

addendum

hp StorageWorks SAN using C-Series product line switches

First Edition (June 2003)

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This document describes the support for C-Series Product Line switches in an HP StorageWorks SAN.

For the latest version of this Addendum, access the HP storage website at:

<http://www.hp.com/country/us/eng/prodserv/storage.html>.



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SAN using Cisco MDS-Model Switches: Addendum
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Addendum Information

This Addendum covers the initial support for the C-Series Product Line, the Cisco MDS 9509 Multilayer Director and the MDS 9216 Multilayer Fabric Switch, in an HP Storageworks SAN.

Increased levels of support are planned for these switches. Refer to the SAN Design Reference Guide for the latest information on support.

<http://h18000.www1.hp.com/products/storageworks/san/documentation.html>

Intended Audience

This document is intended for customers who wish to use the Cisco MDS 9509 or MDS 9216 switches in an HP StorageWorks SAN.

Other C-Series Product Line Switch Documentation

Refer to the Cisco site for further information about the C-Series switch products at this URL:

www.cisco.com/en/US/products/hw/ps4159/ps4358/prod_technical_documentation.html

For information about HP StorageWorks SANs, see the *SAN Design Reference Guide* and its attendant documents at this URL:

<http://h18000.www1.hp.com/products/storageworks/san/documentation.html>

For the specific details about HBAs/drivers/multi-pathing, see SPOCK Streams at:

<http://hps0.rose.hp.com/spock/>

or contact your HP sales representative.

Topology Maximums

The Cisco MDS 9509 and the MDS 9216 switches are supported in a single switch fabric only.

Table 1: Topology Maximums when using the C-Series Product Line Switches

SAN Topology	Maximum Number of Switches	Maximum Total Number of Ports	Maximum Number of User Ports
Single Switch (MDS 9216)	1	48	48
Single Switch (MDS 9509)	1	176	176

Switch Maximums

The Cisco MDS 9509 has up to 224 ports, over 7 modular chassis. The tested "Early Adopter" configuration is 176 ports (3-16 and 4-32 port modules). As the non-blocking feature is not completely implemented for 32 port modules, use the 16 port module for performance intense applications.

The Cisco MDS 9216 has a basic configuration with 16 ports. It has an expansion slot that supports either a 16 or a 32 port card, for 32 or 48 ports in total.

Mixed Storage Common SAN Rules

HP StorageWorks SAN configurations using C-Series switches are implemented by defining zones that isolate servers and storage running with existing HP products and feature sets. Refer to the *SAN Design Reference Guide* for more information on mixed storage configurations.

The current method for SAN fabrics with C-Series switches and XP and EVA storage is shown in [Figure 1](#). The current method with HSG80-based and MSA storage is shown in [Figure 2](#).

Operating systems, host bus adapters and storage systems from HP are supported in the HP StorageWorks SAN Fabric with Cisco MDS switch environment, including the Enterprise Virtual Array, XP128/1024, EMA/ESA12000, EMA16000, MA/RA8000, MA6000, and MSA1000 RAID storage systems.

Operating System Support

HP StorageWorks SANs with C-Series switches are supported with the following operating systems and versions:

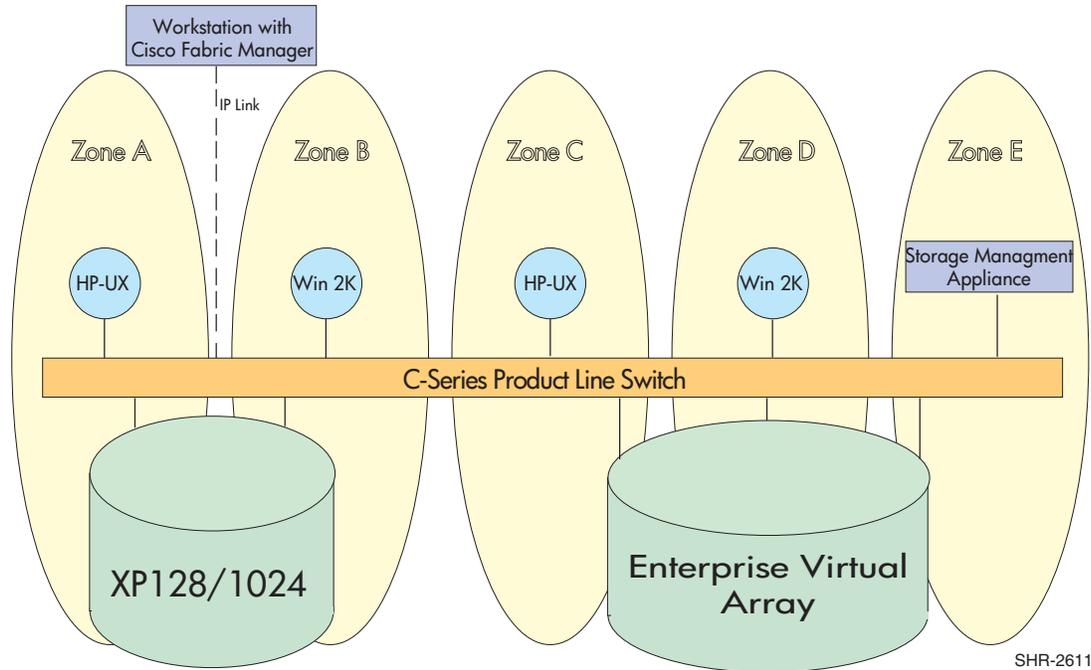
- HP-UX: 11.00 and 11.11 (EVA and XP)
- Windows 2000 with SP3 (EVA, XP, MSA, EMA/ESA12000, EMA16000, MA/RA8000, and MA6000)

See [SPOCK Streams](#) for specific HBA/driver/multi-pathing information.

Storage System Support

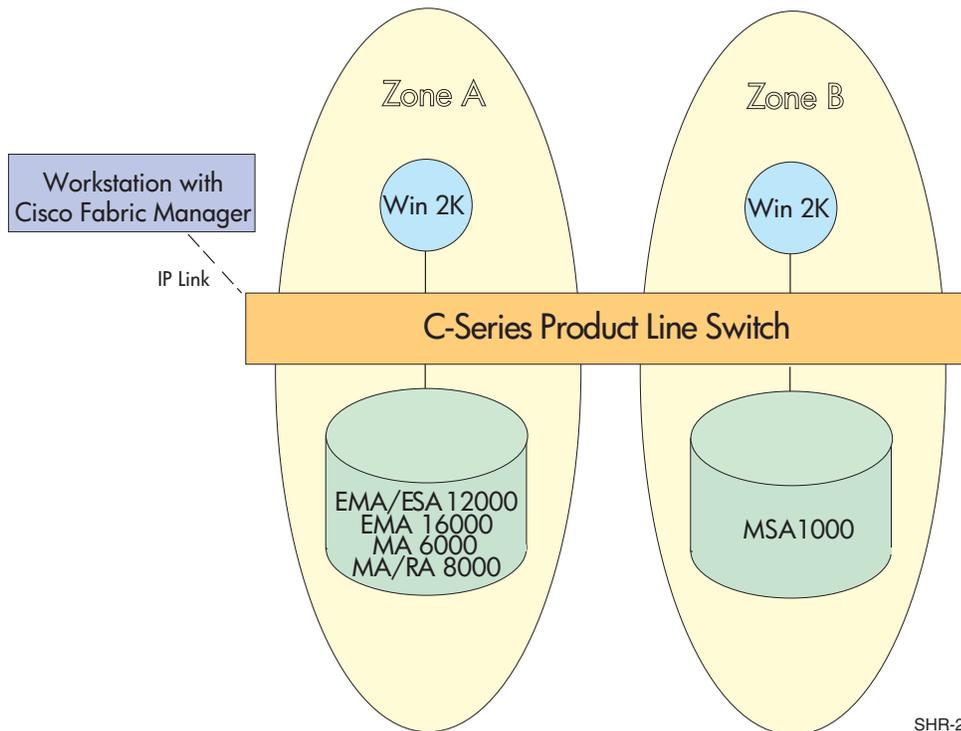
HP StorageWorks SANs with Cisco MDS switches are supported with the following storage systems and versions:

- Enterprise Virtual Array (EVA): VCS 2.002
- XP128/1024: 21.03.03.00/00
- EMA/ESA12000, EMA16000, MA/RA8000, and MA6000: ACS 8.7-1
- MSA1000: FW 2.38



SHR-2611D

Figure 1: Mixed storage SAN using Cisco MDS switches



SHR-2612C

Figure 2: HSG80-based SAN using Cisco MDS switches

SAN Management

The C-Series switches can be managed in several different ways:

- via the serial port/manager console
- via telnet over IP
- with the Cisco Fabric Manager over IP or IP over Fibre Channel.

The Cisco Fabric Manager is a fabric-based, web-loaded application that provides fabric level (Fabric View) and switch (Device View) level management functions from most web-enabled workstations. Fabric Manager also provides a Summary View mode that reports on port statistics.

OVSAM

There is an HP OpenView Device Plug-In (DPI) for Cisco MDS Switches. This DPI extends Storage Node Manager and Storage Optimizer support to discover, map, and monitor the health and performance of the Cisco MDS 9509 and MDS 9216 switches. This DPI can be obtained through this URL:

http://www.openview.hp.com/products/dpi/dpi_0049.html

Zoning and VSANs

The following table (Table 2), indicates how zoning is implemented for the C-Series switches. In HP SANs, VSANs are defined as separate instances of all fabric services, including address space. HP supports only one VSAN per physical fabric.

Table 2: Zone Types on HP fabric switches

Switch Models	Configuration	Enforcement	Comments
C-Series Product Line Switches Cisco MDS 9509 Cisco MDS 9216	Define zones using all domain#/port#	Access authorization at frame level in hardware	HARD zoning (loaded from name server at boot)
	Define zones using all WWNs		HARD zoning (loaded from name server at boot)
	Define zones using a combination of domain#/port# and WWNs		HARD zoning (loaded from name server at boot)

Troubleshooting SANs

General troubleshooting techniques are described in the “Best Practices” chapter of the *SAN Design Reference Guide*. In addition to these techniques, the Cisco Fabric Manager application provides additional tools for troubleshooting SANs using the MDS switches.

Options provided under the Fabric View Troubleshooting menu include:

- **Analyzing Switch Device Health**
This looks at switch hardware and fabric errors and gives a summary.
- **Analyzing End-to-End Connectivity**
Implements ping and traceroute for Fibre Channel
- **Analyzing Switch Fabric Configuration**
Compares switch configurations and policies to insure commonality
- **Analyzing the Results of Merging Zones**
Can catch problems that switches will have when merging into one fabric before they merge.