD594A

Key Features

Overview

- Two 1 Gigabit Ethernet connections per controller to an IP network*
- Ability to mix performance class SCSI and reference class SATA storage behind the same controller for easy to install tiered storage solutions.
- RAID 6 with Advanced Data Guarding (ADG) - Highest level of fault tolerance, 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.
- High performance controller(s) built on DAS to SAN (DtS) architecture
- Scalable to eight- SATA enclosures for 64 TB**, or 4- SCSI enclosures for 16.8 TB of storage capacity with 4- dual channel SCSI I/O cards.
- Hot plug expansion and replacement support - Hot plug expansion and replacement of hard drives, fans, power supplies redundant controllers and enclosures, for simple, fast installation and maintenance.
- The MSA1510i supports a maximum 20 servers, each server needs to have the iSCSI initiator
- The MSA 1510i supports up to 32 LUNs
- The MSA1510i supports Microsoft Initiator V2.02
- Supports Gigabit Ethernet switches and Routers

*The MSA1510i should be connected to a 1000baseT network only

**maximum available storage capacity depends on the RAID level being implemented, and is based on maximum number of LUNs (32) and maximum LUN size (2 TB)

Customer Benefits

- Low cost, high capacity - For less than \$.01 per/MB customers can obtain up to 64 TB of capacity (eight SATA enclosures) using 750 GB SATA disk drives.
- Flexibility - Can choose SATA configuration for secondary storage of data, and/or SCSI configuration for primary storage, mixing of both technologies behind the same controller is supported but limited to separate SCSI I/O modules.
- Ability to utilize a tiered storage approach as data values decrease, choosing the right disk technology for your data storage.

Family Comparison

	MSA1510i	MSA1500cs	MSA1000	MSA500
Capacity (Maximum)	16.8 TB SCSI or 64 TB SATA*	16.8 TB SCSI or 64 TB SATA	12 TB SCSI	4 TB SCSI
Controller Cache	256 MB, upgradeable to 512 MB	256 MB, upgradeable to 512 MB	256 MB, upgradeable to 512 MB	256 MB, upgradeable to 512 MB
Direct or SAN	SAN Attach - IP	SAN Attach - Fibre	SAN Attach - Fibre	Direct Attach - SCSI
Maximum Drives	56 SCSI or 96 SATA or mixed	56 SCSI or 96 SATA or mixed	42 SCSI	14 SCSI
MTBF (drives) (hours)	1.5M w/ SCSI @ 100% 500,000 w/ SATA @ 50%	1.5M w/ SCSI @ 100% 500,000 w/ SATA @ 50%	1.5M @ 100%	1.5M @ 100%
Integrated Interconnect Options	No	No	Yes, 8-port Switch or 3-port Hub	No
Use for Storage	Primary Storage with SCSI Secondary with SATA	Primary Storage with SCSI Secondary with SATA	Primary Storage	Primary Storage

*maximum available storage capacity depends on the RAID level being implemented, and is based on maximum number of LUNs (32) and maximum LUN size (2 TB)

Product Highlights

Product Technology

iSCSI technology - iSCSI technology is a rapidly emerging segment, and the MSA1510i with IP interface will allow users to take advantage of this technology to deploy low cost and easy to manage IP SAN.

Modular Chassis - The modular design of the MSA1510i controller shelf supports up to eight SATA enclosures, 4 single channel SCSI enclosures or 2 dual channel SCSI enclosures. The enclosures are supported on up to 4 dual channel SCSI I/O module.

Scalability - up to 64 TB storage capacity utilizing 750GB SATA hard drives and eight SATA enclosures or up to 16.8 TB storage capacity utilizing 300GB SCSI hard drives and four SCSI enclosures.

RAID 6 with Advanced Data Guarding (ADG) Fault Tolerance - This is the highest level of RAID protection. 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.

DtS Architecture - DtS (Direct Attach to SAN) architecture is an exclusive MSA1000, MSA1500cs and MSA1510i feature that provides a quick and easy way to migrate stored data on SCSI disks protected by most Smart Array controllers to a MSA1000, MSA1500cs or MSA1510i storage system.

Pre-Failure Warranty - Enclosures and hard drives attached to an MSA1510i and monitored under Insight Manager are supported by a Pre-Failure (replacement) Warranty.

NOTE: Pre-Failure Warranty allows for the replacement of designated drives in an HP StorageWorks disk enclosure before they actually fail when using Insight Manager.

NOTE: Some operating systems may not support all of these features.

Configuration and Management Tools - The MSA1510i utilizes a web browser based management and utility software, the HP Storage Management Utility (SMU) is an embedded, web-based application for configuring and managing the MSA1510i. It provides a single interface to configure the storage and iSCSI settings, monitor status, and run diagnostic reports through a standard web-browser. The HP SMU provides both an initial setup wizard to simplify configuration and an advanced interface which provides access to all aspects of the system

Hot Plug Expansion and Replacement Support - The MSA1510i supports hot plug expansion and replacement of redundant controllers, fans, power supplies, and I/O modules for simple, fast installation and maintenance.

Software Components

Overview

The MSA1510i comes integrated with a web browser based software for storage and RAID management, setup, configuration and troubleshooting. This reduces the cost of ownership by reducing the training and technical expertise necessary to install and maintain your HP storage solution.

HP Storage Management Utility

- HP Storage Management Utility is integrated into the MSA1510i
- HP Storage Management Utility is target based (not host based)
- Embedded, web-based application for configuring and managing the MSA 1510i
- Provides a graphical view of HP drive array configurations and a single interface to configure the storage and iSCSI settings, monitor status, and run diagnostic reports through a standard web-browser
- Provides both an initial setup wizard to simplify configuration and an advanced interface which provides access to all aspects of the system.
- Easy to use Wizards for configuration
- Supports on-line configuration
- Remote Web-Based and Off-line configuration
- Offers SSL and SSH protection

NOTE: The MSA1510i also supports the integrated CLI (Command Line Interface) utility.

NOTE: The MSA1510i is not supported with the HP ACU or HP ACU CLI utilities.

Access Controls

- Built-in to the controller firmware and controlled via HP Storage Management Utility
- Allows setting of access rights to the MSA1510i storage by hosts
- Access control can be set up to a logical volume level using the Storage Management Utility

HP Insight Manager

- Powerful storage, server and server option management tool
- Monitor storage from a remote central location
- Browser based, provides full access from anywhere on the Intranet, eliminating the need for a dedicated Insight Manager management console

Compatibility

For the latest list of servers, that support the MSA1510i, check the Compatibility Guide on the MSA1510i product URL:
<http://h18006.www1.hp.com/products/storageworks/msa1510i>

Compatibility

Servers

Supports most HP ProLiant servers including :

ProLiant Intel® servers

DL140 G2, DL320G5, DL360, DL360 G2, DL360 G3
DL380, DL380 G2, DL380 G3
DL560, DL580, DL580 G2
DL740, DL760, DL760 G2
ML370, ML370 G2, ML370 G3
ML530, ML530 G2
ML570, ML570 G2, ML750"

ProLiant INTEL® EM64T servers

DL360 G4, DL360 G4p, DL360 G5
DL380 G4, DL380 G5,
DL580 G3, DL580 G4
ML350 G4, ML350 G4p, ML350 G5
ML370 G4, ML370 G5
ML570 G3, ML570 G4

ProLiant AMD® Opteron servers

DL145, DL145 G2 DC
DL385, DL385 G2 DC
DL585, DL585 G2 DC"

ProLiant Blade Servers

BL20p G2, BL20p G3, BL20p G4
BL25p, BL25p DC, BL25p G2
BL30p, BL35p SC, BL35p DC
BL40p, BL45p SC, BL45p DC
BL460c DC, BL465c, BL480c,
BL685c

NOTE: BL20p G1 servers are not supported

HP Integrity servers

rx1620, rx2600, rx2620, rx3600, rx5670, rx4640 rx6600,
rx7620, rx7640, rx8620, rx8640
HP Integrity Superdome

For a list of servers supported with VMware ESX 3.0.1 check the Compatibility Guide (under Technical documents) on the MSA1510i product URL:

<http://h18006.www1.hp.com/products/storageworks/msa1510i>

Compatibility

OS Support

- Microsoft Windows 2000 (SP4) (32-bit)
- Microsoft Windows 2003 and 2003 R2
- Microsoft Windows 2003 X64
- Microsoft Windows 2003 64-bit (on HP Integrity Servers with Intel Itanium processors)
- VMWare ESX 3.0.1 (single controller only)

Please refer to compatibility matrix at <http://h18006.www1.hp.com/products/storageworks/msa1510i> for complete configuration support.

Industry Standard X86 servers support

- Supports most multi-vendor industry standard 32-bit Intel and AMD based (x86) servers. HP requires the Third-Party Server to be logo'd and listed on the Microsoft Windows Server Catalog.
- Refer to the Microsoft website: <http://www.microsoft.com/windows/catalog/server/>
- HP StorageWorks Division recommends that the Third-Party Server Vendor is an active member of TSANet. Refer to the TSANet website for details: www.tsanet.com
- For multi-vendor industry standard x86 servers to connect to the MSA1510i - they must be running the supported version of the iSCSI initiator, operating system, HP's DSM* and industry standard Gigabit Ethernet NICs. See compatibility guide for the MSA1510i for supported versions <http://h18006.www1.hp.com/products/storageworks/msa1510i>

*HP's DSM software is required for path failover with redundant controllers, however HP required the HP DSM software to be installed for single controller version also. Only HP's DSM must be running on the server, and no only DSM software must be installed.

iSCSI Features supported

- Support for up to 32 sessions per controller
- 32 targets, Portals and Portal Groups
- Multiple Connections per Session
- CHAP for Authentication
- iSNS and SLP support for Discovery
- VLAN support for IP Zoning
- Multiple IP Addresses per port
- Router support

Management Capabilities support

- support for HTTP and HTTPS
- auto failover to standby controller for Management
- Support for Telnet and SSH
- SNMP
- NTP support for synchronizing to server timestamp

Web Browser support

- MSA1510i support target based management, and requires a web browser for management. Only Microsoft Internet Explorer V6.X and above is supported

Compatibility

Optional Software

MPIO failover for Windows

MPIO Basic Failover for Windows provides a single multi-path solution for HP StorageWorks MSA1510i Modular Smart Array on HP ProLiant servers and HP Integrity server hosts by providing basic path failover. Supports Microsoft Windows Server 2000, Windows 2003, Windows 2003 R2, Windows 2003 X64 and Windows 2003 64 bit (on HP Integrity Servers with Itanium processor) operating systems

DSM driver is required from HP for operation and configuration. HP DSM driver software is included in the support CD shipped with the MSA1510i

NOTE: For more information visit

<http://h18006.www1.hp.com/products/sanworks/multipathoptions/index.html>

Configure to Order Program Information

Configure to Order	Products Approved for CTO	Part Number
	HP StorageWorks MSA1510i Modular Smart Array NOTE: cables, disk enclosures and hard drives are ordered separately NOTE: 0D1 will appear after this part number on your sales order when factory integration is indicated.	AD537A
	MSA1510i Redundant controller NOTE: 0D1 will appear after this part number on your sales order when factory integration is indicated.	AD539A
	MSA1510i Ethernet iSCSI module (with 2 Ethernet ports) NOTE: 0D1 will appear after this part number on your sales order when factory integration is indicated.	AD538A
	Dual Channel SCSI I/O Module (1 ships with base unit, 3 more can be added) NOTE: 0D1 will appear after this part number on your sales order when factory integration is indicated.	AA988A
NO CTO Available	Products Not Approved for CTO	
	MSA1510i + MSA30 SCSI enclosure mini bundle NOTE: The MSA30 enclosure in this bundle is a single bus model. This SKU is not available in EMEA (Europe, Middle East and Africa).	AD593A
	MSA1510i + MSA20 SATA enclosure mini bundle NOTE: This SKU is not available in EMEA (Europe, Middle East and Africa).	AD594A

Service and Support, HP Care Pack, and Warranty Information

Warranty

- Three-year limited warranty
- Three years parts exchange
- One year labor
- One year on-site next business day response

Enclosures, Hard drives, and Options for the MSA1510i carry their own warranty. Refer to HP's Limited Warranty Statement for more information.

The MSA1510i has been designed with customer self repairable parts to minimize repair time and provide greater flexibility in performing defective parts replacement. Please refer to HP's limited warranty Statement and parts replacement instructions for further details:

<http://h18006.www1.hp.com/products/storageworks/warranty.html>

Products included in various Kits carry their own individual warranties.

NOTE: The warranty of the hard drive options purchased with the MSA1510i product is different for SCSI hard drives versus SATA hard drives. SCSI hard drive options have a three year warranty and SATA hard drives options have a one year warranty. Reference HP's communication for further details: <http://www.hp.com> go to search, enter CN0089W

Warranty Upgrade Options

- Response - Upgrade on-site response from next business day to same day 4-hour response or 6 Hour Call To Repair
- Coverage - Extend hours of coverage from next business day to 9 hours x 5 days to 24 hours x 7 days
- Duration Select duration of coverage for a period of 1, 3, 4 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 information on Product Services and HP Care Pack, as well as orderable part numbers, please refer to the URL: <http://www.hp.com/hps/carepack/>.

If you have specific questions about availability or how to obtain services contact your local HP representative. Contact information for your local area can be found at:

http://welcome.hp.com/country/us/en/contact_us.html

Service and Support, HP Care Pack, and Warranty Information

Software Product Services Product support provides the customer access to HP's experienced technical support resources, as well as access to HP's Information Services database for support on a variety of multi-vendor/multiplatform software products. Product support includes escalation and problem coordination with the appropriate engineering group. HP Services offer a variety of options to allow you to tailor your product service to meet the needs of your organization. Basic warranty on products can be uplifted from day one to ensure you receive the service you need when you need it.

Warranty and Support HP warrants only that the software media will be free of physical defects for a period of ninety (90) days from delivery.

The following services are offered as HP Care Pack Services at the time of software product order:

- Software Technical Support 24 x 7 (1 and 3 years) is available 24 hours per day, Monday through Sunday, including holidays (includes phone-in software technical support 24 x 7 and software product and documentation updates).
- Installation Service (software installation) and Installation and Startup Service (software installation, configuration, startup testing and knowledge transfer).
- HP Care Pack services must be ordered with the product and are prepaid.
- For tailored support contracts based on personalized statement of work contact your local support center via <http://www.HP.com/support>.

For additional software product services information for HP Care Pack services, as well as orderable part numbers, please refer to the URLs listed below:

All storage services: <http://www.hp.com/hps/storage/>.

All HP Care Pack Services: http://www.hp.com/hps/carepack/storage/cp_networked.html.

Software Support HP Care Pack Services: http://www.hp.com/hps/carepack/software/cp_storage.html.

Installation and Startup Services: http://www.hp.com/hps/storage/ns_implementation.html.

If you have specific service questions contact your local HP representative. Contact information for your local area can be found at: http://welcome.hp.com/country/us/en/contact_us.html

Maintenance releases, bug fixes and software patches are available at:

<http://welcome.hp.com/country/us/en/support.html>.

Hardware Product Services

- Installation services that include basic installation and Array Installation and Startup
- On-site maintenance (includes warranty support)
- Response time upgrades during the warranty period
- Post-warranty coverage or warranty extension
- RAID setup and performance consulting via statement of work
- Migration service consulting via statement of work
- Environmental, Mission Critical Services

For product services information for HP Care Pack services, as well as orderable part numbers, please refer to the URLs listed below:

All storage services: <http://www.hp.com/hps/storage/>.

All HP Care Pack Services: http://www.hp.com/hps/carepack/storage/cp_networked.html.

Installation and Startup Services: http://www.hp.com/hps/storage/ns_implementation.html.

If you have specific service questions contact your local HP representative. Contact information for your local area can be found at: http://welcome.hp.com/country/us/en/contact_us.html

Service and Support, HP Care Pack, and Warranty Information

Array Installation and Startup Services

The HP installation and startup for HP StorageWorks Disk Arrays service package provides installation and configuration of HP StorageWorks Disk Array products. Service highlights include:

- Service planning
- Installation and Startup provides installation, Virtual Disk Design and configuration of the MSA1510i. This includes:
 - Service planning
 - Service deployment
 - Installation Verification Testing (IVT) required for this service
 - Customer orientation session

Development of a customized virtual disk design that includes all of the physical disk drives controlled by the MSA iSCSI Controller to meet the array configuration objectives as previously defined by the customer as long as it does not exceed the limits specified in the product specifications.

- Please contact your local HP sales organization for further details

Support Services via HP Authorized Commercial Resellers - Fixed Care Packs

Product SKUs

MSA1510i

MSA1510iKits

AD537A

AD593A
AD594A

Support Description

Care Pack

1 Yr 4hr 24x7/Onsite

UA774A/E

UC762A/E

1 Yr 4hr 13x5/Onsite

UA775A/E

UC777A/E

1 Yr 6 hr CTR

UA776A/E

UC778A/E

3 Yr next Day/Onsite

UB950A/E

UB153A/E

3 Yr 4hr 13x5 /Onsite

UB951A/E

UB154A/E

3 Yr 4hr 24x7 /Onsite

UB952A/E

UB155A/E

3 Yr 6 hr CTR

UB953A/E

UB156A/E

5 Yr 6hr CTR

UC986E

*Hardware Installation

UA4368A/E

UB958A/E

*Installation and Startup

UA868A/E

UA868A/E

*SERVICES NOTE:

Hardware Installation is not required for individual hardware components, when the Installation and Startup service is being purchased.

Service and Support, HP Care Pack, and Warranty Information

Support Services via HP Authorized Resellers and HP Direct -Flexible Care Packs

Product SKUs

MSA1510i

MSA150i
Kits

AD537A

AD593A
AD594A

Support Description

Care Pack

BAND

BAND

1 Yr 4hr 13x5 Hardware	HA103A1	8PN	8PM
1 Yr 4h 24x7 Hardware	HA104A1	8PN	8PM
1 Yr 6 hr CTR	HA105A1	8PN	8PM
1 Yr Support Plus	HA109A1	8PN	8PM
1 Yr Support Plus 24	HA110A1	8PN	8PM
1 Yr Proactive 24	HA111A1	8PN	8PM
1 Year Critical Services	HA112A1	8PN	8PM
3 yr Next Day	HA101A3	8PN	8PM
3 Yr 4hr 13x5 Hardware	HA103A3	8PN	8PM
3 Yr 4hr 24x7 Hardware	HA104A3	8PN	8PM
3YR 6hr CTR	HA105A3	8PN	8PM
3Yr Support Plus	HA109A3	8PN	8PM
3 Yr Support Plus 24	HA110A3	8PN	8PM
3 Yr Proactive 24	HA111A3	8PN	8PM
3 Year Critical Services	HA112A3	8PN	8PM
4 year Next Day	HA101A4	8PN	8PM
4 Yr 4hr 13x5 Hardware	HA103A4	8PN	8PM
4 Yr 4h 24x7 Hardware	HA104A4	8PN	8PM
4 Yr 6 hr CTR	HA105A4	8PN	8PM
4 Yr Support Plus	HA109A4	8PN	8PM
4 Yr Support Plus 24	HA110A4	8PN	8PM
4 Yr Proactive 24	HA111A4	8PN	8PM
4 Year Critical Services	HA112A4	8PN	8PM
5 Year 4hr 13x5 Hardware	HA104A5	8PN	8PM
5 Year Support Plus 24	HA110A5	8PN	8PM
Hardware Installation	HA113A1	5J0	5FZ
Installation and Startup	HA114A1	5J0	5FZ

SERVICES NOTE:

Hardware Installation is not required on the individual hardware components, when quoting the Installation and Startup service.

Kit Contents

Model Name	Kit Contents Description	Part Number
MSA1510i	HP StorageWorks MSA1510i Modular Smart Array MSA1510i 2U iSCSI Controller Shelf Includes (1)-controller, (1) iSCSI Ethernet module (with 2 Ethernet ports) , (1)- dual channel SCSI I/O module, (2)110/120 VAC US/Canada power cables, (2) power cables to connect to a PDU in a rack, redundant fans, redundant power supplies, universal rack-mounting kit, MSA1510i support CD and documentation, serial cable. NOTE: cables, disk enclosures and hard drives are ordered separately Unit ships with 110/120 VAC US/Canada power cables only, country specific power cables must be ordered separately	AD537A
MSA1510i controller	MSA1510i Redundant controller	AD539A
Ethernet iSCSI module	MSA1510i Ethernet iSCSI module (with 2 Ethernet ports)	AD538A
SCSI I/O module	Dual Channel SCSI I/O Module (1 ships with base unit, 3 more can be added)	AA988A
MSA 1510i +MSA30 SCSI enclosure	MSA1510i + MSA30 SCSI enclosure mini bundle NOTE: The MSA30 enclosure in this bundle is a single bus model. This SKU is not available in EMEA (Europe, Middle East and Africa).	AD593A
MSA 1510i + MSA20 SATA enclosure	MSA1510i + MSA20 SATA enclosure mini bundle NOTE: This SKU is not available in EMEA (Europe, Middle East and Africa).	AD594A

Configuration Information

Step 1 - "Product" - Base Configuration

Select one:

Model Name	Model Description:	Part Number
MSA1510i	<p>HP StorageWorks MSA1510i Modular Smart Array MSA1510i 2U iSCSI Controller Shelf</p> <p>Includes (1)-controller, (1) iSCSI Ethernet module (with 2 Ethernet ports) , (1)- dual channel SCSI I/O module, (2)110/120 VAC US/Canada power cables, (2) power cables to connect to a PDU in a rack, redundant fans, redundant power supplies, universal rack-mounting kit, MSA1510i support CD and documentation, serial cable.</p> <p>NOTE: cables, disk enclosures and hard drives are ordered separately Unit ships with 110/120 VAC US/Canada power cables only, country specific power cables must be ordered separately</p>	AD537A

Step 2 - Options (Choose at least one SCSI or Serial ATA enclosure)

Select each option with quantities specified.

NOTE: SATA drives are designed for archival or reference data. They should not be used in a heavy or intense I/O environment. Those situations require the use of enterprise-class SCSI drives.

Step 2a - Options

Description with Parts Shipped:	Quantity	Part Number
256 MB Cache Modules for Controller (one additional for each controller)	1 per controller	254786-B21
NOTE: The MSA1510i, MSA1500 and MSA1000 utilize the same Cache Modules		
Dual Channel SCSI I/O Module (1 ships with base unit, 3 more can be added) Required for adding more than one SCSI drive shelf or more than two SATA shelves.	Up to 3	AA988A
NOTE: Each supports one single MSA30 SCSI enclosure OR two MSA20 SATA enclosures.		

Step 2b - when choosing SCSI Drive Options

MSA30 - Single Channel SCSI enclosure, SCSI cable, redundant fans and power supplies, power cable. Holds up to 14 Ultra320 SCSI drives	Up to 4 each attached to a single Dual SCSI I/O module	302969-B21
MSA30 - Dual Channel SCSI enclosure, SCSI cable, redundant fans and power supplies, power cable Holds up to 14 Ultra320 SCSI drives	Up to 2 each attached to two Dual SCSI I/O modules	302970-B21
72.8 GB Pluggable Ultra320 Universal Hard Drive, 10,000 rpm (1")	Up to 14 per MSA30 enclosure	286714-B22
146.8 GB Pluggable Ultra320 Universal Hard Drive, 10,000 rpm (1")	Up to 14 per MSA30 enclosure	286716-B22
300 GB Pluggable Ultra320 Universal Hard Drive, 10,000 rpm (1")	Up to 14 per MSA30 enclosure	350964-B22
36.4 GB Pluggable Ultra320 Universal Hard Drive, 15,000 rpm (1")	Up to 14 per MSA30 enclosure	286776-B22
72.8 GB Pluggable Ultra320 Universal Hard Drive, 15,000 rpm (1")	Up to 14 per MSA30 enclosure	286778-B22
146.8 GB Pluggable Ultra320 Universal Hard Drive, 15,000 rpm (1")	Up to 14 per MSA30 enclosure	347708-B22
300 GB Pluggable Ultra320 Universal Hard Drive, 15,000 rpm (1")	Up to 14 per MSA30 enclosure	411089-B22

Configuration Information

300 GB Pluggable Ultra320 Universal Hard Drive, 15,000 rpm (1")	Up to 14 per MSA30 enclosure	411089-B22
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Step 2c - when choosing SATA Drive Options

MSA20 - Serial ATA enclosure, SCSI cable, redundant fans and power supplies, power cable. Holds up to 12 SATA drives	Up to 8 up to 2 per Dual SCSI I/O module	335921-B21
160 GB Pluggable Serial ATA Universal Hard Drive, 7200 rpm (1")	Up to 12 per MSA20 enclosure	349238-B21
250 GB Pluggable Serial ATA Universal Hard Drive, 7200 rpm (1")	Up to 12 per MSA20 enclosure	349239-B21
500 GB Pluggable Serial ATA Universal hard drive, 7200 rpm (1")	Up to 12 per MSA20 enclosure	395473-B21
750 GB Pluggable Serial ATA Universal hard drive, 7200 rpm (1")*	Up to 12 per MSA20 enclosure	432341-B21

NOTE: It is recommended that the same hard drive capacity (example: All 250 GB SATA in SATA enclosure or all 146 GB SCSI in SCSI enclosure) be installed in a disk enclosure.

NOTE: For complete compatibility information, refer to the Compatibility Guide located at <http://h18006.www1.hp.com/products/storageworks/msa1510i>

***NOTE:** when using 750GB SATA HDD behind a MSA1510i, the maximum capacity available is 64 TB, maximum available storage capacity depends on the RAID level being implemented, and is based on maximum number of LUNs (32) and maximum LUN size (2 TB). Support for 750GB SATA requires minimum firmware V1.32 on MSA1510i and V2.02 on MSA20

Must choose optional Power Cord for Non-U.S. Configurations	Quantity required	Part Number
Power Cord, 110/120 VAC, US/Canada/Mexico	2	163719-002
NOTE: Shipped standard with all units.		
Power Cord, 220/240 VAC, (US/Canada/Mexico)	2	227099-002
Power Cord, (Australia/China/New Zealand)	2	227098-011
Power Cord, (Central Europe)	2	157215-021
Power Cord, (United Kingdom/Hong Kong)	2	157216-031
Power Cord, (Switzerland)	2	157219-111
Power Cord, (Italy)	2	157217-061
Power Cord, (Denmark)	2	157218-081
Power Cord, (Japan)	2	139867-006
Power Cord, (South East Asia/India)	2	157220-AR1
MSA1510i to PDU		
10 ft AC, IEC-IEC PDU Jumper cable	2	142263-003
NOTE: Shipped standard with all units.		
3.0m (9.8') 10A, IEC C 13 to IEC C14 PDU Jumper Cable	2	142257-003
2.5m (8.2') 10A, IEC C 13 to IEC C14 PDU Jumper Cable	2	142257-002
1.4m (4.5') 10A, IEC C 13 to IEC C14 PDU Jumper Cable	2	142257-006

Configuration Information

Step 3 – Choose Redundant MSA1510i System Options

Description with Parts Shipped:	Quantity	Part Number
MSA1510i Redundant controller (requires an additional MSA1510i 2-port Ethernet iSCSI module)	1	AD539A
MSA1510i 2-port Ethernet iSCSI module	1	AD538A

NOTE: Redundant configurations require two Ethernet NICs per server, additional redundant controller, additional Ethernet iSCSI module and failover software, HP MPIO is available at

<http://h18006.www1.hp.com/products/sanworks/multipathoptions/index.html>

NOTE: The MSA1510i only supports HP's MPIO DSM for iSCSI, for path failover.

Step 4 – Choose Supported Options For Gigabit Infrastructure

Select each required option with quantities specified.

The MSA1510i supports industry standard Gigabit Ethernet components from various manufacturers that conform to IEEE 802.3ab (1000base-T).

Description with Parts Shipped:	Part Number
For details on standard Gigabit Ethernet components (including Gigabit Ethernet switches, Network Interface cards and Ethernet cables) from HP http://welcome.hp.com/country/us/en/prodserv/networking.html	

NOTE: The list below is a partial list of supported HP ProCurve Switches and Gigabit NICs.

Gigabit Ethernet NIC	HP NC320T PCI Express Gigabit Server Adapter	367047-B21
	HP NC1020 Cu Gigabit Server Adapter 32 PCI Single Port	353377-B21
	HP NC7170 Dual Port PCI-X 1000T Gigabit Server Adapter	313881-B21
	HP NC7770 PCI-X Gigabit Server Adapter	244948-B21
	HP NC7771 PCI-X Gigabit Server Adapter	290563-B21
	HP NC370T PCI-X Multifunction Gigabit server adapter	374191-B22
	NOTE: Supported as standard NIC only. iSCSI acceleration and TOE capability will be supported in future	
Gigabit Ethernet NIC	HP NC380T PCI Express Dual Port Multifunction Gigabit server adapter	394795-B21
	NOTE: Supported as standard NIC only. iSCSI acceleration and TOE capability will be supported in future	
HP ProCurve Gigabit Ethernet switches	HP Procurve 6108 Switch	J4902A
	HP Procurve 5308xl Switch	J4907A
	HP Procurve 5372xl Switch	J4820A
	HP Procurve 3400cl-24G Switch	J4905A
	HP Procurve 3400cl-48G Switch	J4906A
	HP Procurve 4160gl Switch	J8152A
	HP Procurve 4140gl Switch	J8151A
	HP Procurve 2848 Switch	J4904A
HP Procurve 2824 Switch	J4903A	

Configuration Information

CAT 5e cables	CAT 5e cable, RJ45 to RJ45, M/M 1.2m (4ft)	C7533A
	CAT 5e cable, RJ45 to RJ45, M/M 2.1m (7ft)	C7535A
	CAT 5e cable, RJ45 to RJ45, M/M 4.3m (14ft)	C7536A
	CAT 5e cable, RJ45 to RJ45, M/M 7.6m (25ft)	C7537A
	CAT 5e cable, RJ45 to RJ45, M/M 15.2m (50ft)	C7542A
	CAT 5e cable kit, 10 of C7636A	C7543A

Step 5 – Choose Rack Options

Select each required option with quantities specified.

10647 (47U) Rack Cabinet - Pallet	245160-B21
10647 (47U) Rack Cabinet - Crated	245160-B23
10642 (42U) Rack Cabinet - Pallet	245161-B21
10642 (42U) Rack Cabinet - Shock Pallet	245161-B22
NOTE: It is mandatory to use a shock pallet in order to ship racks with equipment installed	
10642 (42U) Rack Cabinet - Crated	245161-B23
10636 (36U) Rack Cabinet - Pallet	245162-B21
10636 (36U) Rack Cabinet - Shock Pallet	245162-B22
NOTE: It is mandatory to use a shock pallet in order to ship racks with equipment installed	
10636 (36U) Rack Cabinet - Crated	245162-B23
10622 (22U) Rack Cabinet - Pallet	245163-B21
10622 (22U) Rack Cabinet - Shock Pallet	245163-B22
NOTE: It is mandatory to use a shock pallet in order to ship racks with equipment installed.	
10622 (22U) Rack Cabinet - Crated	245163-B23
S10614 (14U) Rack Cabinet - Shock Pallet	292302-B22
NOTE: It is mandatory to use a shock pallet in order to ship racks with equipment installed.	
10842 (800 mm wide, 42U) Rack Cabinet - Pallet	257415-B21
10842 (800 mm wide, 42U) Rack Cabinet - Shock Pallet	257415-B22
NOTE: It is mandatory to use a shock pallet in order to ship racks with equipment installed.	
Rail Kit for mounting in a M-Series rack	313877-B21
42U EVA cab 60Hz	338042-B21
36U EVA cab 60Hz	338044-B21
22U EVA cab 60Hz	338046-B21
42U EVA cab 50 Hz	338043-B21
36U EVA cab 50 Hz	338045-B21
22U EVA cab 50 Hz	338047-B21
HP9000 Std Rack System E25	A4900A
HP Rack System/E, 33U, quartz color	A4901A
HP Rack System/E, 33U, graphite color	A4901D
HP Rack System/E, 41U, quartz color	A4902A
HP Rack System/E, 41U, graphite color	A4902D

Step 6– Choose HP Care Pack Services

9x5 Next Business Day, Onsite Coverage, 3 years (6-3)	103840-002
9x5 Next Business Day, Onsite Coverage, 3 years (2-5-2)	FM-FCXHW-36
9x5, 4-Hour Response, On-Site Coverage, 3 years (6-3)	402165-002
9x5, 4-Hour Response, On-Site Coverage, 3 years (2-5-2)	FM-FC4HR-36
24x7, 4-Hour Response, On-Site Coverage, 3 years (6-3)	402164-002
24x7, 4-Hour Response, On-Site Coverage, 3 years (2-5-2)	FM-FC724-36
9x5, Next Business Day, On-Site Coverage, 5 years (6-3)	170183-002
9x5, Next Business Day, On-Site Coverage, 5 years (2-5-2)	FM-FCXHW-60
9x5, 4-Hour Response, On-Site Coverage, 5 years (6-3)	170185-002
9x5, 4-Hour Response, On-Site Coverage, 5 years (2-5-2)	FM-FC4HR-60
24x7, 4-Hour Response, On-Site Coverage, 5 years (6-3)	170187-002
24x7, 4-Hour Response, On-Site Coverage, 5 years (2-5-2)	FM-FC724-60
Hardware Installation (6-3)	402162-002

Related Options

MPIO failover for Windows

MPIO iSCSI Basic Failover provides a multi-path solution for HP MSA1510i Modular Smart Array on a Microsoft Windows Server 2000 or 2003. HP DSM software is required.

For more information visit <http://h18006.www1.hp.com/products/sanworks/multipathoptions/index.html>

Technical Specifications

Modular Smart Array 1510i	LED Indicators on Front Panel	System heartbeat System UID Power On/Standby Fault detected in enclosure
	LED Indicators on Rear Panel	System UID SCSI Module Power indicator (1 per SCSI I/O module) SCSI Activity (1 per SCSI I/O module) Ethernet iSCSI Module Status indicator (1 per module) Ethernet iSCSI Module Link indicator (1 per module) Ethernet iSCSI Module Activity indicator (1 per module) Power supply status (1 per power supply) Fan Module status (1 per fan module)
	Interface	Ultra3 SCSI to Hard Drives Enclosures Two 1 Gigabit Ethernet Interfaces
	Maximum Number of Drives	Up to 96 SATA hard drives in 8 MSA20 SATA enclosure or 56 SCSI hard drives in 4 MSA30 SCSI enclosures
	Temperature Range	Operating 50° to 95° F (10° to 35° C) Shipping -22° to 122° F (-30° to 50° C)
	Relative Humidity	Operating 10% to 90% Non-operating Up to 95%
	Maximum wet-bulb temperature	Long term storage 84.2° F (29° C) Short term storage 86° F (30° C)
	Input Power Requirements	Rated Input Voltage 100 to 240 VAC Rated Input Frequency 47 to 63 Hz Rated Input Current 6.4A Max, 1A typical Input Power (max) 400W Max*, 95W typical
	Heat Dissipation* (Maximum)	2187 BTU/hr <i>*Input Power and Heat Dissipation specifications are maximum values and apply to worst-case conditions at full rated power supply load. The power/heat dissipation for your installation will vary depending on the equipment configuration.</i>
	User Interface	Controller display with Status Indicators (2) and push buttons (4) on front of controller
	Electrical Interface	LVD (Low Voltage Differential)
	Protocol Support	Wide Ultra3 SCSI
	SCSI Ports	2-ports per Dual Channel SCSI I/O Module, up to 4 modules total
	Maximum Capacity with additional enclosures	64 TB with 750 GB SATA HDD, or 16.8 TB with 300 GB SCSI HDD
	Logical Drives (LUN)	Up to 32 Logical Drives
	Maximum Logical Drive size	2.0 TB

Technical Specifications

MSA 1510i Controller	User Interface	Controller Display with Status Indicators (2) and Push Buttons (4) Status Indicators on front of Controller (16)
	Electrical Interface	LVD (Low Voltage Differential)
	Protocol Support	Wide Ultra3 SCSI Compliant with 1000Base-TX as defined by IEE 802.2, 802.3u and 802.3ab specifications
	Hardware Implemented	iSCSI Gigabit Ethernet TCP/IP Offload Engine
	RAID Support	RAID 6 with ADG (Advanced Data Guarding) RAID 5 (Distributed Data Guarding) RAID 1 + 0 (Mirroring + Striping) RAID 1 (Mirroring) RAID 0 (Striping)
	Cache Memory	Up to 512 MB Read/Write (256 MB modules). If redundant controllers are used they must have equally configured cache ECC protection, battery-backed, and removable
	Memory	32 MB SDRAM
	Cache Batteries	Up to three days of redundant battery life, removable for easy replacement
	Upgradeable Firmware	4 MB flashable ROM
	Disk Drive and Enclosure Protocol Support	HP Ultra 320 and Ultra3 SCSI 1-inch Universal drives

MSA1510i 2-port Ethernet iSCSI Module	Connector Type	RJ45
	Number of Ethernet Ports	Two per Ethernet iSCSI module
	Bandwidth	1Gbps each port
	Operation Modes	1000base-T, Auto MDI/MDIX
	Protocols Supported	IEEE 802.3ab, IEEE 802.1q

MSA1510i Controller Shelf 2U Rack Form Factor	Product Dimensions (H x W x D)	3.46 x 19.06 x 24.32 in (8.78 x 48.41 x 61.77 cm)
	Product Weight	55 lb (24.94 kg)
	Shipping Packaging Dimensions (H x W x D)	11.25 x 32.50 x 34.06 in (28.57 x 82.55 x 86.51 cm)
	Shipping Weight (Gross)	68 lb (30.84 kg)

Dual Channel SCSI I/O Module	Product Dimensions (H x W x D)	3.2 x 0.92 x 14.62 in (8.14 x 2.35 x 37.13 cm)
	Product Weight	1.01 lb (0.45 kg)
	Shipping Packaging Dimensions (H x W x D)	19.88 x 9.06 x 2.76 in (50.49 x 23.01 x 7.01 cm)
	Shipping Weight (Gross)	1.93 lb (0.875 kg)

Technical Specifications

2-port Ethernet iSCSI Module	Product Dimensions (H x W x D)	3.2 x .92 x 14.62 in (8.14 x 2.35 x 37.13 cm)
	Product Weight	.92 lbs (0.42 kg)
	Shipping Packaging Dimensions (H x W x D)	19.88 x 9.06 x 2.76 in (50.49 x 23.01 x 7.01 cm)
	Shipping Weight (Gross)	1.87 lbs (0.85 kg)

MSA1510i controller	Product Dimensions (H x W x D)	3.46 x 19.06 x 24.32 in (8.78 x 48.41 x 61.77 cm)
	Product Weight	2.4 lbs (1.1 kg)
	Shipping Packaging Dimensions (H x W x D)	11.25 x 32.50 x 34.06 in (28.57 x 82.55 x 86.51 cm)
	Shipping Weight (Gross)	4.4 lbs (2.0 kg)

MSA1510i with SCSI enclosure	Product Dimensions (H x W x D)	8.71 x 19.06 x 24.32 in (22.12 x 48.41 x 61.77 cm)
	Product Weight	81 lbs (36.8 kg)
	Shipping Packaging Dimensions (H x W x D)	30.25 x 33.5x34.5 in (76.8 x 85.09 x 87.63 cm)
	Shipping Weight (Gross)	110 lbs (50 kg)

MSA1510i with SATA enclosure	Product Dimensions (H x W x D)	6.96x19.06x24.32 in (17.67 x 48.41 x 61.77 cm)
	Product Weight	108 lb (48.98 kg)
	Shipping Packaging Dimensions (H x W x D)	30.25 x 33.5x34.5 in (76.8x 85.09x 87.63 cm)
	Shipping Weight (Gross)	143 lbs (64.86 kg)

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