Compaq Computer Corporation
Enterprise Storage Group

StorageWorks^{TM} SAN Director 64
Configuration Guide

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Table of Contents

1.0 <u>Introduction</u>

The purpose of the SAN Director Configuration Guide is to enable users to tailor their solution to meet their specific business need. By working through this configuration guide, customers can choose the components and options that best meet their needs, including the product, factory assembling and related product services

2.0 *StorageWorks* SAN Director 64

Serving the connectivity and high availability needs of mission critical Enterprise applications

The StorageWorks SAN Director is a fault-tolerant, non-blocking, high port-count switch designed for enterprise data centers as an aggregation point for connectivity and consolidation in highly available implementations. As Compaq's first Director-class switch for Multi-Vendor Storage environments, the SAN Director 64 strengthen Compaq's solution' portfolio by satisfying customers' connectivity and high availability needs for mission critical applications

3.0 Configuration Options

Table #1 describes the main components and options offer with the SAN Director 64.

Table #1: SD-64 Part Numbers

Description	Part Number
SD-64 Base 32 port Configuration	254512-B21
SANworks Director Connectivity Mgr Kit	254514-B21
Long-wave 4-port module kit	254515-B21
Short-wave 4-port module kit	254516-B21
Combo S (3 ports), L(1 port)-wave module kit	254517-B21
Rack-mount kit, M-Series Cabinets	254520-B21

In order to determine the best choices for your needs, please follow the recommended steps described below.

Configuration Steps:

- Step 1- Factory Assembling: Choosing if you would like the unit assembled at the factory or whether or not you would like to assemble the unit yourself
- Step 2 - Ordering the base unit
- Step 3 - Selecting the right cabinet for your IT environment
- Step 4 - Management Solution
- Step 5 - Ordering the right fibre channel cables for their unit
- Step 6 – Scaling port-count for your connectivity needs

4.0 Configuration Process

CONFIGURATION INFORMATION

REQUIRED

STEP 1 – FACTORY ASSEMBLING OPTION

The first step in configuring a SD-64 is to determine how the unit will be shipped. Customers have two options:
- Order the unit assembled or
- Order the unit unassembled.

If customers prefer to order the unit unassembled, they can simply move to step 2 below. With this option, the components of the SD-64 would arrive at the customer's location unassembled.

If customers prefer to receive the unit already assembled, or Configured-to-Order (CTO), they must indicate this by including the following part number with the order. **This Configure-to-Order part number must be the first number on the order.**

Configure-To-Order	Part Number	Description with parts shipped
Indicates that parts on the order are to be assembled at the factory – Must appear as first number on your order.	**258158-888**	North America and Asia Pacific Factory Integration Number
	178267-999	EMEA Factory Integration Number

REQUIRED

STEP 2 – ORDERING BASE UNIT

The second step in the configuration process is to order the SD-64 base unit. The base unit comes populated with 8 short-wave port cards for a total of 32 available ports.

Part Number	Quantity	Model Description
254512-B21	**1**	**StorageWorks SAN Director 64 Base 32-port Configuration**
		Base Unit Includes:
	1	SAN Director fully redundant (64 port capable) with 32-ports (8 short-wave port cards with 32 Short-wave SFF Optical Transceivers)
	1 1 2	Director Product Manager License Firmware License Standard US AC power cords
	2 1	PDU power cord Torque Driver w/Integrated 5/32" bit

BASE UNIT (CONTINUED)		
	1 1	Null-modem cable 10ft Cable Organizer Tray
	1	Rack mount kit 9000 series cabinet only (includes mounting hardware)
	4 1	Loop back plug (multi-mode/short wave) Full Documentation set

REQUIRED

STEP 3 – SELECTING THE CABINET

Customers have a choice of cabinets. Customers can choose a cabinet that best fits their needs for size, color, and 60 or 50 Hz requirements. The rack mount kits for these cabinets come standard with the base unit, ordered in Step 2.

Part Number	Cabinet Description with parts shipped	Number of Switches Housed
180311-B21	42 U MODULAR STORAGE CABINET, 60 HZ PDU, 220 to 240 V, OPAL, REDUNDANT PDU	1-4
180312-B22	42 U MODULAR STORAGE CABINET, 50 HZ PDU, 220 to 240 V, OPAL, REDUNDANT PDU	1-4
180313-B21	36 U MODULAR STORAGE CABINET, 60 HZ PDU, 220 to 240 V, OPAL, REDUNDANT PDU	1-3
180314-B22	36 U MODULAR STORAGE CABINET, 50 HZ PDU, 220 to 240 V, OPAL, REDUNDANT PDU	1-3

Marquis Cabinet

Customers also have the option of ordering a Marquis cabinet. Customers who choose this option must order a special rack mount kit for this cabinet.

Part Number	Cabinet Description with Parts Shipped:	Number of Switches Housed
180317-B21	41 U MODULAR STORAGE CABINET, 60 HZ PDU, 220 to 240 V, BLUE, REDUNDANT PDU	1-4
180318-B22	41 U MODULAR STORAGE CABINET, 50 HZ PDU, 220 to 240 V, BLUE, REDUNDANT PDU	1-4
254520-B21	Rack Mount Kit M Series Cabinet	

* Note: For more informational on purchasing modular storage cabinets with services please refer to Appendix A

REQUIRED

STEP 4 – MANAGEMENT SOLUTION

The next step is to order the SANworks Director Connectivity Manager Kit. The SDCM kit provides user-friendly management for your Director based fabric. Only one SDC Manager is needed per each SAN, with each SAN composed of multiple interconnected Directors.

Part Number	Quantity	Description with Parts Shipped:
254514-B21	1	**SANworks Director Connectivity Manager Kit**
		SDCM Kit includes:
	1	SDC Manager Software kit and license

SANWORKS DIRECTOR CONNECTIVITY MANAGER (CONTINUED)

	1	PC laptop server with preloaded software
	1	PC Laptop AC Adapter and adapter power cord
	1	Zip Drive with data cable AC adapter and power cord
	2	16" Power adapter cables for PDU
	1	Management Server slide-out shelf (Universal), includes mounting hardware
	1	Slide-out Universal shelf cabinet Installation Instructions
	2	Blank Zip disk - 100mb
	1	Zip disk Software Pack
	1	CD/Microsoft Windows NT Workstation Software
	1	Notebook Declaration of Conformity

REQUIRED

STEP 5 – ORDERING FIBRE CHANNEL CABLES

The next step is to order the appropriate fibre channel cables. The SD-64 requires fibre channel cables with a small form factor connector, while the MA/EMA product family requires large form factor cables. To accommodate this, the cables listed below are fitted with one large and one small form factor connector.

Fibre Channel Cables

Part Number	Description with Parts Shipped:
221691-B22	FC Short Wave 5-Meter Cable, LC/SC (1Gb/s to 2Gb/s)
221691-B23	FC Short Wave 15-Meter Cable, LC/SC (1Gb/s to 2Gb/s)
221691-B26	FC Short Wave 30-Meter Cable, LC/SC (1Gb/s to 2Gb/s)
221691-B27	FC Short Wave 50-Meter Cable, LC/SC (1Gb/s to 2Gb/s)

OPTIONAL

STEP 6- ORDER EXPANSION KIT

The SD-64 is scalable to satisfy your connectivity needs. Some customers may choose to use the base unit alone populated with 8 short-wave port cards for a total of 32 ports. Other customers may want to expand their units for up to 64 useable ports, by ordering additional port cards, or expansion kits

StorageWorks offers three types of port expansion kits: a short-wave expansion kit, a long-wave expansion kit, and a Combo expansion kit, with both short and long wave ports

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EXPANSION KIT (CONTINUED)

Port Cards
- Short-wave port cards-Used to connect devices that are 2m to 500m from the Director.
- Long-wave port cards-Used to connect devices that are 500m to 20km from the Director.
- Combination port cards-Used to provide additional flexibility. Combination port cards have one long-wave port card and three short-wave port cards.

OPTIONAL

PORT CARD UPGRADES

Part Number	Quantity	Model Description
254515-B21	**1**	**Long-Wave Port Module Kit**
		Kit includes:
	1	Long-Wave 4 port card
	4	Long-Wave Optical Transceivers
	1	Loop back plug

Part Number	Quantity	Model Description
254516-B21	**1**	**Short-Wave Module Kit**
		Kit includes:
	1	Short-Wave 4 Port card
	4	Short-wave Optical Transceivers
	1	Loop back plug (multi-mode/Short wave)

Part Number	Quantity	Model Description
254517-B21	**1**	**Combination Long-Wave/Short-Wave Port Module Kit**
		Kit includes:
	3	Short-wave Optical Transceivers
	1	Long-wave Optical Transceiver
	1	Loop back plug (single-mode/Long-wave)
	1	Loop back plug (multi-mode/Short wave)

5.0 Services Bundle

Compaq Storage Services Bundling offers the flexibility of purchasing installation and maintenance service with the SAN Director 64. The Storage Services Bundling takes the existing product along with the existing services and creates bundles of storage hardware and appropriate services. The increased level of support provides a higher level of product reliability for the customer.

The bundle described in Table #2 combines the SAN Director 64 with 24x7 support with 4-hour response for 3 years, and basic installation.

Table #2: SD-64 Service Bundle

Description	Part Number
SAN Director and 3 years of 7X24, 4 hr response service and basic installation	264320-B21
The Bundle includes the following: • StrgWrks SAN Dir 64 • 3YR 24X7/4hr SAN Director 64 • Basic Install SAN Director 64	254512-B21 262197-002 262189-002

6.0 Configuration Examples

Customer A: Grow with your Needs

Customer A operates a moderately sized IT infrastructure. He decided to go with the SD-64 based on its business continuance needs, and the fact that he could easily expand the port count as his business grew. He was also interested in the fact that he could upgrade easily to 2Gb in the future. His configuration was as follows:

Step 1-Determine Configuration Option
Customer A decided that he would prefer to assemble the unit himself so at Step 1, he did not need to include the CTO part number at the top of his order.

Step 2-Ordering the Base Unit

The first number on Customer A's order form was 254512-B21 (the part number for the base unit with 32 ports).

Step 3-Choosing a Cabinet
Since he was only ordering the base unit, he decided that he didn't need the biggest cabinet. But, he also wanted to give himself room to add another switch in the future as his business grew. He decided on the 36U cabinet as this would give him room for two more switches as his business grew. Since the rack mount kits for the standard cabinet ships with the base unit, Customer A is ready to move on to the next step.

Step 4-Ordering the SANworks Director Connectivity Manager Kit
Customer A then ordered the SDCM kit that provides user-friendly management tools to manage his switch. Customer A realized that he needed an SDCM kit to manage his first Director switch but that this one kit could manage other switches that he might add as his IT environment grew. The next time that Customer A orders an SD-64, he won't need to order another SDCM kit.

Step 5-Ordering the Fibre Channel Cables
Customer A then ordered fibre channel cables in the appropriate lengths as needed by his room layout.

This completes the order for Customer A.

Customer B: Global 100 Customer

Customer B has very different needs from Customer A. Customer B is a large, Global 100 business with a large IT infrastructure. Customer B chose the SD-64 based on the high performance and high reliability features of the switch for mission critical data center applications. Customer B's configuration process was as follows:

Step 1-Determining Configuration Option
Customer B decided that, for the sake of convenience, she would like to have the unit delivered completely assembled from the factory. The first number that she placed on her form was 258158-888, which signaled that the unit was to be configured at the factory.

Step 2-Ordering the Base Unit
Customer B ordered four base units, configured with 32 ports each.

Step 3-Choosing a Cabinet
Because Customer B wanted 4 SD-64's in the same cabinet, she ordered the 42U modular storage cabinet.

Step 4-Ordering the SANworks Director Connectivity Manager Kit
The next step was to order the SDCM kit to manage her four switches. Since one SDCM kit will manage all the Directors, she only needed to order one kit for her four switches.

Step 5-Ordering the Fibre Channel Cables
Because her IT environment was spread out over a larger area, Customer B had to order several different lengths of fibre channel cables.

Step 6-Ordering Expansion Kits
Customer B knew that she wanted to take full advantage of the high density of these units so she decided to expand all four of her units to the maximum 64 ports. She counted how many ports she would need for devices within 500 meters and ordered the appropriate amount of short-wave cards and how many ports she would need for devices between 500 meters and 20 kilometers and ordered the appropriate number of long wave cards.

This completed the order for Customer B.

Appendix A

Additional Cabinet Information

Compaq Storage Services Bundling offers the flexibility of purchasing installation and maintenance service with the cab of your choice. The Storage Services Bundling takes the existing storage products along with the existing services and creates bundles of storage hardware and appropriate services. The increased level of support provides a higher level of product reliability for the customer. Each of the bundles below combines the noted modular storage cabinet with 24x7 support with 4 hour response for 3 years, and basic installation.

Cabinet Bubdles	Part Number	Description
42U Modular Storage Cabinet 60 Hz Bundle	253725-001	42 U Modular Storage Cabinet for MA8000/EMA12000 (60Hz) - Bundle
42 U Modular Storage Cabinet 50 Hz Bundle	253726-001	42 U Modular Storage Cabinet for MA8000/EMA12000 (50Hz) - Bundle
36U Modular Storage Cabinet 60 Hz Bundle	253727-001	36 U Modula Storage Cabinet for MA8000/EMA12000 (60Hz) - Bundle
36U Modular Storage Cabinet 50 Hz Bundle	253728-001	36 U Modula Storage Cabinet for MA8000/EMA12000 (50Hz) - Bundle
22U Modular Storage Cabinet 60 Hz Bundle	253729-001	22 U Modular Storage Cabinet for MA8000/EMA12000 (60Hz) - Bundle
22U Modular Storage Cabinet 50 Hz Bundle	253730-001	22 U Modular Storage Cabinet for MA8000/EMA12000 (50Hz) - Bundle
41U Modular Storage Cabinet 60 Hz Bundle	253731-001	41 U Modular Storage Cabinet for MA8000/EMA12000 (60Hz) - Bundle
41U Modular Storage Cabinet 50 Hz Bundle	253732-001	41 U Modular Storage Cabinet for MA8000/EMA12000 (50Hz) - Bundle