

## Configuration Overview

# hp StorageWorks Modular Smart Array 1000 (MSA1000)



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## Configuration Planning Worksheet

Use this Worksheet to help you prepare for your MSA1000 installation.

This checklist supports most MSA1000 configurations—from the simple to the relatively complex. If your configuration is relatively simple, you will only need some of the items on checklist. If your configuration is more complex, you will need most of the items.

**Note:** Please note that this worksheet and the companion worksheets in the *HP StorageWorks MSA1000 Installation Guide* are not prerequisites for installing your MSA1000, but some of the information on the worksheets is required for zoning, multi-pathing, future configuration changes, and troubleshooting purposes.

### 1

#### 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 MSA1000 configurations.

Second, place a check next to any additional items needed for your configuration, such as “*Items for Multi-Path Configurations*” and “*Items for Clustered Servers*”.

### 2

#### Record information about the items

Go through the checklist and write down information about the items needed for your MSA1000 configuration.

Gather and record as much information as you can, but be sure to find the information for the items marked with an “\*”.

**Note:** You do not need to complete the entire worksheet at this time. Some information is easiest to obtain during the process of installing your MSA1000.

### 3

#### Verify that the items are supported

After you have indicated your MSA1000 configuration type and the items that you need to use to install the MSA1000 in your SAN, you must verify that the items you plan to use are approved for use with the MSA1000 in your operating system environment.

Go to the MSA1000 website: <http://www.hp.com/go/msa1000>.

Locate, print, and read the *MSA1000 Compatibility Guide* on the **Technical Documentation** page of the MSA1000 website to confirm your installation plans.

During this process, you may need to obtain some new items and adjust your plans.

**Proceed with installing your MSA1000 only after obtaining all of the necessary hardware and software components and verifying that the models and versions you plan to use are supported.**

### 4

#### Read the other side of this poster

Now that you have gathered all of the items required for your MSA1000 configuration, please read the other side of this poster for an overview of the installation process and some MSA1000 best practices.

## Additional Resources about the MSA1000 and Storage Area Networks (SANs)

### MSA1000 website:

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

Go to the MSA1000 website for the most current and up-to-date information about your MSA1000.

Navigate through the site to obtain the following reference documents:

- *MSA1000 QuickSpecs*
- *MSA1000 Compatibility Guide*

### Secure Path website:

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

Go to the Secure Path website for information about Secure Path multi-pathing software, used in Windows, Linux, and NetWare environments.

### SAN Infrastructure website:

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

Go to the SAN Infrastructure website for information about HP SANs, switches, and HBAs.

**Note:** In addition to the other information available on the SAN website, please navigate to the *SAN Design Guide* and print out a hardcopy of this guide to review.

### High Availability website:

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

Go to the High Availability website for information about clustering.

# My MSA1000 Configuration

☐ Single-path, non-clustered

☐ Single-path, clustered

☐ Multi-path, non-clustered

☐ Multi-path, clustered

☐ **MSA1000**

MSA1000 Serial number \_\_\_\_\_  
MSA1000 WWNN \_\_\_\_\_  
MSA1000 WWPNN \_\_\_\_\_  
\* MSA1000 Controller firmware version \_\_\_\_\_  
\* MSA1000 Support Software CD version \_\_\_\_\_  
Optional storage enclosures, model \_\_\_\_\_

☐ **Additional MSA1000 Controller for Multi-Path Configurations**

MSA1000 WWNN \_\_\_\_\_  
MSA1000 WWPNN \_\_\_\_\_

☐ **Fibre Interconnect Device**

(Standard I/O Module, Switch 2/8, Hub 2/3, or External SAN device)

\* Device make and model \_\_\_\_\_  
Switch firmware version \_\_\_\_\_  
Switch IP address \_\_\_\_\_  
Switch WWNN \_\_\_\_\_  
Switch WWPNN \_\_\_\_\_

☐ **Additional Interconnect Device for Multi-Path Configurations**

Device make and model (same as the primary device)  
Switch firmware version (same as the primary device)  
Switch IP address \_\_\_\_\_  
Switch WWNN \_\_\_\_\_  
Switch WWPNN \_\_\_\_\_

☐ **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 WWPNN \_\_\_\_\_

☐ **Additional Server-Related Items for Multi-Path Configurations**

Secure Path software 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 WWPNN \_\_\_\_\_

☐ **Additional Server-Related Items for Clustered Servers**

Clustering software version \_\_\_\_\_  
Cluster cabling \_\_\_\_\_

☐ **Fibre Cables**, for MSA1000, interconnect device, and HBA connections

☐ **SCSI Cables**, for additional storage enclosure connections

☐ **Hard Drives**

## Possible Additional Items in a more Complex SAN

☐ **An Additional MSA1000**

MSA1000 Serial number \_\_\_\_\_  
MSA1000 WWNN \_\_\_\_\_  
MSA1000 WWPNN \_\_\_\_\_  
MSA1000 Controller firmware version \_\_\_\_\_  
MSA1000 Support Software CD version \_\_\_\_\_  
Optional storage enclosures, model \_\_\_\_\_

☐ **The Additional MSA1000 Controller for Multi-Path Configurations**

MSA1000 WWNN \_\_\_\_\_  
MSA1000 WWPNN \_\_\_\_\_

☐ **An Additional Interconnect Device**

(Standard I/O Module, Switch 2/8, Hub 2/3, or External SAN device)

Device make and model \_\_\_\_\_  
Switch firmware version \_\_\_\_\_  
Switch IP address \_\_\_\_\_  
Switch WWNN \_\_\_\_\_  
Switch WWPNN \_\_\_\_\_

☐ **The Additional Interconnect Device in Multi-Path Configurations**

Device make and model (same as the primary device)  
Switch firmware version (same as the primary device)  
Switch IP address \_\_\_\_\_  
Switch WWNN \_\_\_\_\_  
Switch WWPNN \_\_\_\_\_

☐ **An Additional Sever**

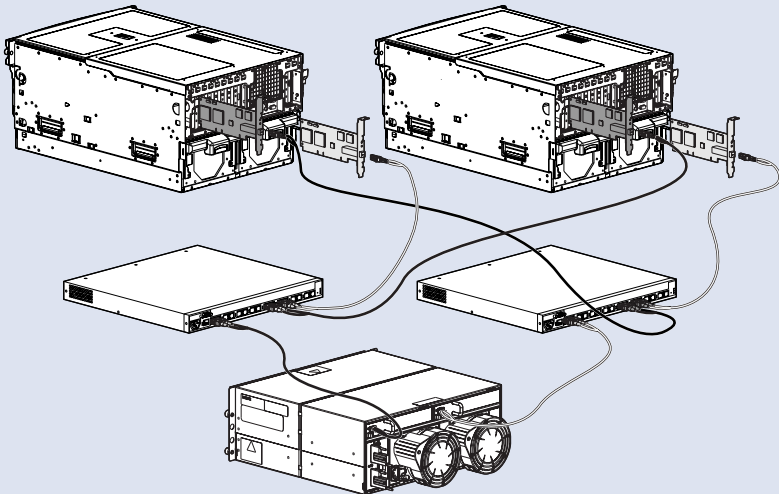
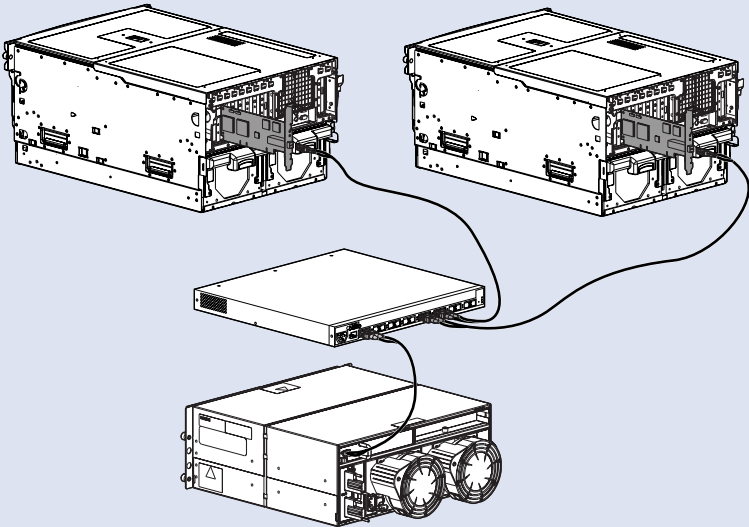
Server make and model \_\_\_\_\_  
Operating sytem & version \_\_\_\_\_  
Operating sytem service pack / errata \_\_\_\_\_  
Server name \_\_\_\_\_  
HBA model \_\_\_\_\_  
HBA slot location \_\_\_\_\_  
HBA driver version \_\_\_\_\_  
HBA firmware version \_\_\_\_\_  
HBA boot BIOS firmware (boot from SAN) \_\_\_\_\_  
HBA WWNN \_\_\_\_\_  
HBA WWPNN \_\_\_\_\_

☐ **The Additional Server-Related Items for Multi-Path Configurations**

Secure Path software 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 WWPNN \_\_\_\_\_

☐ **Additional Server-Related Items for Clustered Servers**

Clustering software version \_\_\_\_\_  
Cluster cabling \_\_\_\_\_



# Installation Overview Master Checklist

This section introduces the steps of installing an MSA1000 and may be used as a master checklist, but please use the *MSA1000 Installation Guide* to actually install your MSA1000.

**Note:** The MSA1000 must be installed in the sequence listed here and in the *HP StorageWorks MSA1000 Installation Guide*. There are specific dependencies; if you deviate from this sequence, you may have to uninstall and reinstall your MSA1000, beginning at step 1.

1

Review your configuration plan

Before you install your MSA1000, it is important that you first thoroughly research, study, and establish a configuration and installation plan for your specific environment.

HP suggests that you go to the MSA1000 website for configuration specifications and late-breaking information and complete the Configuration Planning Worksheet on the reverse side of this poster.

As part of the planning process, now is the time to determine how you need to configure the MSA1000 storage.

✓

Installation Guide section: *Step 1: Reviewing your Plans*

2

Prepare your site

Before you install you MSA1000, select a location that meets the environmental standards described in the MSA1000 Installation Guide.

Site requirements include adequate sources of power, airflow, and temperature control.

✓

Installation Guide section: *Step 2: Preparing your Site*

3

Prepare your servers

Depending on your plans, you will connect your MSA1000 to either a new or an existing server. In both scenarios, it is important that your server is operating properly before adding any MSA1000-specific components to it.

If more than one server will be accessing the MSA1000, HP recommends designating one of the servers as a management server. It is on this server that you will load management software (such as the ACU) and from this server that you will perform your SAN management tasks.

✓

Installation Guide section: *Step 3: Preparing your Servers*

4

Install the HBA in your servers

Because the MSA1000 can be deployed into a variety of operating system environments and configurations (including single-path and multi-path), specific HBA are required for the different deployments. Obtain the correct HBA for your environment and install the HBA into each server that will access the MSA1000.

**Note:** Be sure to follow the procedure as detailed in the *HP StorageWorks MSA1000 Installation Guide*.

✓

Installation Guide section: *Step 4: Installing the HBA in your Servers*

5

Prepare your switches and hubs

In an existing SAN, your switches and hubs are already set up and configured, but if you are deploying your MSA1000 into a new SAN, you need to install and configure your Fibre interconnect devices at this time.

✓

Installation Guide section: *Step 5: Preparing your Switches and Hubs*

6

Install option kits in your MSA1000

If your plans include adding any of the available option kits for the MSA1000, install them now. It is easier to install these options before you install your MSA1000 in the rack.

Some of the MSA1000 option kits include a redundant controller, additional controller cache, redundant Fibre Channel I/O Module, embedded MSA SAN Switch 2/8, and an embedded MSA Hub 2/3.

**Note:** Do not install any hard drives into the MSA1000 until after the MSA1000 installed in the rack.

✓

Installation Guide section: *Step 6: Installing Option Kits*

7

Install the MSA1000 in the rack

At this point in the process of installing your MSA1000, you have prepared your SAN for the MSA1000 and are ready to physically install your MSA1000.

After you install the MSA1000 and any additional storage enclosures in the rack, you can install the hard drives into the units.

✓

Installation Guide section: *Step 7: Installing your MSA1000 in the Rack*

8

Connect the cables

With the MSA1000 and any additional storage enclosures installed in the rack, you can now connect the SCSI, Fibre, and power cables.

**Note:** Multi-path configurations have exacting cable requirements.

✓

Installation Guide section: *Step 8: Connecting the Cables*

9

Power on your MSA1000

At this point in the installation process, you have prepared your servers and Fibre interconnect devices for the MSA1000 and have connected your MSA1000 to your SAN. With your SAN ready to go and the MSA1000 installed and ready to go, you can now power up your MSA1000.

**Note:** Be sure to follow the procedure as detailed in the *HP StorageWorks MSA1000 Installation Guide*.

✓

Installation Guide section: *Step 9: Powering On your MSA1000:*

10

Configure your MSA1000

After the servers and interconnect devices are set up and the MSA1000 is physically installed, connected and powered up, you can configure the MSA1000 for your operating system environment.

These configuration steps vary for each operating system.

**Note:** Be sure to follow the procedure as detailed in the *HP StorageWorks MSA1000 Installation Guide*.

✓

Installation Guide section: *Step 10: Configuring your MSA1000*



# MSA1000 Installation and Configuration Best Practices

## Consider the following when planning for and installing your MSA1000:

- Complete the Planning Worksheet on the opposite side of this document to help you gather all of the items required for installing your MSA1000.
- Go to the MSA1000 website at <http://www.hp.com/go/msa1000> to confirm your plans and review current information about your MSA1000.
- When planning your LUNs, customize the RAID type and striping method to the type of data that will be stored on the array.

For example, for non-critical data, you may want to use RAID 0, which provides no fault tolerance, but provides rapid storage of large amounts of data. For critical data, use RAID 1 (RAID 1+0), RAID 5, or RAID ADG, choosing the RAID type the offers the desired combination of fault-tolerance, I/O performance, and capacity utilization.

**Note:** Depending on the number of drives that you include in an array, the ACU automatically assumes a default RAID type of ADG, which maximizes fault tolerance and capacity utilization, but at a significant cost of I/O performance. For comparable fault tolerance but higher performance, consider using RAID 1+0.

- When planning your LUNs, set the drive rebuild priority of your LUNs to “high” to minimize exposure during a drive failure.
- When planning your LUNs, to optimize performance and redundancy in a mirrored environment (RAID 1 or RAID 1+0), stripe the drives in the array across the separate buses within the MSA1000 and any attached enclosures.

For example, because drive bays 1-7 in the MSA1000 are located on bus 1 and bays 8-14 are located on bus 2, when creating a mirrored array with 6 drives, include the drives in bays 1, 2, 3, and 8, 9, 10.

- In a SAN with multiple-servers, HP recommends designating one of the servers as a management server, to centralize your management tasks.

It is on this server that you will install management software such as the ACU, and it is from this server that you will perform your SAN management tasks.

- Use the *HP StorageWorks MSA1000 Installation Guide* to actually install and configure your MSA1000.

Details are available in the guide that are not provided in this Overview poster.

- Install your MSA1000 in the sequence listed in the installation guide.  
  
Several installation and configuration steps include dependencies and if you deviate from the listed sequence, you may have to un-install and then re-install your MSA1000, beginning at step 1.
- Before installing your MSA1000, consider redundancies of power, storage, and data paths.

To provide redundant power, be sure to plug the two power supplies on the MSA1000 into separate Uninterruptable Power Supplies (UPS) on separate power sources. If you only have 1 UPS, maintain separate power paths by plugging one MSA1000 power supply to the UPS on one power source and plug the other MSA1000 power supply to a separate power source.

To provide redundant storage, configure your LUNs using fault-tolerant RAID levels and striping methods.

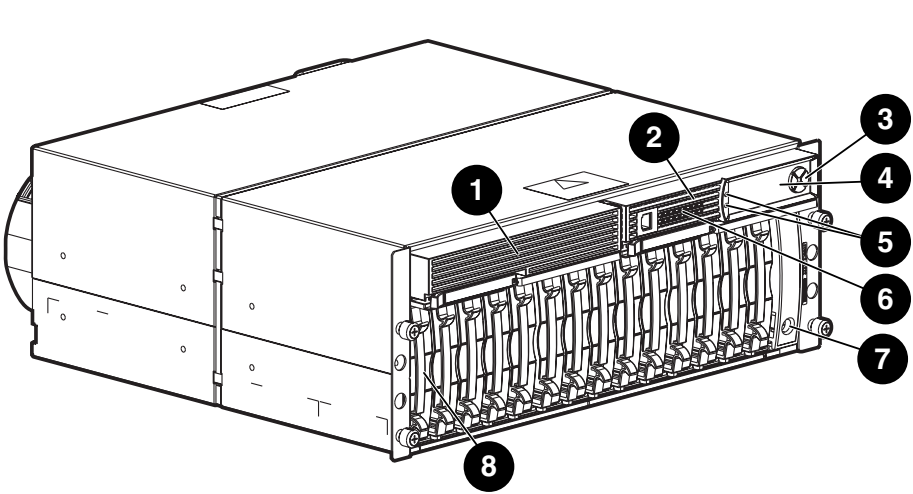
To provide redundant data paths, you must include two isolated fibre channel fabrics and the associated hardware and software components in the configuration. (For example, you must include two MSA1000 controllers, two interconnect devices, and two HBAs in each server. Environments using Secure Path software must install the software on each server.)

- When installing or updating the HBA drivers, always use the drivers and the installation scripts provided on the MSA1000 Support Software CD or the MSA1000 website.  
  
Your MSA1000 will not operate as intended if you update your HBA driver manually or use drivers obtained from the HBA manufacturer.
- After installing your MSA1000, remember to set your host mode to identify your operating system to the MSA1000.
- If you need to install Secure Path software, be sure to follow every server reboot prompt that is presented.

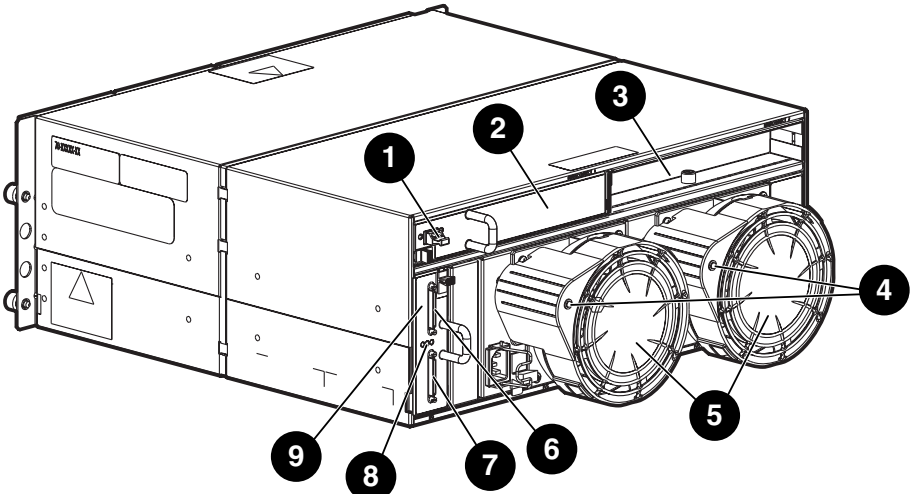
Failure to acknowledge a server reboot prompt may result in your path redundancy not functioning properly. Be sure to reboot your server after the server portion of the install and again after the client portion of the install.

## MSA1000 Features

Two views of the MSA1000 are shown, with the key components identified.



MSA1000 (Front View)	
Reference #	Identifier
1	Redundant Controller Slot Blank
2	Primary MSA1000 Controller
3	Display Buttons
4	Display Panel
5	Display Indicators
6	Status Indicators
7	Power Switch
8	Drive Bay(s)



MSA1000 (Rear View)	
Reference #	Identifier
1	2-Gb Small Form Factor Pluggable (SFP) Transceiver
2	Fibre Channel I/O Module
3	Redundant Fibre Channel I/O Module Slot (Blank)
4	Power Supply Indicators
5	Blowers Attached to Power Supply
6	SCSI Expansion Port A
7	SCSI Expansion Port B
8	Environmental Monitoring Unit Indicators
9	Environmental Monitoring Unit