Quantum DX-Series System Unpacking and Installation Instructions

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Introduction

The Quantum DX-Series system consists of the DX30 and DX100 device. Both are backup devices based upon high speed disk drives instead of tape drives.

The DX30 consists of:

- A single controller and 1 to 4 storage arrays.

The DX100 consists of:

- A single controller and 2 to 16 storage arrays
- One or two Fibre Channel switches
- An Ethernet switch
- Two or more AC power sequencers.

The system emulates an ATL P1000 library with up to 55 virtual digital linear tape (DLT™) 7000 tape drives for DX100 and up to 30 DLT7000 tape drives for DX30 (see figure 1).

Note: The DX-Series storage array is shipped with the following RAID configuration (refer to the *Quantum DX-Series User's Guide* PN6513501 for more information on RAID configurations):

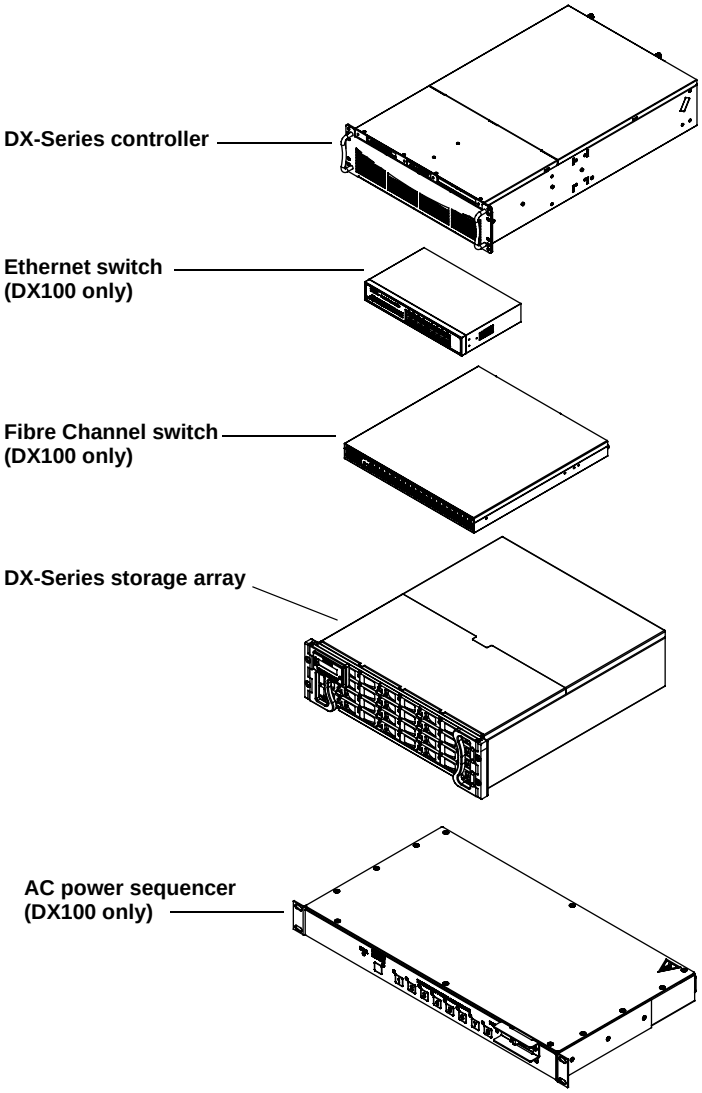
- 1 logical drive configured in RAID 5 (7 data drives + 1 parity drive)
- 1 logical drive configured in RAID 5 (6 data drives + 1 parity drive)
- 1 global hot spare

To reconfigure the DX-Series storage array to either remove the hot spare or add an additional hot spare (total of two hot spares), refer to the *Quantum DX-Series Field Service Manual* PN6513503. **The RAID configuration MUST be set prior to powering on the DX-Series system.**

Both the DX30 and the DX100 use the same system components (controller and storage arrays). The DX100 storage arrays, however, contain dual RAID controllers and the overall DX100 system can expand to sixteen storage arrays. The DX100 controller also has a full compliment of Fibre Channel HBAs (two quad port HBAs and four dual port HBAs) whereas the DX30 has two Fibre Channel HBAs (one quad port HBA and one dual port HBA).

This document describes how to unpack and install both a DX30 and DX100 system into a customer-provided rack enclosure.

Figure 1 DX-Series Components



Selecting an Installation Location

When choosing an installation site for the DX-Series system, consider the following requirements:

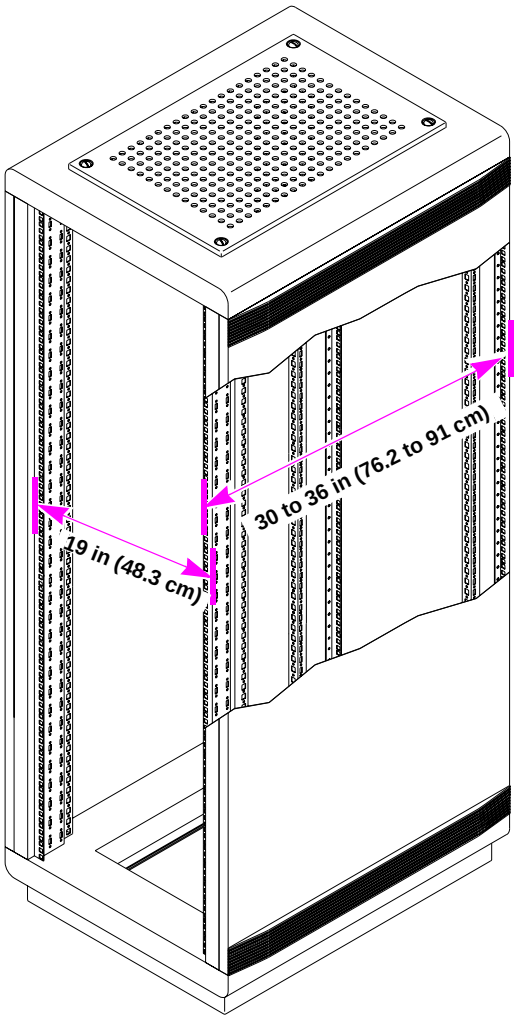
- Rack Space Requirements
- Environmental Conditions

Rack Space Requirements

Figure 2 shows the minimum rack space required by both the DX30 and DX100.

- Depth - 30 in (76.2 cm)
- Width - 19 in (48.3 cm)
- Height - 10.5 in (27 cm) - 3U per additional array
  - DX30 base unit - 6U (15U with a maximum of 4 storage arrays)
  - DX100 base unit - 12U (58U for a maximum of 16 storage arrays, two Fibre Channel switches, two or more AC power sequencers, and one Ethernet switch)
- Weight - Storage array - 75 lbs (34 kg), controller - 52 lbs (24 kg)
  - DX100 only - Fibre Channel switch 20 lbs (9 kg), Ethernet switch - 5 lbs (2.3 kg), and AC power sequencer - 10 lbs (4.5 kg)
- Clearance behind DX-Series system - 4 in (10 cm) for proper air flow
- Clearance above DX-Series controller module - 6 in (15 cm) for access to the fan modules and Fibre Channel HBAs in the controller.

Figure 2 Rack Space Requirements



Environmental Conditions

The installation site must have the following environmental conditions:

- Humidity: 20%-80% non-condensing
- Temperature: 15°C-35°C (59°F-95°F)
- Altitude: -984 to 10,000 feet (-300 to 3048 meters)

These environmental conditions apply when the DX-Series system is in operation.

Note: For additional DX-Series specifications (including environmental requirements during shipping and storage), see the *Quantum DX-Series User's Guide* (PN 6513501).

Preparing for the Installation

Before you begin the installation procedure in this section, make the following preparations as described in this section:

- Providing Necessary Tools and Equipment
- Taking ESD Precautions

Providing Necessary Tools and Equipment

Provide the following tools for unpacking the DX-Series system:

- #1 PHILLIPS® screwdriver
- #2 PHILLIPS screwdriver
- #1 Flat head screwdriver
- Antistatic wrist strap included in accessory kit

Taking ESD Precautions

Some components within the DX-Series system contain static-sensitive parts. To avoid damaging these parts while performing installation procedures, always observe the following precautions:

- Keep the DX-Series system turned off during all installation procedures.
- Use an antistatic wrist strap (included in the accessory kit).
- Keep static-sensitive parts in their original shipping containers until ready for installation.
- Do not place static-sensitive parts on a metal surface. Place them inside their protective shipping bag or on an antistatic mat.
- Avoid touching connectors and other components.

Note: Dry climates and cold-weather heating environments have lower relative humidity and are more likely to produce static electricity.

Unpacking the DX-Series System

This section explains how to unpack the DX-Series system components and move them to their final installation location. The DX-Series system is shipped in two configurations: DX30 and DX100 (see table 1):

Table 1 DX-Series Packaging Contents

Components	DX30 Base System	DX100 Base System
Controller	1	1
Storage array*	1-single RAID controller (4 max)	2-dual RAID controllers (16 max)
Fibre Channel Switch	Not required	1
Ethernet switch	Not required	1
AC power kit containing 2 AC power sequencers	Not required	1 kit for every 4 storage arrays (ordered separately)
* Additional storage arrays can be added to increase system capacity		

By following these instructions, you help ensure that the system will continue to be safeguarded after it arrives at the installation site.

Unpack and remove the following components from the packing materials (see figure 3, figure 4, figure 5, and figure 6):

- DX-Series controller
- DX-Series storage array(s)
- DX-Series Fibre Channel switch (DX100 only)
- Ethernet switch (DX100 only)
- AC power sequencer (DX100 only)

Figure 3 Unpacking the DX30

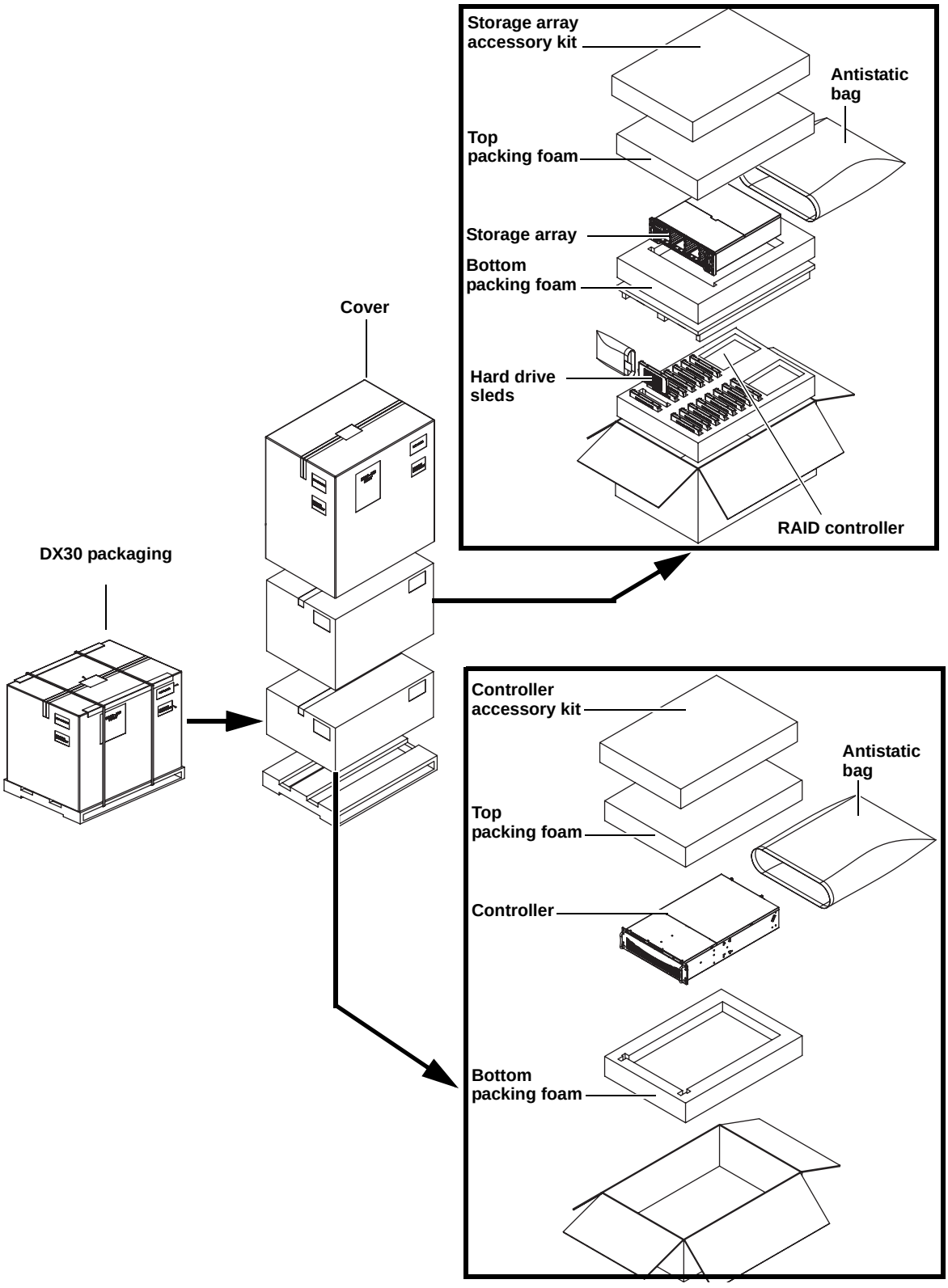


Figure 4 Unpacking the DX100

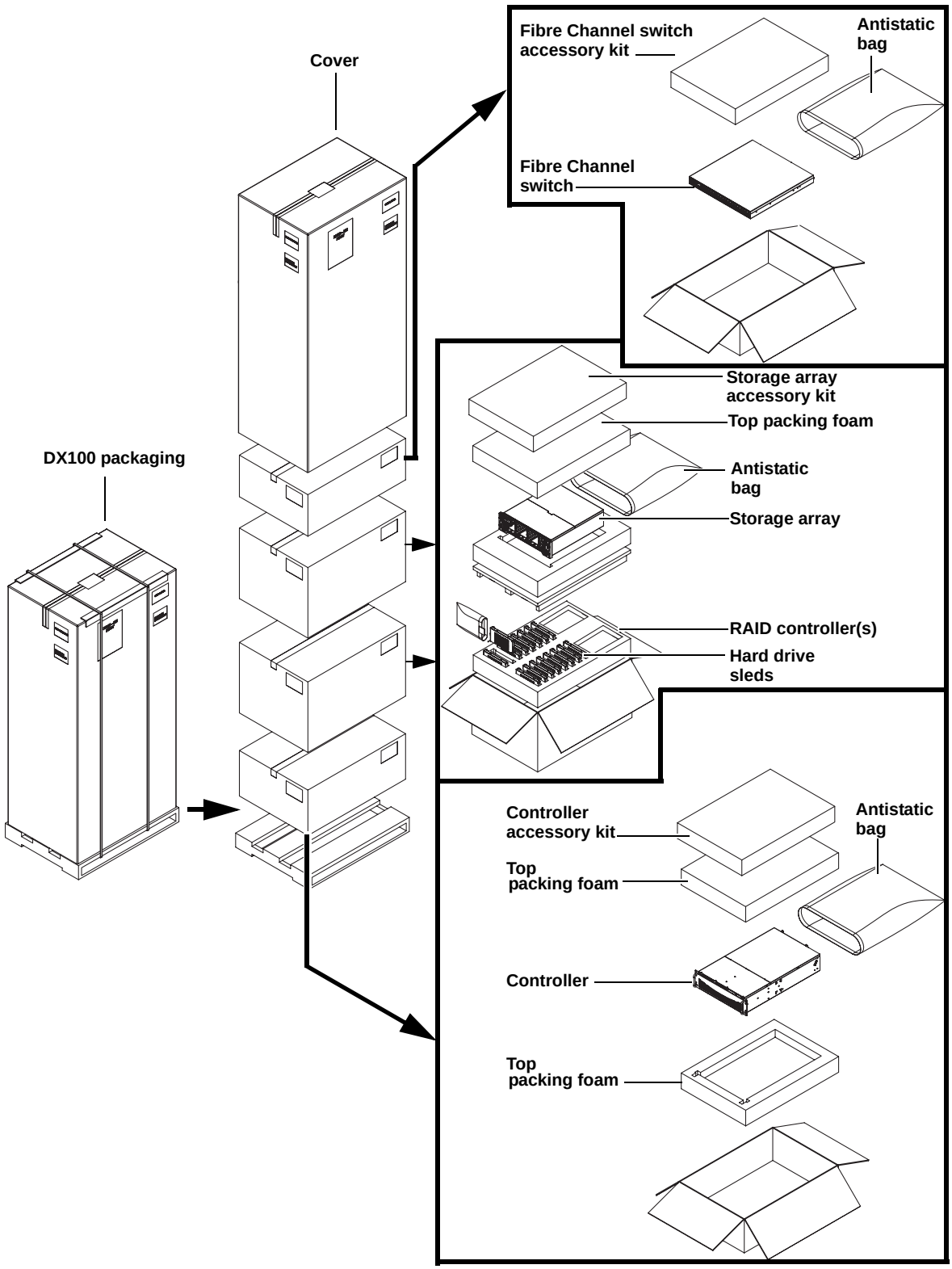


Figure 5 Unpacking Additional Storage Array(s)

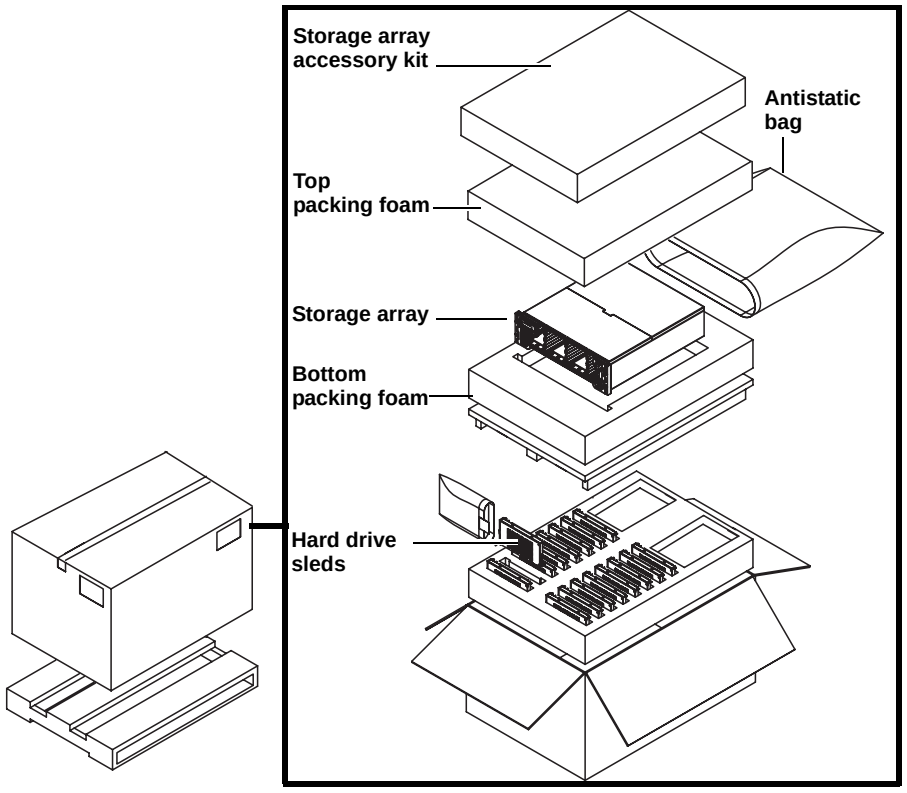
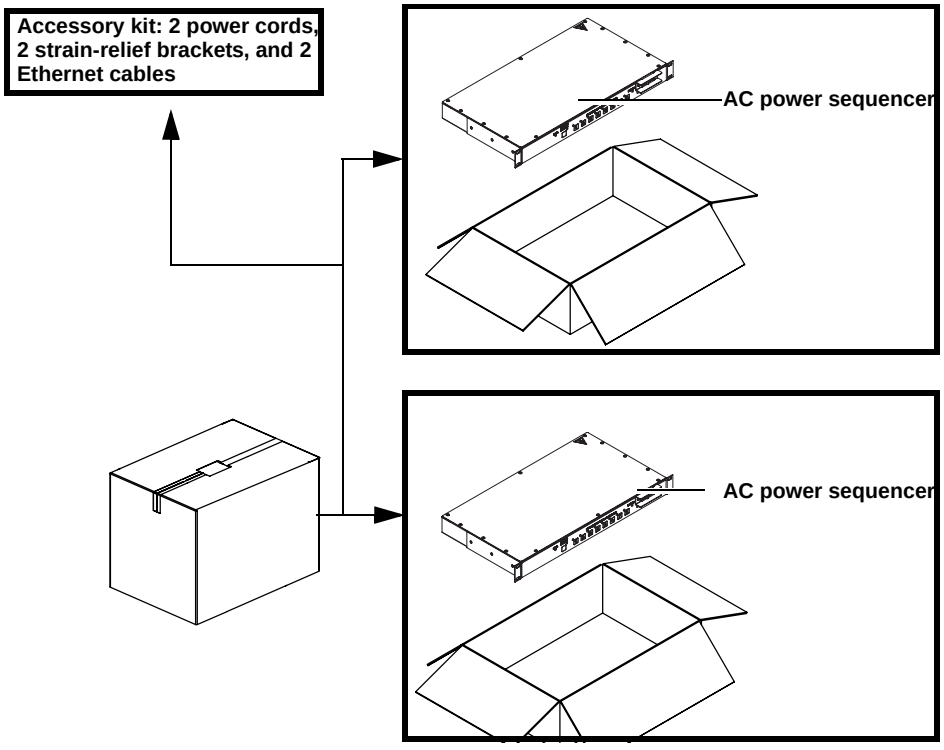


Figure 6 Unpacking the Power Kit



Installing the DX-Series System

Installing the DX-Series in a rack consists of the following steps:

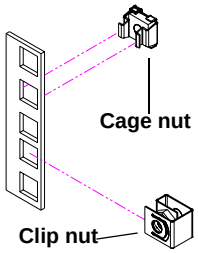
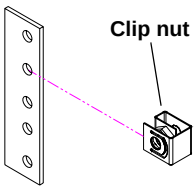
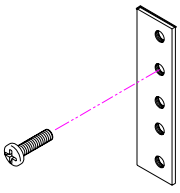
- Locating the Mounting Position
- Installing the DX-Series Storage Array
- Installing the Fibre Channel Switch (DX100 Only)
- Installing the Ethernet Switch (DX100 Only)
- Installing the AC Power Sequencers (DX100 Only)
- Installing the DX-Series Controller

Locating the Mounting Position

Both components of the DX-Series system are designed to fit in a standard 19 inch wide rack.

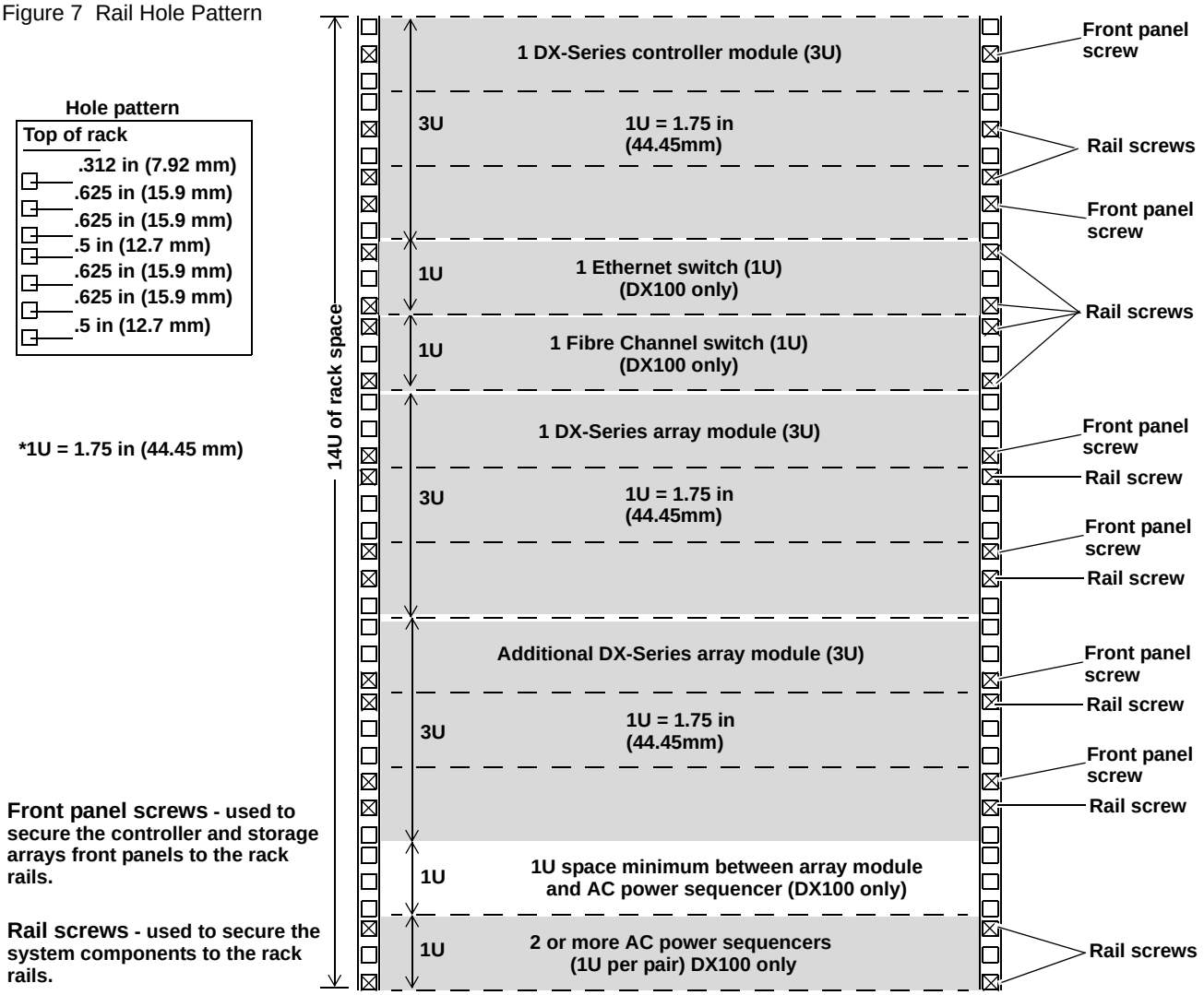
It is important to the chassis installation to locate the hole pattern in the rack rails (see figure 7). The chassis must be installed at the beginning of the hole pattern. Refer to table 2 for information on common rack hole types.

Table 2 Rack Hole Types

Figure	Description
	Square rack holes are the most common type of rack holes. They can accept either cage nuts which mount from the back of the rail or clip nuts which clip on from the side of the rack rail.
	Through holes require clip nuts to accept mounting hardware.
	Threaded holes require neither cage or clip nuts to accept mounting hardware.

Note: The rails within the rack have a hole pattern that repeats throughout the rail. X marks the screw positions. Install nut clips (included in the accessory kit) on the rails if necessary.

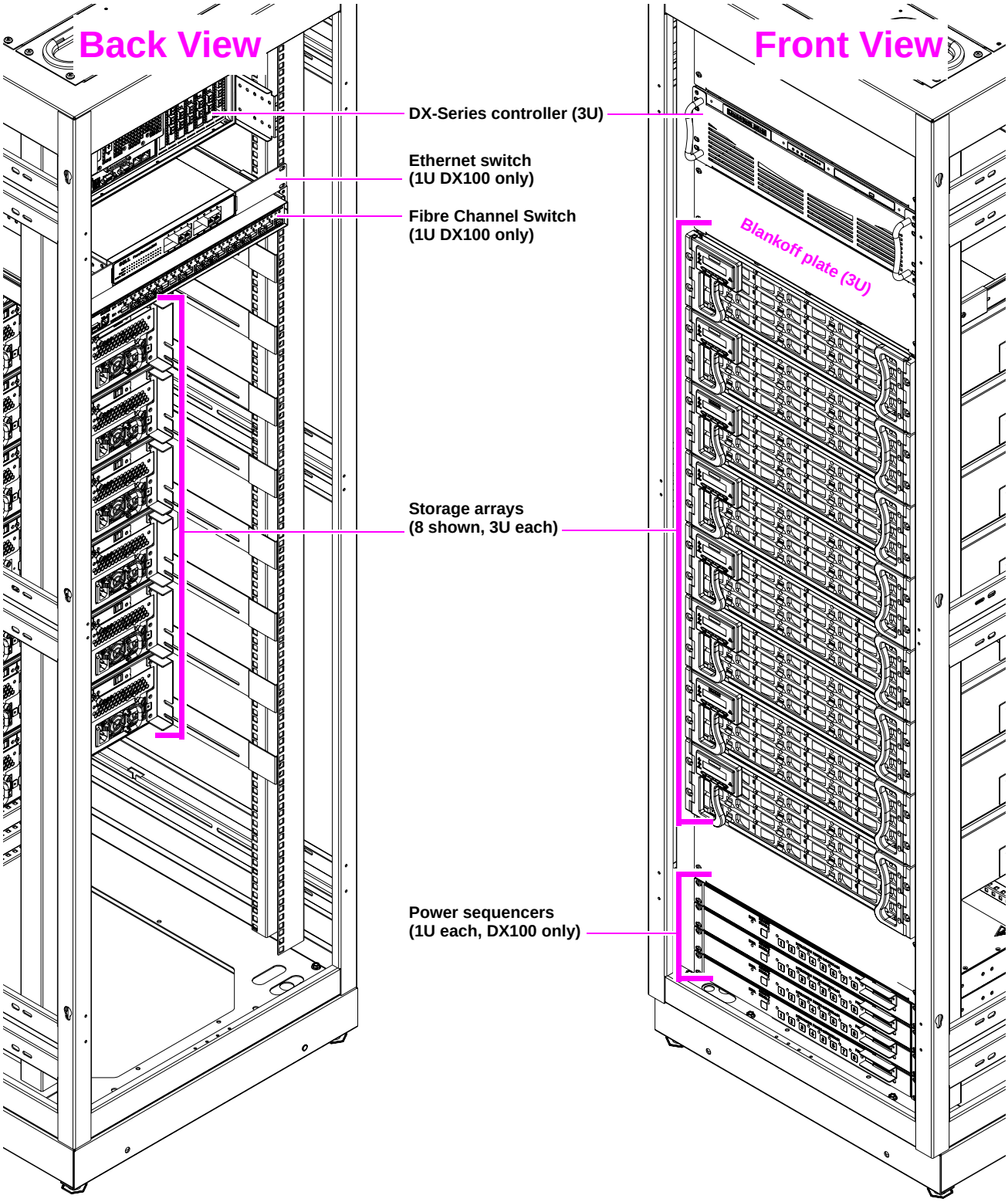
Figure 7 Rail Hole Pattern



Note: Leave approximately 6 in. (15 cm) above the controller for access to the fan modules and Fibre Channel HBAs in the controller.

Warning: If the rack is empty at the time of installation, do NOT install the DX-Series components too high in the rack. The combined weight of the components may cause the rack to become "top heavy" and unstable if installed in the top of an empty rack. Begin installing the DX-Series components from the bottom of the rack.

Figure 8 Mounting Locations



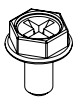
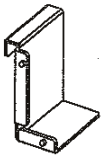
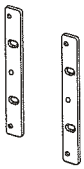
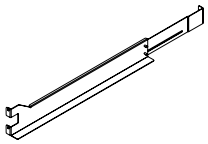
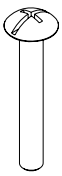
Installing the DX-Series Storage Array

Installing the DX-Series storage array consists of the following steps:

> **Note:** If this is an upgrade to an existing DX-Series system, see Installing Additional Storage Arrays on page 41.

- Preparing the Storage Array for installation
- Installing the Storage Array

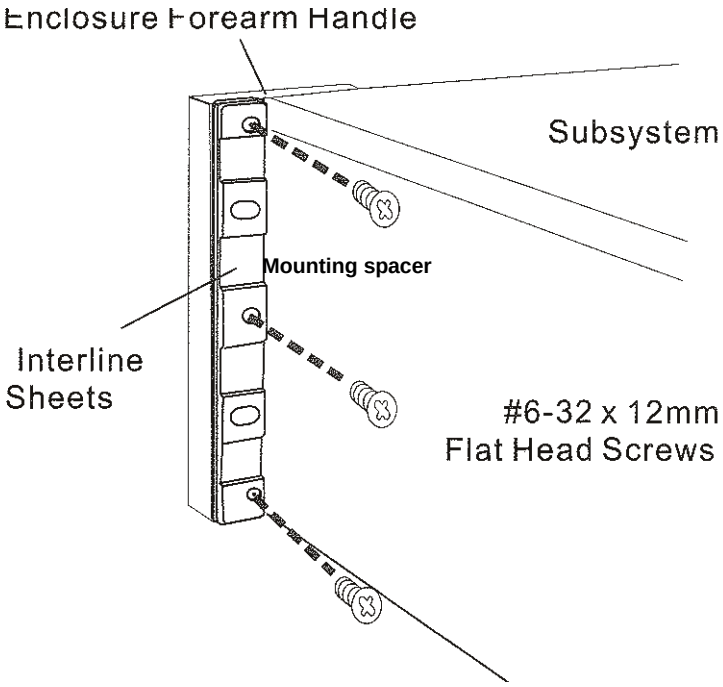
Table 3 Storage Array Mounting Hardware

Qty	Figure	Description
6		32 x 10 pan head PHILLIPS screws
6		32 x 10 flat head PHILLIPS screws
2		Right and left mounting bracket (right shown)
2		Right and left mounting spacer (left shown)
2		Right and left support bracket (left shown)
8		10-32 x .50 in. slotted screws
4		10-32 x 1.25 in. (M5 x 32 metric also provided) black PHILLIPS screws

Preparing the Storage Array for installation

1 Install a spacer on each side with 6-32 x 10 flat head PHILLIPS screws provided in the storage array accessory kit (see figure 9).

Figure 9 Installing the Mounting Spacers



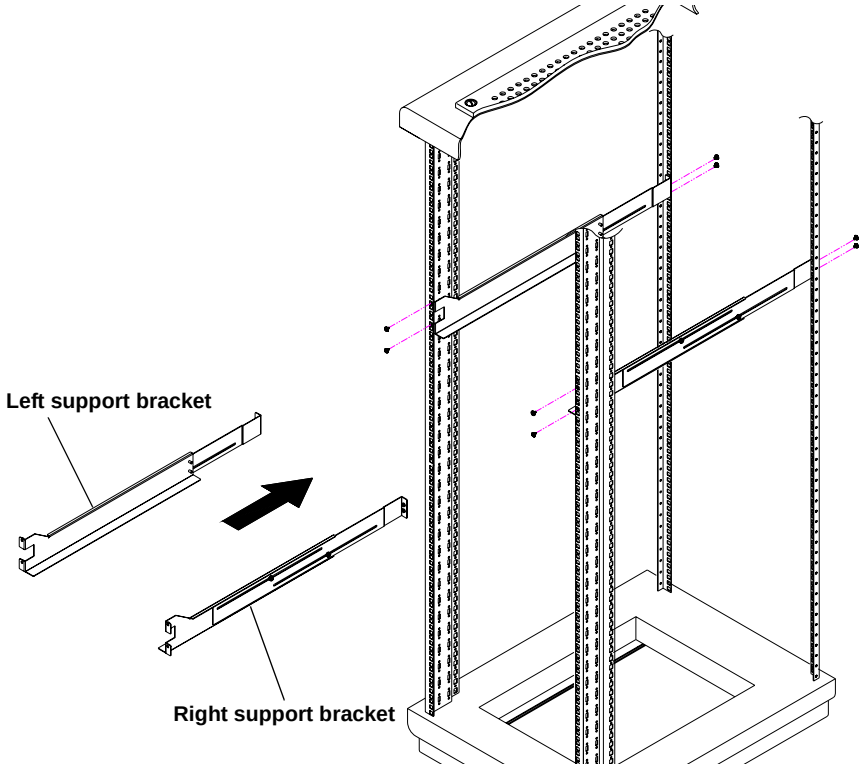
Installing the Storage Array

1 Install the left and right storage array support brackets at the beginning of a hole pattern (see Locating the Mounting Position on page 12) and loosely install two 10-32 x .50 in. slotted screws on each rail at the front and back of the rack (see figure 10).

Note:	The support brackets must be installed on the inside rack rails.

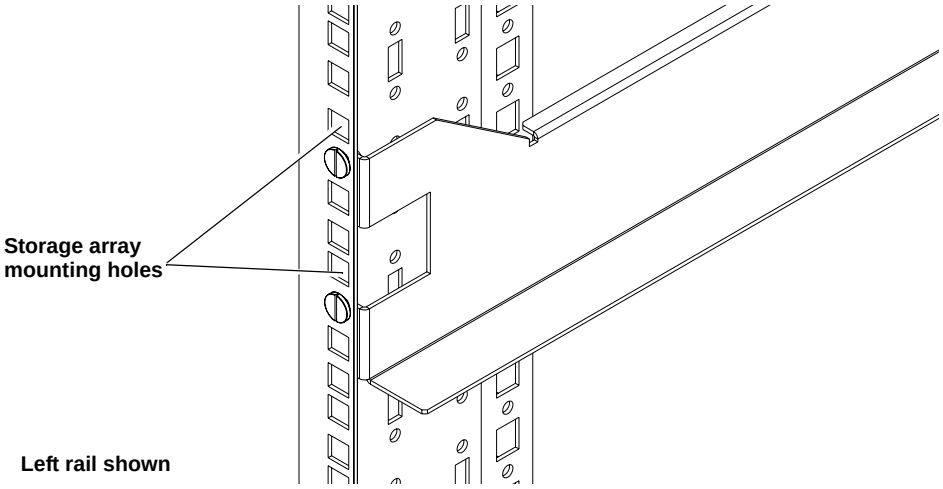
Note:	The support brackets extend to accommodate rack depths of 30 to 36 in. (76.2 to 91 cm).

Figure 10 Installing the Storage Array Support Brackets



2 With the support brackets installed, prepare the storage array mounting holes if necessary. Refer to table 2 to determine the type of hardware required for your rack (see figure 11 for hole location).

Figure 11 Storage Array Mounting Holes



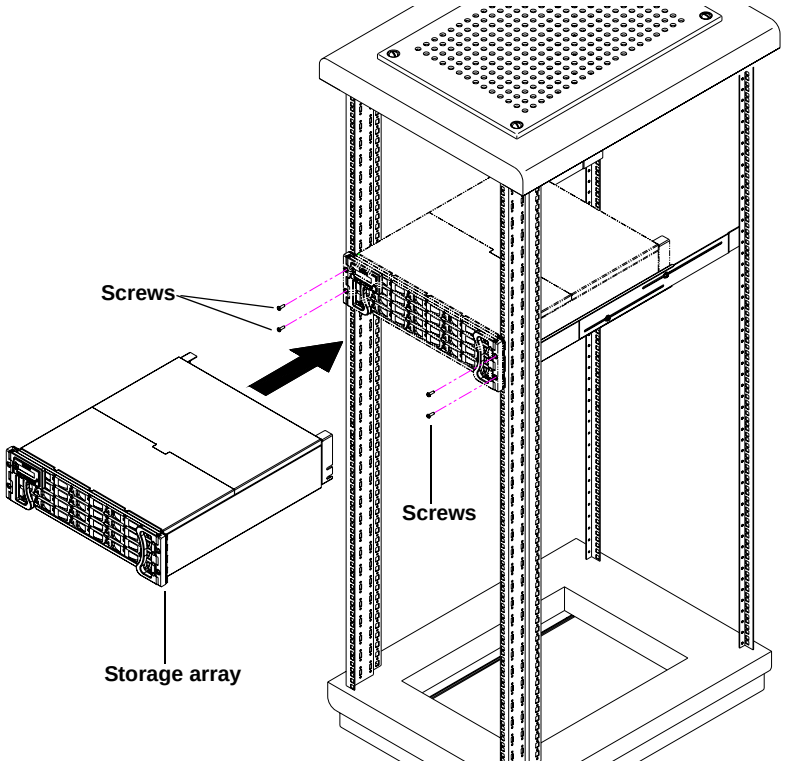
3 Tighten the screws securing the front and back of the support brackets.

4 Tighten adjustment screws on each rail.

5 Carefully slide the storage array into the rack.

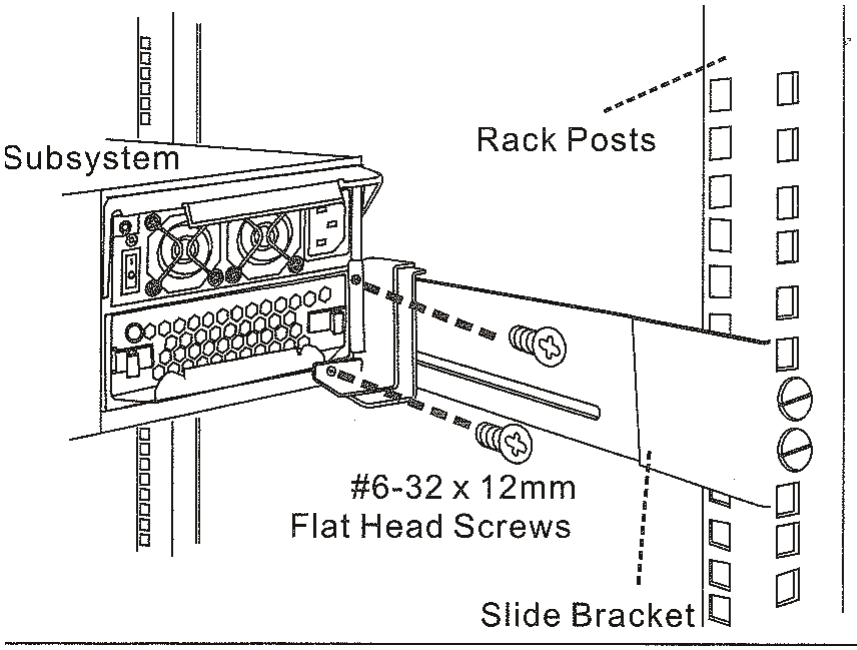
6 Secure the storage array to the rack with two 10-32 x 1.25 in. (M5 x 32 metric also provided) black PHILLIPS screws on each side of the front of the chassis. (see figure 12).

Figure 12 Securing the Storage Array to the Rack



7 Install the right and left mounting brackets with 6-32 x 10 pan head screws provided in the storage array accessory kit (see figure 13).

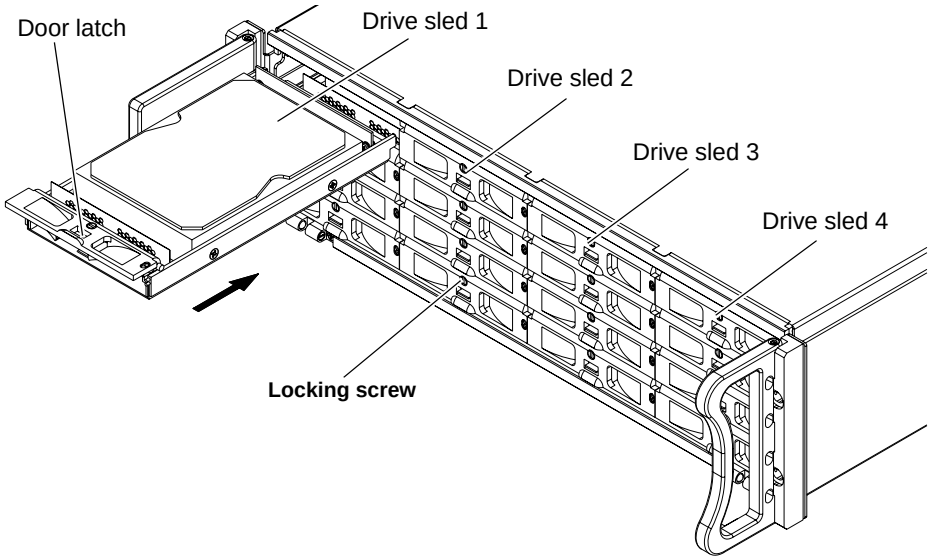
Figure 13 Installing the Mounting Brackets



8 Install each of the hard drive sleds into the DX-Series storage array chassis (see figure 14).

Note:	The hard drives must be installed in the proper sequence since RAID sets have already been established at the factory. Refer to the label on the bottom of the drive sled for the drive number. The hard drives must also be installed in the array in which it was configured.

Figure 14 Installing the Hard Drive Sleds



Storage Array Drive Bay Numbering

1	2	3	4
5	6	7	8
9	10	11	12
13	14	15	16

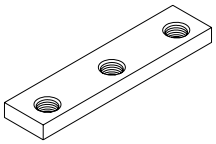
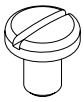
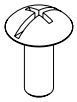
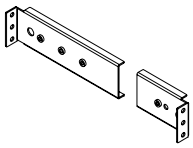
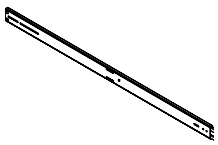
The DX-Series storage array is now installed in the rack. If this is a DX30 installation, continue with Installing the DX-Series Controller on page 27. If this is a DX100 installation, continue with Installing the Fibre Channel Switch (DX100 Only).

Installing the Fibre Channel Switch (DX100 Only)

To install the Fibre Channel switch, refer to the Fiber Channel switch hardware described in table 4 and the following instructions:

Note: The Fibre Channel switch may be slightly different from the switch documented in this procedure. The installation procedure should be similar.

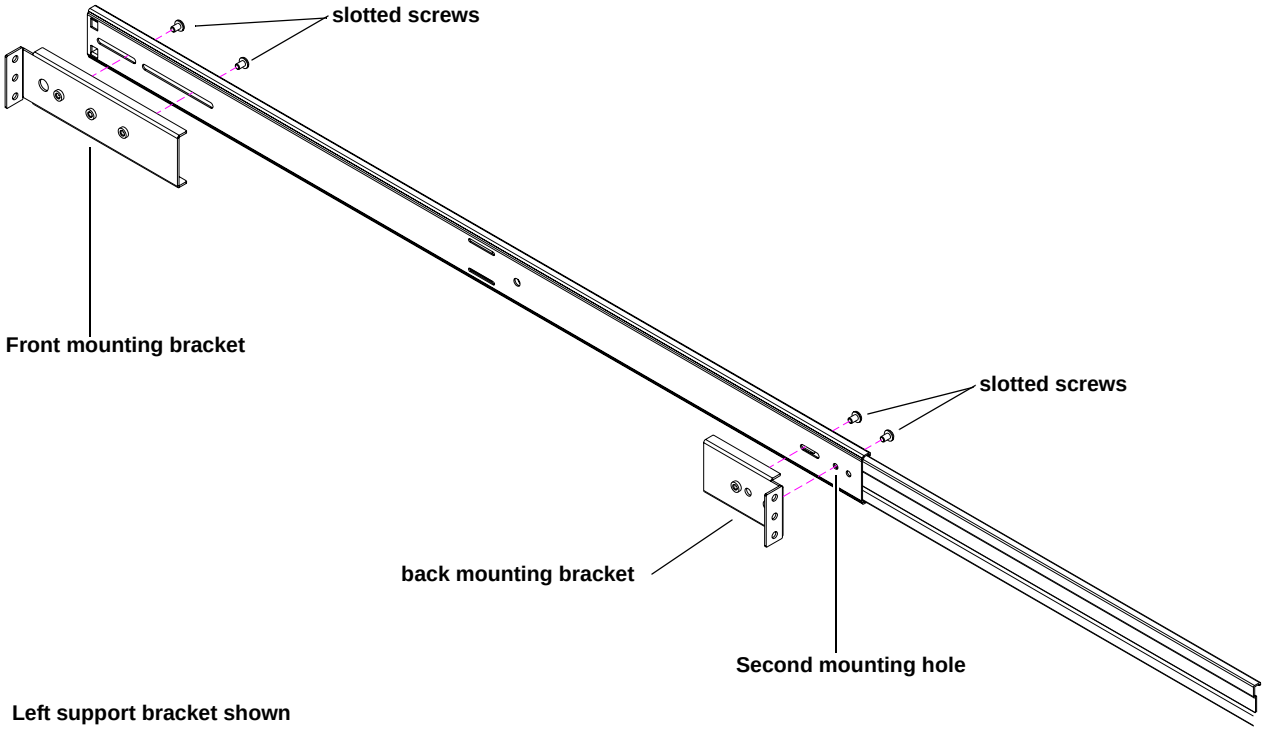
Table 4 Fibre Channel Switch Mounting Hardware

Qty	Figure	Description
4		Mounting plates (used only with rack rails with through holes or threaded holes)
14		Slotted screws
12		PHILLIPS screws (only 8 used for front and back rack mounting)
4		Front and back mounting brackets (left shown)
2		Right and left support bracket (left shown)

Note: To accommodate the Fibre Channel cabling connections, the Fibre Channel switch must be installed with the Fibre Channel ports facing the back of the rack. A 2U blank-off plate is provided to cover the front portion of the rack.

1 Loosely assemble the left and right support brackets with two slotted screws on the front and the back of the bracket. DO NOT TIGHTEN. You must pull the slide out of the support brackets to gain access to the mounting holes. The back mounting bracket must be installed in the second hole (see figure 15).

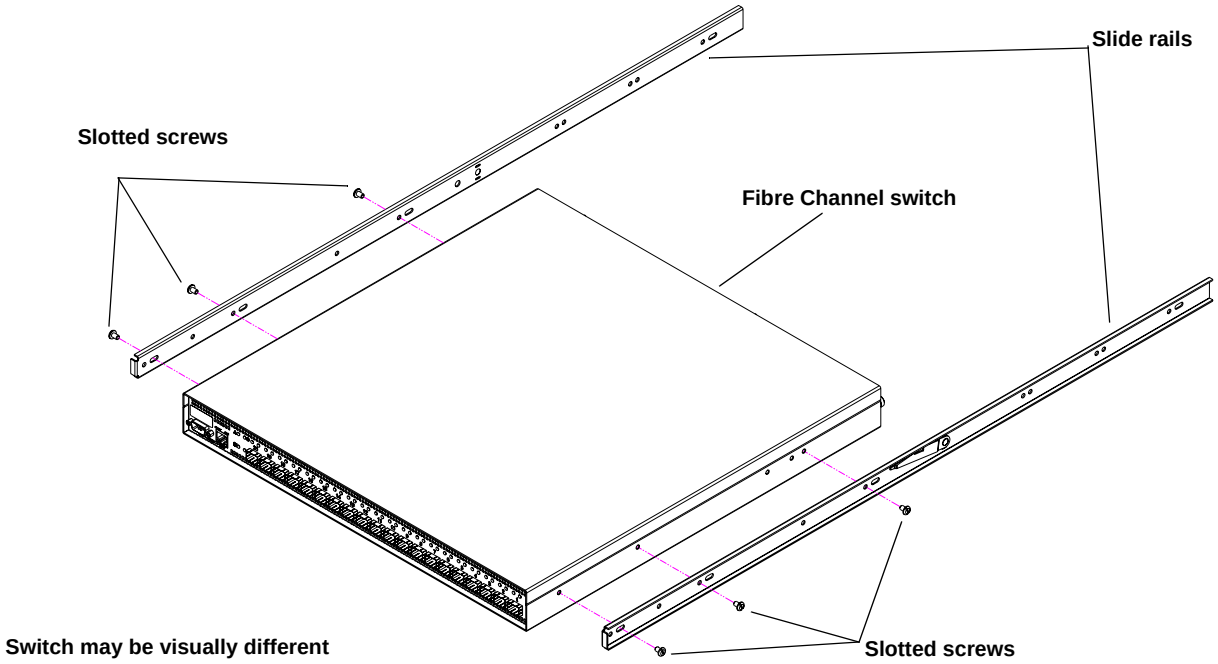
Figure 15 Assembling the Right and Left Support Brackets



2 Remove the right and left slide rails from the support brackets.

3 Install the right and left slide rails on the Fibre Channel switch with three slotted screws on each side (see figure 16).

Figure 16 Installing the Fibre Channel Switch Slide Rails



4 From the back of the rack, install the Fibre Channel switch support brackets with two PHILLIPS screws on each bracket in the front and in the back of the rack (see figure 17).

Note: To support bracket installation in racks with through holes (see table 2), mounting plates are provided with the switch accessory kit for use behind the rail mounting positions.

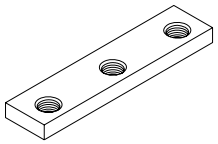
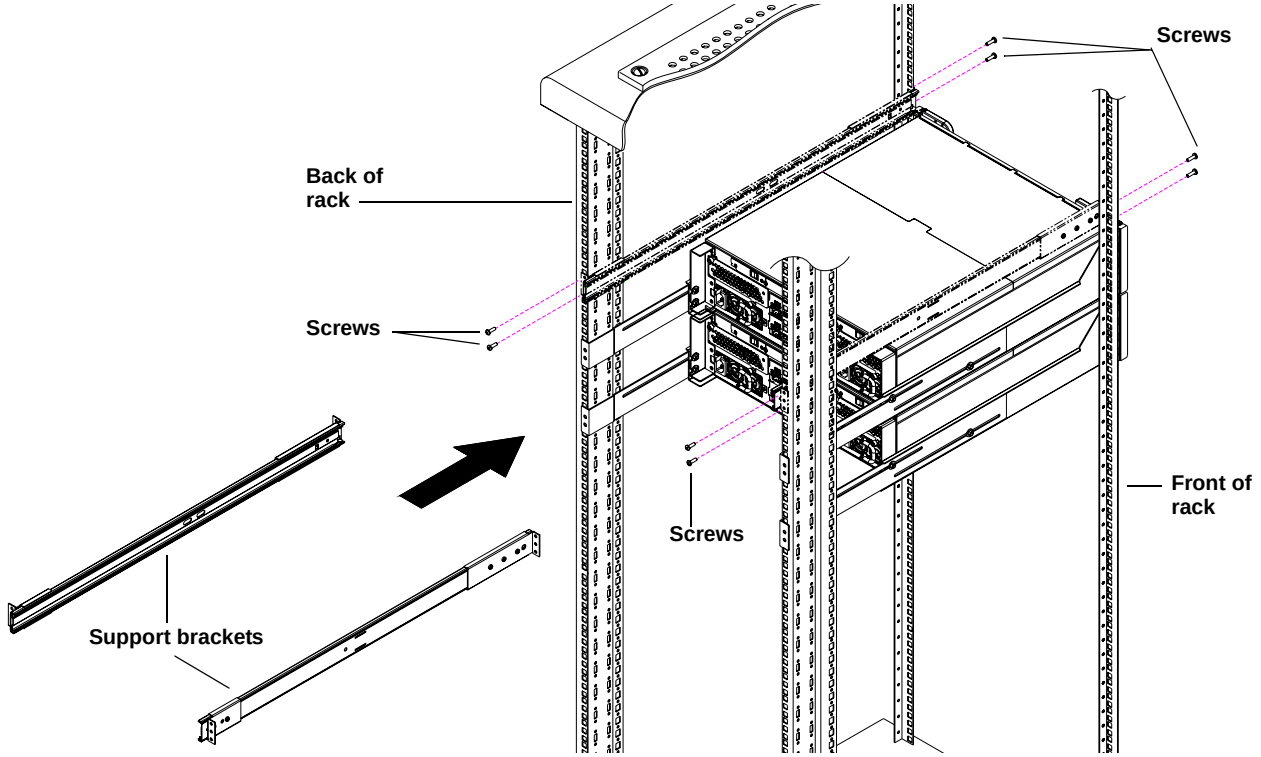
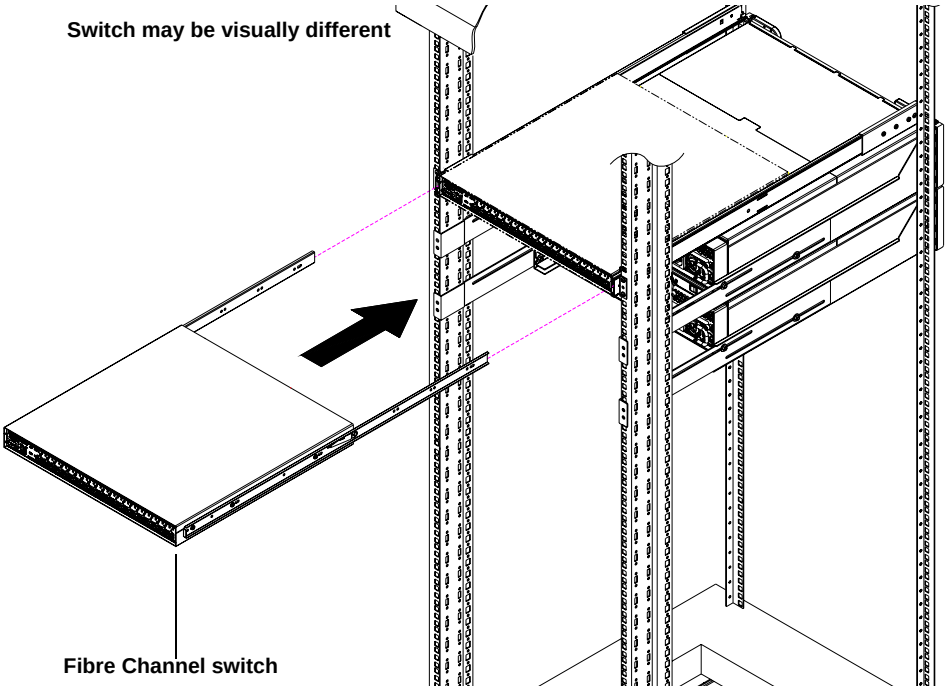


Figure 17 Installing the Right and Left Support Brackets in the Rack



5 Slide the Fibre Channel switch into the support brackets in the back of the rack (see figure 18).

Figure 18 Sliding the Fibre Channel Switch into the Support Brackets



6 Install 2U blank-off plate in front of rack covering the space taken by the Fibre Channel switch and Ethernet switch.

> **Note:** Install two 10-32 x .50 in. screws in the rack under the right and left top corners of the 2U blank-off plate.

Repeat this procedure for an additional Fibre Channel switch in a second rack to support more than 8 storage arrays.

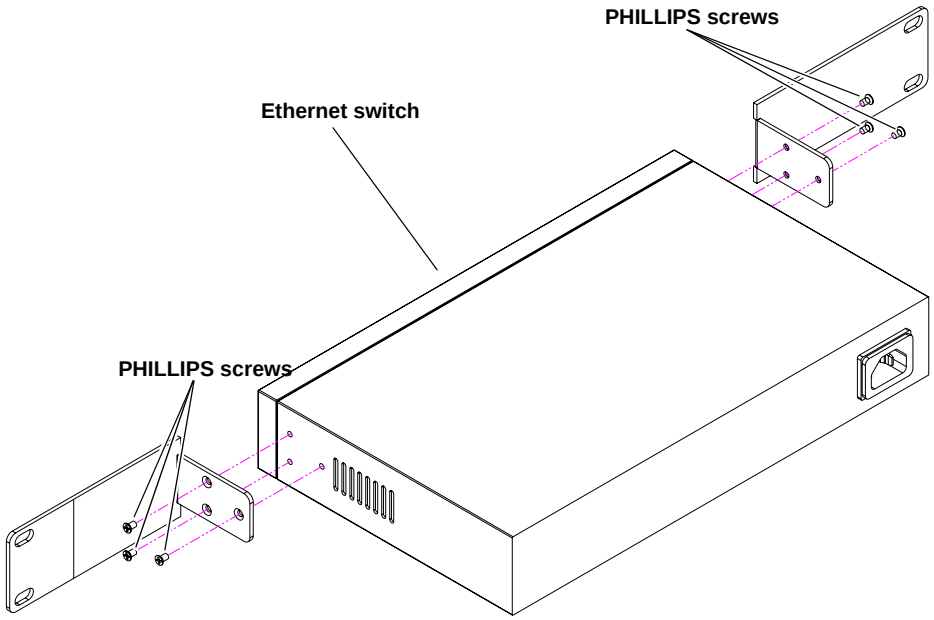
Installing the Ethernet Switch (DX100 Only)

To install the Ethernet switch:

> **Note:** To accommodate the Ethernet cabling connections, the Ethernet switch must be installed with the ports facing the back of the rack.

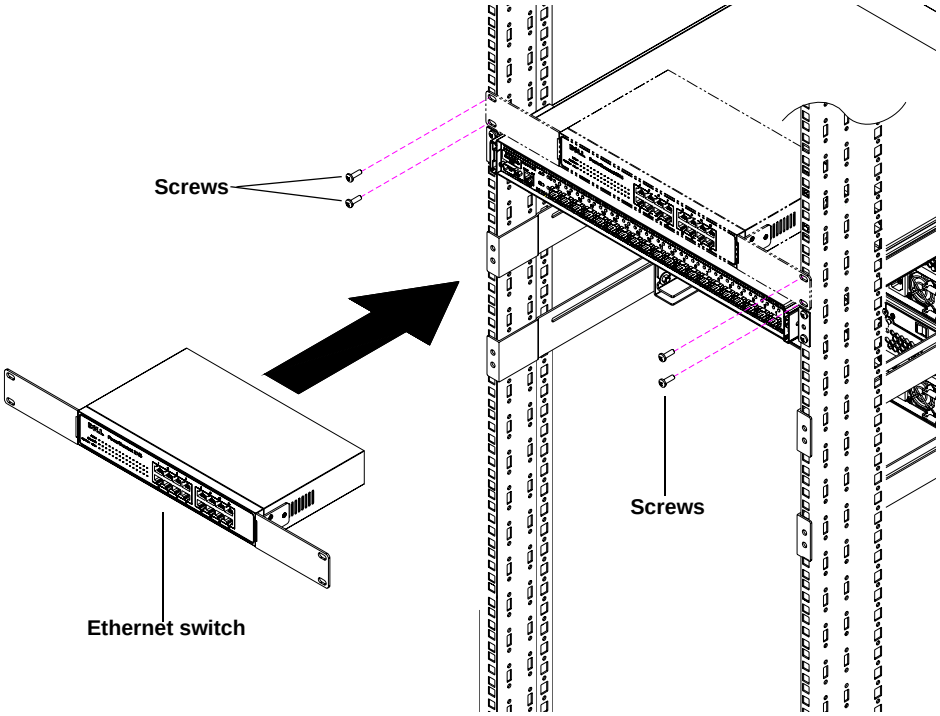
1 Install the mounting ears on to the Ethernet switch with three PHILLIPS screws on each side (see figure 19).

Figure 19 Installing the Ethernet Mounting Ears



2 Install the Ethernet switch into the back of the rack directly above the Fibre Channel switch and secure with two screws on each side (see figure 20).

Figure 20 Installing the Ethernet Switch into the Rack

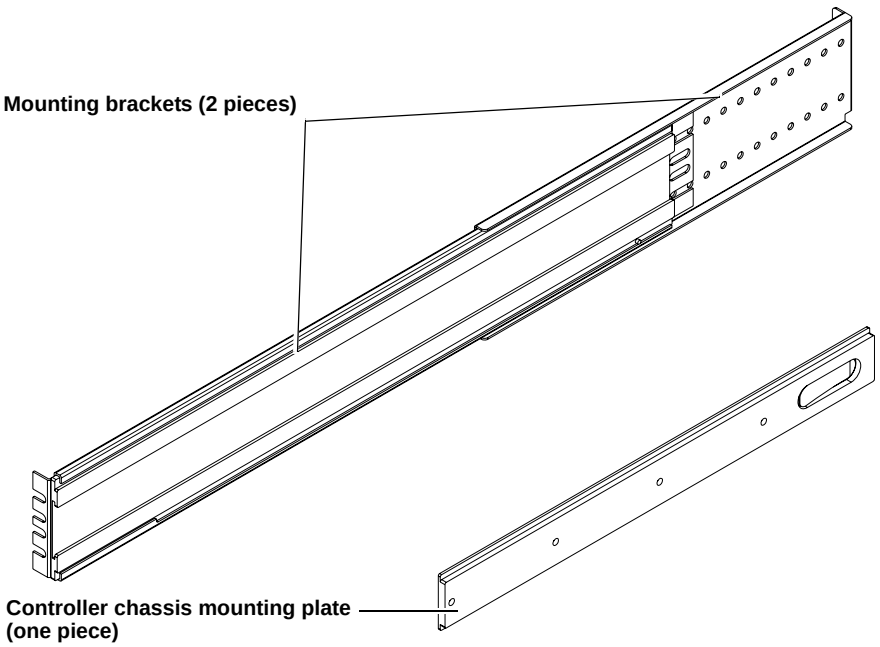


Installing the DX-Series Controller

To install the DX-Series controller:

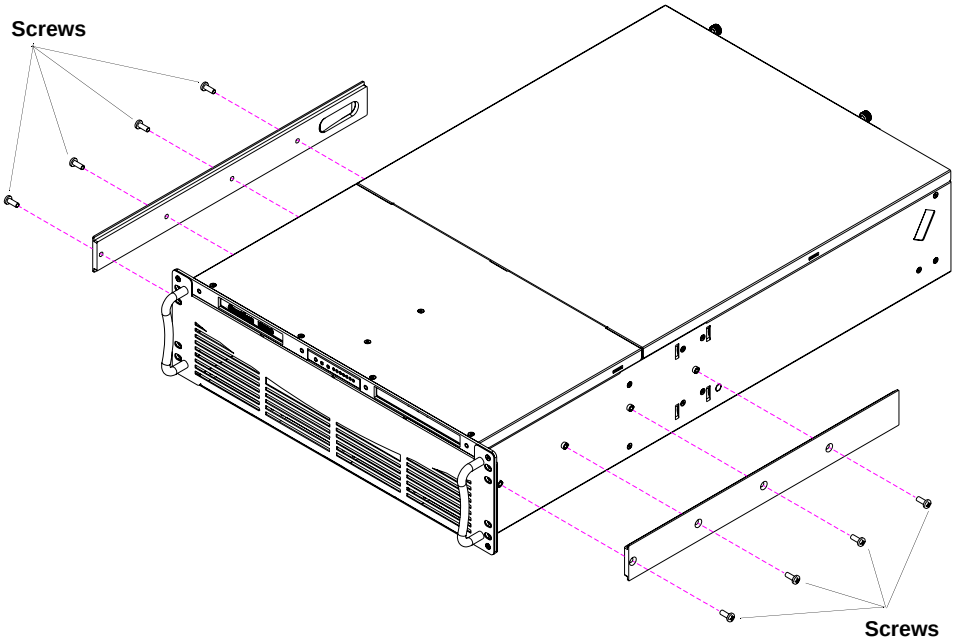
1 Each DX-Series controller rail is shipped in three pieces, six total for both rails (see figure 21).

Figure 21 DX-Series Controller Rails



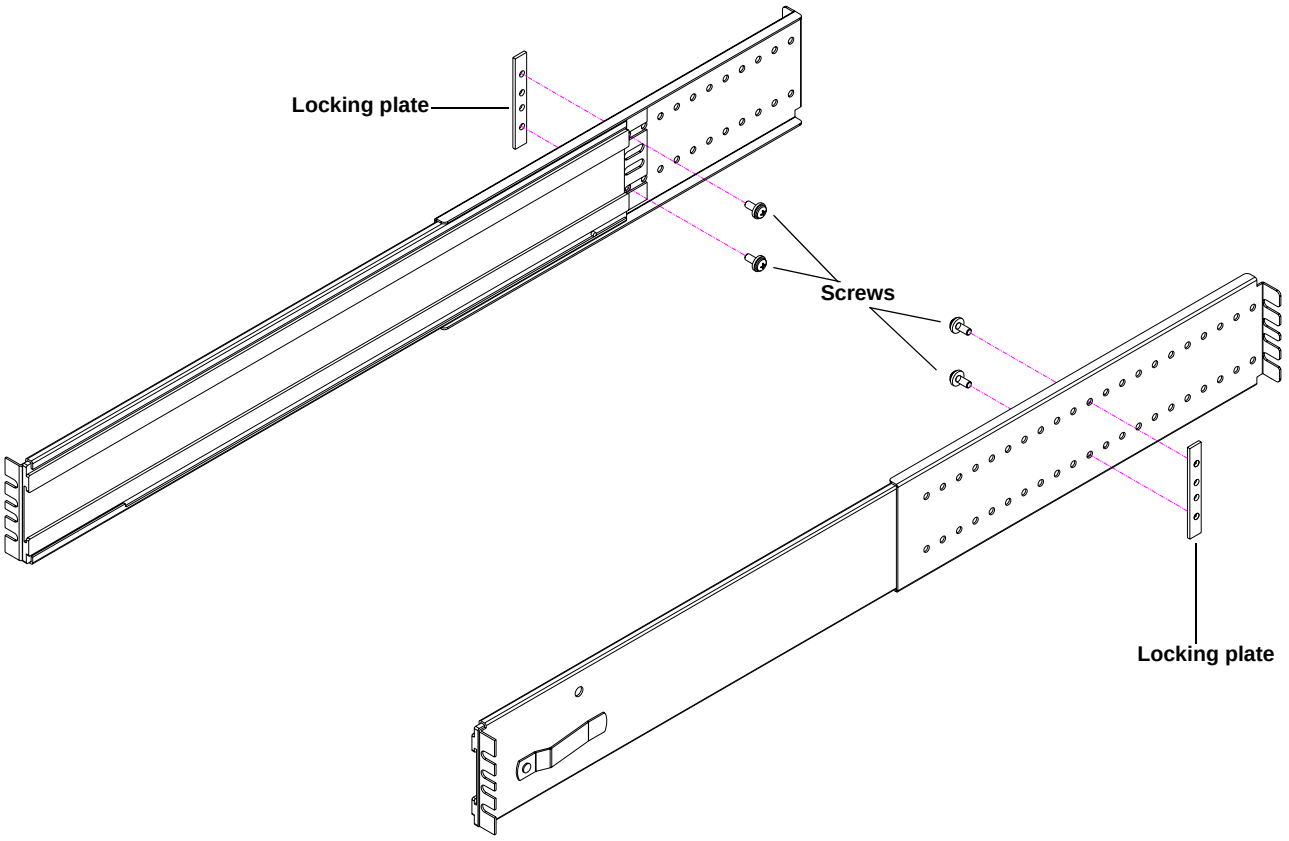
2 Install the chassis mounting plate on each side of the controller with four 10-32 x .50 in. PHILLIPS screws (see figure 22).

Figure 22 Installing the Controller Chassis Mounting Plates



3 Determine the depth of the rack (30 in, 76.2 cm minimum) and assemble each DX-Series controller rail with two PHILLIPS screws and locking plate at the appropriate depth (see figure 23).

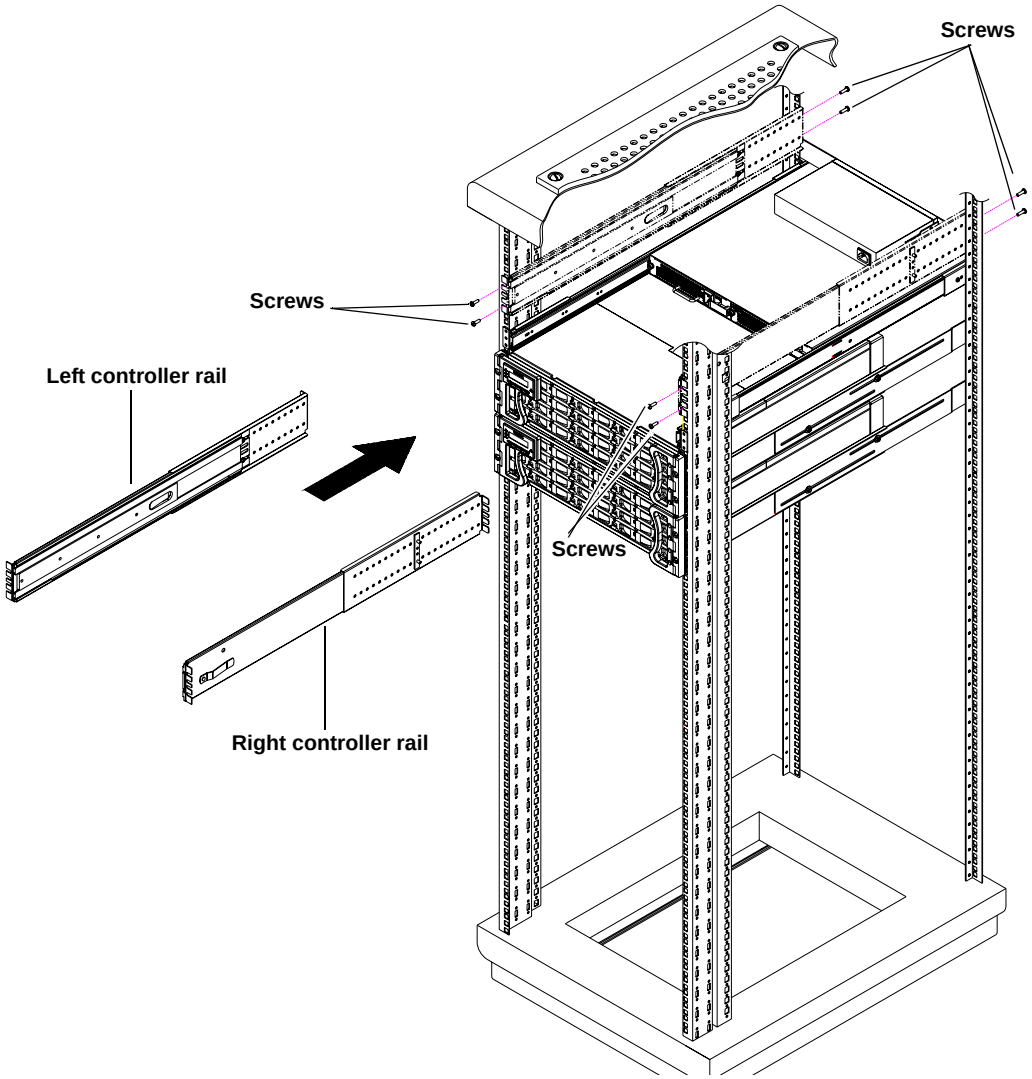
Figure 23 Assembling the Controller Rails



4 Install the DX-Series controller rails into the rack with four 10-32 x .50 in. PHILLIPS screws on each side (two in the front and two in the back) (see figure 24).

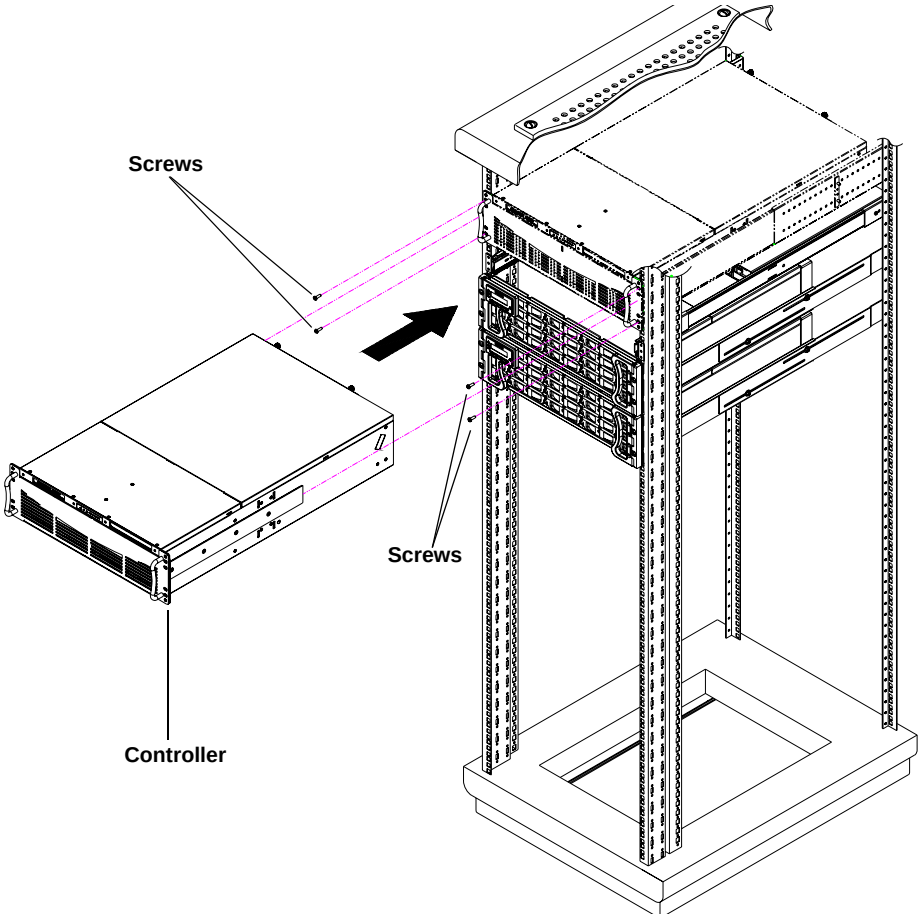
> **Note:** To support bracket installation in racks with through holes (see table 2), mounting plates are provided with the switch accessory kit for use behind the rail mounting positions.

Figure 24 Installing the DX-Series Controller Rails



5 Slide the DX-Series controller into the support brackets in the rack and secure with two black 10-32 x .75 in. PHILLIPS screws on each side of the controller (see figure 25).

Figure 25 Installing the DX-Series Controller



Installing the AC Power Sequencers (DX100 Only)

The DX100 storage arrays must be powered on in the correct order to avoid inrush current overflows. To achieve this, the power sequencers are installed to automatically power on the storage arrays in the correct order.

Caution: Turn off the AC power sequencer circuit breakers prior to installing.

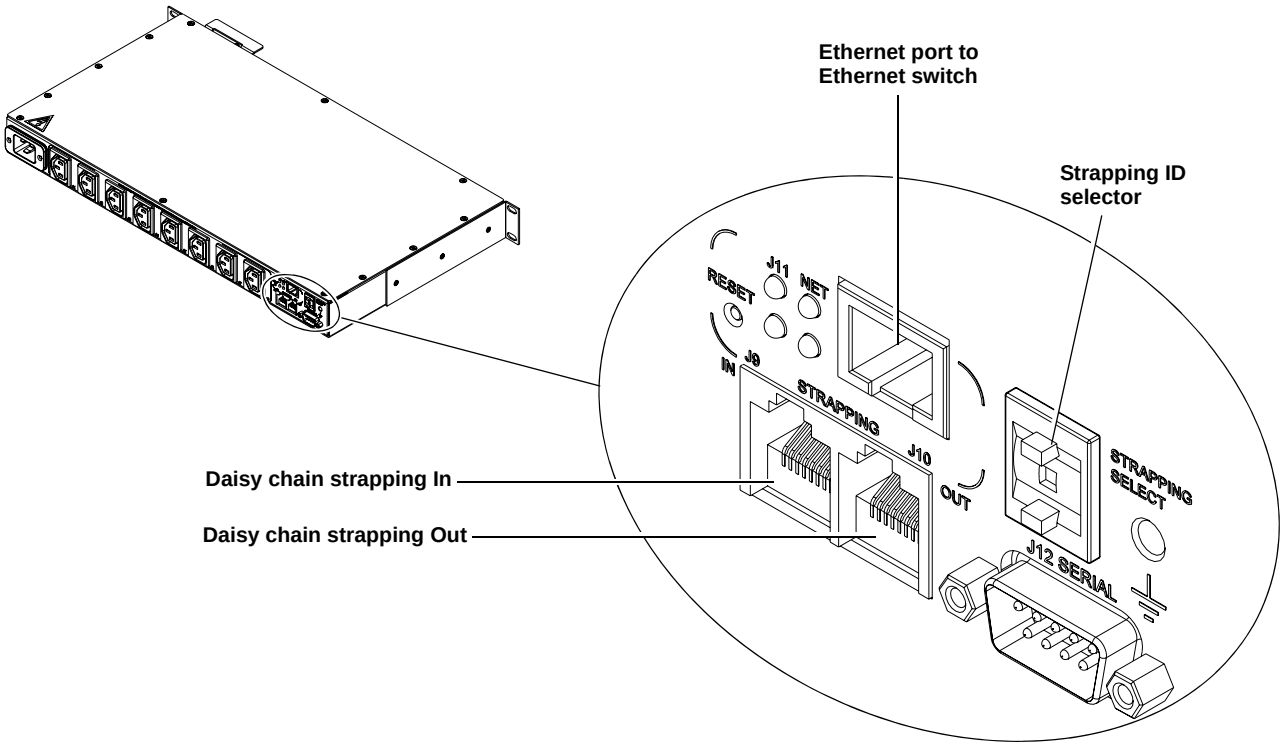
Installing the AC power sequencers consists of the following steps:

- Configuring the AC Power Sequencer
- Cabling and Installing the AC Power Sequencer

Configuring the AC Power Sequencer

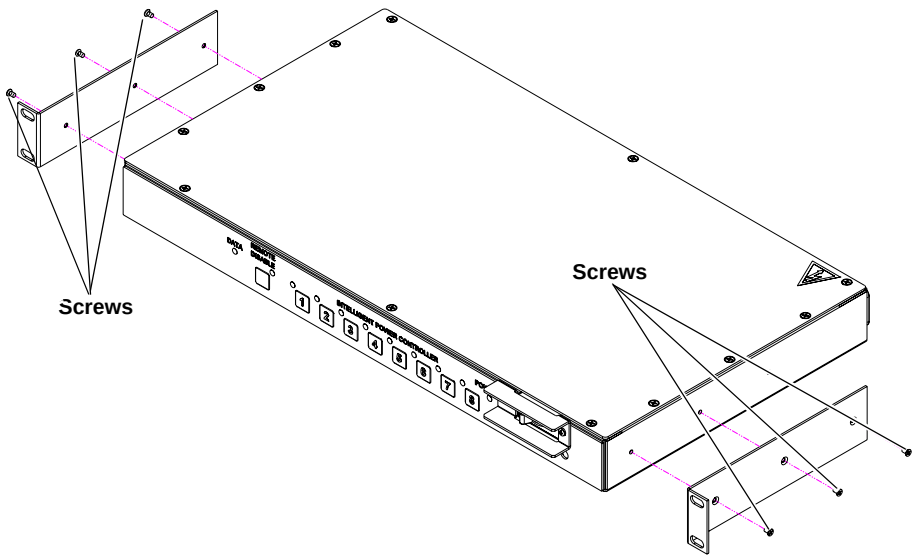
1. The AC power sequencers must have a specific strapping ID set prior to operating. Use the up and down buttons located on the back of the AC power sequencer to set the strapping ID to 0 for the first power sequencer, 1 for the second sequencer, 2 for the third power sequencer, and 3 for the fourth power sequencer (see figure 26).

Figure 26 Setting the Power Sequencer Strapping IDs



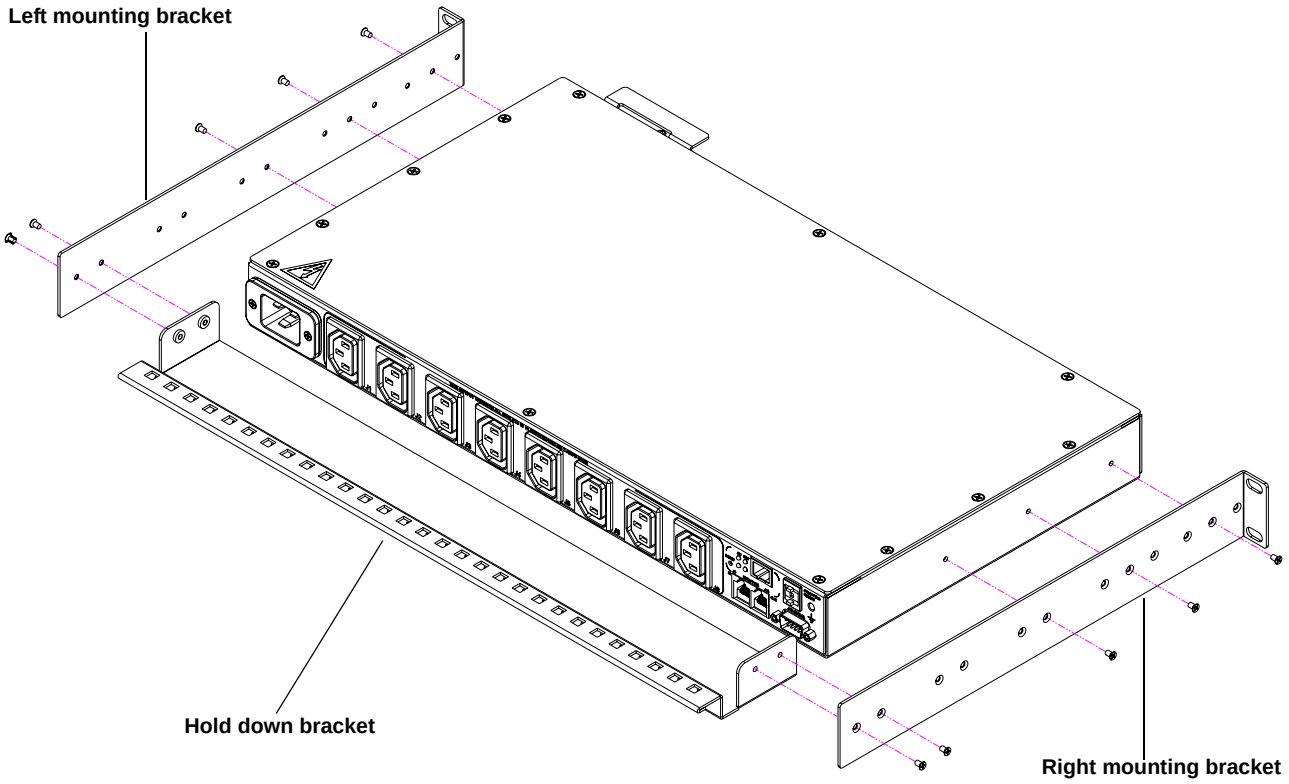
2 Remove the three PHILLIPS screws securing the mounting brackets on each side of the power sequencer (see figure 27).

Figure 27 Removing the Mounting Brackets



3 Install the hold down mounting assembly with five PHILLIPS screws on each side of the power sequencer (see figure 28).

Figure 28 Installing the Hold Down Bracket Assembly



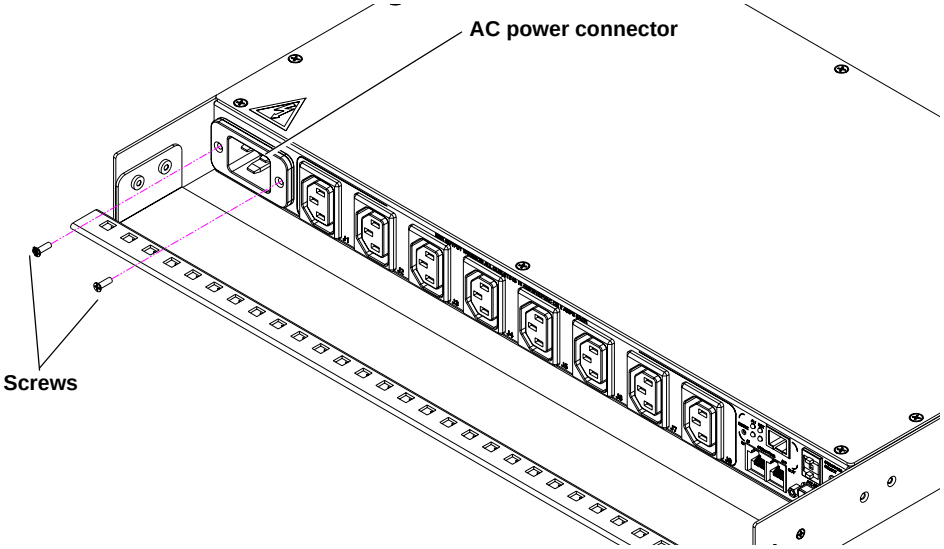
Cabling and Installing the AC Power Sequencer

To simplify installation, the power cords for the AC power sequencer, controller, Ethernet switch, Fibre Channel switch, and storage arrays must be installed outside of the rack. After all cords have been connected, the power sequencers are installed.

To cable and install the AC power sequencers:

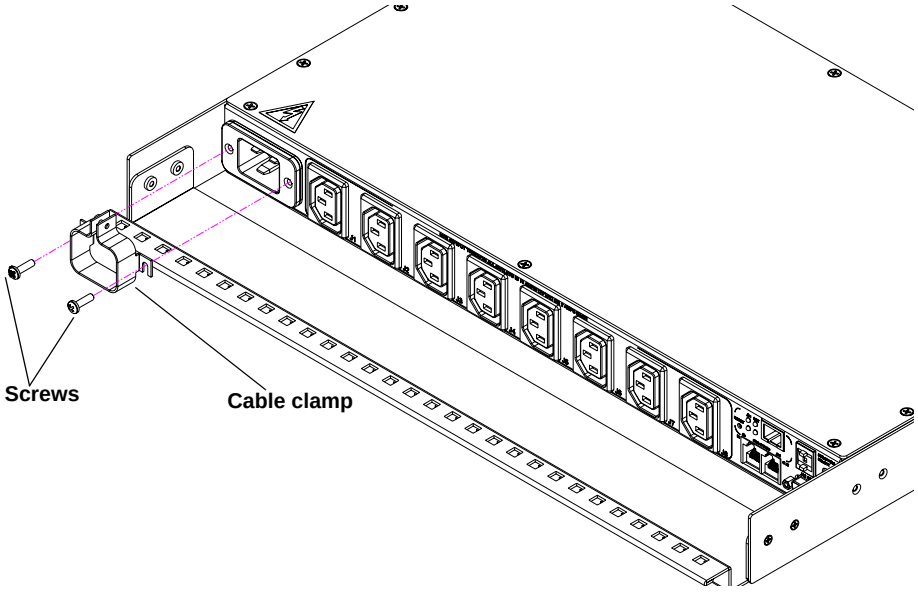
1 Remove the two PHILLIPS screws securing the power connector to the power sequencer (see figure 29).

Figure 29 Removing the AC Power Connector Screws



2 Install the cable clamp on the power sequencer using two pan head PHILLIPS screws provided in the accessory kit (see figure 30).

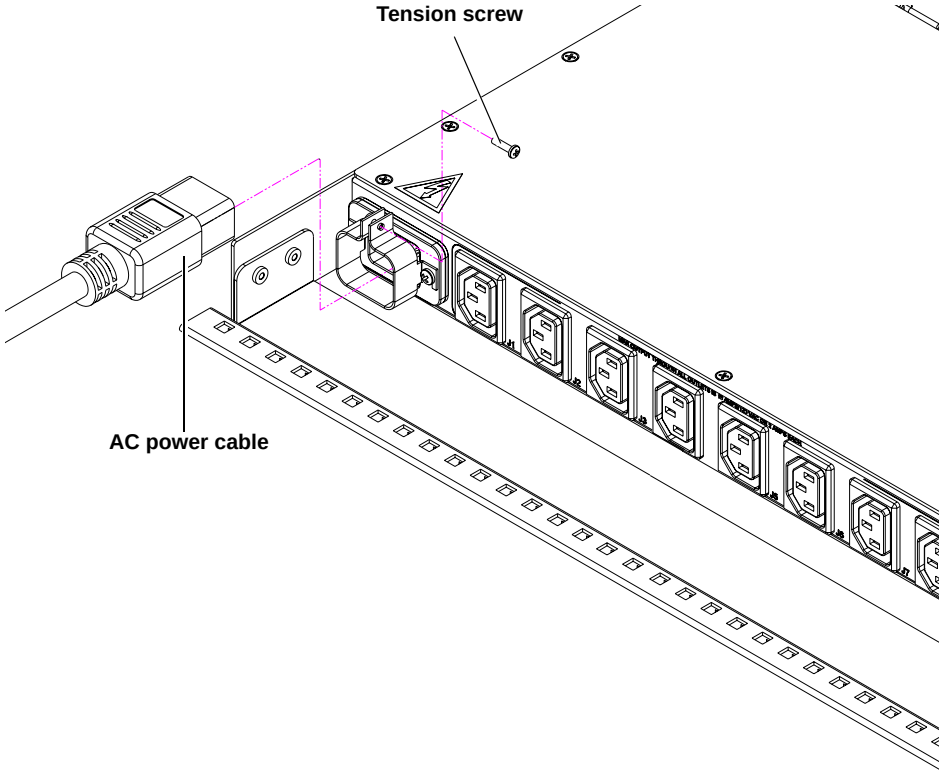
Figure 30 Installing the Cable Clamp and Power Cable



3 Install the AC power cable through the cable clamp and into the AC power sequencer. Tighten the cable clamp with the tension screw to secure the power cable (see figure 31).

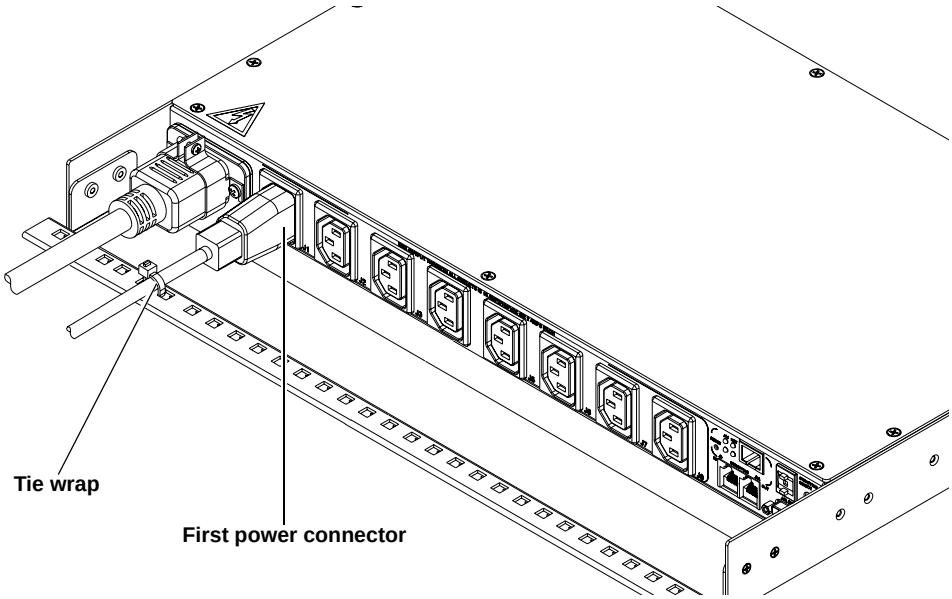
> **Note:** A rubber shim is included with the cable clamp for power cables smaller than the cable clamp.

Figure 31 Installing the AC Power Cable



4 Connect the first power connector on the controller to outlet J1 on the first AC power sequencer and secure with a tie wrap (see figure 32).

Figure 32 Connecting the First Power Connector



5 Connect the second power connector on the controller to outlet J1 on the second AC power sequencer and secure with a tie wrap.

6 Connect the following power cables for systems with two to sixteen storage arrays (see table 5 and figure 33 through figure 38):

Table 5 Storage Array Power Cabling

Power Sequencer	Ports								
	AC Input	J1	J2	J3	J4	J5	J6	J7	J8
Sequencer 1	Primary AC	Controller	FC switch #1	Eth. switch		Storage array 1 (first connector)	Storage array 2 (first connector)	Storage array 3 (first connector)	Storage array 4 (first connector)
Sequencer 2	Secondary AC	Controller	FC switch #1			Storage array 1 (second connector)	Storage array 2 (second connector)	Storage array 3 (second connector)	Storage array 4 (second connector)
Sequencer 3	Primary AC					Storage array 5 (first connector)	Storage array 6 (first connector)	Storage array 7 (first connector)	Storage array 8 (first connector)
Sequencer 4	Secondary AC					Storage array 5 (second connector)	Storage array 6 (second connector)	Storage array 7 (second connector)	Storage array 8 (second connector)
Sequencer 5	Primary AC		FC switch #2			Storage array 9 (first connector)	Storage array 10 (first connector)	Storage array 11 (first connector)	Storage array 12 (first connector)
Sequencer 6	Secondary AC		FC switch #2			Storage array 9 (second connector)	Storage array 10 (second connector)	Storage array 11 (second connector)	Storage array 12 (second connector)
Sequencer 7	Primary AC					Storage array 13 (first connector)	Storage array 14 (first connector)	Storage array 15 (first connector)	Storage array 16 (first connector)
Sequencer 8	Secondary AC					Storage array 13 (second connector)	Storage array 14 (second connector)	Storage array 15 (second connector)	Storage array 16 (second connector)

7 Connect strapping port **Out** on the first AC power sequencer to strapping port **In** on the second AC power sequencer.

8 If four AC power sequencers are present, connect strapping port **Out** on the second AC power sequencer to strapping port **In** on the third AC power sequencer.

9 Connect strapping port **Out** on the third AC power sequencer to strapping port **In** on the fourth AC power sequencer.

10 If AC power sequencers five through eight are present in a second rack:

a Connect strapping port **Out** on the fourth AC power sequencer (in the first rack) to strapping port **In** on the fifth AC power sequencer.

b Connect strapping port **Out** on the fifth AC power sequencer to strapping port **In** on the sixth AC power sequencer.

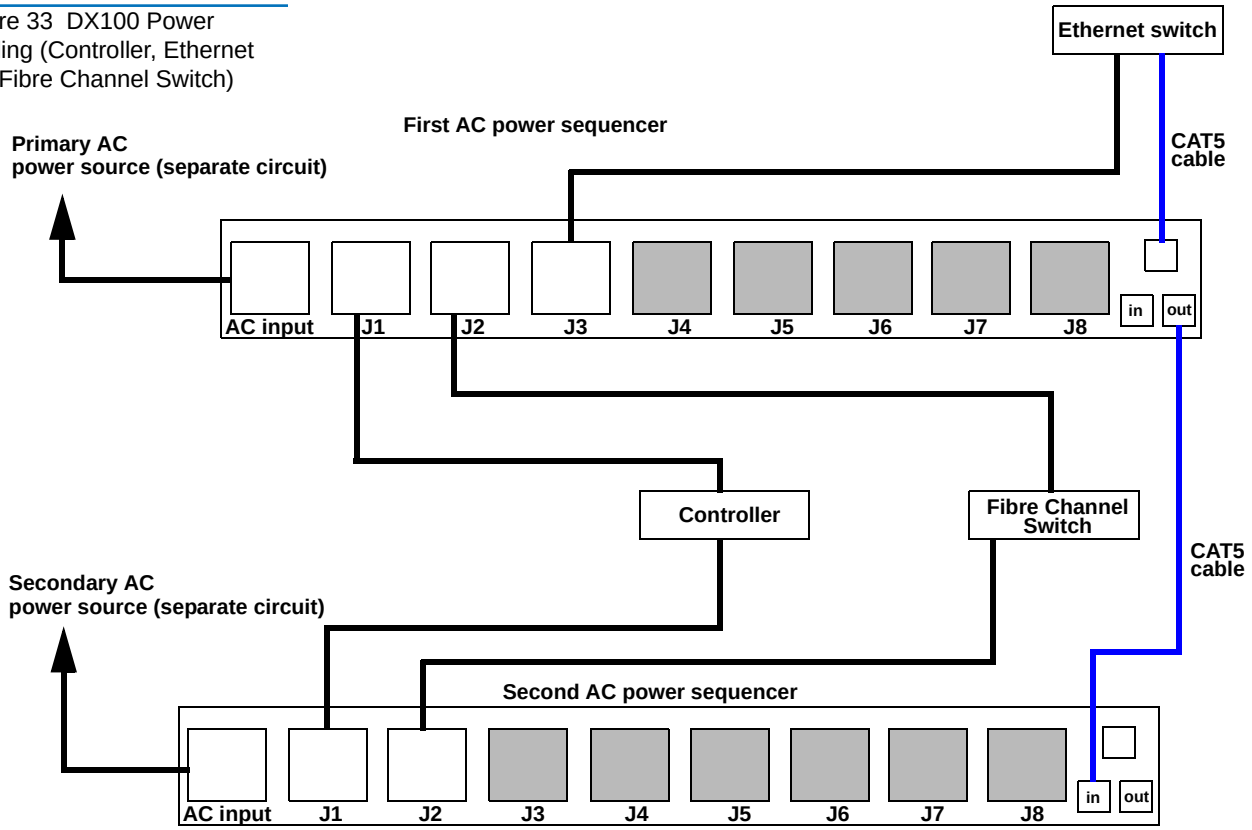
c Connect strapping port **Out** on the sixth AC power sequencer to strapping port **In** on the seventh AC power sequencer.

d Connect strapping **Out** on the seventh AC power sequencer to strapping port **In** on the eight AC power sequencer.

Note: Odd and even numbered AC power sequencers should be on separate circuits for redundancy.

Note: The storage arrays MUST be connected to the exact outlets specified to allow the software discovery to function correctly.

Figure 33 DX100 Power Cabling (Controller, Ethernet and Fibre Channel Switch)



Note: Connect AC inputs to an external AC power source on a dedicated circuit. Ensure that the AC inputs are secured to the power sequencers with cable retention clamps.

Figure 34 DX100 Power Cabling (One to Four Storage Arrays)

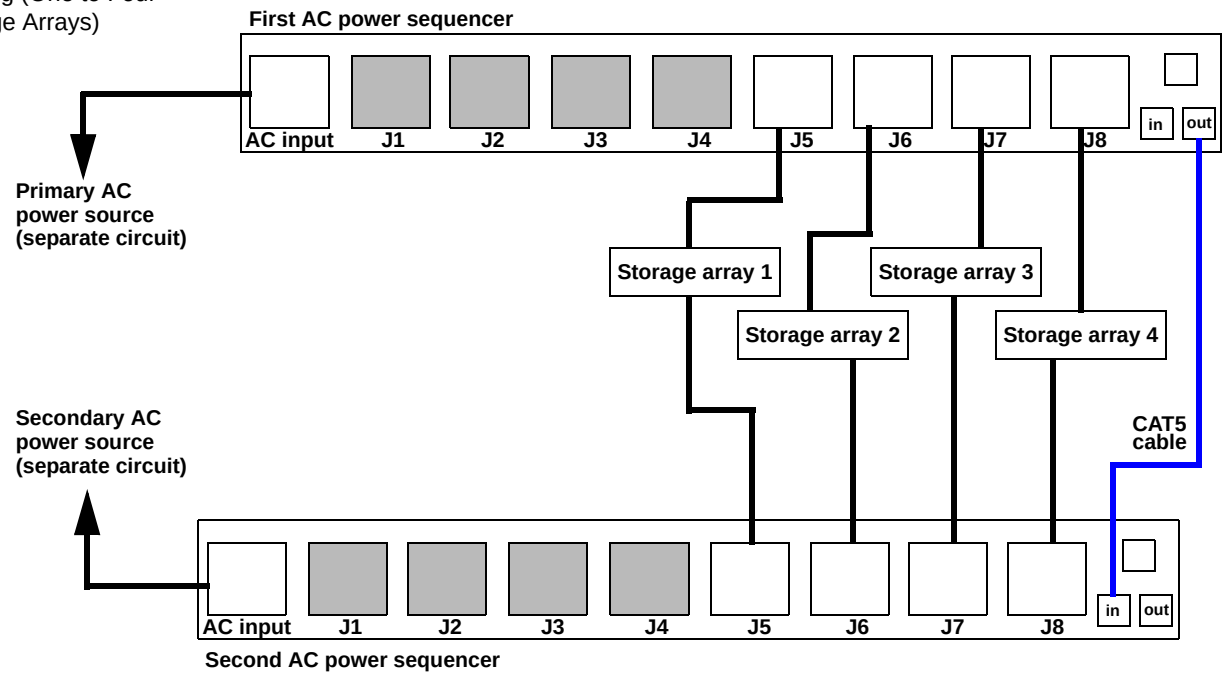


Figure 35 DX100 Power Cabling (Five to Eight Storage Arrays)

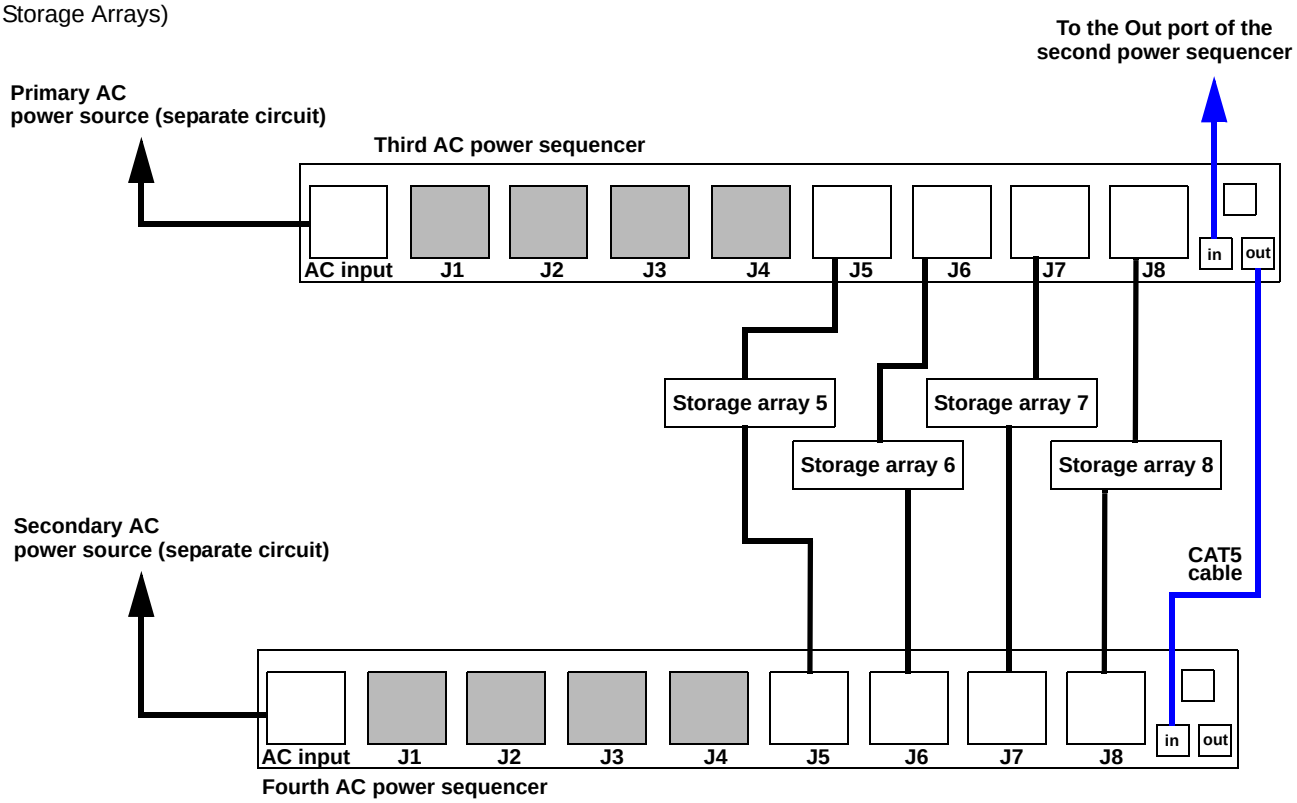
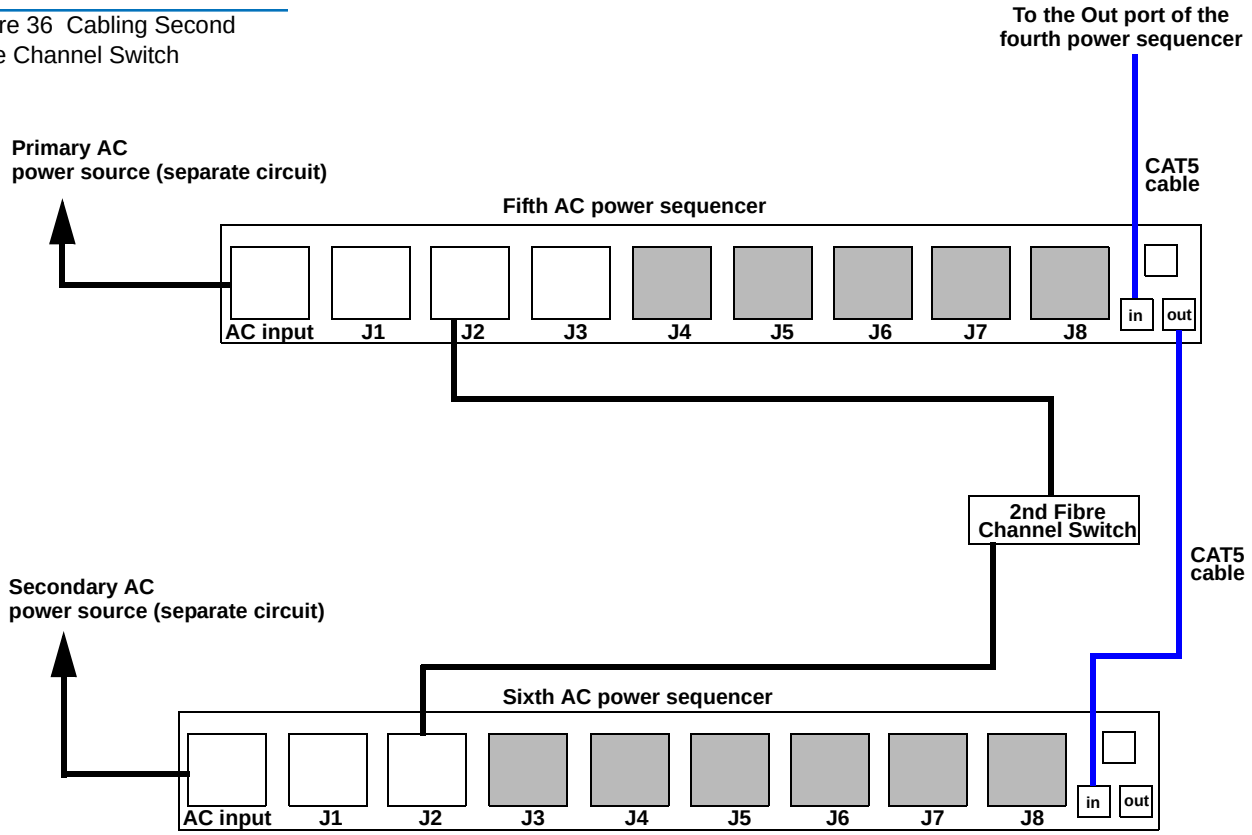


Figure 36 Cabling Second Fibre Channel Switch



Note: Connect AC inputs to an external AC power source on a dedicated circuit. Ensure that the AC inputs are secured to the power sequencers with cable retention clamps.

Figure 37 DX100 Power Cabling (Nine to Twelve Storage Arrays)

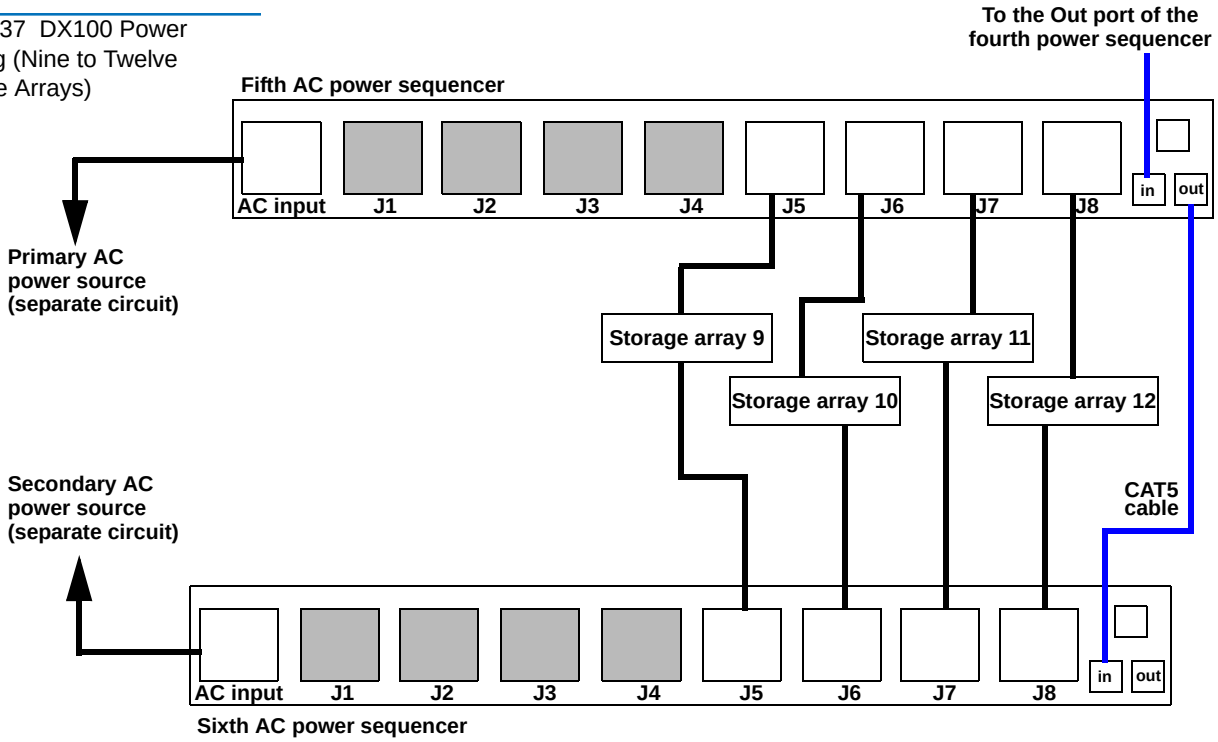
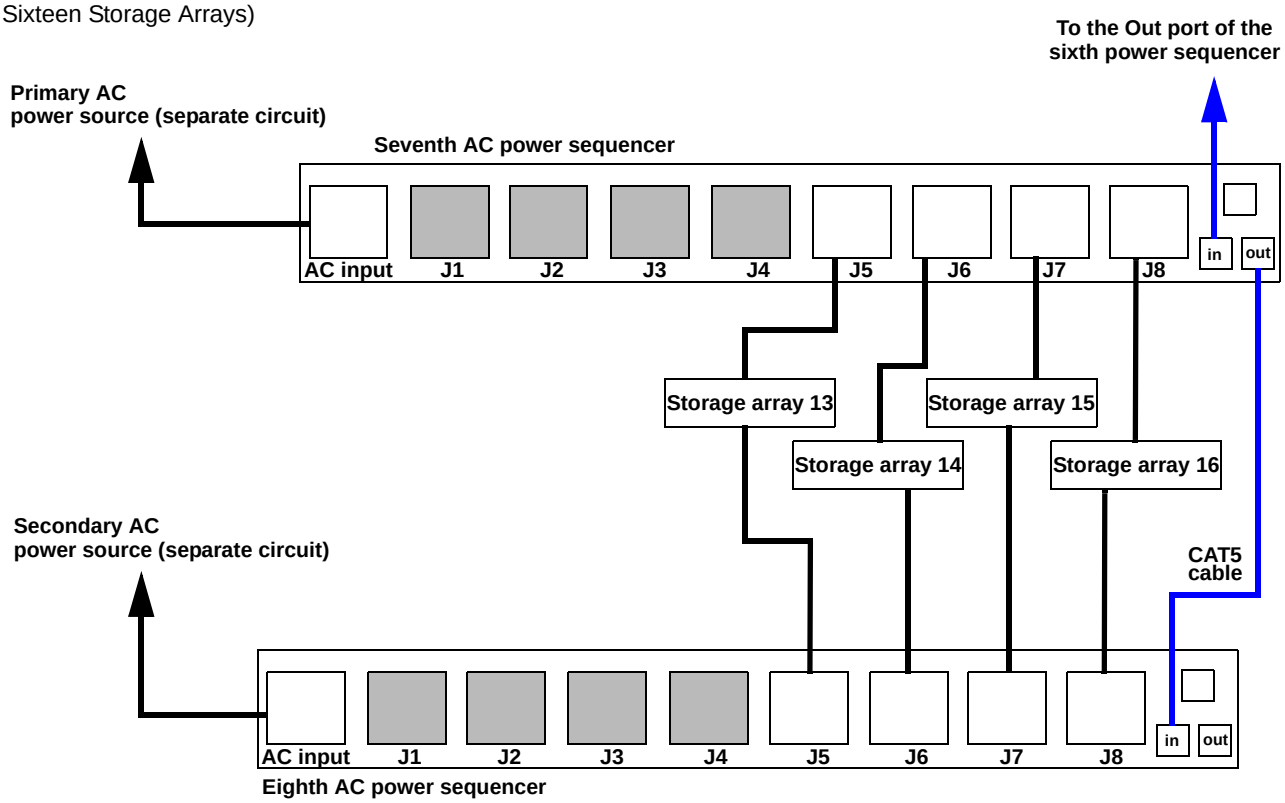


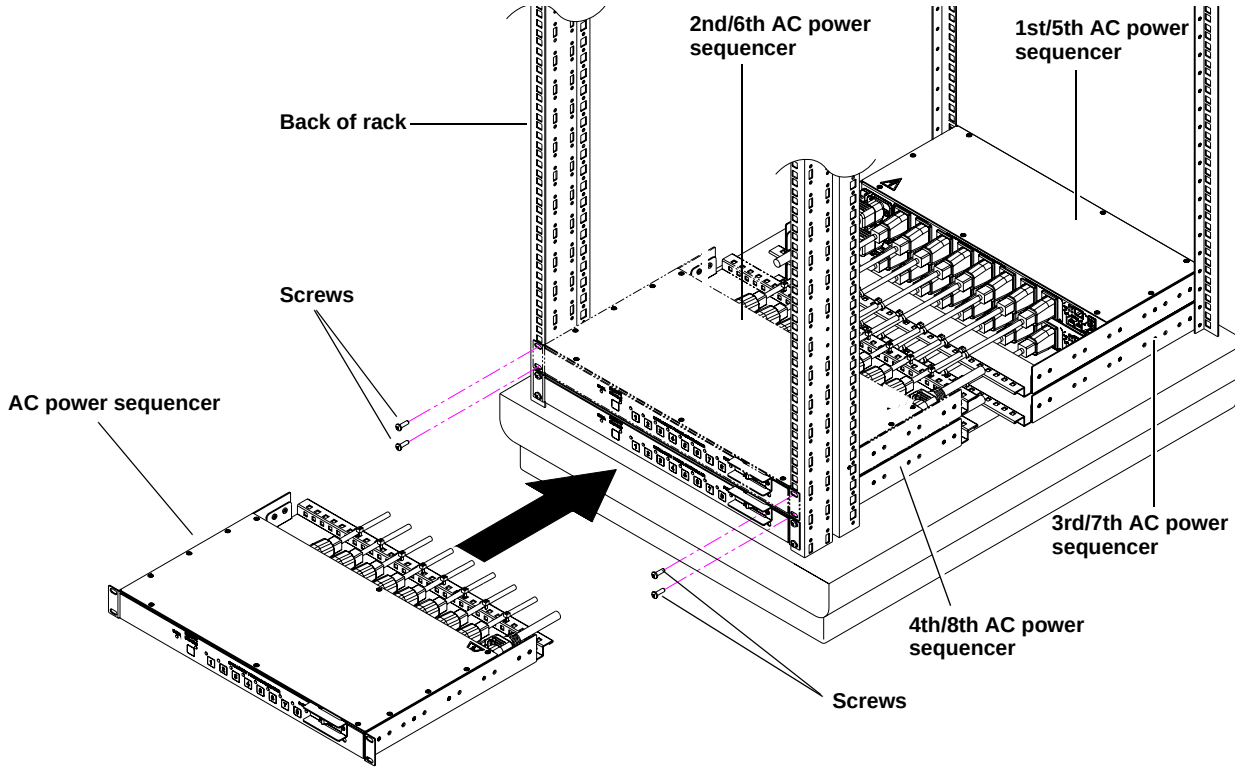
Figure 38 DX100 Power Cabling (Thirteen to Sixteen Storage Arrays)



11 Starting in the back of the rack, install the AC power sequencers with four PHILLIPS screws (two power sequencers for up to four storage arrays, four power sequencers for five to eight storage arrays, six power sequencers for up to twelve storage arrays, and eight power sequencers for thirteen to sixteen storage arrays). The first, third, fifth, and seventh AC power sequencers are installed in the front of the rack and the second, fourth, sixth, and eight AC power sequencers are installed in the back of the rack (see figure 39).

> **Note:** If you have enough space in the rack, install all of the sequencers in the front of the rack with sequencer 1 on top. This allows easier access to the power connectors.

Figure 39 Installing the AC Power Sequencers



Installing Additional Storage Arrays

To install additional storage arrays:

Note: If this is an upgrade to an existing DX-Series system, the additional storage arrays must be installed below the original DX-Series system.

1 Refer to Installing the DX-Series Storage Array on page 15.

Tech Tip: If more than two storage arrays are to be installed, start the installation with the bottom storage array and work up.

Cabling the DX-Series System

There are several possible cabling scenarios for the DX-Series system depending on the installation. Refer to the following sections for cabling examples:

- Installing the SFP Connectors
- Verifying Storage Array Dip Switches
- Cabling a DX30
- Cabling a DX100
- Power Cabling

Caution: Use extreme care when handling the LC-to-LC Fibre Channel cables. Do not pinch the cables and keep the connector ends free from debris.

Installing the SFP Connectors

Both the Fibre Channel switch and the storage array(s) need SFP (Small Form-Factor Pluggable) connectors installed prior to connecting Fibre Channel cables. The SFP connectors are located in both the Fibre Channel switch and storage array accessory kits.

Install the following SFP connectors:

1 Fibre Channel switch ports (see figure 40) that have Fibre Channel cable connections (DX100 requires four SFPs plus two for every installed storage array).

2 Storage array RAID controllers (see figure 41) that have Fibre Channel cable connections (channel 0 on the top left of the storage array and channel 1 on the upper right of the storage array).

Figure 40 Installing the SFPs in the Fibre Channel Switch (DX100 Only)

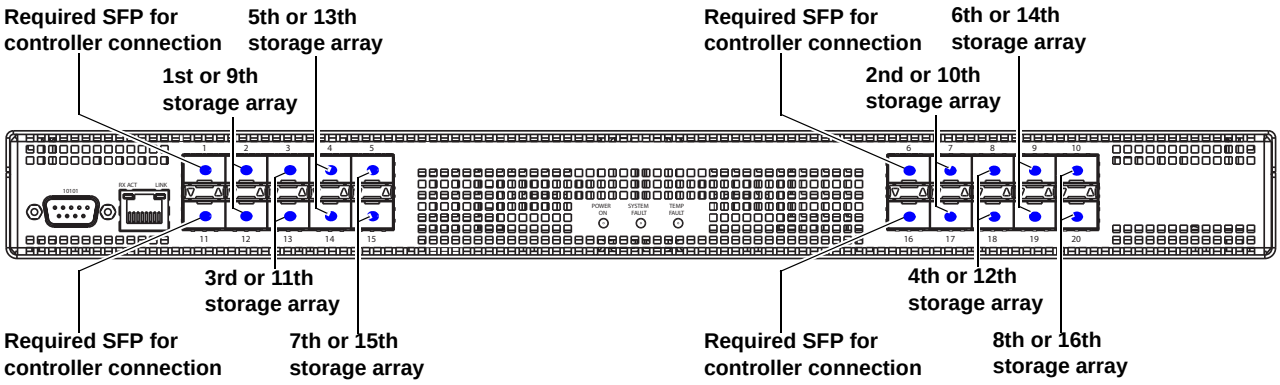
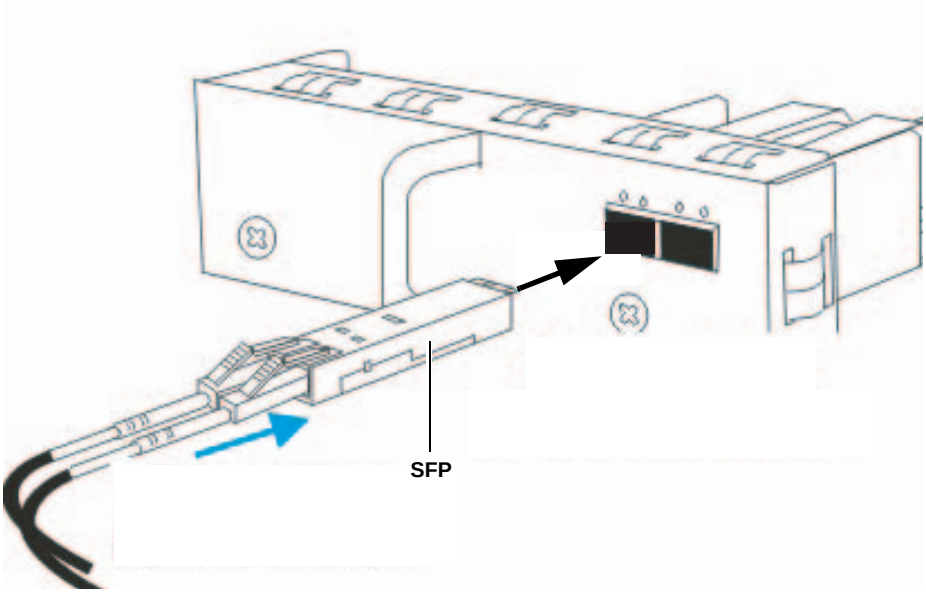


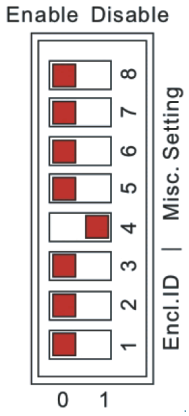
Figure 41 Installing the SFP(s) in the Connection Modules



Verifying Storage Array Dip Switches

Each storage array has a set of dip switches located on the back of the array in the upper left-hand corner. The switches are set in manufacturing, but verify the settings prior to cabling the system (see figure 42).

Figure 42 Verifying the Storage Array Dip Switches



All dip switches are enabled except for dip switch 4.

Cabling a DX30

To cable a DX30 with up to four storage arrays:

1 Connect the power cords, LC-to-LC Fibre Channel cables, and Ethernet network connection as shown in table 6 and figure 43.

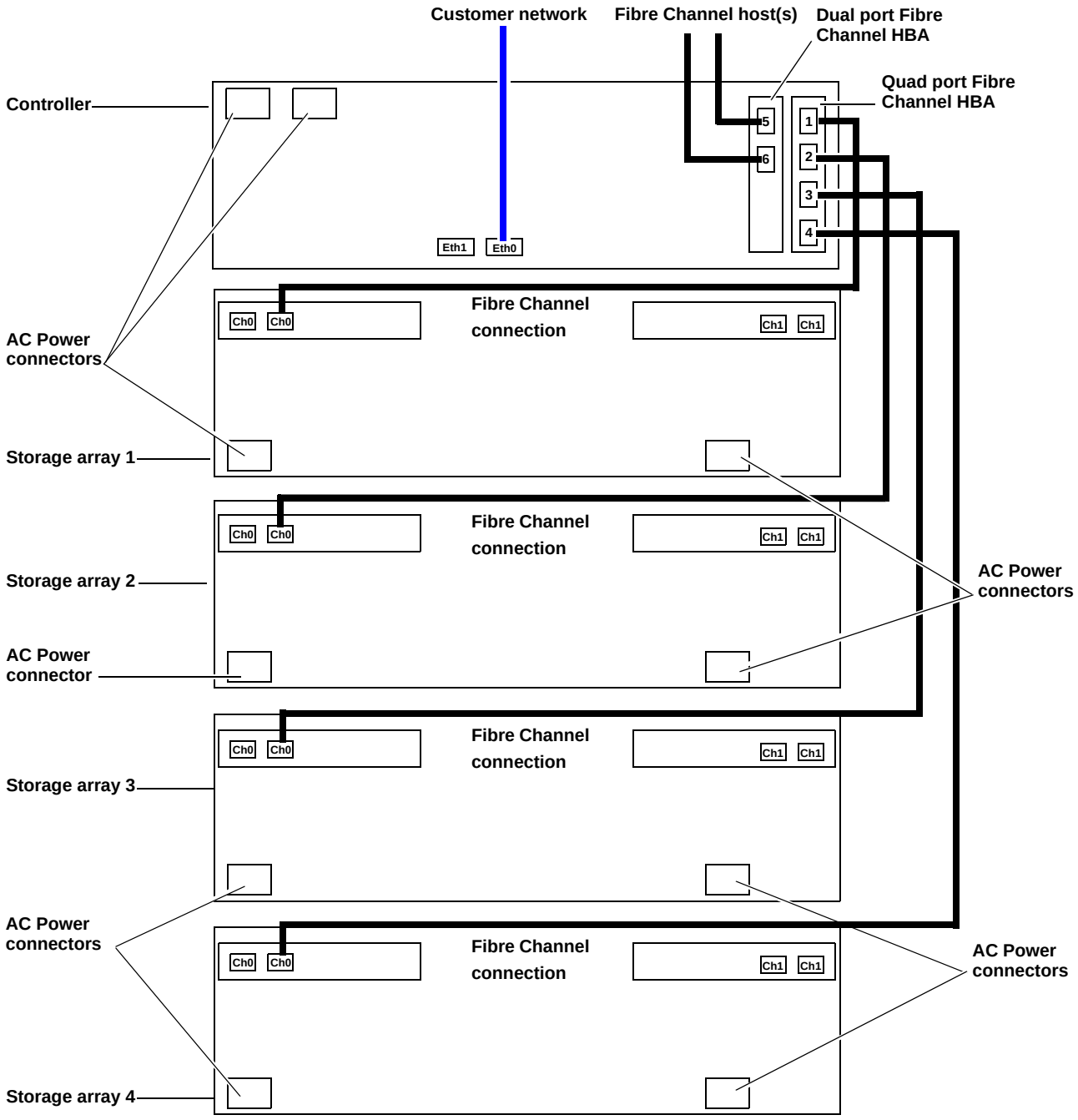
Table 6 DX30 Fibre Channel and Ethernet Cabling

Controller Connections (see figure 43)	Storage Array/Network
FC port 1	Storage array 1, FC-CH0 (right-hand port)
FC port 2	Storage array 2, FC-CH0 (right-hand port)
FC port 3	Storage array 3, FC-CH0 (right-hand port)
FC port 4	Storage array 4, FC-CH0 (right-hand port)
FC port 5	Customer FC host
FC port 6	Additional FC host
Eth0	Customer network
Eth1	Not used

Note: An additional Fibre Channel cable can be connected to port 6 on the dual port Fibre Channel HBA to support multiple customer hosts or to improve throughput capability.

Note: The medium changer (robot) and three virtual tape drives, by default, are presented on port 5 and the remaining three virtual tape drives are presented on port 6. Refer to Configuring the Fibre Channel Settings on page 75 for a description of how to re-map the devices to Fibre Channel ports.

Figure 43 Connecting the DX30 Cables (Four Storage Arrays)



Cabling a DX100

To cable a DX100 system:

1 Connect the power cords, LC-to-LC Fibre Channel cables, and Ethernet network connection for the controller and storage arrays as shown in table 7, table 8, table 9 and figure 44, figure 45, figure 46, and figure 47. Refer to figure 34 and figure 35 for AC power connections.

Table 7 DX100 Fibre Channel and Ethernet Cabling (Controller to FC Switch)

Controller Connections (see figure 44)	FC Switch/Network
FC port 1	FC Switch 1, port 1
FC port 2	FC Switch 2, port 1 (9 to 16 arrays only)
FC port 3	FC Switch 2, port 11 (9 to 16 arrays only)
FC port 4	FC Switch 1, port 11
FC port 5	Customer FC host
FC port 6	Additional FC hosts
FC port 7	
FC port 8	
FC port 9	
FC port 10	
FC port 11	
FC port 12	
FC port 13	FC Switch 1, port 6
FC port 14	FC Switch 2, port 6 (9 to 16 arrays only)
FC port 15	FC Switch 2, port 16 (9 to 16 arrays only)
FC port 16	FC Switch 1, port 16
Eth0	Customer network
Eth1	Ethernet switch

Note: Additional Fibre Channel cables can be connected to ports 6 through 12 on the dual port Fibre Channel HBAs to support multiple customer hosts or to improve throughput capability.

Note: The medium changer (robot) and three virtual tape drives, by default, are presented on port 5 and the remaining three virtual tape drives are presented on port 6. Refer to Configuring the Fibre Channel Settings on page 75 for a description of how to re-map the devices to Fibre Channel ports.

Table 8 DX100 Fibre Channel and Cabling (Storage Arrays 1 through 8)

Connection	From:	To:
Storage array 1	Primary connection module FC- Ch0 (right-hand port)	FC switch 1, port 2
	Secondary connection module FC- Ch1 (left-hand port)	FC switch 1, port 12
Storage array 2	Primary connection module FC- Ch0 (right-hand port)	FC switch 1, port 7
	Secondary connection module FC- Ch1 (left-hand port)	FC switch 1, port 17
Storage array 3	Primary connection module FC- Ch0 (right-hand port)	FC switch 1, port 3
	Secondary connection module FC- Ch1 (left-hand port)	FC switch 1, port 13
Storage array 4	Primary connection module FC- Ch0 (right-hand port)	FC switch 1, port 8
	Secondary connection module FC- Ch1 (left-hand port)	FC switch 1, port 18
Storage array 5	Primary connection module FC- Ch0 (right-hand port)	FC switch 1, port 4
	Secondary connection module FC- Ch1 (left-hand port)	FC switch 1, port 14
Storage array 6	Primary connection module FC- Ch0 (right-hand port)	FC switch 1, port 9
	Secondary connection module FC- Ch1 (left-hand port)	FC switch 1, port 19
Storage array 7	Primary connection module FC- Ch0 (right-hand port)	FC switch 1, port 5
	Secondary connection module FC- Ch1 (left-hand port)	FC switch 1, port 15

Connection	From:	To:
Storage array 8	Primary connection module FC- Ch0 (right-hand port)	FC switch 1, port 10
	Secondary connection module FC- Ch1 (left-hand port)	FC switch 1, port 20

Table 9 DX100 Fibre Channel and Cabling (Storage Arrays 9 through 16)

Connection	From:	To:
Storage array 9	Primary connection module FC- Ch0 (right-hand port)	FC switch 2, port 2
	Secondary connection module FC- Ch1 (left-hand port)	FC switch 2, port 12
Storage array 10	Primary connection module FC- Ch0 (right-hand port)	FC switch 2, port 7
	Secondary connection module FC- Ch1 (left-hand port)	FC switch 2, port 17
Storage array 11	Primary connection module FC- Ch0 (right-hand port)	FC switch 2, port 3
	Secondary connection module FC- Ch1 (left-hand port)	FC switch 2, port 13
Storage array 12	Primary connection module FC- Ch0 (right-hand port)	FC switch 2, port 8
	Secondary connection module FC- Ch1 (left-hand port)	FC switch 2, port 18
Storage array 13	Primary connection module FC- Ch0 (right-hand port)	FC switch 2, port 4
	Secondary connection module FC- Ch1 (left-hand port)	FC switch 2, port 14
Storage array 14	Primary connection module FC- Ch0 (right-hand port)	FC switch 2, port 9
	Secondary connection module FC- Ch1 (left-hand port)	FC switch 2, port 19
Storage array 15	Primary connection module FC- Ch0 (right-hand port)	FC switch 2, port 5
	Secondary connection module FC- Ch1 (left-hand port)	FC switch 2, port 15

Connection	From:	To:
Storage array 16	Primary connection module FC- Ch0 (right-hand port)	FC switch 2, port 10
	Secondary connection module FC- Ch1 (left-hand port)	FC switch 2, port 20

Figure 44 Connecting the DX100 Cables (Eight Storage Arrays 1-4 shown)

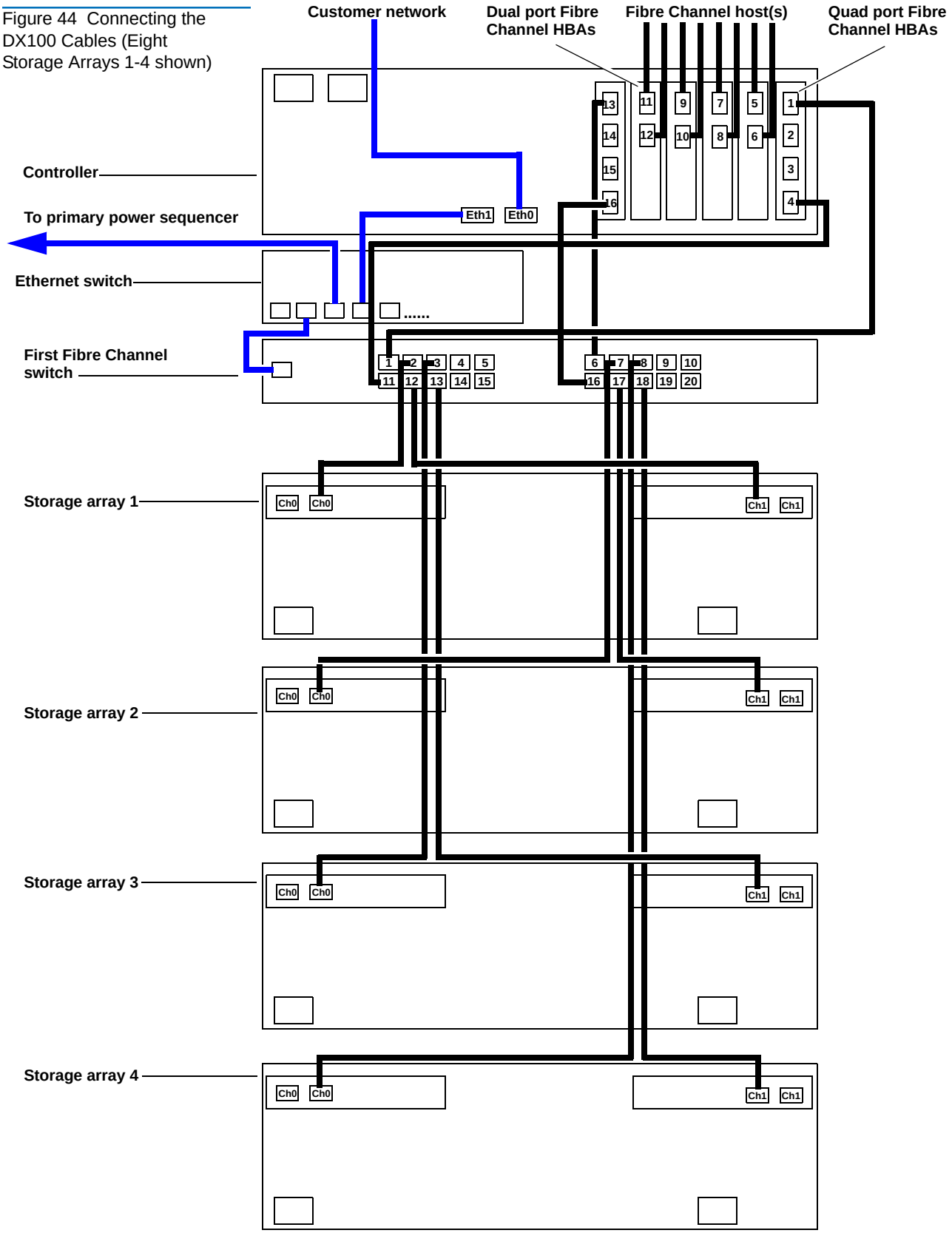


Figure 45 Connecting the DX100 Cables (Eight Storage Arrays 5-8 shown)

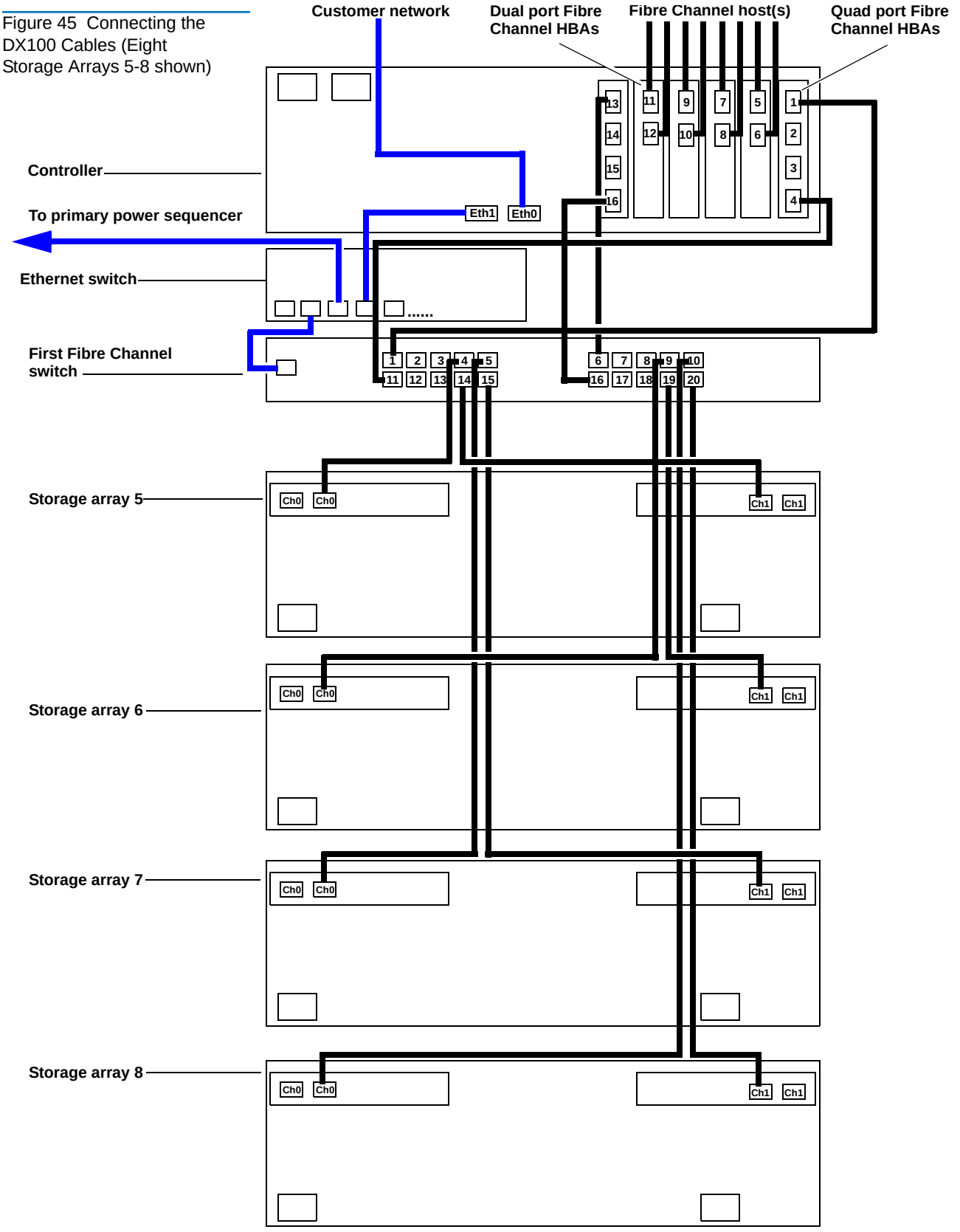


Figure 46 Connecting the DX100 Cables (Sixteen Storage Arrays 9-12 shown)

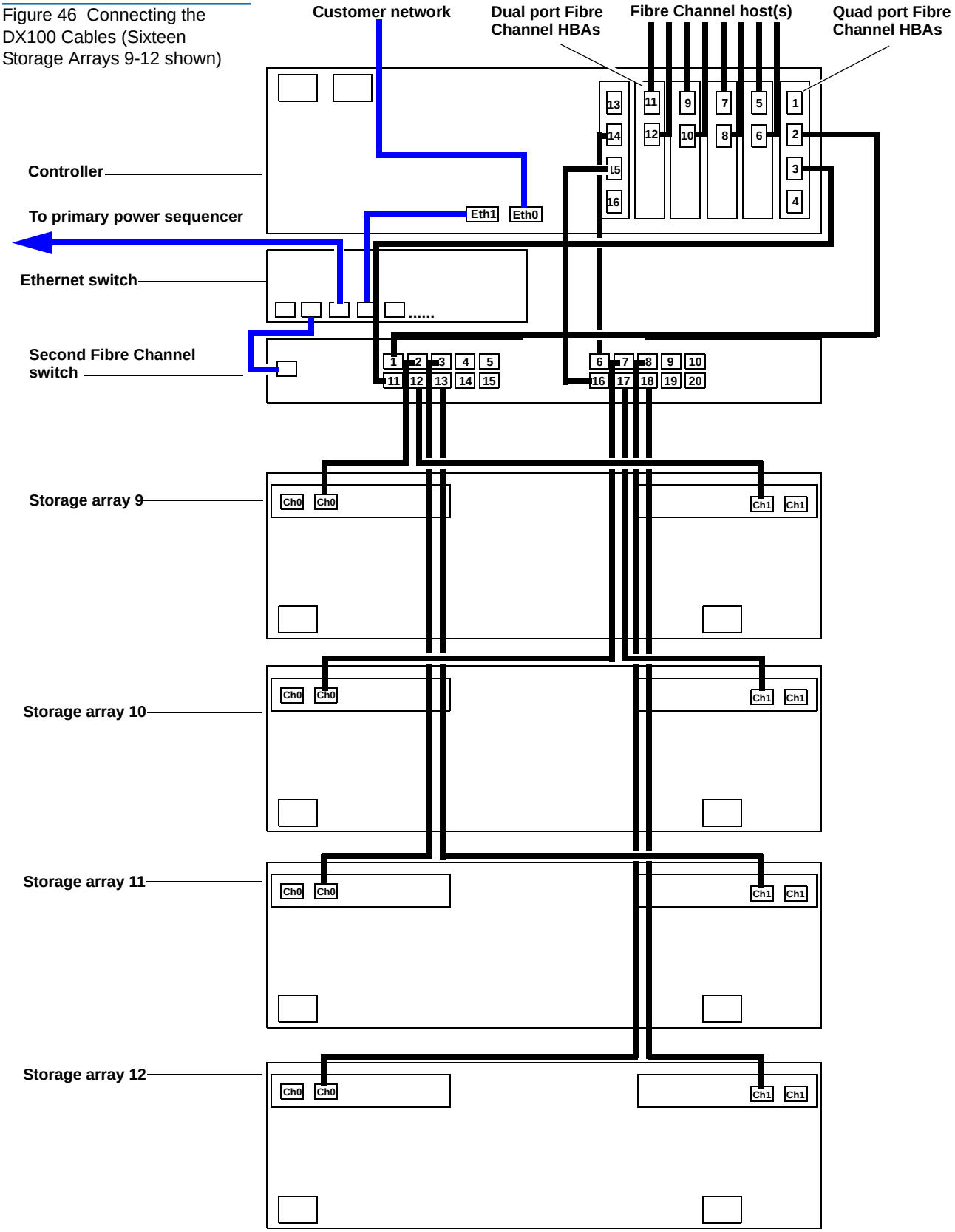
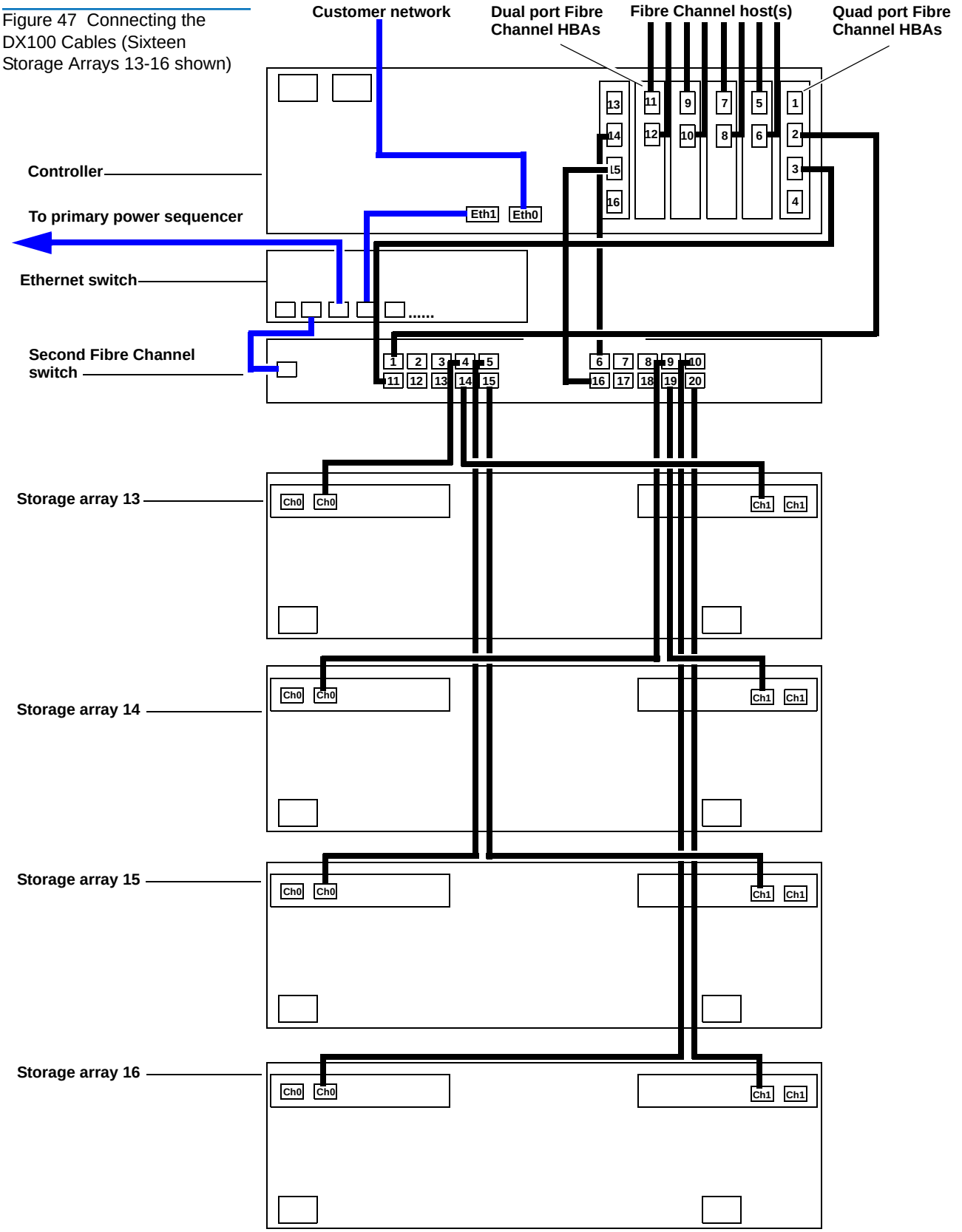


Figure 47 Connecting the DX100 Cables (Sixteen Storage Arrays 13-16 shown)



Power Cabling

The procedure for connecting the power cables differs depending on the DX-Series system being installed. Refer to the following sections for your particular installation:

- DX30 Power Cabling
- DX100 Power Cabling

DX30 Power Cabling

The DX30 system does not require any additional power supply equipment. Simply connect the DX30 system AC power connectors (two for the controller and two per storage array) to available grounded outlets using the power cords supplied in the accessory kits.

DX100 Power Cabling

The DX100 system requires additional AC power sequencers to provide power to the system.

- Two AC power sequencer are required for one to four storage arrays.
- Four AC power sequencers are required for five to eight storage arrays.
- Six AC power sequencers are required for nine to twelve storage arrays.
- Eight AC power sequencers are required for thirteen to sixteen storage arrays.

See Cabling and Installing the AC Power Sequencer on page 32 for information on DX100 power cabling.

Configuring the DX-Series System

After all components of the DX-Series system are installed in the rack, the controller must be configured with network information.

Configuring the DX-Series system consists of the following steps:

- Turning On the DX-Series System
- Initially Configuring the DX-Series System
- Accessing the DX-Series Controller
- Adding a Partition
- Configuring the Network Information
- Configuring the Date and Time
- Configuring the Security Options
- Configuring the Fibre Channel Settings
- Configuring the Email Settings

- Configuring the SNMP Settings
- Enabling Fibre Channel Compression
- Saving the DX-Series Configuration File
- Restarting the System

Turning On the DX-Series System

The power on procedure differs depending on the DX-Series system (DX30 or DX100). Refer to the following section to turn on the DX-Series system:

Caution: If you need to reconfigure the RAID sets on the storage arrays, refer to the *Quantum DX-Series Field Service Manual* PN6513503. The RAID configuration MUST be set prior to powering on the DX-Series system.

- Turning on the DX30
- Turning on the DX100

Turning on the DX30

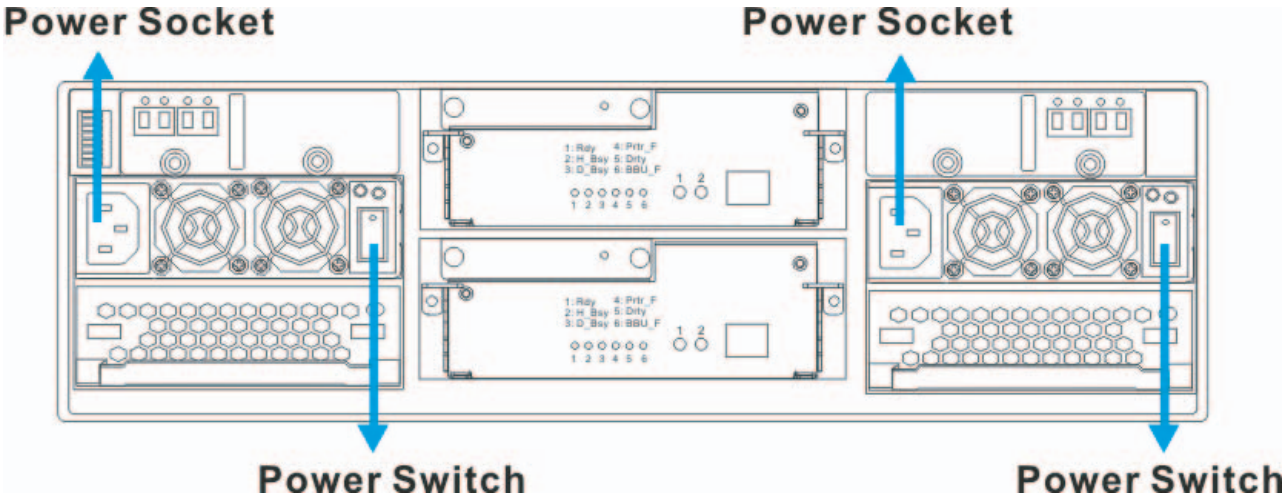
The DX30 components must be turned on in the following order:

- DX-Series storage array(s)
- DX-Series controller

To turn on the DX-Series system:

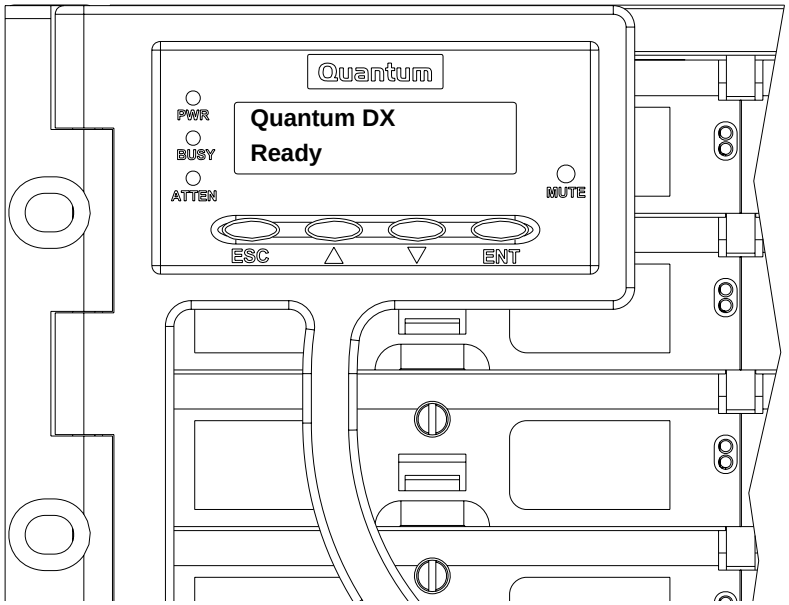
1. Turn on both power switches on all DX-Series storage arrays (see figure 48).

Figure 48 DX-Series Storage Array Power Switches



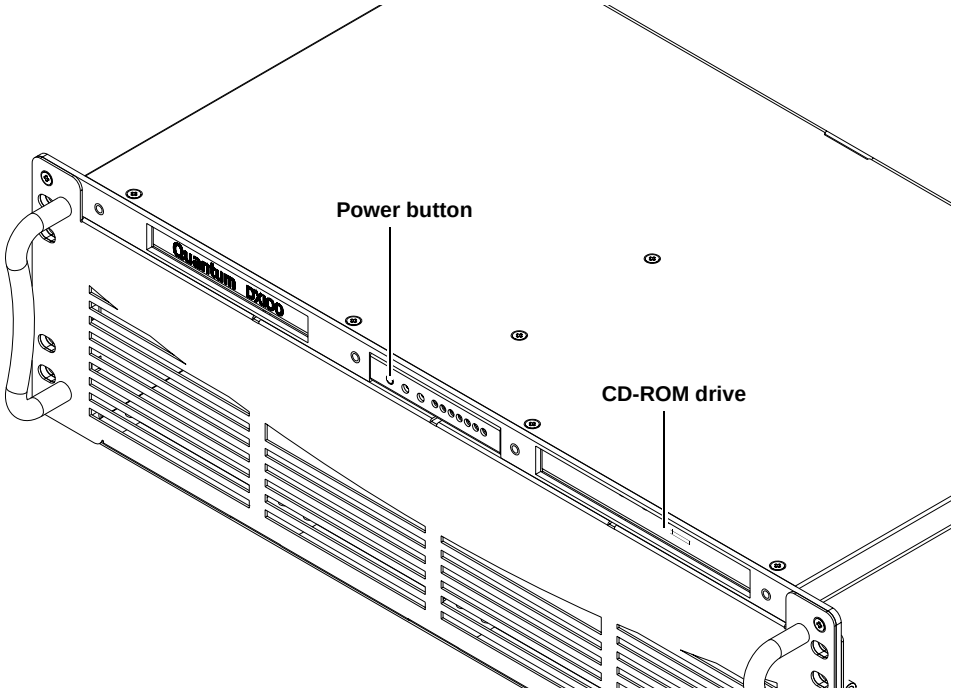
During the DX-Series storage array power on sequence, the LCD screen will indicate that the array is starting up. When all tests are completed, the LCD will display **Quantum DX** and **Ready** (see figure 49).

Figure 49 Storage Array LCD Display



2 Turn the DX-Series controller on by pushing the power button located on the front of the unit (see figure 50).

Figure 50 Turning on the DX-Series Controller



The controller boots. Continue with Configure Service Options on page 58.

Turning on the DX100

The DX100 must be powered on in the following sequence:

- Turn on both power switches on the storage arrays and controller (they will not power on yet, but will power on automatically)
- Turn on the circuit breakers of the AC power sequencers
- Wait for all of the storage arrays to become ready

Note: The system during the initial discovery process takes up to 3 minutes per storage array to become ready. Subsequent boots during normal operation will take up to 10 seconds per array to become ready. The system is ready when all connected ports on the Fibre Channel switch show a green status.

Tech Tip: If you have already established a HyperTerminal connection with the controller before powering on the controller (see Connecting to the DX-Series Controller), the following text will display:

- Checking FC Switch Configuration
- Checking Power Sequencer Configuration
- Setting Sequencer Configuration
- Configuration Updated, Rebooting
- Checking FC Switch Configuration
- Checking Power Sequencer Configuration

Initially Configuring the DX-Series System

Before you can access the web management pages from the DX-Series controller, you must initially configure the system with an IP address and other network information as well as create cartridges on all connected storage arrays.

Initially configuring the DX-Series consists of the following steps:

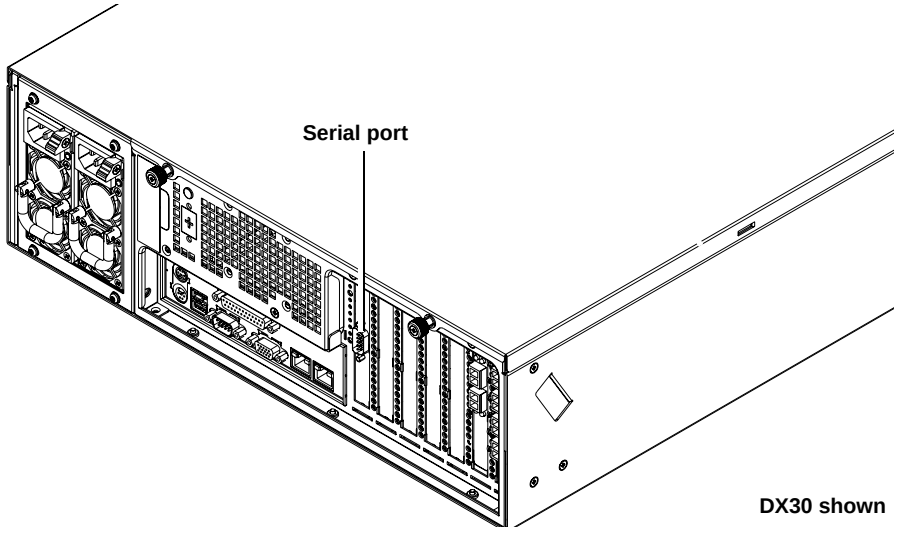
- Connecting to the DX-Series Controller
- Configure Service Options
- Configuring User Options
- Creating Cartridges
- Updating Device Firmware
- Running the Collect Script (Recommended)

Connecting to the DX-Series Controller

To initially configure the DX-Series system:

1. Connect a 9-pin RS-232 null modem cable to the COM port in the left-most PCI slot the back of the DX-Series controller and to a COM port on the service PC (see figure 51).

Figure 51 Connecting the Service PC to the DX-Series Controller



2. Open a HyperTerminal window on the service PC and set the following properties:
   - Baud rate 115200
   - Data bits 8
   - Parity none
   - Stop bits 1
   - Flow control none
   - Emulation ANSI

Configure Service Options

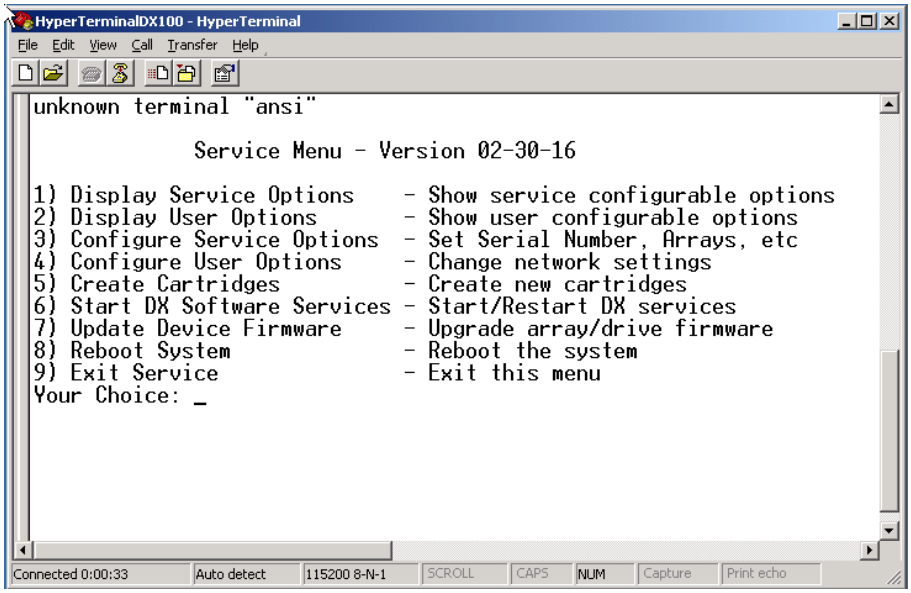
To configure the service options:

1. Press <Enter> to access the command prompt.
2. At the command prompt, type `service` and press <Enter>.

   The system prompts you for a password.
3. Type the <service password> and press <Enter>.

   The system displays the DX-Series Service Menu (see figure 52).

Figure 52 DX-Series Service Menu



4 Type 3 and press <Enter>.

The system prompts you to enter a serial number.

5 Enter the system serial number and press <Enter>.

> **Note:** The serial number insert is in the Read Me First packet attached to the outside of the box.

The system prompts you to enter the number of licensed storage arrays.

6 Enter the number of licensed storage arrays and press <Enter>.

The system prompts you to confirm the service options.

7 Type y and press <Enter> to accept the service options.

The service options are saved and will take effect after the next reboot. Continue with Configuring User Options.

Configuring User Options

To configure user options:

1 Type 4 (see figure 52) and press <Enter> to configure the user options.

2 The system prompts you to enter the following information:

- System Hostname
- System IP Address
- Network Mask
- Network Gateway IP Address
- Network Domain Name
- Network DNS IP Address
- Network Link Speed and Duplex Mode

> **Note:** All default values are shown in [].

> **Note:** Do not use an IP address in the range of 192.168.xx since that address is reserved for the internal control network among the DX100 controller, Fibre Channel switch, and AC power sequencers.

The system displays the information and asks for confirmation.

3 Type y and press <Enter>.

4 The system saves the user options. Press <Enter> to display the Service Menu and continue with Creating Cartridges.

Creating Cartridges

Before you can backup data to the DX-Series system, you must create tape cartridges on the storage array(s).

> **Note:** All of the storage arrays must be on before creating cartridges.

To create cartridges on the storage array(s):

> **Caution:** Creating cartridges will destroy all data on existing storage array cartridges.

1 Select 5 from the **Service Menu** (see figure 52) to create cartridges.

2 The system warns you that creating cartridges will destroy any existing cartridge data and prompts you to continue. Type y and the system services are shut down.

The cartridge creation process asks you to make the following selection:

- Type 1 to create cartridges on ALL storage arrays.

- Type 2 to create cartridges on a SPECIFIED storage array.

> **Caution:** If this is an upgrade to an existing system, create cartridges ONLY on the new storage arrays.

- Type 3 to create cartridges on a specified RAID set.
- Type 4 to exit create cartridges.

3 The system confirms your choice and asks for verification. Type y to continue.

4 Enter the starting cartridge barcode and press <Enter>.

> **Note:** The barcode format must be AANNNN, where A is any uppercase alpha-numeric character and N is any single digit (0-9). Barcodes automatically increment.

The system indicates partitioning and formatting for each RAID set on the storage arrays.

5 The system asks how you wish to create cartridges, by quantity or capacity:

> **Note:** Creating cartridges differs depending on the size of the hard drives (250GB, 400GB, or 500GB).

For 250GB Drives:

a If you select **By quantity**, you can create between 1 and 80 cartridges per RAID set. The capacity decreases the more tape cartridges you create. For example, if you select 1 tape cartridge per RAID set, each cartridge has approximately 1.7 TB (1.45 TB for the second RAID set) in capacity. If you select 80 tape cartridges, each cartridge has 20 GB capacity.

b If you select **By capacity**, you choose between 20 and 1700 GB (43 and 1450 for second RAID set) capacity per cartridge. The number of cartridges decreases with higher capacity per cartridge. For example, if you select 20 GB per cartridge, the number of cartridges per RAID set is 80. If you select 1700 GB per cartridge, the number of cartridges per RAID set is 1.

> **Note:** The capacity estimates mentioned in the examples above assume a RAID 5 configuration on the storage array with "global hot" spare. If a "global hot" spare is not used, the total capacity is increased by 250GB. If two "global hot" spares are used, the total capacity is decreased by 250GB.

For 400GB Drives:

a If you select **By quantity**, you can create between 1 and 80 cartridges per RAID set. The capacity decreases the more tape cartridges you create. For example, if you select 1 tape cartridge per RAID set, each cartridge has approximately 1.7 TB (1.45 TB for the second RAID set) in capacity. If you select 80 tape cartridges, each cartridge has 20 GB capacity.

b If you select **By capacity**, you choose between 20 and 1700 GB (43 and 1450 for second RAID set) capacity per cartridge. The number of cartridges decreases with higher capacity per cartridge. For example, if you select 20 GB per cartridge, the number of cartridges per RAID set is 80. If you select 1700 GB per cartridge, the number of cartridges per RAID set is 1.

> **Note:** The capacity estimates mentioned in the examples above assume a RAID 5 configuration on the storage array with "global hot" spare. If a "global hot" spare is not used, the total capacity is increased by 400GB. If two "global hot" spares are used, the total capacity is decreased by 400GB.

For 500GB Drives:

a If you select **By quantity**, you can create between 1 and 80 cartridges per RAID set. The capacity decreases the more tape cartridges you create. For example, if you select 1 tape cartridge per RAID set, each cartridge has approximately 1.7 TB (1.45 TB for the second RAID set) in capacity. If you select 80 tape cartridges, each cartridge has 20 GB capacity.

b If you select **By capacity**, you choose between 20 and 1700 GB (43 and 1450 for second RAID set) capacity per cartridge. The number of cartridges decreases with higher capacity per cartridge. For example, if you select 20 GB per cartridge, the number of cartridges per RAID set is 80. If you select 1700 GB per cartridge, the number of cartridges per RAID set is 1.

> **Note:** The capacity estimates mentioned in the examples above assume a RAID 5 configuration on the storage array with "global hot" spare. If a "global hot" spare is not used, the total capacity is increased by 500GB. If two "global hot" spares are used, the total capacity is decreased by 500GB.

6 The cartridges are created on the storage arrays. Press <Enter> to continue.

The **Service Menu** displays.

7 Type 6 to restart DX software services.

> **Note:** Restarting DX software services will NOT reboot the DX-Series system.

Updating Device Firmware

To ensure that the DX-Series storage array and hard drives contain the most up-to-date firmware, the **Service Menu** provides an option to update this firmware.

To update the storage array and hard drive firmware:

1 Type 7 (see figure 52) and press <Enter> to update the firmware.

> **Note:** Ensure that the Setup CD is inserted in the DX-Series controller CD-ROM drive.

The system prompts you if the storage arrays or hard drives require firmware updates. You have the following options:

a If the storage arrays and hard drives contain the most up-to-date firmware, no further action is required and the **Service Menu** displays.

b If any devices require firmware updates, you will be prompted as follows:

- # storage array(s) require updates. Do you wish to update? (y/n)

  Type Y and press <Enter> to update the storage array firmware. After the storage arrays are updated, the update process continues:

- # hard drive(s) require updates. Do you wish to update? (y/n)

  Type Y and press <Enter> to update the hard drive firmware. After all hard drives are updated, the **Service Menu** displays.

> **Note:** The entire update process can take up to 12 minutes depending on the number of arrays and hard drives in the system. If the system hangs during the update process, manually power down the system and turn it back on. Repeat the firmware update procedure.

Running the Collect Script

The collect script is included in the DX-Series controller software. It collects status information from the controller and the array so it can be analyzed by Quantum. It is recommended that you run a collect script prior to leaving the customer site.

1. When prompted for a login, enter serviceshell and the <service password> for the password.

   Note: Passwords are case sensitive.

2. From the **Transfer** menu at the top of Hyper Terminal, select the **Capture Text...**
3. Enter a file name and click **Start**.
4. At the command prompt, type /hurricane/collect and press <Enter>.
5. After the command has executed, select **Stop** from the **Capture Text** menu.

   The DX-Series system is now initially configured and ready to be accessed via the management web pages. Disconnect the cable from the DX-Series controller serial port.

Accessing the DX-Series Controller

Accessing the DX-Series controller consists of the following steps:

- Setting Up the Service PC
- Connecting the Service PC to the Network

Setting Up the Service PC

To setup the service laptop to communicate with the DX-Series system:

1. From Windows desktop, right-click on **Network Neighborhood**.
2. Under the **Protocols** tab, highlight the TCP/IP adapter.
3. Click **Properties**.
4. Set the IP address so that the last digit of the address is one number less than the active IP address.

   Example: If the active IP address is 192.168.54.45, set the TCP/IP properties IP address to 192.168.54.44.
5. Set the network mask to 255.255.255.0
6. Set the Default Gateway (if necessary) so that the last digit of the active IP address is 1.

   Example: If the active IP address is 192.168.54.45, set the default gateway to 192.168.54.1. Click Apply.

   Reboot the service laptop.

Connecting the Service PC to the Network

1 Connect the service PC to the network switch on the same subnet as the DX-Series controller with an Ethernet cable.

> **Note:** You can also directly connect the service PC to Eth0 on the DX-Series controller using a cross-over cable.

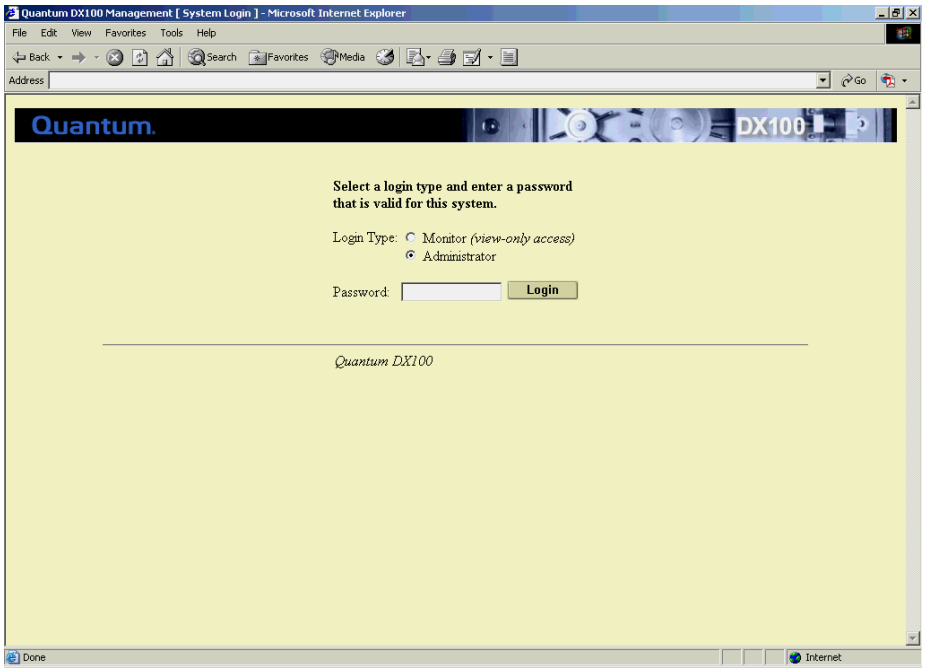
2 On the service PC, open the Internet browser software.

> **Note:** If Internet Explorer is the default browser on the client system:
>
> - The latest security updates for Microsoft VM (virtual machine) must be installed on the client system.
> - The security settings must be set no higher than "medium". If the settings are set to "high security", the browser will not be able to login to the DX-Series system since the system needs write access to the client.
> - The "Play animations in web pages" item in the Internet Options/Advanced/Multimedia menu must be enabled.

3 In the **Address** field, enter the DNS name or IP address configured in Configuring User Options on page 59.

The **Log In** screen displays (see figure 53):

Figure 53 Log In Screen



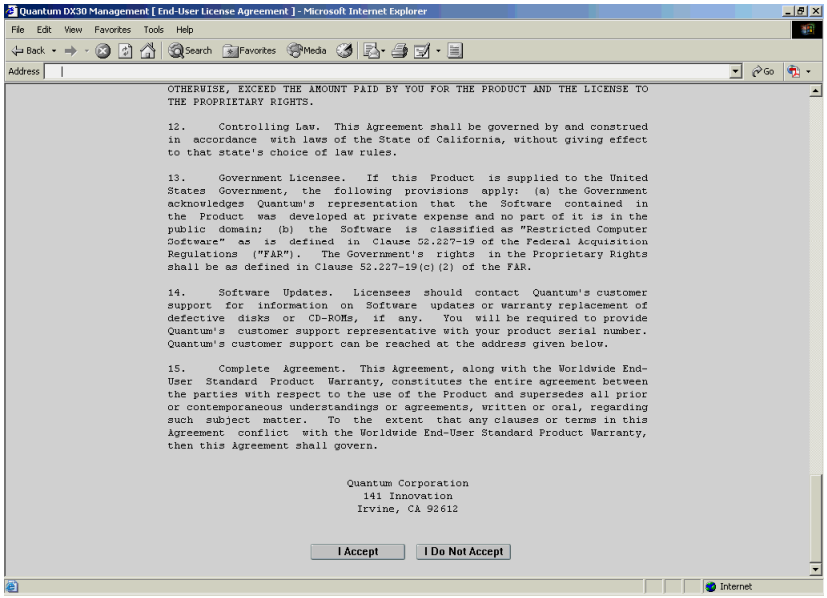
4 Select **Administrator** and type *password* as the default password.

> **Note:** The passwords must be lower case and limited to 15 characters. Commas (,) and percent signs (%) are NOT valid characters.

5 Click **Login**.

The License page displays (see figure 54).

Figure 54 License Page

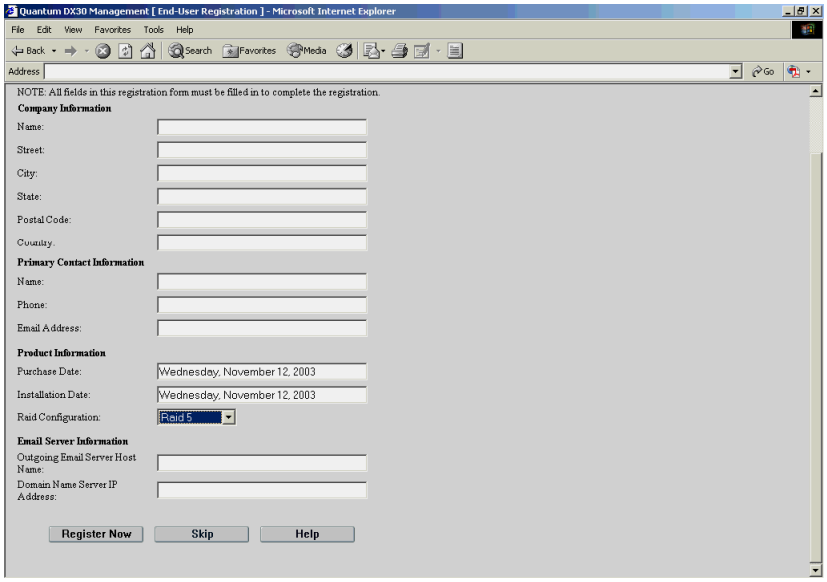


6 After the customer has read and agreed to the license agreement, press **I Accept**.

> **Note:** If the customer does NOT accept the license agreement, the DX-Series system will not function.

The **Registration** page displays (see figure 55).

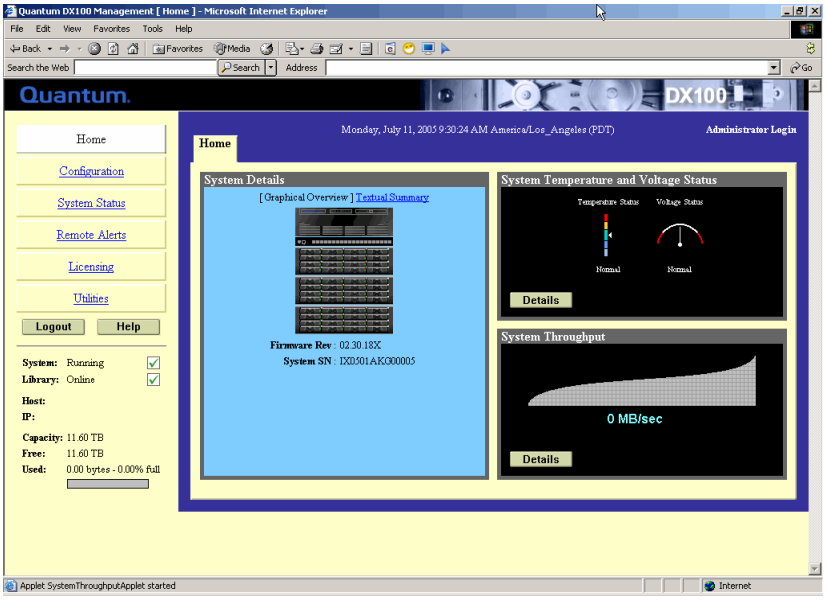
Figure 55 Registration Page



The registration information is sent to Quantum to allow the DX-Series system to be easily serviced and maintained. If you do not want to register on-line, press **Skip**, then fill out and mail the warranty card included in the DX-Series accessory kit.

The **Home** page displays (see figure 56)

Figure 56 Home Screen



Note: The number of storage arrays displayed in the **Home** screen changes depending on the number of arrays configured during Initially Configuring the DX-Series System on page 57.

Adding a Partition

Partitioning provides the capability to divide the DX-Series virtual tape drives and storage elements into separate partitions, usable by separate host computers on the same network. The **Partitions** page contains a list of unassigned tape drives and cartridges as well as all user defined partitions currently configured on the system. This page also contains the ability to add, edit, and delete partitions.

At least one partition must be created on the DX-Series system. Up to eight partitions can be added to a DX30 system and up to thirty two partitions can be added to a DX100 system.

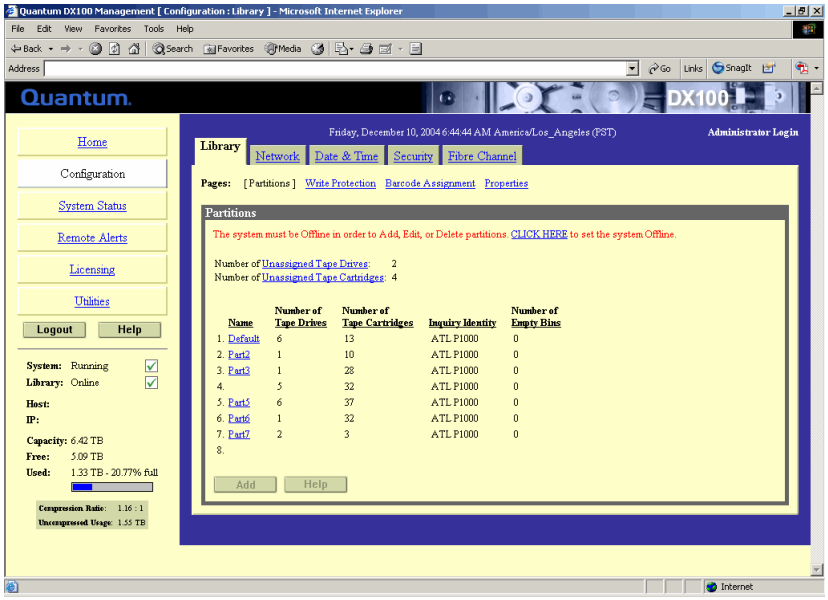
> **Caution:** Ensure that your backup package is properly configured for the correct number of tape drives emulated in the DX-Series system partition. Failure to do so may cause your backup application to malfunction or cease to operate.

To add a partition:

1. Turn the DX-Series system offline from the **Utilities** page prior to adding a partition.
2. lick **Configuration** to add a partition to the system.

   The **Configuration** page displays (see figure 57).

Figure 57 Configuration Page

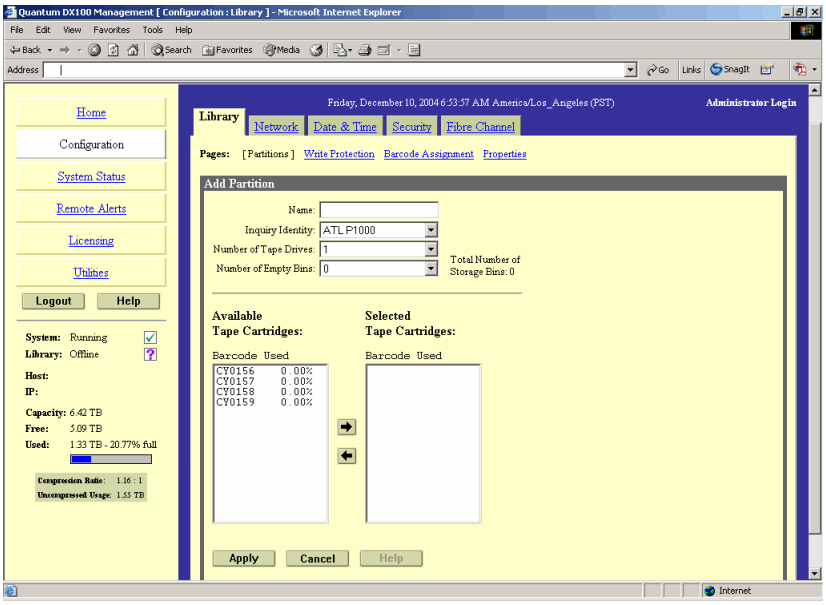


3. Click **Add** to add a partition to the system.

> **Note:** To add, edit, or delete a partition, the system must be offline.

The **Add Partition** page displays (see figure 57).

Figure 58 Adding a Partition



4 Enter a library name that identifies the partition so it can be distinguished from other partitions on the DX-Series system.

> **Note:** The partition name is independent of the host name in the **Network** tab (see Configuring the Network Information on page 70).

5 Select the inquiry identity to determines the inquiry string returned from the DX-Series system. If you select **ATL P1000**, the DX-Series appears as an ATL P1000 to the host and backup application. If you select **Quantum DX30** or **Quantum DX100**, the host and backup application recognize the device as a **Quantum DX30** or **Quantum DX100** respectively.

> **Note:** Quantum recommends that the device configuration be set to **ATL P1000** unless your specific backup application supports the DX-Series inquiry strings. If your backup application does support DX30 and DX100, you should select that setting for improved performance.

6 Select the number of tape drives (emulated DLT7000) available to the host and backup application in this partition. The Default partition contains 6 tape drives at the time of installation, however, you can change the number of drives (DX30 up to 30 tape drives; DX100 up to 55 tape drives).

> **Note:** If all tape drives are assigned to other partitions, you must unassign one or more tape drives to make them available for a new partition. Be aware that in a DX30, all tape drives are assigned to the Default partition at the time of installation.

7 Enter the number of empty bins available in addition to the number of cartridges created in the partition. The default number of empty bins is 0 and up to 28 empty bins can be selected.

8 Select the number of tape cartridges from the **Available Tape Cartridge** list and click the right arrow button to move the cartridges into the partition.

> **Note:** If all tape cartridges are assigned to other partitions, you must unassign one or more tape cartridges to make them available for a new partition. Be aware that all cartridges that were created at the time of installation are assigned to the Default partition.

9 Click **Apply** to create the partition.

Map the Fibre Channel ports as described in Configuring the Fibre Channel Settings on page 75.

10 Return the DX-Series system to the online state from the **Utilities** page.

The partition is added to the partition list. To add another partition, repeat this procedure.

> **Note:** For more information on adding, editing, or deleting a partition, see the *DX-Series User's Guide* (PN 6513501).

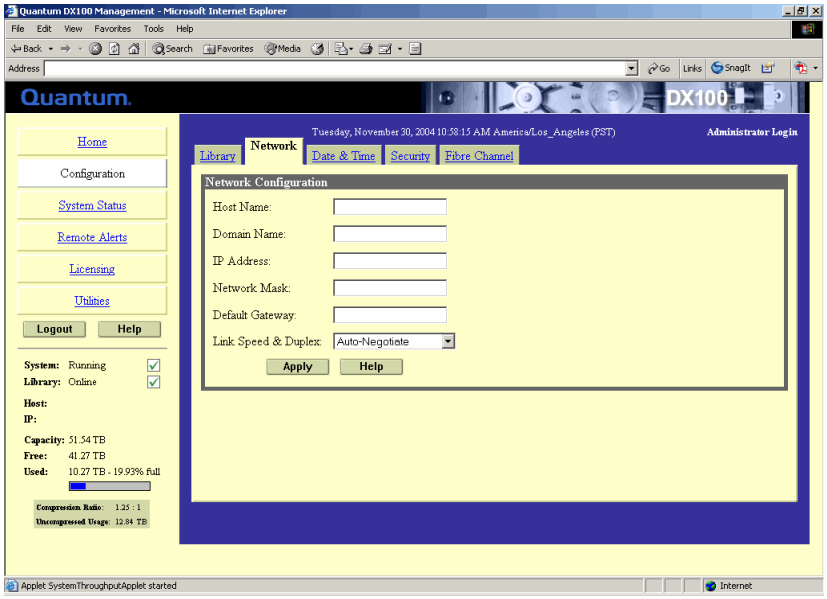
Configuring the Network Information

If you have not configured the network information, configure the network information via the following web pages:

1 To access the **Network Configuration** page, from the **Configuration** page, click **Network**.

The management frame displays the **Network Configuration** page (see figure 59).

Figure 59 Network Configuration Page



2 Edit the configuration information as desired (see table 10 for a description of the fields).

Table 10 Network Configuration Fields

Field	Description
Hostname	View or set the hostname for the DX-Series system (for example, the DNS name)
Domain Name	View or set the DX-Series system domain name
IP Address	View or set the IP address for the DX-Series system
Network Mask	View or set the network mask for the DX-Series system
Default Gateway	View or set the default gateway for the DX-Series system
Link Speed & Duplex	View and set the link speed and duplex mode for the DX-Series system (10/100/half/full/auto)

3 Click **Apply**.

The network information is now configured.

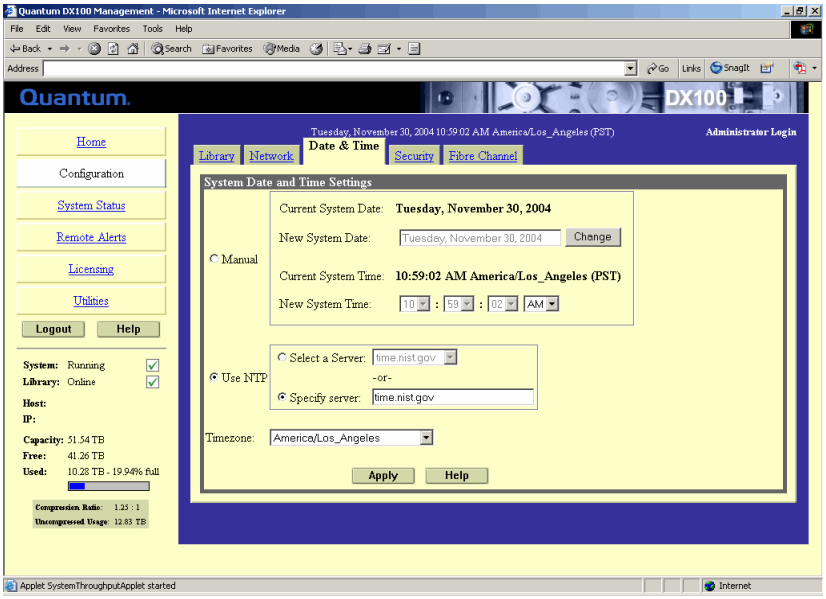
Configuring the Date and Time

The date and time can be set from the DX-Series web pages. Setting the correct date and time allows the DX-Series system to provide accurate reports when events occur.

1 In the **Configuration** page, click **Date & Time**.

The management frame displays the **Date & Time Configuration** page (see figure 60).

Figure 60 Date and Time Configuration



2 There are two options for setting the system date and time:

a Select **Manual** to manually set the system date and time using the **Change** button for the system date and drop down boxes for the system time.

b Select **Use NTP** (Network Time Protocol) to synchronize the DX-Series system clock to the U.S. Naval Observatory Master Clocks in Washington, DC and Colorado Springs, Colorado. NTP sends periodic time requests to the DX-Series system, obtaining time stamps and using them to adjust the client's clock.

3 Select the appropriate time zone from the Timezone drop down box.

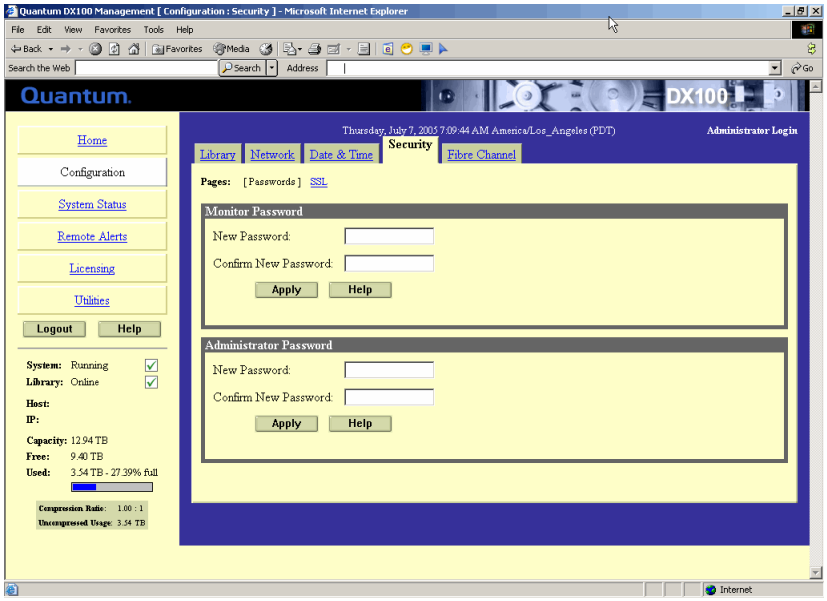
Configuring the Security Options

To access the **Security** page:

1 In the **Configuration** page, click **Security**.

The management frame displays the **Security** page (see figure 61).

Figure 61 Security Configuration



The **Security** page is divided into two sections:

- Passwords
- SSL

Passwords

The DX-Series system has two levels of security built into the system: Monitor and Administrator. The monitor user is allowed to view the DX-Series system management pages, but not change them. The administrator user can both view and change the management pages. This section allows you to change the passwords for these accounts.

To set the monitor and administrator passwords:

1 Under **Monitor Password**, enter the desired password in the **New Password** field and again in the **Confirm New Password** field.

> **Note:** The passwords must be lowercase and limited to 15 characters.

Login Type	Default Password	New Password
Monitor	password	
Administrator	password	

2 Click **Apply**.

A **Results** page indicates the password has been changed.

3 Under **Administrator Password**, enter the desired password in the **New Password** field and again in the **Confirm New Password** field.

> **Note:** The passwords must be lower case and limited to 15 characters.

4 Click **Apply**.

A **Results** page indicates the password has been changed.

SSL

SSL (Secure Sockets Layer) is a protocol that provides security and privacy over the Internet by negotiating encryption keys before transmitting data between a client and a server.

To establish a secure SSL connection, your DX-Series system must have an encryption key assigned to it by a Certification Authority in the form of a certificate file, private key file, and pass phrase. Once you install these components, you can establish a secure connection using the SSL protocol. The Quantum DX-Series system comes with a SSL certificate; however, you can purchase other certificates and add them to the DX-Series SSL configuration.

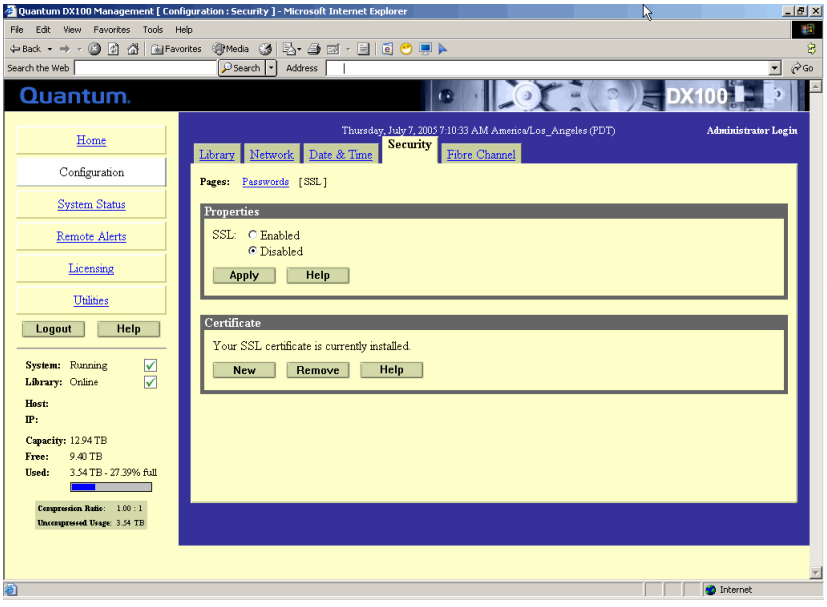
To access the **SSL** page:

1 In the **Security** page, click **SSL**.

The management frame displays the **SSL** page (see figure 62).

> **Note:** The default setting for SSL is **disabled**.

Figure 62 SSL Configuration

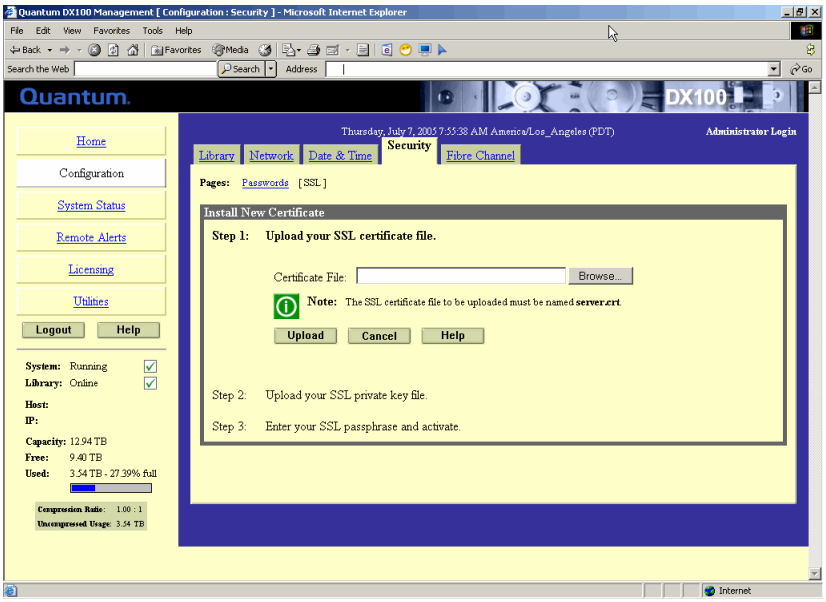


2 To enable SSL, select **Enable** and click **Apply**.

3 To add a SSL certificate, click **New**.

The **Install SSL Certificate** page displays (see figure 63).

Figure 63 Install SSL Certificate Page



4 Under **Upload Your SSL certificate file**, type the location and filename of the new SSL certificate file.

> **Note:** Use the **Browse** button to browse the system and locate the desired SSL certificate file. The SSL certificate file must be named **server.crt**.

5 Click **Upload** to install the SSL certificate file.

6 Type your private key and press **Enter**.

7 Type your pass phrase and press **Enter**.

8 A **Successful Upload** page displays indicating that the SSL certificate file has been installed on the system. Click **Ok** to continue.

The certificate displays in the certificate area on the SSL page.

Configuring the Fibre Channel Settings

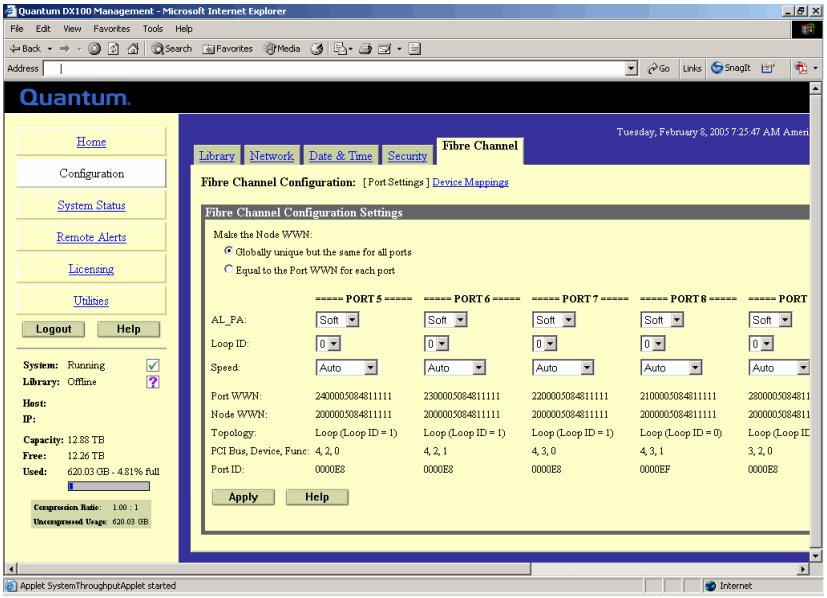
The DX-Series system allows you to control and configure the Fibre Channel HBAs that reside in the controller.

To configure the **Fibre Channel** page:

1 In the **Configuration** page, click **Fibre Channel**.

The management frame displays the **Fibre Channel** page (see figure 64).

Figure 64 Fibre Channel Configuration



Note: The DX-Series system must be off-line to configure the Fibre Channel options.

2 The **Port Settings** page (see table 11 for field descriptions) allows you to set the AL_PA, Loop ID and speed for every Fibre Channel port connecting the DX-Series system to the customer SAN (DX30 has two ports and DX100 has eight ports).

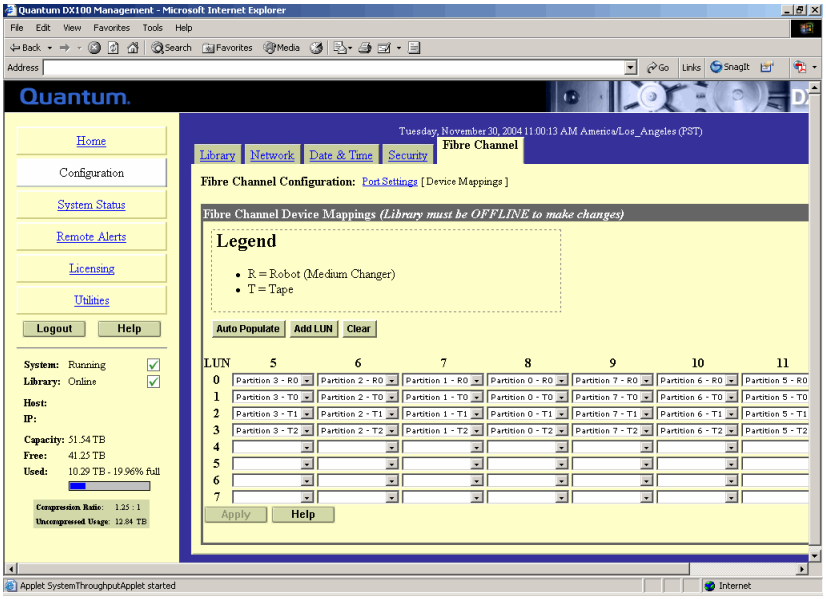
Table 11 Port Settings

Field	Description
Make the Node WWN	While the Port WWNs are always unique, the Node WWNs can be set according to the **Make the Node WWN** section as follows: • Selecting **Globally Unique but same for all ports** makes the Node WWNs the same for all Fibre Channel ports. • Selecting **Equal to the Port WWNs for each port** makes the Node WWNs equal to the Port WWNs.
AL_PA and Loop ID	This field allows you to set either a soft or hard AL_PA. Soft allows the customer SAN to automatically assign a loop ID to the DX-Series System. Hard allows you to manually assign the loop ID. The Default setting is soft.
Speed	This field allows you to select the maximum speed of the Fibre Channel port (1GB/sec, 2GB/sec, or Automatic). The default setting is Automatic.

3 To map specific devices to Fibre Channel ports, click **Device Mappings**.

The **Device Mappings** page displays (see figure 65).

Figure 65 Device Mappings Configuration



The Device Mapping page allows you to map or assign DX-Series virtual devices (robot and tape drives) to specific Fibre Channel ports. The default setting for both the DX30 and DX100:

- Port 5 is assigned the robot and tape drives 0 through 2.
- Port 6 is assigned tape drives 3 through 5.

4 There are two ways to assign virtual devices to a specific Fibre Channel port:

a Click **Auto Populate** to allow the DX-Series controller to automatically assign virtual devices to a Fibre Channel port. The controller assigns a robot and partition to each port.

Example: A system with 1 partition would have a robot assigned to LUN 0 and all other devices within that partition assigned to additional LUNs on that port.

b Use the drop down boxes located under the port number to select the devices mapped to that port. Do NOT assign the same device to more than one port unless your backup application can support multiple mappings of the same device to more than one port.

Example: Assign the robot and tape drives 0 and 1 to port 5. From the host, only the robot and tape drive 0 and 1 are visible from port 5. Assign tape drive 2 and 3 to port 6. Only tape drive 2 and 3 are visible from port 6.

5 When all of the virtual devices have been assigned to the appropriate port, click **Apply** to accept the port settings.

> **Note:** Microsoft Windows has a known issue recognizing more than eight LUNs on a single Fibre Channel port. See Microsoft Knowledge Base Article 310072: http://support.microsoft.com/default.aspx?scid=kb;en-us;310072 for information on reconfiguring Windows to overcome this limitation.

The settings will take effect after the next system reboot (see Restarting the System on page 86).

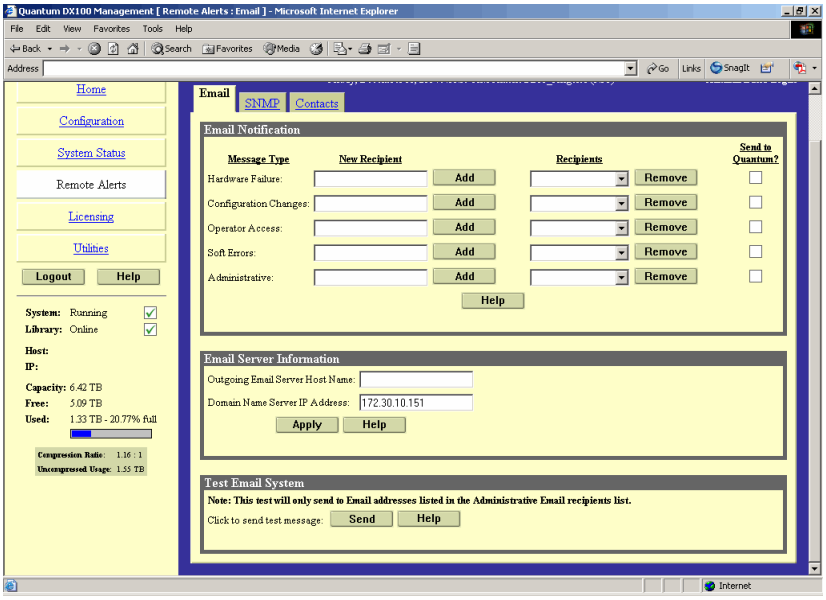
Configuring the Email Settings

To configure the Email settings:

1 To access the **Email** page, from the **Remote Alerts** page, click the **Email** tab.

2 The management frame displays the **Email** tab (see figure 66).

Figure 66 Email Tab



3 Edit the Email server information as desired (see table 12 for a description of the fields) and click **Apply**.

4 After editing the Email server information, click the **Send** button to test the notification system. If the test is not successful, verify the email server information and the administrative recipients list and try again.

The **Email** tab details are shown in table 12 and table 13.

Table 12 Email Notification

Field	Description
Message Type: Hardware Failure	When a hardware failure occurs on the DX-Series system such as a transition to a degraded, limited access, or failed system state, an email is sent to everyone on the hardware failure recipient list.
Message Type: Configuration Changes	When a configuration change is made on the DX-Series system such as changing a bar code label or network configuration, an email is sent to everyone on the configuration changes recipient list.
Message Type: Operator Access	When an operator access occurs on the DX-Series system such as starting up or shutting down the system, an email is sent to everyone on the operator access recipient list.
Message Type: Soft Error	When a soft error has occurred on the DX-Series system such as an attention state (high temperature warning), an email is sent to everyone on the soft error recipient list.
Message Type: Administrative	Future enhancement
New Recipient	To add a new recipient to a specific list, type the email address of the new recipient in the field and click **Add**.
Recipients	Each message type has a recipients list that is viewed by clicking on the specific drop-down box. To remove a recipient, select the individual email address from the list and click **Remove**.
Send to Quantum?	To send an email notification to Quantum Corporation as well as the recipients list, select the Send to Quantum check box for the specific message type. The company and contact information is sent to Quantum as an attachment to this email.

Table 13 Email Server Information

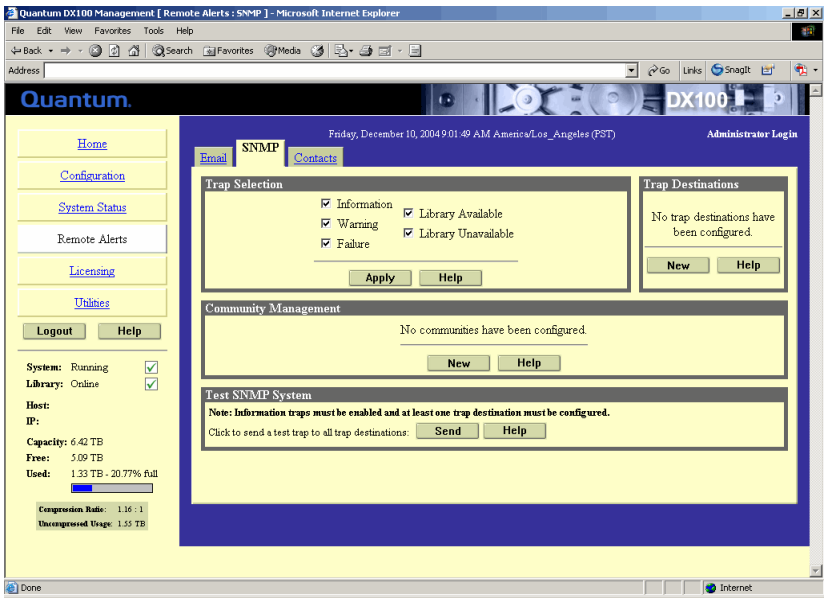
Field	Description
Outgoing Email Server Host Name	View or set the outgoing SMTP-compliant email server hostname for the DX-Series system (for example, the DNS name).
Domain Name Server IP Address	View or set the domain name server IP address for the DX-Series system.

Configuring the SNMP Settings

If the customer wishes to use the DX-Series system with a network framework application such as HP OpenView or CA Unicenter, the SNMP configuration must be defined. SNMP is short for Simple Network Management Protocol, a set of protocols for managing complex networks. SNMP works by sending messages, called protocol data units (PDUs), to different parts of a network. SNMP-compliant devices, called agents, store data about themselves in Management Information Bases (MIBs) and return this data to the SNMP requesters.

1. To access the **SNMP** page, from the **Remote Alerts** page, click the **SNMP** tab.
2. The management frame displays the **SNMP** tab (see figure 67).

Figure 67 SNMP Tab



3. Enable the trap selections to be reported (see table 14):

Table 14 SNMP Trap Selections

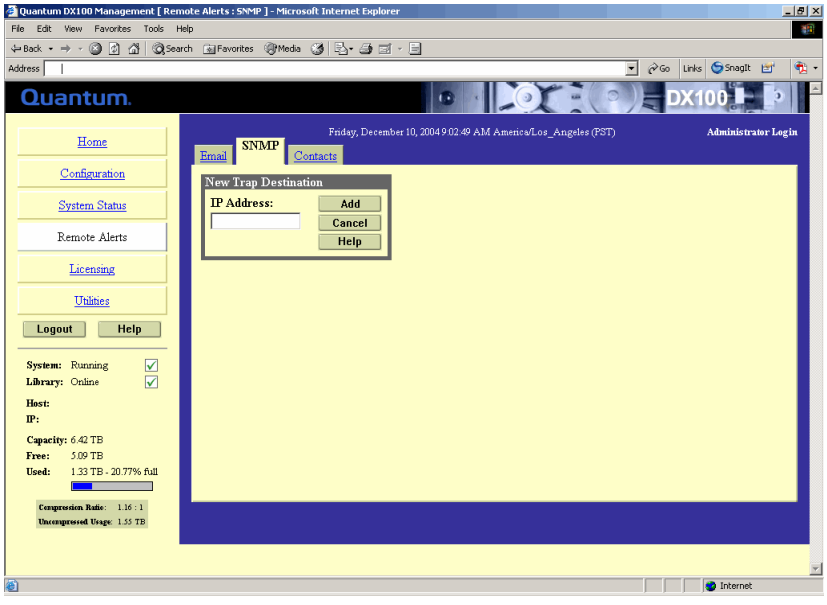
Field	Description
Informational	If selected, **Informational Traps** are enabled.
Warning	If selected, **Warning Traps** are enabled.
Failure	If selected, **Failure Traps** are enabled.
Available	If selected, a trap is generated every time the library transitions from an unavailable to an available state.
Unavailable	If selected, a trap is generated every time the library transitions from an available to an unavailable state.

4 Click **Apply**.

A **Results** page displays indicating the configuration has been changed.

5 Click **New** in the Trap Destination area (see figure 68), to set the IP addresses that are to receive the traps generated by the DX-Series system, for example, 12.34.56.78. Up to five trap destination addresses may be set. If less than five trap destinations are required, leave unused **Trap Destination** fields blank.

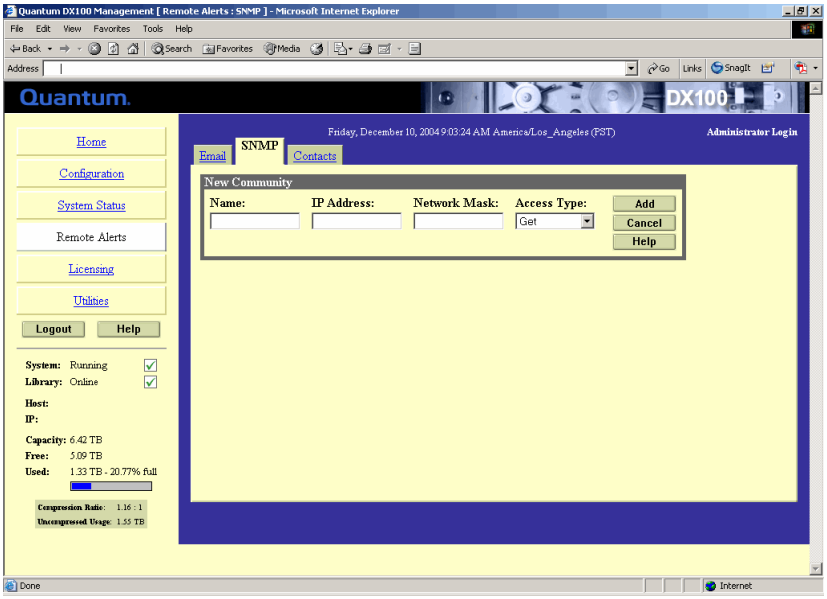
Figure 68 SNMP Trap Destinations



6 Click **Add** to add the IP address to the trap destinations and return to the SNMP tab.

7 Click **New** in the Community Management area to edit the SNMP communities (see figure 69).

Figure 69 SNMP Community Management



8 Under **New Community**, enter the new community information:

a A unique name in the **Name** field, the field holds up to 20 characters (a-z, A-Z), no special characters or blank spaces are allowed

> **Caution:** If no communities are defined, the DX-Series system is universally accessible through a "public" community (read-only).

b IP address in the **IP Address** field, if the value in the Network Mask edit box ends in a zero, the value in the IP address edit box must also end in a zero

c Subnet mask in the **Network Mask** field

> **Note:** A single community with an IP address or network mask set to 0.0.0.0, or left blank, indicates that IP-address-based access control is disabled.

d Access rights for the new community:

- **Get** allows SNMP **get** operations:
- **Get/Set** allows both SNMP **get** and **put** operations

9 Click **Add**.

A **Results** page displays indicating the community has been added.

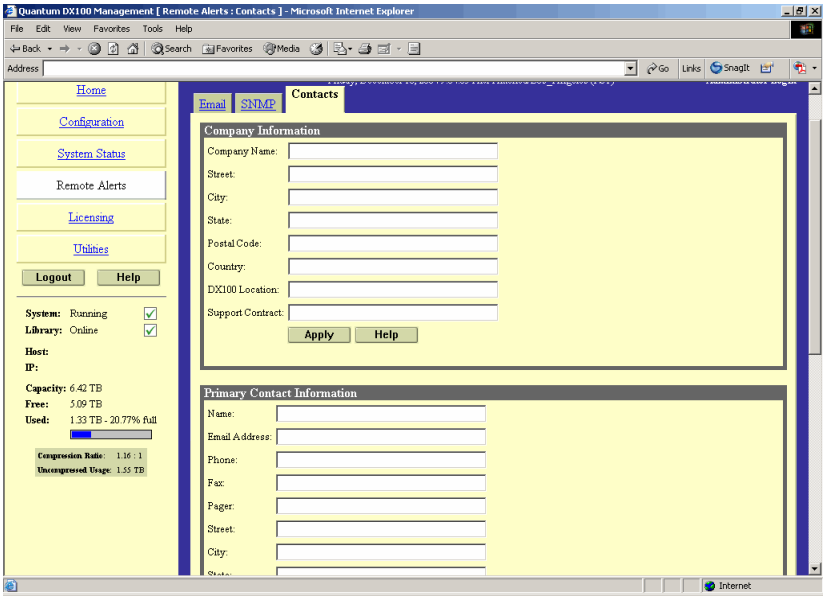
10 Click **Send** from the SNMP tab to send a test SNMP trap. Verify that the SNMP trap was received by the specified destination system.

Contacts Page

1 To access the **Contacts** page, from the **Remote Alerts** page, click the **Contacts** tab.

The management frame displays the **Contacts** tab (see figure 70).

Figure 70 Contacts Tab



2 Edit the configuration information as desired and click **Apply**.

The **Contacts** tab details are shown in table 15 and table 16.

Table 15 Company Information

Field	Description
Company Name	View or edit the company name where the DX-Series system resides.
Street	View or edit the street name where the company is located.
City	View or edit the city where the company is located.
State	View or edit the state where the company is located.
Postal Code	View or edit the postal code.
Country	View or edit the country where the company is located.

Field	Description
DX-Series System Location	View or edit the physical location of the DX-Series system (example: data center).
Support Contract	View or edit the support contract number.

Table 16 Primary/ Secondary Contact Information

Field	Description
Name	View or edit the primary/secondary contact name.
Email Address	View or edit the primary/secondary contact email address.
Phone	View or edit the primary/secondary contact phone number.
Fax	View or edit the primary/secondary contact fax number.
Pager	View or edit the primary/secondary contact pager number, if available.
Street	View or edit the primary/secondary contact street address.
City	View or edit the primary/secondary contact city location.
State	View or edit the primary/secondary contact state location.
Postal Code	View or edit the primary/secondary contact postal code.
Country	View or edit the primary/secondary contact country location.

Enabling Fibre Channel Compression

To activate the Fibre Channel compression card(s), you must enable the feature by entering a license key.

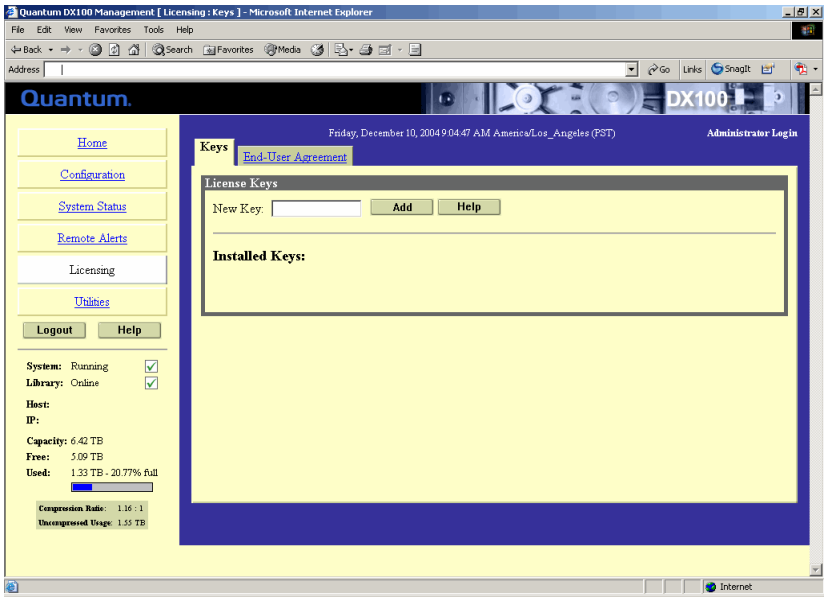
Note: This license key is sent to the customer prior to installation.

To enter the licence key:

1 Access the **Licensing** page, in the contents frame, click **Licensing**.

The management frame displays the **Licensing** page (see figure 71).

Figure 71 Licensing Page



2 Enter the Fibre Channel compression license key in the **New Key** edit box and click **Add**.

The license key is added to the installed keys list.

Saving the DX-Series Configuration File

This option allows the current configuration to be downloaded to the administrator's system as a single file. The system configuration file contains all of the configuration information entered by the DX-Series system administrator including:

- IP configuration
- All other configured features

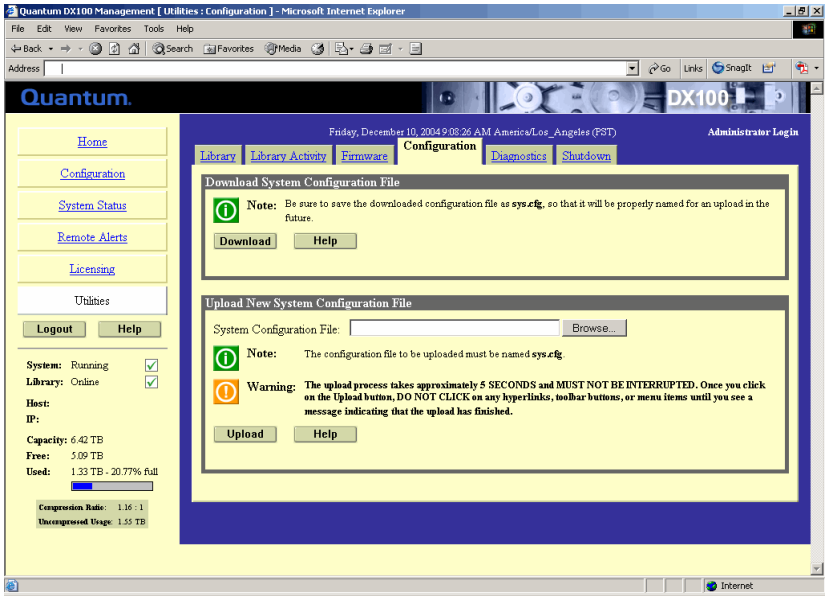
Note: For disaster recovery purposes, download the configuration file whenever there are major changes to the DX-Series system configuration.

To download a system configuration file:

1 Access the **Utilities** page.

2 Click the **Configuration** tab (see figure 72).

Figure 72 Downloading Configuration Files



3 Under **Download System Configuration File**, click **Download**.

A confirmation message will display, asking whether to open or save the file.

4 Select **Save this file to disk**, and click **OK**.

A **Results** page indicates the configuration file has been downloaded.

5 Click **OK** to return to the **Utilities** page.

Restarting the System

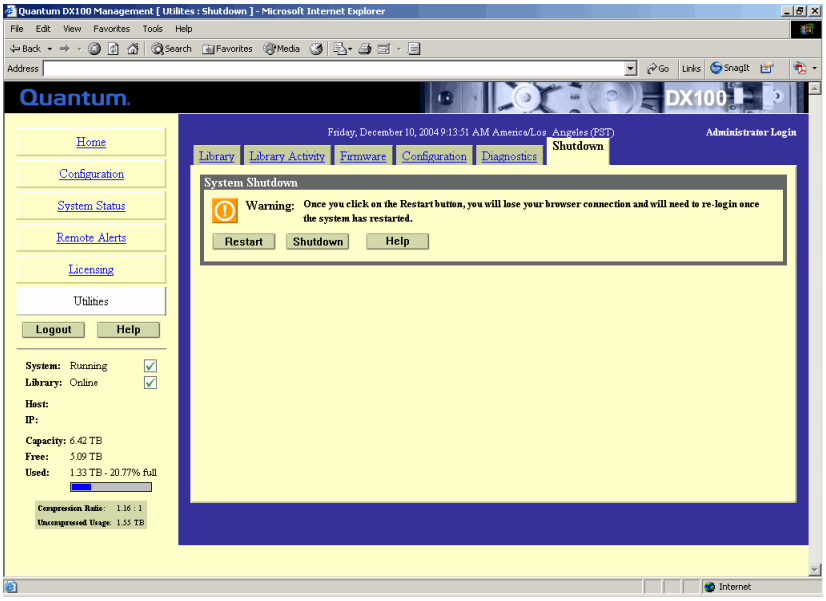
The DX-Series system must be restarted to activate the new configuration information.

To restart the DX-Series system:

1 Click the **Utilities** page.

2 Click the **Shutdown** tab (see figure 73).

Figure 73 Shutting Down the DX-Series System



3 Under **System Shutdown**, click **Restart**.

The DX-Series reboots.

The installation procedure is complete.