

HP StorageWorks 1000 Modular Smart Array installation and configuration overview

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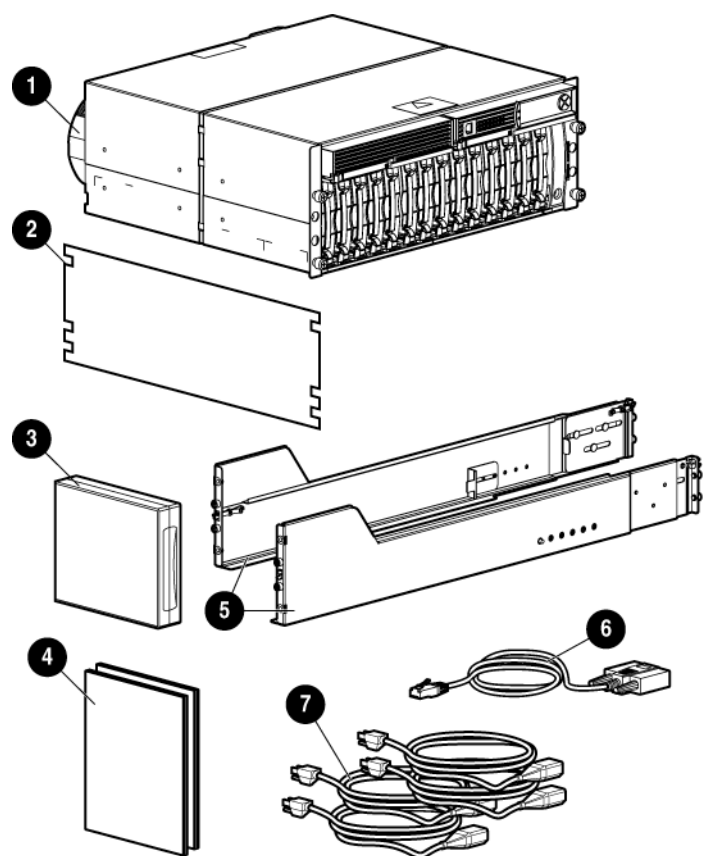
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Shipping contents

The following items are shipped with the MSA1000:



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- 1 MSA1000
- 2 4U rack mounting template
- 3 MSA1000/1500 setup and management CD kit
- 4 Printed user documents
- 5 4U rack mounting kit
- 6 Custom CLI configuration cable
- 7 Power cords

Important: Locate and set aside the MSA1000/1500 setup and management CD kit. CDs in this kit are used when installing and configuring the MSA.

Getting started

Use this worksheet to prepare for your installation.

This worksheet supports most configurations. If your configuration is simple, you need only some of the items on the worksheet. If your configuration is more complex, you need most of the items.

Note: This worksheet and the companion worksheets in the *HP StorageWorks MSA1000 installation guide* are not prerequisites for installing your MSA1000, but some information on the worksheets is required for zoning, multipathing, future configuration changes, and troubleshooting purposes.

Complete the following tasks on the Web

- Add the MSA1000 product page as a favorite in your browser. This site (<http://www.hp.com/go/msa1000>) includes the latest information about the MSA1000, including product specifications, compatibility information, software and firmware downloads, user documents, and support advisories and notifications.
- Sign up to automatically receive new advisories and notices. This site (<http://www.hp.com/go/e-updates>) includes options to register for and automatically receive, by e-mail, personalized product tips, update information, driver- and support-related advisories, and other notices for this and other HP devices.
- Review all old product advisories and notices. To help you better plan for and successfully install your MSA1000, read all of the outstanding customer advisories before installing the array. Advisories are available on the **Software, firmware, and drivers** page of the MSA1000 website.

Check the boxes for the items you need

First, place a check in all of the left-most boxes in the checklist—these items are required for all configurations.

Second, place a check next to any additional items needed for your configuration, such as an additional controller or Fibre Channel I/O module for multipathing, clustering software and hardware components, or additional servers or switches.

Record information about the items

Read through the checklist and write down information about the items needed for your configuration. Record as much information as possible.

Items marked with an asterisk (*) are required.

Note: You do not need to complete the entire worksheet at this time. Some information is easier to obtain during the installation.

Verify that your items are supported

After you have determined your configuration type and items you plan to use, verify that these items are approved for use. Read the compatibility guide on the **Technical Documentation** page of the MSA1000 website to confirm compatibility of your hardware and software components.

Learn about the installation process

Now that you have determined which items are needed for your installation and have confirmed their support, read the other side of this poster for an overview of the installation process and some best practices.

Key websites

MSA1000: <http://www.hp.com/go/msa1000>

MSA products: <http://www.hp.com/go/msa>

Storage products: <http://www.hp.com/go/storage>

Servers: <http://www.hp.com/go/servers>

Clustering: <http://h18000.www1.hp.com/solutions/enterprise/highavailability/index.html>

SAN infrastructure: <http://www.hp.com/go/san>

Systems Insight Manager: <http://www.hp.com/go/hpsim>

Secure Path: <http://www.hp.com/go/securepath>

Configuration worksheet

- Singlepath, nonclustered Singlepath, clustered Multipath, nonclustered Multipath, clustered

Items in basic configurations

MSA1000

Chassis serial number _____
 Controller WWNN _____
 Controller WWPN _____
 * Controller firmware version _____
 * Support Software CD version _____

Additional controller for multipath configurations

Controller WWNN _____
 Controller WWPN _____

Additional I/O module for multipath configurations

Hard drive storage enclosures

(model and quantity) _____

Fibre Channel interconnect device

* Device make and model _____
 Switch firmware version _____
 Switch IP address _____
 Switch WWNN _____
 Switch WWPN _____

Additional interconnect device for multipath configurations

Device make and model (same as the primary device) _____
 Switch firmware version (same as the primary device) _____
 Switch IP address _____
 Switch WWNN _____
 Switch WWPN _____

Server

* Server make and model _____
 * Operating system & version _____
 * Operating system service pack / errata _____
 Server name _____
 * HBA model _____
 HBA slot location _____
 * HBA driver version _____
 * HBA firmware version _____
 HBA boot BIOS firmware (boot from SAN) _____
 HBA WWNN _____
 HBA WWPN _____

Additional items for multipath configurations

Multipathing software and version _____
 2nd HBA model (same as the primary HBA) _____
 2nd HBA slot location (same as the primary HBA) _____
 2nd HBA firmware versions (same as the primary HBA) _____
 2nd HBA WWNN _____
 2nd HBA WWPN _____

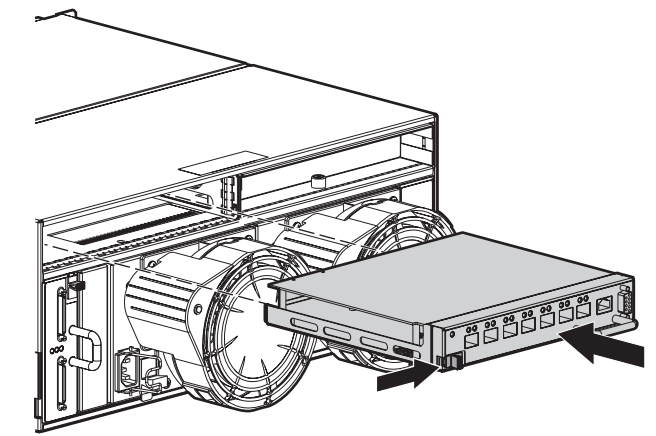
Additional items for clustered servers

Clustering software version _____
 Cluster cabling _____

Fibre Channel cables

SCSI cables

Hard drives



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Example illustration: Installing an optional, redundant MSA Fibre Channel I/O module (to support an optional, redundant MSA controller installed in slot 2 on the front of the MSA)

Additional items in more complex configurations

Additional server

Server make and model _____
 Operating system and version _____
 Operating system service pack/errata _____
 Server name _____
 HBA model _____
 HBA slot location _____
 HBA driver version _____
 HBA firmware version _____
 HBA boot BIOS firmware (boot from SAN) _____
 HBA WWNN _____
 HBA WWPN _____

Additional items for multipath configurations

Multipathing software and version _____
 2nd HBA make and model (same as the primary HBA) _____
 2nd HBA slot location (same as the primary HBA) _____
 2nd HBA firmware versions (same as the primary HBA) _____
 2nd HBA WWNN _____
 2nd HBA WWPN _____

Additional items for clustered servers

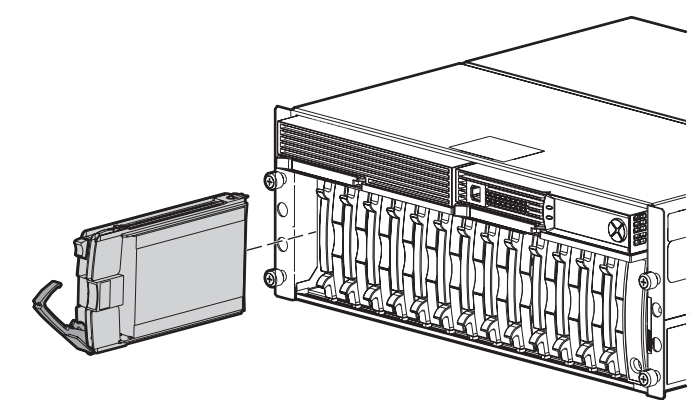
Clustering software version _____
 Cluster cabling _____

Additional interconnect device

Device make and model _____
 Switch firmware version _____
 Switch IP address _____
 Switch WWNN _____
 Switch WWPN _____

Another additional interconnect device

Device make and model _____
 Switch firmware version _____
 Switch IP address _____
 Switch WWNN _____
 Switch WWPN _____



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Example illustration: Installing hard drives in the MSA1000

Installation and configuration best practices

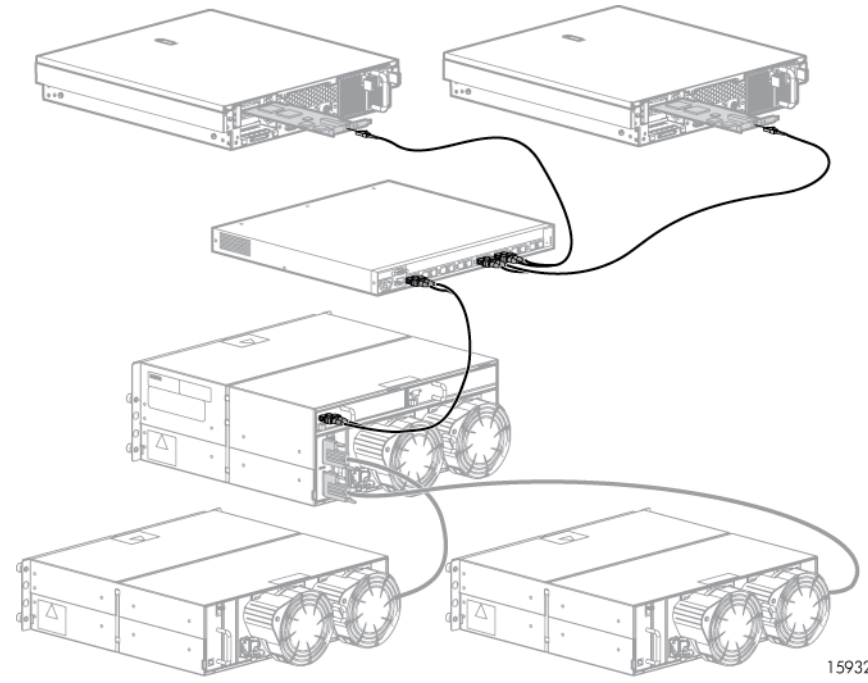
- Use the configuration planning worksheet on the opposite side of this poster to help you gather all of the items required for installing your MSA array.
 - Go to the MSA1000 website (<http://www.hp.com/go/msa1000>) to confirm your plans and review current information about the MSA1000.
 - Install your MSA array in the sequence listed in this poster and in the installation guide. Several installation and configuration steps include dependencies; if you deviate from the listed sequence, you may have to uninstall and then reinstall your MSA.
 - Use the installation guide to install and configure your MSA array. Details not provided in this overview are available in the guide.
 - When planning your storage arrays and LUNs:
 - Customize the RAID level and striping method to the type of data that will be stored on the array.
 - Set the drive rebuild priority of the array to "high" to minimize exposure during a drive failure.
 - Optimize performance and redundancy by striping the drives in the array across separate storage enclosures on different SCSI buses, especially in mirrored environments using RAID 1 or RAID 1+0.
- Note:** Depending on the number of drives that you include in an array, the ACU automatically assumes a default RAID type of RAID 6 (ADG), which maximizes fault tolerance and storage efficiency at a significant cost of I/O performance. For comparable fault tolerance but higher performance, consider using RAID 1+0.
- If your environment includes multiple servers, consider designating one of the servers as a management server to centralize your management tasks. It is from this server that you will perform SAN management tasks.
 - Before installing your MSA array, consider redundancies of power, storage, and data paths.
 - To provide redundant power, be sure to plug the two power supplies of the MSA array into separate Uninterruptable Power Supplies (UPS) on separate power sources. If you have only one UPS, maintain separate power paths by plugging one MSA power supply to the UPS on one power source, and plug the other MSA power supply to a separate power source.
 - To provide redundant storage, configure your LUNs using fault-tolerant RAID levels and striping methods.
 - To provide redundant data paths, you must include two isolated Fibre Channel fabrics and the associated hardware and software components in the configuration. (For example, you must include two MSA controllers, two interconnect devices, and two HBAs in each server.)
 - When installing or updating HBA drivers, always use drivers and installation scripts provided on the MSA Support Software CD or the MSA website. Your MSA will not operate as intended if you update your HBA driver manually or use drivers obtained from the HBA manufacturer.
 - After configuring the storage, remember to:
 - Identify the operating system (set the host mode profile) of each HBA with access to the storage.
 - Verify that each HBA in each server has been granted access to the storage.
 - Control access to the storage by indicating which HBA can access which array.
 - If you are installing your MSA in a multipath environment that uses Secure Path, be sure to follow every server reboot prompt that is presented. Failure to acknowledge a server reboot prompt may result in your path redundancy not functioning properly. Be sure to reboot your server after the copy from the source media to the server is completed, and again after the redundancy driver is attached to the arrays.

Cabling examples

Singlepath cabling

In singlepath configurations, one Fibre Channel cable connects a server HBA to a Fibre Channel network switch, and another Fibre Channel cable connects the switch to the MSA Fibre Channel I/O module (associated with the MSA controller in slot 1.) SCSI cables connect the external hard drive storage enclosures to the MSA SCSI I/O module.

In the following illustration, two servers are accessing an MSA storage system.



Example singlepath cabling diagram, showing two servers accessing a single-controller MSA1000 (with two attached MSA30 SCSI storage enclosures)

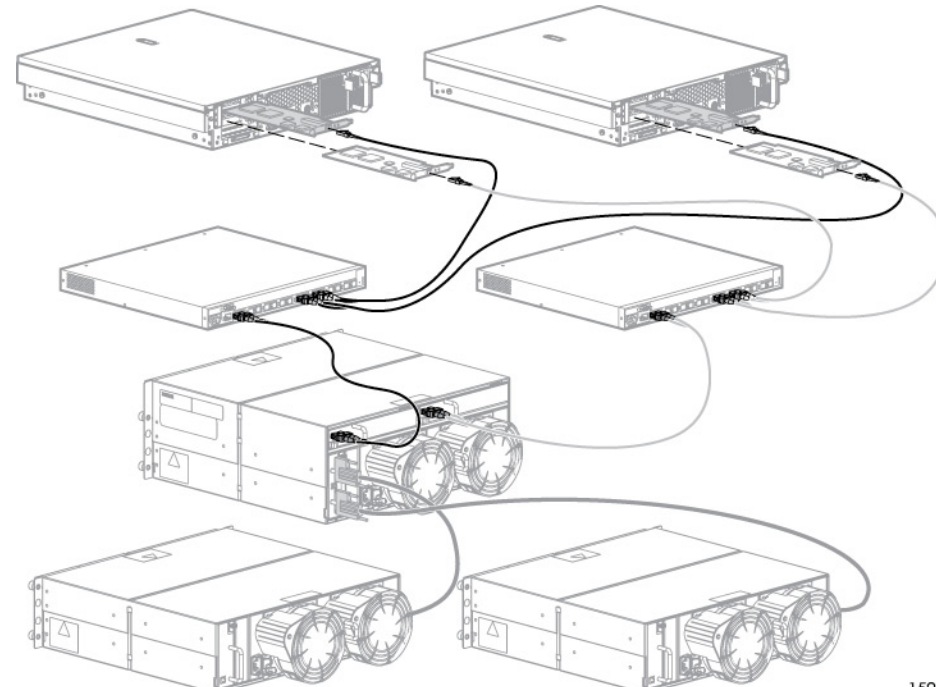
Multipath cabling

In multipath configurations, the Fibre Channel cables connecting the servers, the switches, and the MSA must follow specific cabling rules. These rules ensure expected connectivity, performance, and path failover. These rules also aid the troubleshooting of future support issues.

Multipathing cabling rules include:

- For the primary path from each server to the MSA - the HBA that boots up first must connect to a switch that connects to the MSA Fibre Channel I/O module associated with the MSA controller in slot 1.
- For the additional path from each server to the MSA - the HBA that boots up second must connect to a switch that connects to the MSA Fibre Channel I/O module associated with the MSA controller in slot 2.
- For the connections to the switch - designate the same port number on each switch to be for the two connections to one of the servers. Also designate the same port number on each switch to be for the connection to the MSA.

The following illustration demonstrates multipathing cabling rules. The darker Fibre Channel cables represent the primary path to the MSA, and the lighter Fibre Channel cables represent the additional path to the MSA. Note the use of designated switch ports for the connections to the servers and the MSA.



Example multipath cabling diagram, showing two servers accessing a dual-controller MSA1000 (with two attached MSA30 SCSI storage enclosures)

Installation and configuration overview

The following sections in the installation guide detail the installation and configuration process. This overview is intended to help you plan for and obtain a basic understanding of this process and may be used as a master checklist. Be sure to use the installation guide to actually install your MSA. The installation guide is available on the Documentation CD and MSA website.

Step 1: Review and confirm your plans

HP recommends thoroughly researching, studying, and establishing an installation and configuration plan for your environment. Complete the Configuration worksheet on the opposite side of this poster, and go to the MSA website for current support and compatibility information. Record your plans for configuring the hard drives into logical units, and be sure to review all provided installation and configuration best practices.

Step 2: Prepare your site

Select a location that meets the environmental standards detailed in the installation guide. Approved environments include all of the following: adequate structural support, physical space, ventilation, temperature control, and sources of power.

Step 3: Install MSA option kits

If your plans include adding any of the available option kits to the MSA chassis, install them now. It is easier to install these options before racking the MSA. Some of the available option kits include an additional controller and an additional Fibre Channel I/O module.

Step 4: Rack the MSA and the storage enclosures

The MSA array and its supported external hard drive storage enclosures can be installed in most standard server racks. After installing the storage enclosures in the rack, you can install the hard drives into the enclosures.

Step 5: Install the hard drives

Now that the MSA and the storage enclosures are secured in the rack, you may install hard drives in the hard drive bays.

Step 6: Prepare your servers

Depending on your plans, you will connect your MSA array to a new or an existing server. In both scenarios, it is important that the server is operating properly before adding any MSA-specific components to it.

If more than one server will access the MSA array, HP recommends designating one of the servers as a management server. It is from this server that you will perform your SAN management tasks.

Step 7: Install the HBA in your servers

The MSA can be deployed in a variety of operating system environments and configurations (including singlepath and multipath). Specific Host Bus Adapters (HBAs) are required for the different deployments. Obtain the correct HBA for your environment, and install it in the servers that will access the MSA.

Step 8: Prepare your switches

In an existing SAN, the switches and hubs are already set up and configured, but if you are deploying your MSA in a new SAN, install and configure your Fibre Channel interconnect devices now.

Step 9: Connect the cables

After preparing the SAN and installing the MSA array, the storage enclosures, and the hard drives, connect all of the cables between the devices. This includes SCSI cables, Fibre Channel cables, and power cords.

Note: Multipath configurations have exacting cable-connection requirements. See the Cabling examples section of this document and refer to the installation guide.

Step 10: Power on the devices

After the MSA is installed and connected to the SAN, power on all of the devices in the SAN.

Note: Be sure to follow the power-on sequence as detailed in the installation guide.

Step 11: Configure your MSA

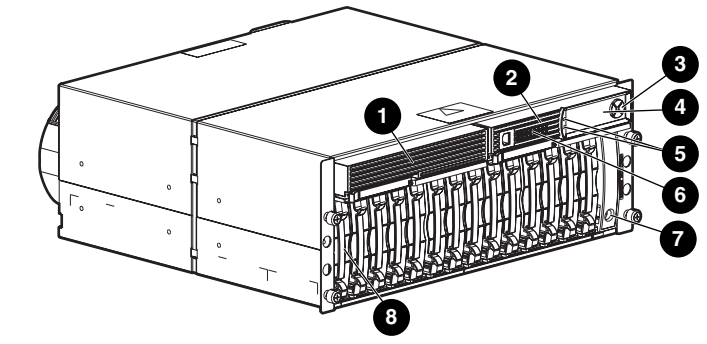
After the servers and Fibre Channel interconnect devices are set up and the MSA array is physically installed, connected, and powered on, configure the MSA controller and the storage.

Note: Be sure to follow the configuration procedures for your operating system as detailed in the installation guide.

MSA1000 features

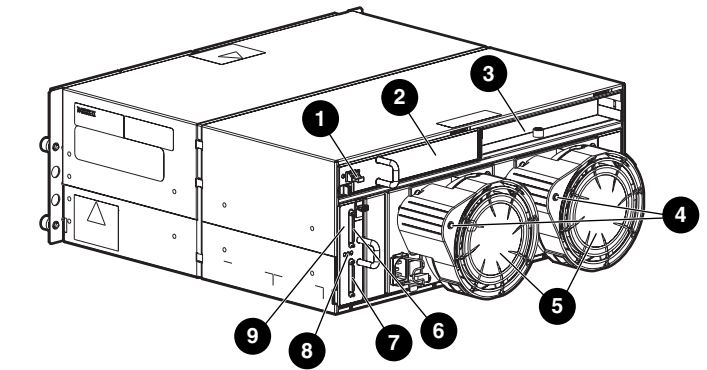
When unpacking your MSA array, take the time to identify its primary features.

Front features



- 1 Blank for an additional controller (in controller slot 2)
- 2 MSA controller (in controller slot 1)
- 3 Controller LCD display panel push buttons
- 4 Controller LCD display panel
- 5 Controller status lights
- 6 Controller status lights
- 7 Chassis Power On/Standby button
- 8 Hard drive bays

Rear features



- 1 2-Gb Small Form Factor Pluggable (SFP) transceiver
- 2 Fibre Channel I/O module (for the controller in controller slot 1)
- 3 Blank for additional Fibre Channel I/O module (for the controller in controller slot 2)
- 4 Power supply module status lights
- 5 Fan modules attached to the power supplies
- 6 SCSI expansion port A
- 7 SCSI expansion port B
- 8 Environmental Monitoring Unit (EMU) lights
- 9 Environmental Monitoring Unit (EMU)