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User's Guide User's Guide User's Guide User's Guide User's Guide

Quantum DX-Series

DX-Series

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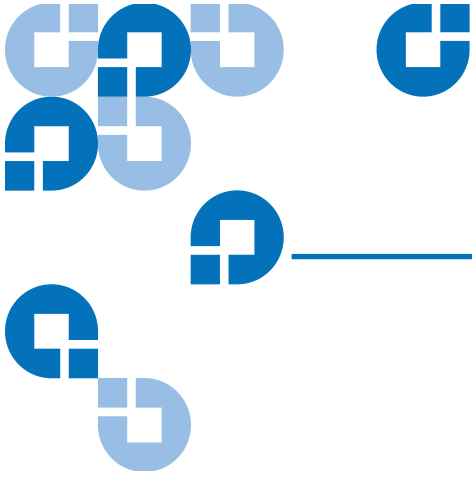
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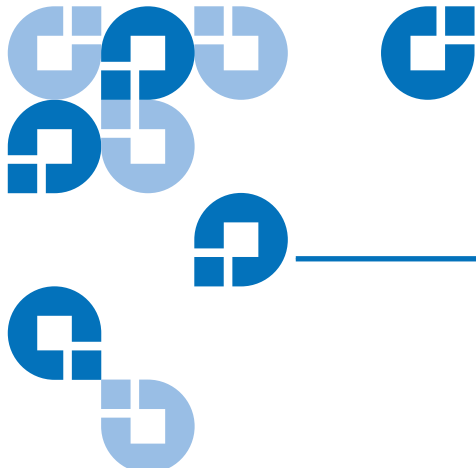
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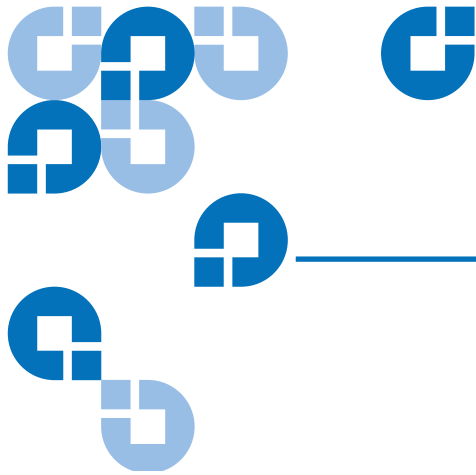
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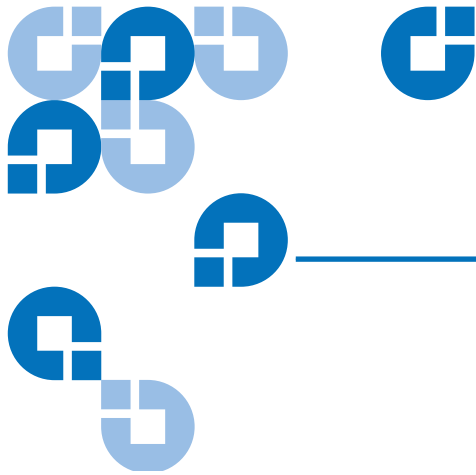
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Preface

This manual introduces the Quantum DX-Series enhanced data protection system and discusses:

- DX-Series system operations
- Configuration
- Web interface
- Basic troubleshooting

Audience

This manual is written for DX-Series system operators and field service engineers.

Document Organization

Following is a brief description of chapter contents.

- [Chapter 1, “DX-Series System Description,”](#) provides an overview of the DX-Series system.
- [Chapter 2, “Basic Operations,”](#) provides installation instructions for the DX-Series system.
- [Chapter 3, “DX-Series Remote Management,”](#) discusses using the DX-Series system management pages to control the DX-Series system remotely.

- [Chapter 4, “Troubleshooting.”](#) discusses problems you may encounter during the setup and operation of the DX-Series system.
- The Appendices provide system specifications, event handling, and regulatory statements.

Notational Conventions

This manual uses the following conventions:

Caution: Caution indicates potential hazards to equipment or data.

Warning: Warning indicates potential hazards to personal safety.

Note: Note emphasizes important information related to the main topic.

Tech Tip: Tech tip provides additional technical information that may assist in installation and configuration.

- Right side of the system – Refers to the right side as you face the component being described.
- Left side of the system – Refers to the left side as you face the component being described.
- *b* – All binary numbers are succeeded by “b.”
- *h* – All hexadecimal numbers are succeeded by “h.”
- Error or attention conditions are represented in parenthesis that translate as follows:

(SK=S ASC=AA ASCQ=QQ)

where:

S – hexadecimal sense key value

AA – hexadecimal additional sense code

QQ – hexadecimal additional sense code qualifiers

Related Documents

The following Quantum document is also available for the DX-Series system:

Document No.	Document Title	Document Description
6513502	Quantum DX-Series Unpacking and Installation Instructions	Describes unpacking and installing the DX-Series System

Supported Internet Browsers

The Internet browser software is not supplied with the DX-Series system; you must obtain and install it independently. The DX-Series system supports the following Internet browsers:

- Microsoft Internet Explorer 6.0 SP1 or later
You can download this software from <http://www.microsoft.com>.

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.

- Mozilla Suite 1.7 on Solaris 10
You can download this software from <http://www.mozilla.org>.
- Firefox 1.0.6 on Windows
You can download this software from <http://www.mozilla.org>.
- Java Plug-in 1.4.2 or later
You can download this software from <http://www.java.com>

SCSI-2 Specification

The SCSI-2 communications specification is the proposed American National Standard for information systems, dated March 9, 1990. Copies may be obtained from:

Global Engineering Documents
15 Inverness Way, East
Englewood, CO 80112
(800) 854-7179 or (303) 397-2740

Contacts

Quantum company contacts are listed below.

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P.O. Box 57100
Irvine, CA 92619-7100
(949) 856-7800
(800) 284-5101

Technical Publications

To comment on existing documentation send e-mail to:

doc-comments@quantum.com

Quantum Home Page

Visit the Quantum home page at:

<http://www.quantum.com>

Customer Support

The Quantum Customer Support Department provides a 24-hour help desk that can be reached at:

North/South America: (949) 725-2100 or (800) 284-5101

Asia/Pacific Rim: (International Code) + 61 7 3839 0988

Europe/Middle East/Africa: (International Code) + 44 (0) 1256 848748

Send faxes for the Customer Support Department to:

North/South America: (949) 725-2176

Asia/Pacific Rim: (International Code) + 61 7 3839 0955

Europe/Middle East/Africa: (International Code) + 44 (0) 1256 848777

Send e-mail for the Customer Support Department to:

North/South America: www.quantum.com/askaquestion

Asia/Pacific Rim: apachelp@quantum.com

Europe/Middle East/Africa: eurohelp@quantum.com

StorageCare Guardian

StorageCare Guardian is a remote monitoring and diagnostic solution that enables Quantum to proactively monitor the health of Quantum products, use diagnostic data to predict possible failures, and determine whether or not the problem involves a Quantum product or other critical component in the environment.

Benefits

StorageCare Guardian gives the customer added assurance that Quantum will make sure its products are running optimally to ensure maximum operational efficiency. Deploying this solution is easy and enables customers to minimize the costs associated with system downtime and service issues should a problem arise.

More Reliable Backups

Through continuous 24x7x365 monitoring, **StorageCare Guardian** proactively checks Quantum systems for common errors and alerts the customer when a Quantum product is underperforming. By proactively identifying red flags, the risk of failed backups and machine downtime can be mitigated.

Faster Resolution Time

When the system is down, **StorageCare Guardian** provides the necessary diagnostics data that enables Quantum to identify the root cause and expedite the problem resolution process. Problems that used to take days to fix can now be fixed in minutes. When problems require onsite support, field engineers will have better information along with the right parts necessary to fix the problem.

StorageCare Guardian allows Quantum to

- Monitor diagnostic data related to Quantum products
- Receive alarms that notify Quantum of issues at the customer site
- Run diagnostic utilities to more quickly determine the root cause of issues
- Initiate remote connection to remote management interface to get more in-depth information about the health of your Quantum product.
- Distribute software/firmware upgrades - this will be available as a future enhancement

Product Features

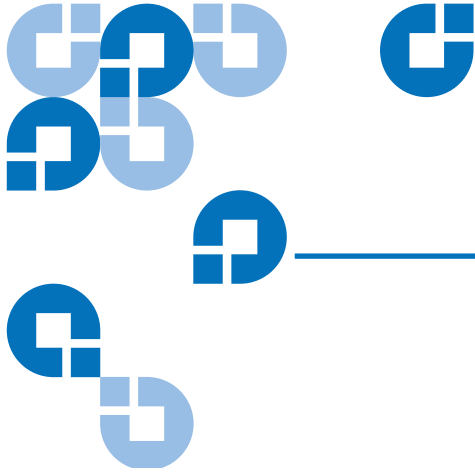
- Continuous Monitoring - Proactive 7x24x365 monitoring of Quantum products enabling Quantum Support to be alerted on events such as errors or marginal conditions that are defined by the user.
- Root Cause Diagnosis - Allows Quantum to quickly isolate and identify the root cause of a problem.
- Rapid Problem Resolution- Quantum can rapidly recommend and/or implement the corrective actions needed to resolve a problem ensuring minimal impact to the IT environment.

- Quantum Remote Software Update - Distributed software update capability allows fast updates to agent software and Quantum hardware installed at customer sites
- Real-time Data Collection - Instant on-demand or scheduled diagnostic data collection from Quantum products as well as the ability to run user-defined data collection scripts from agent.
- Access Management - Customer has full control over Quantum's access rights and privileges.
- Audit Logging - Audit logs are kept for all communications to and from the agent.

How it works:

- 1 Customers can download the **StorageCare Guardian** agent software from <http://www.quantum.com/guardiandownload>.
- 2 Customer installs the **StorageCare Guardian** agent on any Windows 2000/2003/XP or Solaris 8/9 server located at the customer's site.
- 3 The **StorageCare Guardian** agent monitors Quantum products, and provides information and updates to the Quantum Enterprise Server that resides at Quantum Support.
- 4 If an error or problem is detected, Quantum queues a request to the **StorageCare Guardian** agent for data collection or real-time access to the system.
- 5 The **StorageCare Guardian** agent checks access policy settings to determine if access is allowed.
- 6 If approved, the information is transferred to Quantum, or a remote connection is initiated.
- 7 Quantum Support will diagnose the problem and, if necessary, send the needed parts and/or field personnel to resolve the issue.

Quantum can identify if the backup problem is not associated with the Quantum device and then direct the customer to resolve the issue with appropriate third-party vendor.



Chapter 1

DX-Series System Description

This chapter describes the DX-Series system and its components. The chapter consists of:

- [Overview](#)
- [Features and Benefits](#)
- [DX-Series Components](#)
 - [DX-Series Storage Array](#)
 - [DX-Series Controller](#)
- [Supported RAID Configurations](#)
- [Typical Configurations](#)

Overview

The DX-Series Enhanced Backup Solution utilizes a disk-based backup system to complement a tape library. This solution addresses the most important problems facing Information Technology professionals:

- [Time Required for Backup](#)
- [Confidence in Completing the Backup](#)
- [Time to Restore Data](#)

Time Required for Backup

Not only is the amount of data that needs to be backed up growing by nearly 100% per year, but the time window for performing the backup is shrinking due to the impact of global operational expansion. Adding more tape drives is no longer an efficient way to reduce the time required for backup.

Confidence in Completing the Backup

Confidence in completing the backup job within the backup window can be very low because of time constraints or “hang ups” during the backup process due to errors generated by mechanical problems. If these types of errors could be eliminated by removing issues that are inherent in any mechanical device, confidence in the backup job completing would improve greatly.

Time to Restore Data

The time required to restore data from a tape library is determined by how long it takes to mount a cartridge in a tape drive and find the proper position on the tape. This can take several minutes and then the restore time is also reduced by the tape drive transfer speed. Restoring data from hard drives (emulating tape cartridges) improves restore time by eliminating the time required to load a cartridge and transfer speed restrictions.

DX-Series System

The DX-Series system solves these problems by separating the backup target (servers) from the backup archive (tape libraries). The DX-Series system takes advantage of high speed hard drives to greatly reduce the time required for backup/restore functions and also improve confidence in completing the backup in the time allowed. The data stored on the DX-Series system can then be migrated to a tape library without utilizing valuable network resources.

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

Table 1 DX-Series Capacity Specifications

DX Model (with Drive Size)	Number of Storage Arrays	Number of Tape Drives	Number of Cartridges	Usable Capacity	Usable Capacity (with 2:1 Compression)
DX30 (250 GB drives)	1 to 4	Up to 30 virtual DLT7000 drives	160 cartridges per storage array (640 max)	3.25 TB to 13 TB	6.5 TB to 26 TB
DX100 (250 GB drives)	2 to 16	Up to 55 virtual DLT7000 drives	160 cartridges per storage array (2560 max)	3.25 TB to 52 TB	6.5 TB to 104 TB
DX30 (400 GB drives)	1 to 4	Up to 30 virtual DLT7000 drives	320 cartridges per storage array (1280 max)	5.2 TB to 20.8 TB	10.4 TB to 41.6 TB
DX100 (400 GB drives)	2 to 16	Up to 55 virtual DLT7000 drives	320 cartridges per storage array (5120 max)	10.4 TB to 83.2 TB	20.8 TB to 166.4 TB

DX Model (with Drive Size)	Number of Storage Arrays	Number of Tape Drives	Number of Cartridges	Usable Capacity	Usable Capacity (with 2:1 Compression)
DX30 (500 GB drives)	1 to 4	Up to 30 virtual DLT7000 drives	320 cartridges per storage array (1280 max)	6.5 TB to 26 TB	13 TB to 52 TB
DX100 (500 GB drives)	2 to 16	Up to 55 virtual DLT7000 drives	320 cartridges per storage array (5120 max)	13 TB to 104 TB	26 TB to 208 TB

Note: The ATL P1000 library emulation is an inquiry string only and can be configured via the remote management interface (see [Chapter 3](#) on page 33). The ATL P1000 was selected because it operates with all backup applications allowing the DX-Series system to integrate seamlessly in a data center.

Note: The DX-Series storage array is shipped with the following RAID configuration:

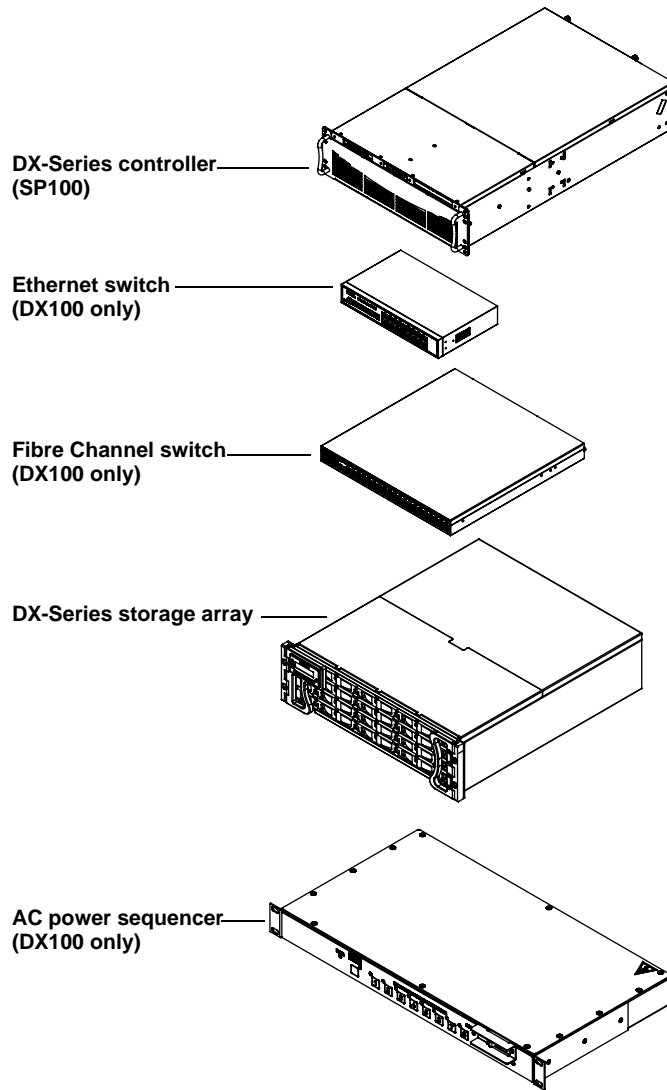
- 1 logical drive configured in RAID 5 (7 data drives + 1 parity drive)
- 1 logical drive configured in RAID 5 (6 data drives + 1 parity drive)
- 1 global hot spare drive

To reconfigure the DX-Series storage array to either remove the hot spare or add an additional hot spare (total of two hot spares), contact Quantum customer support (see [Customer Support](#) on page xvii). Reconfiguring the storage array RAID configuration will cause all previously stored data to be lost.

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 (a single quad port HBA and a single dual port HBA).

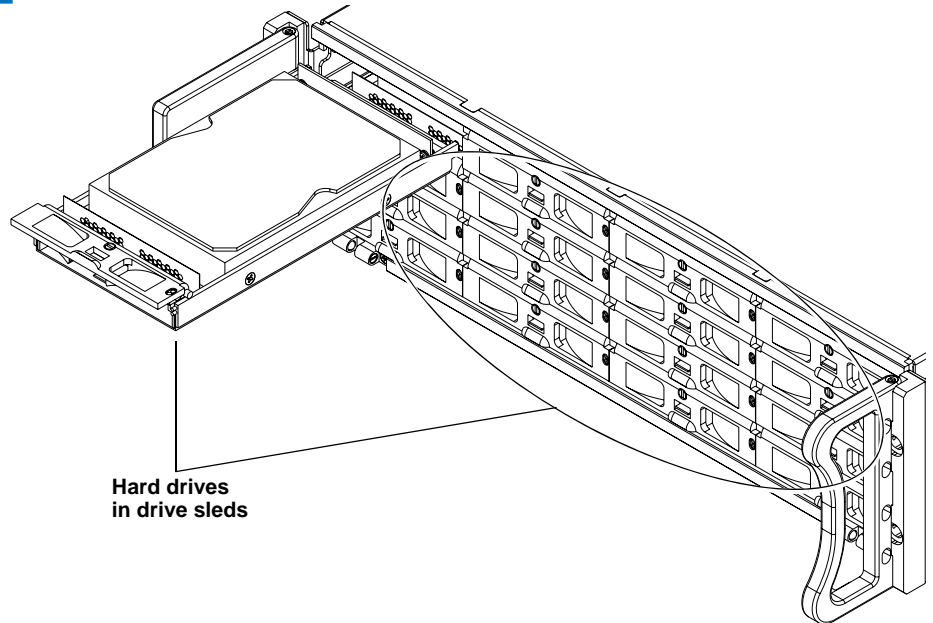
Figure 1 DX-Series System Components



Serial ATA hard drives are the heart of the DX-Series system. These hard drives (1 drive per drive sled = 16 total drives) appear to the backup application as DLT tape cartridges (see [figure 2](#)).

Data is stored on the hard drives through an interface that appears as an ATL P1000 tape library. This allows backup applications to recognize and integrate a DX-Series system into a data center environment just like a typical tape library.

Figure 2 DX-Series Hard Drives



Hard drives
in drive sleds

Caution: Removing hard drives during system operation may cause loss of data or degraded system performance. Contact Quantum customer support (see [Contacts](#) on page xvi) to report any hard drive failure.

Features and Benefits

The DX-Series system provides the following features and benefits:

- Restores files 5 to 10 times faster than a conventional tape library
- High availability features:
 - RAID 5 file system with one logical drive of 7+1 and one logical drive of 6+1 with a global hot spare to ensure data protection even if one drive fails (Optional RAID 5 with zero or two hot spares)
 - Event monitoring and logging
 - Redundant cooling, power supplies, and disk parity protection
 - Global spare and hot-swappable hard drives
 - Up to two RAID controllers per storage array
 - Flexible alert notification including e-mail and SNMP traps
- Serial ATA drive technology
- Restore latency under 10 seconds
- Two 2 Gbit/sec Fibre Channel interfaces for DX30; eight for DX100
- Hardware based 2:1 compression capability
- 10/100/1000 BaseT Ethernet interface for auxiliary management functionality (web based management)
- Browser based remote management system that provides status and configuration options
- Rack space requirements:
 - 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, eight AC power sequencers, and an Ethernet switch)
- Quantum DLT7000 and ATL P1000 emulation
- Supported by every major backup software vendor preserving software investment
- Installs in a standard rack with a minimum depth of 30 in (76.2 cm)

DX-Series Components

The DX-Series system consists of the following major components:

- [DX-Series Storage Array](#)
- [DX-Series Controller](#)
- [Fibre Channel Switch \(DX100 Only\)](#)
- [Ethernet Switch \(DX100 Only\)](#)
- [AC Power Sequencer \(DX100 Only\)](#)

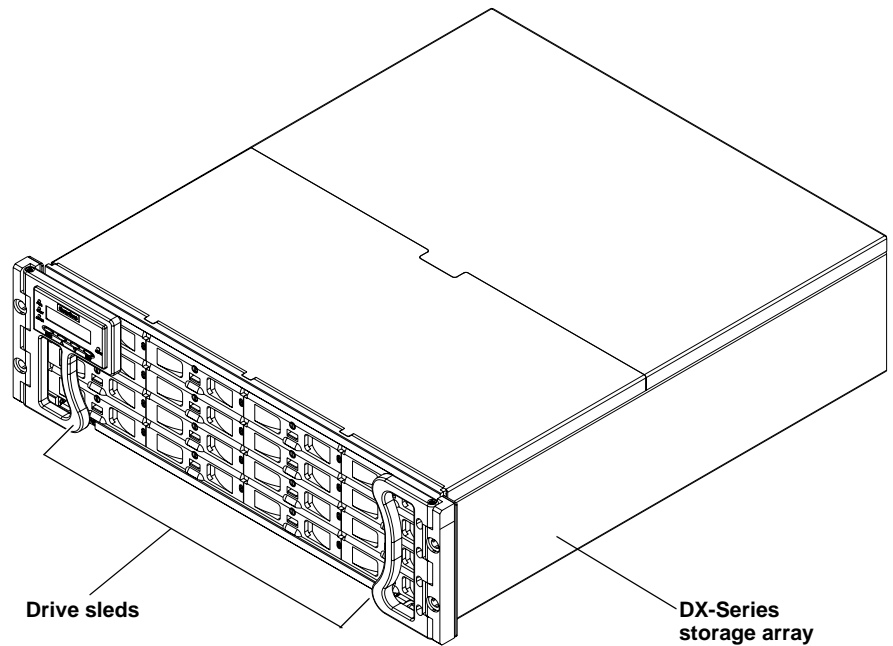
DX-Series Storage Array

Up to four storage arrays can be installed in a DX30 system and up to sixteen storage arrays can be installed in a DX100 system. The storage array houses the following components:

- Drive sleds (16 per storage array)
- Two redundant power supplies
- Two redundant fan modules
- RAID controller(s) (contains Fibre Channel interfaces)
 - DX30 contains a single RAID controller
 - DX100 contains dual RAID controllers

These components are removed and replaced either through the front or back of the array (see [figure 3](#)).

Figure 3 DX-Series Storage
Array



RAID Sets

The DX-Series storage array is divided into two RAID sets. The first RAID set is made up of the first eight drive sleds (sleds 1-8). The second RAID set is made up of the next seven drive sleds (sleds 9-15). The last hard drive (drive sled 16) is reserved as a global hot spare. Both RAID sets contain 2 LUNs or logical units. Each RAID set can sustain a single drive sled failure and can hold a maximum of 160 virtual tape cartridges (80 cartridges per LUN).

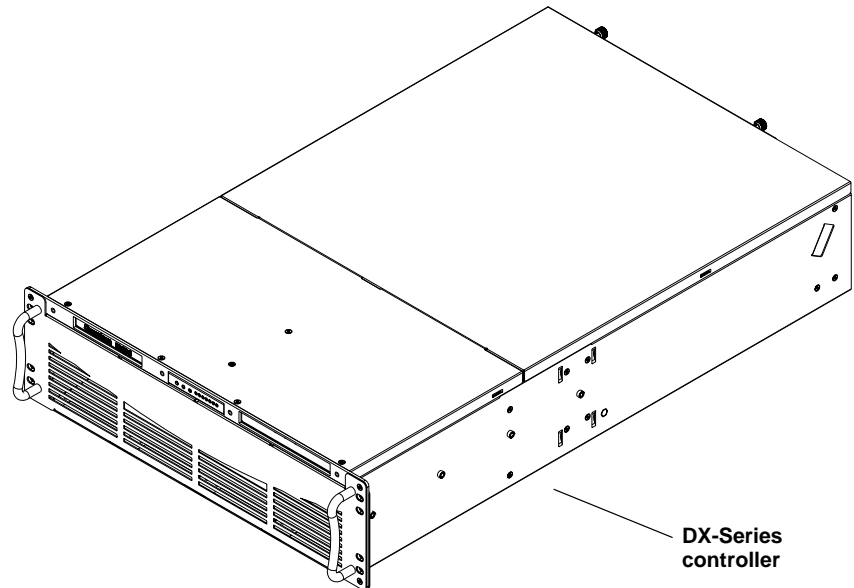
Drive Sleds

Each drive sled located on the front of the DX-Series storage array contains one hard drive.

DX-Series Controller

The DX-Series controller contains a Linux based operating system that provides the library and tape drive emulation as well as Fibre Channel and Ethernet interfaces (see [figure 4](#)).

Figure 4 DX-Series Controller



Ethernet Interface

The Ethernet port is provided for remote management of the DX-Series controller via web-based configuration and management screens (see [DX-Series Remote Management](#) on page 33).

Fibre Channel Interfaces

Channel network at the customer site as well as the DX-Series storage arrays in the system.

The DX30 contains the following Fibre Channel HBAs:

- A dual port Fibre Channel HBA (connects to customer Fibre Channel network)

- A quad port Fibre Channel HBA (connects to DX-Series storage arrays)

The DX100 contains the following Fibre Channel HBAs:

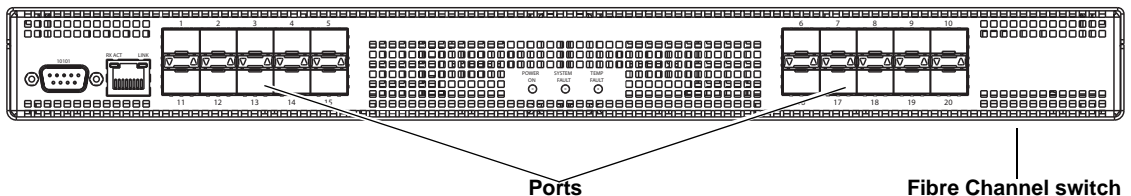
- Four dual port Fibre Channel HBAs (connects to customer Fibre Channel network)
- Two quad port Fibre Channel HBA (connects to DX-Series storage arrays)

This connection can be a direct connection to the Fibre Channel host or to a Fibre Channel switch. The Fibre Channel interface automatically detects the mode being used by the network and sets itself appropriately.

Fibre Channel Switch (DX100 Only)

The Fibre Channel switch provides twenty ports for connecting up to eight storage arrays to the DX-Series controller. Each storage array has two connections to the Fibre Channel switch for redundancy and improved performance. One Fibre Channel switch is required for two to eight storage arrays; a second Fibre Channel switch is required for nine to sixteen storage arrays (see [figure 5](#)).

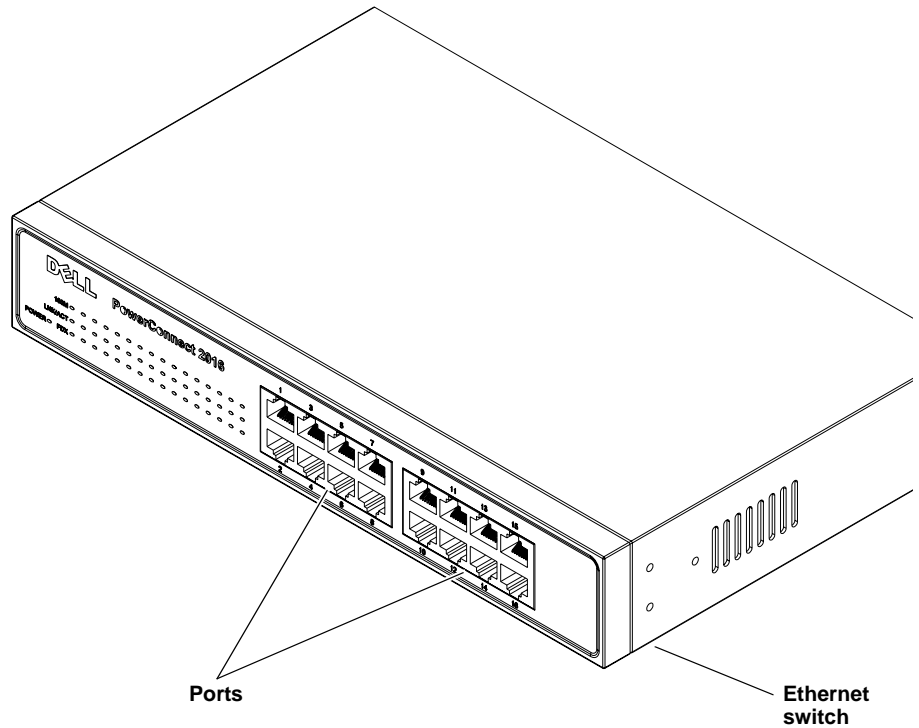
Figure 5 Fibre Channel Switch



Ethernet Switch (DX100 Only)

The Ethernet switch provides 16 ports for connecting the AC power sequencer and Fibre Channel switch to the DX-Series controller (see [figure 6](#)).

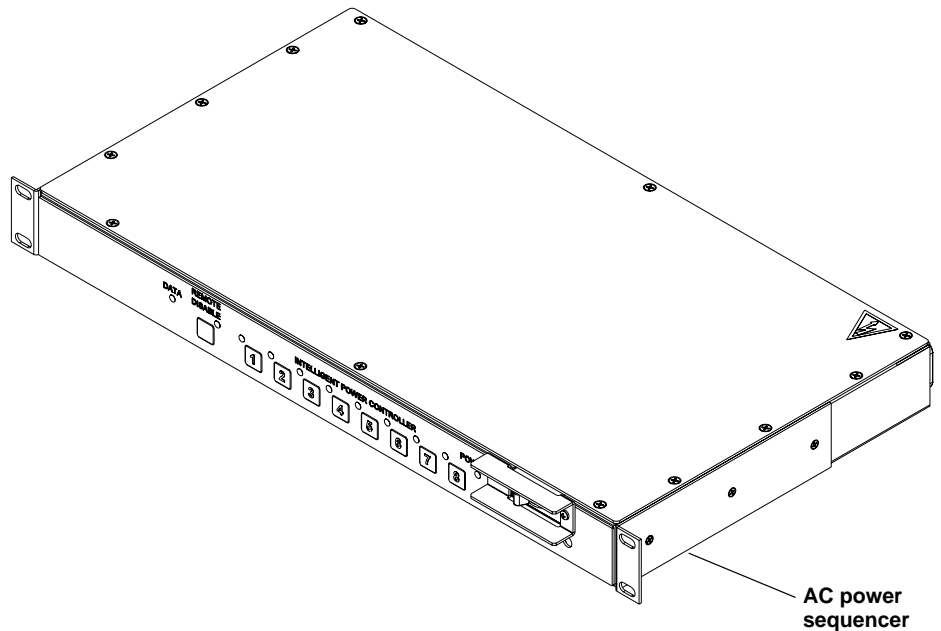
Figure 6 Ethernet Switch



AC Power Sequencer (DX100 Only)

The AC power sequencer (two power sequencers for every four storage arrays) are programmed by the DX-Series controller to power on the storage arrays in proper order (see [figure 7](#)).

Figure 7 AC Power Sequencer



Supported RAID Configurations

RAID is short for Redundant Array of Independent (or Inexpensive) Disks, which is a category of hard [disk drives](#) that employ two or more drives in combination for [fault tolerance](#) and performance. There are a number of RAID levels in use today such as 0, 1, 3, 5, and 10.

The DX-Series system supports RAID 5 in both 7+1 and 6+1 with hot spare configurations.

RAID 5 Configuration

The RAID 5 configuration is the most common RAID level in use today. RAID 5 minimizes the write bottlenecks of other RAID levels by distributing parity stripes over a series of hard drives. In doing so it provides relief to the concentration of write activity on a single drive,

which in turn enhances overall system performance. Instead of allowing any one drive in the array to assume the risk of a bottleneck, all of the drives in the array assume write activity responsibilities. The distribution frees up the concentration on a single drive, improving overall subsystem throughput.

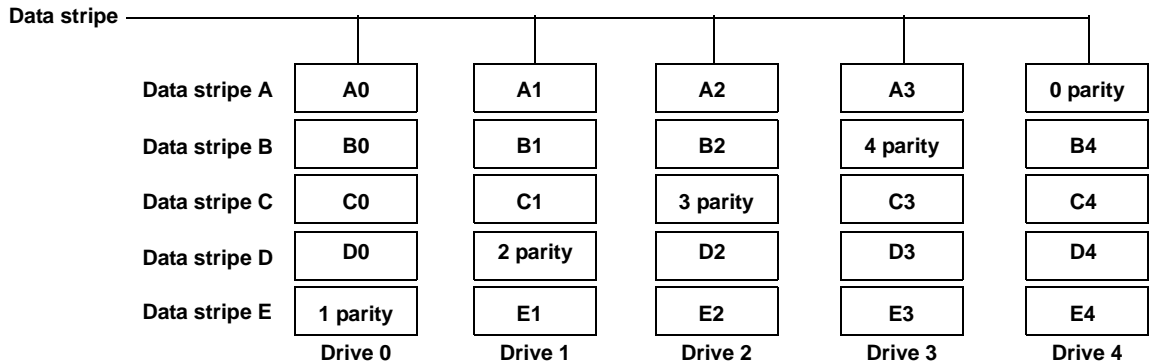
The RAID 5 parity encoding scheme maintains the system's ability to recover any lost data should a single drive fail. This can happen as long as no parity stripe on an individual drive stores the information of a data stripe on the same drive. In other words, the parity information for any data stripe must always be located on a drive other than the one on which the data resides (see [figure 8](#)).

Note: The DX-Series storage array is shipped with the following RAID configuration:

- 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 drive

To reconfigure the DX-Series storage array to either remove the hot spare or add an additional hot spare (total of two hot spares), contact Quantum customer support (see [Customer Support](#) on page xvii). Reconfiguring the storage array RAID configuration will cause all previously stored data to be lost.

Figure 8 RAID 5 Configuration

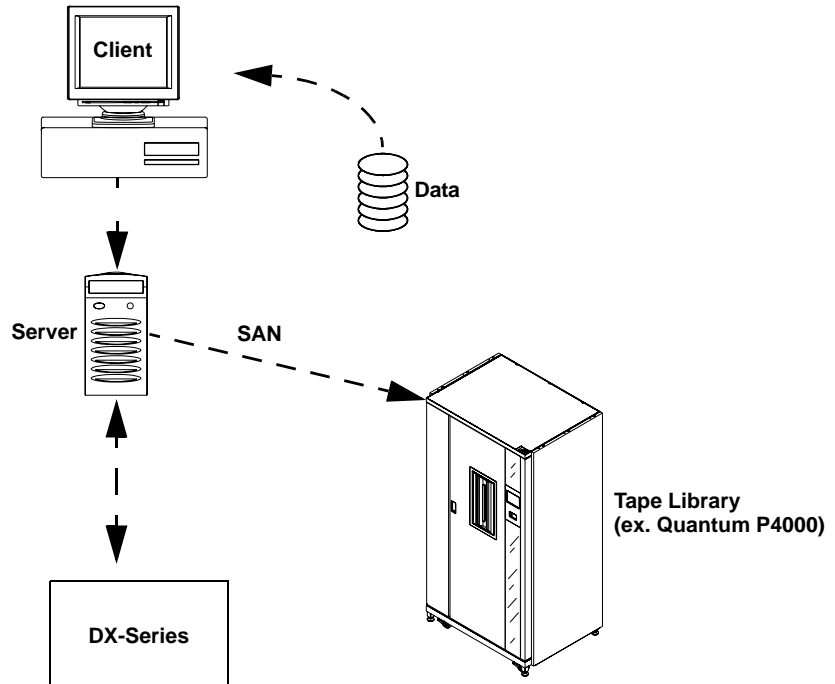


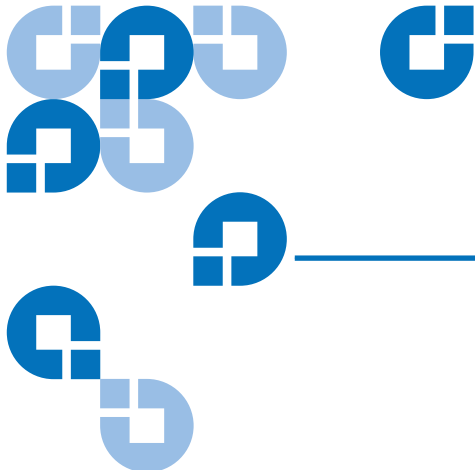
Typical Configurations

The DX-Series system has many advantages over typical tape cartridge based systems such as faster data transfer, instant availability, and greater reliability. You can add storage arrays to the system to increase storage capacity.

To take advantage of the DX-Series systems speed and reliability and still have the safety of off-site storage, Quantum recommends exporting the data from the DX-Series system to an automated tape library (see [figure 9](#)). This configuration still allows fast backup and restores as well as the safety of off-site backups on tape cartridges. Storage management software applications often refer to this operation as “cloning” or “vaulting.” Check with your software supplier for information on enabling this feature.

Figure 9 DX-Series System
Plus a Tape Library





Chapter 2 Basic Operations

Although the vast majority of DX-Series system operations are handled through the [DX-Series Remote Management](#) on page 33, basic DX-Series system operations include:

- [Turning on the DX-Series Components](#)
- [DX-Series Controller Operations](#)
- [DX-Series Storage Array Operations](#)
- [Fibre Channel Switch LED Descriptions](#)
- [Relocating the DX-Series System](#)

Turning on the DX-Series Components

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:

- [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 DX30 system (see [figure 10](#)):

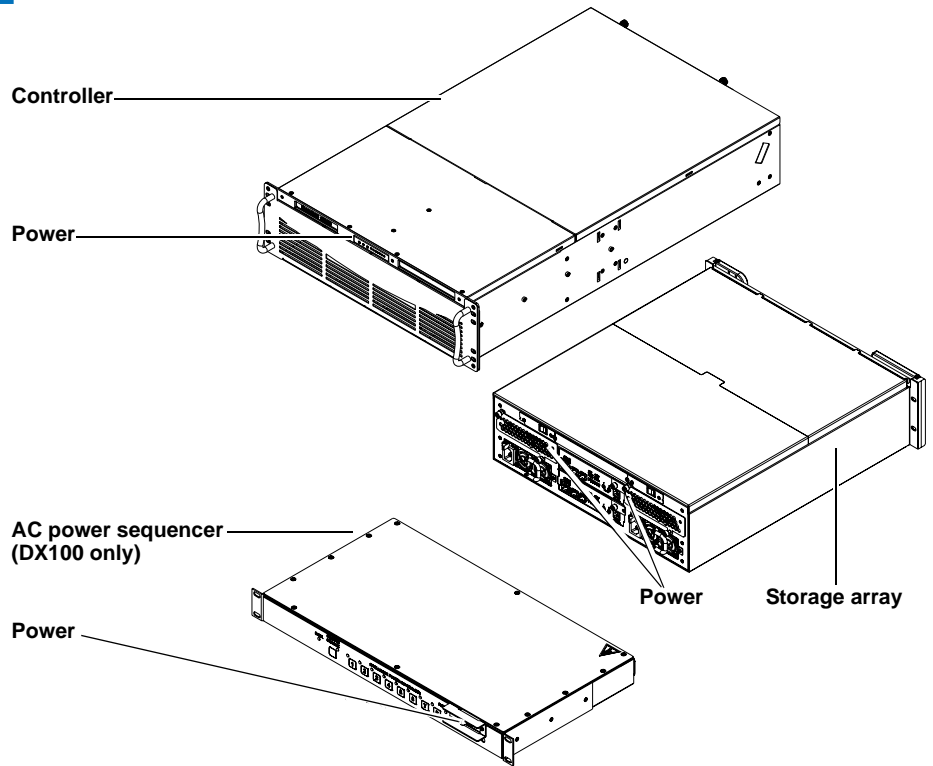
- 1 Turn on both power switches on all DX-Series storage arrays.
- 2 Turn the DX30 controller on by pushing the power button located on the front of the unit

Turning on the DX100

The DX100 must be powered on in the following sequence (see [figure 10](#)):

- 1 Turn on both power switches on the storage arrays (they will not power on yet).
- 2 Turn on the circuit breakers of the AC power sequencers.
- 3 Turn on the DX100 controller.

Figure 10 Power Switch Locations



DX-Series Controller Operations

The DX-Series controller contains the Linux operating system as well as the Fibre Channel HBAs connecting the unit to the storage arrays and to the customer host systems.

The front panel of the controller has a series of buttons and LED indicators (see [figure 11](#)).

Figure 11 Controller Front Panel

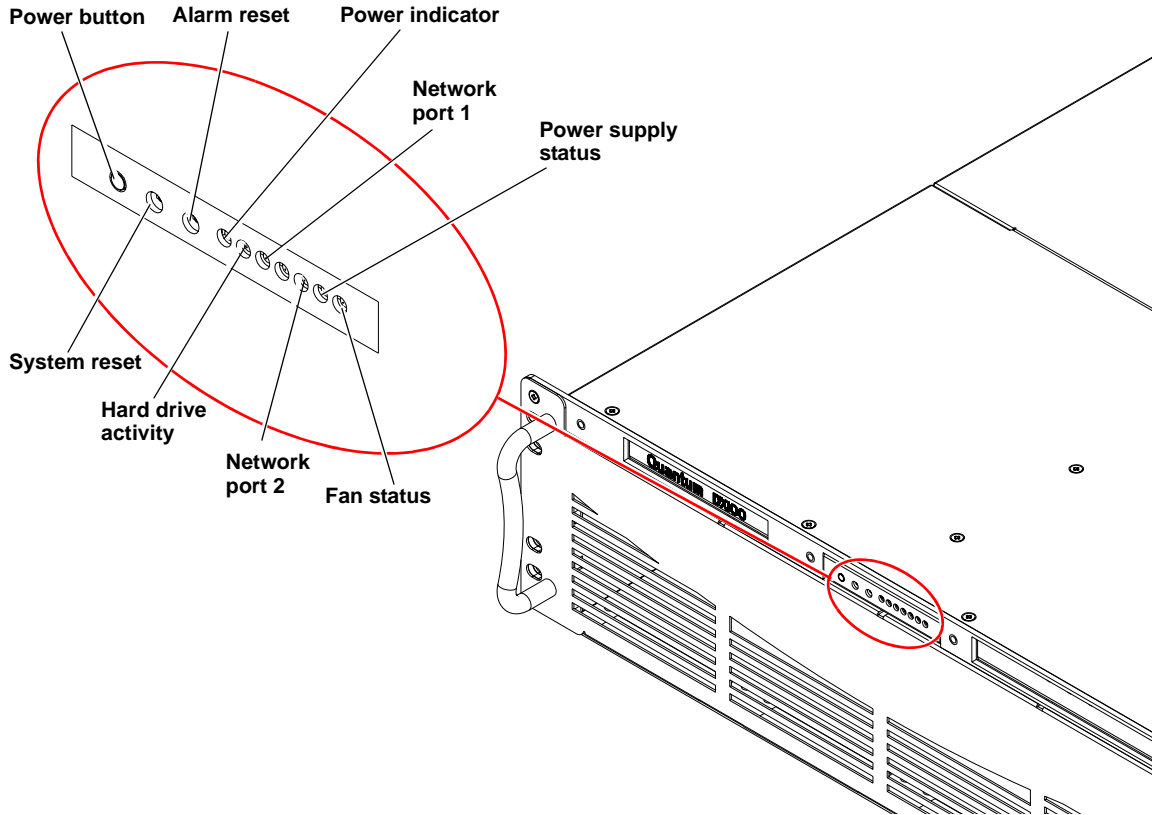


Table 2 Controller Front Panel

Button/LED	Description
Power button	Powers the controller on or off
System reset	Resets the controller
Alarm reset	Resets the alarm after a failure occurred
Power indicator	This LED is lit when the controller is on
Hard drive activity	This LED flashes when the flash disk is active

Button/LED	Description
Network port 1	This LED flashes indicating activity on the first network port
Network port 2	This LED flashes indicating activity on the second network port
Power supply status	Green indicates a good status on both power supplies. Red indicates a single power supply failure
Fan status	Green indicates a good status on all internal cooling fans. Red indicates at least one fan failure.

DX-Series Storage Array Operations

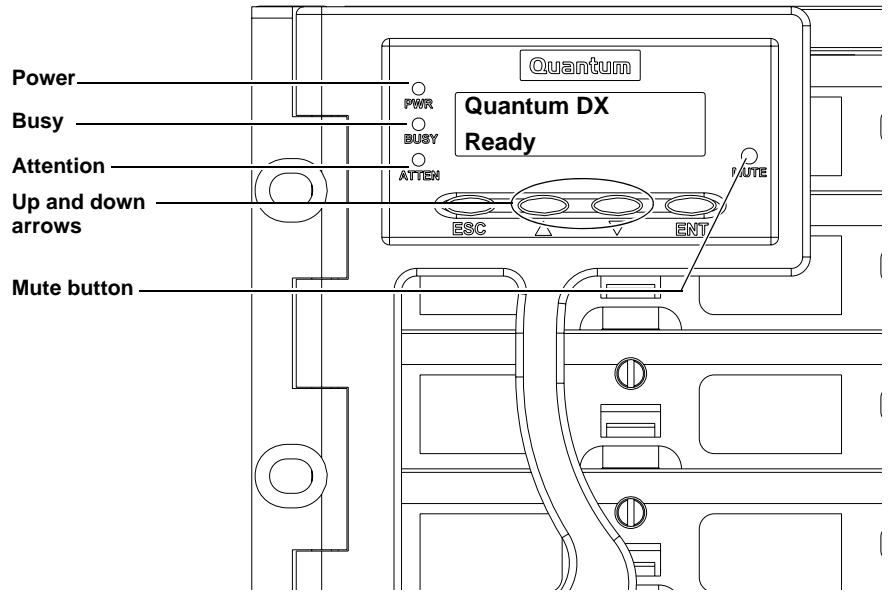
This section describes how to monitor the DX-Series storage array. The DX-Series storage array can be monitored either through the front LCD panel, various LEDs located on the front and back of the unit, and also through an audible alarm. Refer to the following sections for descriptions of the LCD and component LEDs:

- [Storage Array LCD](#)
- [RAID Controller LEDs](#)
- [Control Module LEDs](#)
- [BBU LEDs](#)
- [Power Supply LEDs](#)
- [Fan Module LEDs](#)
- [Audible Alarm](#)

Storage Array LCD

The storage array LCD is located in the upper left corner of the unit (see [figure 12](#)).

Figure 12 Storage Array LCD Location



The LEDs located to the left side of the front LCD are described in [table 3](#).

Table 3 Front LED Descriptions

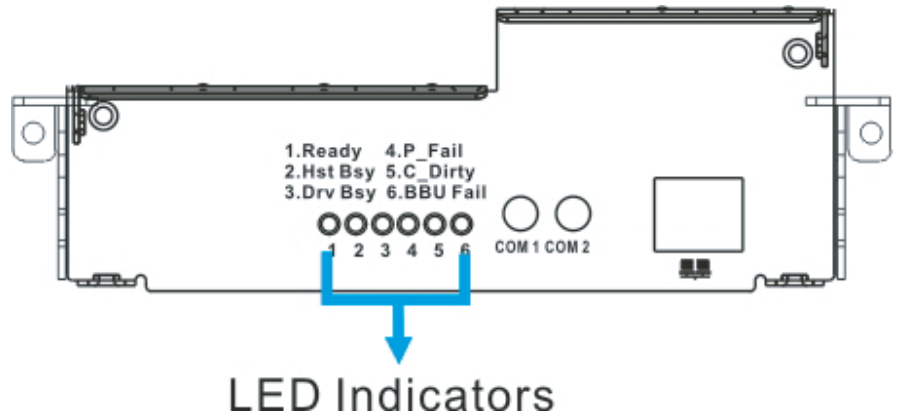
LED	On/Off	Description
Power - <i>Blue</i>	On	The storage array is powered on.
	Off	The storage array is powered off.
Busy - <i>White</i>	On	The host or drive channel is active.
	Off	There is no host or drive activity.
Attention - <i>Red</i>	On	System status events have been detected by the firmware. Use the up and down arrows on the LCD to view the events.
	Off	All system components are functioning normally.
Button		Description
Mute button		Press the mute button to stop the alarm.

Note: If the **Attention - Red** light is on, it does NOT necessarily mean that a component within the storage array has failed. Check the LCD display and use the up and down arrows to view the events that occurred on the storage array.

RAID Controller LEDs

The RAID controller LEDs are located in the back of the storage array (see [figure 13](#)). The DX30 storage array contains a single RAID controller located in the upper bay and the DX100 storage array contains dual RAID controllers.

Figure 13 RAID Controller Locations



The LEDs located on the RAID controller are described in [table 3](#).

Table 4 RAID Controller LED Descriptions

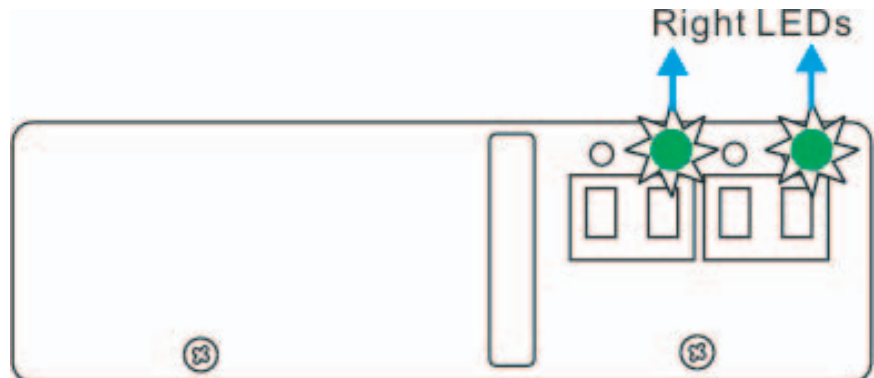
LED	On/Flash/Off	Description
1: Controller Ready - <i>Green</i>	On	Indicates that the RAID controller is active and operating properly.
	Flashing	The RAID controller is initializing.
	Off	The RAID controller is not ready for operation.
2: Host Active - <i>Green</i>	Flashing	There is activity on the host ports.
	Off	There is no activity on the host ports.
3: Drive Busy - <i>Green</i>	Flashing	There is activity on the drive ports.
	Off	There is no activity on the drive ports.
4: Partner Failed (DX100 only) - <i>Amber</i>	On	Indicates that the partner controller in a redundant controller subsystem has failed.
	Off	The partner controller is operating correctly.
5: Cache Dirty - <i>Amber</i>	On	Indicates that data is currently being cached in memory or is being held up by the BBU during a system power loss.
6: BBU Fault - <i>Amber</i>	On	The BBU cannot sustain the cache memory. BBU may also be missing.
	Off	The BBU is able to sustain the cache memory.
	Flash	The BBU is charging.

LED	On/Flash/Off	Description
A: CH0 Link <i>- Green</i>	On	Channel 0 link is established.
	Off	Channel 0 link is not established or is cut off.
B: CH1 Link <i>- Green</i>	On	Channel 1 link is established.
	Off	Channel 1 link is not established or is cut off.
C: EXP Link <i>Green</i>	On	Expansion port link is established.
	Off	Expansion port link is not established or is cut off.

Control Module LEDs

The control module LEDs are located in the back of the storage array in the upper left and upper right portion of the storage array. (see [figure 14](#)). The control modules provide Fibre Channel ports for host connections.

Figure 14 Control Module Locations



The LEDs located on the control module are described in [table 5](#).

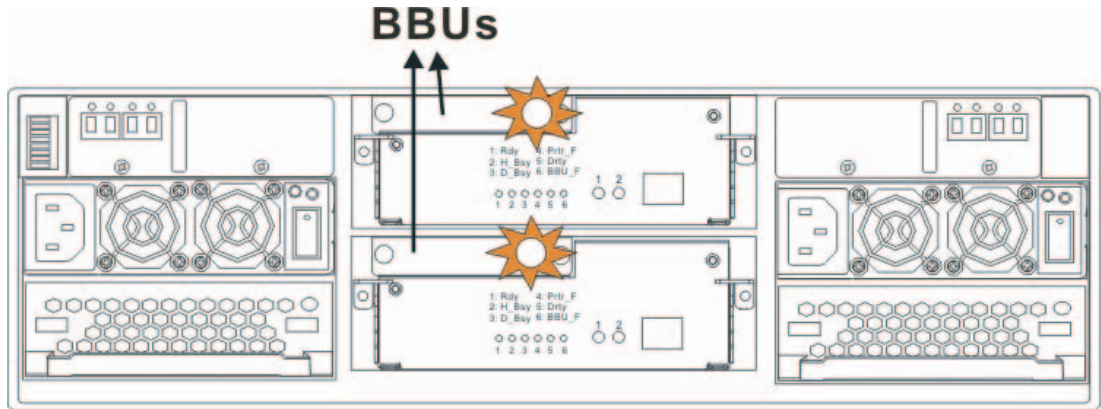
Table 5 Control Module LED Descriptions

LED	On/Flash/Off	Description
Right port - Green	On	Link is established.
	Off	Link is not established or is cut off.
	Flashing	Link has data traffic.
Left port - Green	The left-hand LED on both ports is not used and will not be lit.	

BBU LEDs

The BBU LEDs are located in the back of the storage array in the center section portion of the storage array. (see [figure 15](#)). The LEDs indicate the health or status of the BBU.

Figure 15 BBU Locations



The LEDs located on the BBU are described in [table 6](#).

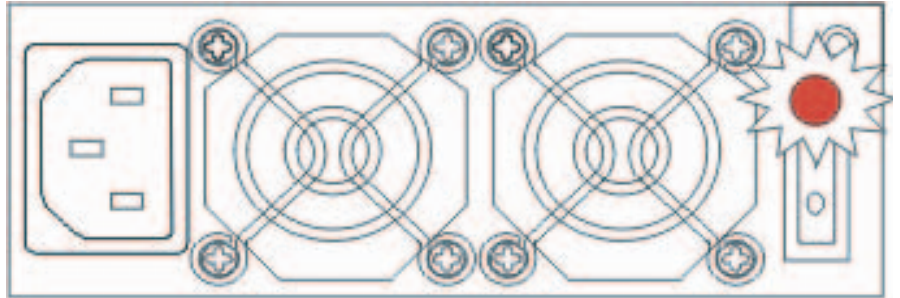
Table 6 BBU LED Descriptions

LED	On/Flash/Off	Description
BBU LED- <i>Amber</i>	On	The BBU cannot sustain the cache memory. BBU may also be missing.
	Off	The BBU is able to sustain the cache memory.
	Flashing	The BBU is charging.

Power Supply LEDs

Each power supply comes with a single LED located just above the power switch. This LED indicates the operational status of the PSU module. (see [figure 16](#)).

Figure 16 Power Supply Locations



The LEDs located on the power supply are described in [table 7](#).

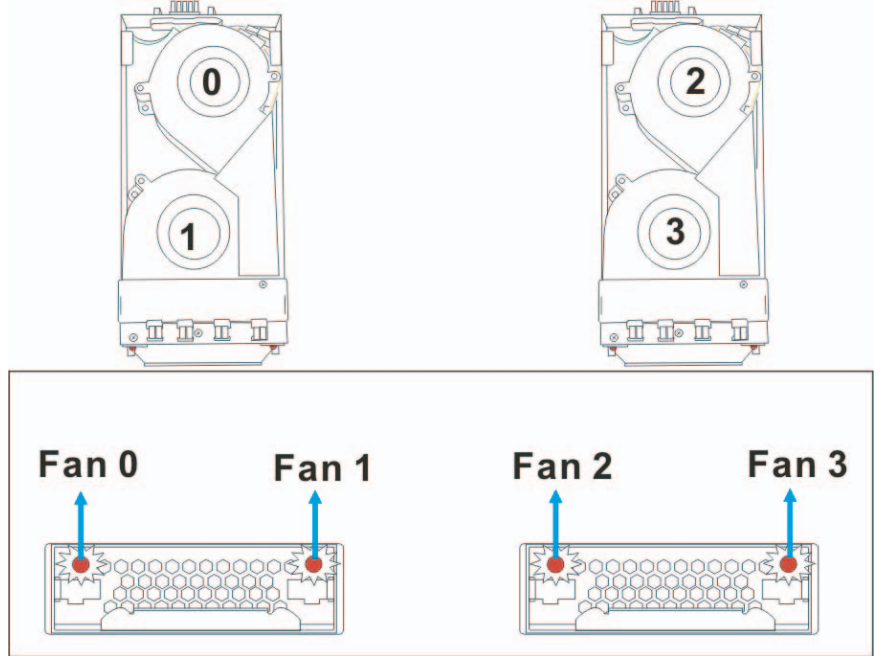
Table 7 Power Supply LED Descriptions

LED	On/Flash/Off	Description
Power Supply LED- <i>Green or Red</i>	Green On	The power supply is operating normally.
	Green Off	The storage array has not been connected into a power source.
	Green Flashing	The power supply has not been turned on. The PSU module LED will blink when the subsystem is connected to a power source but not yet turned on.
	Red On	The power supply has failed and is unable to provide power to the storage array.

Fan Module LEDs

Each cooling module has two red LEDs on the back. Each LED corresponds to a single fan in the fan module. (see [figure 17](#)).

Figure 17 Fan Module Locations



The LEDs located on the fan module are described in [table 7](#).

Table 8 Fan Module LED Descriptions

LED	On/Flash/Off	Description
Fan Module LED- <i>Red</i>	On	The fan module has failed.
	Off	The fan module is operating normally.

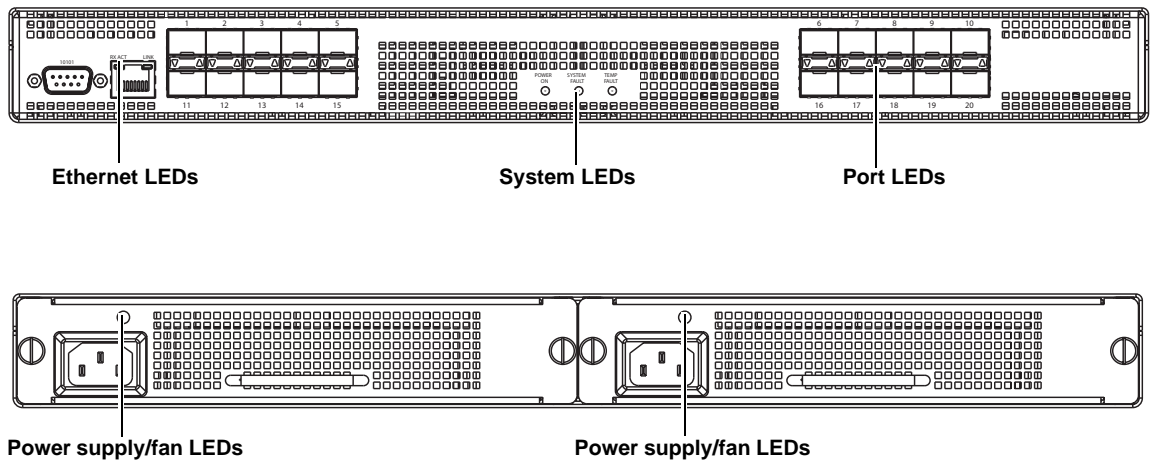
Audible Alarm

Whenever any of the threshold values assigned to the different components within the DX-Series storage array have been surpassed or when an active component has failed, an audible alarm is triggered. To determine what component has triggered the alarm, read the error message on the LCD screen (see [figure 12](#)).

DX-Series Fibre Channel Switch Operations

This section describes how to monitor the DX-Series Fibre Channel switch. The DX-Series Fibre Channel switch can be monitored through the various LEDs located on the front and back of the unit. Refer to the following section for descriptions of the component LEDs (see [figure 18](#)):

Figure 18 Fibre Channel Switch LED Locations



The LEDs are described in [table 9](#).

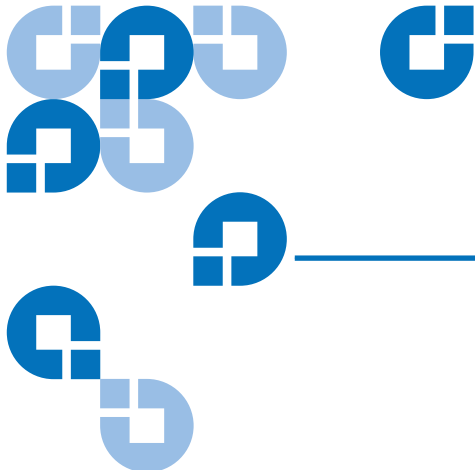
Table 9 Fibre Channel Switch LED Descriptions

LED	On/Flash/Off	Description
Ethernet LEDs- <i>Green</i>	Ethernet Activity (left port) Flashing	The Ethernet port is receiving data.
	Ethernet Link (left port) On	The switch is connected to an operational Ethernet network.

LED	On/Flash/Off	Description
System LEDs- <i>Green or Yellow</i>	Power On (<i>Green LED</i>)	The switch is plugged in and the internal power supplies are functional.
	System Fault (<i>Yellow LED</i>)	An event has occurred that meets or exceeds the current Fault LED threshold setting. Contact Quantum Customer support.
	Temp Fault (<i>Yellow LED</i>)	The internal temperature has exceeded acceptable levels. Contact Quantum Customer support.
Port LEDs- <i>Green or Yellow</i>	Off	An SFP is not installed in the port.
	On <i>Green</i>	An SFP is installed in the port and a link has been established. This is the normal port operational status.
	On <i>Yellow</i>	The port has an SFP installed but a link has not been established.
	Flashing <i>Green</i>	Data is being transferred between the port and the device.
Power Supply/Fan LED - <i>Green</i>	On	The power supply and fan is functioning normally.
	Off	The power supply or fan has failed. Contact Quantum Customer Support.

Relocating the DX-Series System

If you ever need to install the DX-Series system components in a different location, refer to the “Quantum DX-Series Unpacking and Installation Instructions” PN6513502 included on the documentation CD. These instructions include hardware installation and cabling as well as software configuration.



Chapter 3

DX-Series Remote Management

The DX-Series system utilizes a web-based interface which allows you to configure and manage the DX-Series system from a remote workstation on the same network. The DX-Series system is managed through the following web pages (accessible using Internet browser software installed on the host computer):

- [Home](#) allows you to view the status of all system components.
- [Configuration](#) allows you to set up information about the DX-Series system such as network, date and time, passwords, and Fibre Channel port settings and device mappings.
- [System Status](#) allows you to view the status of the emulated tape drives, cartridges, and robot, as well as system performance.
- [Remote Alerts](#) allows you to set up e-mail messages and SNMP alerts to alert you when certain events occur on the DX-Series system.
- [Licensing](#) allows you to view the license agreement as well as add license keys to enable optional product features.
- [Utilities](#) allows you to upload and activate new firmware revisions as well as configuration files.

DX-Series Web Pages

The Internet browser software is not supplied with the DX-Series system; you must obtain and install it independently. The DX-Series system supports the following Internet browsers:

- Microsoft Internet Explorer 6.0 SP1 or later
You can download this software from <http://www.microsoft.com>.

Note: If Internet Explorer is the default browser on the client system:

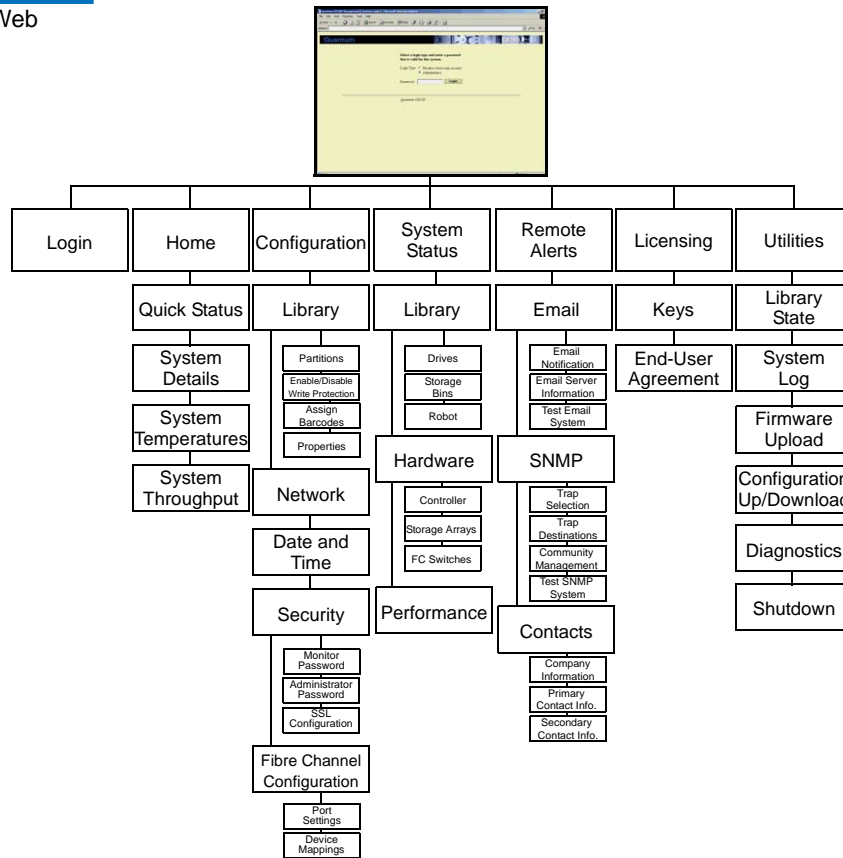
- The latest security updates for Microsoft VM (virtual machine) must be installed on the client system.
- The security settings must be set no higher than “medium”. If the settings are set to “high security”, the browser will not be able to login to the DX-Series system since the system needs write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

- Mozilla Suite 1.7 on Solaris 10
You can download this software from <http://www.mozilla.org>.
- Firefox 1.0.6 on Windows
You can download this software from <http://www.mozilla.org>.
- Java Plug-in 1.4.2 or later
You can download this software from <http://www.java.com>

DX-Series Web Page Menu Items

The following figure depicts the menu items available from the DX-Series Web pages.

Figure 19 DX-Series Web Page Menu Items



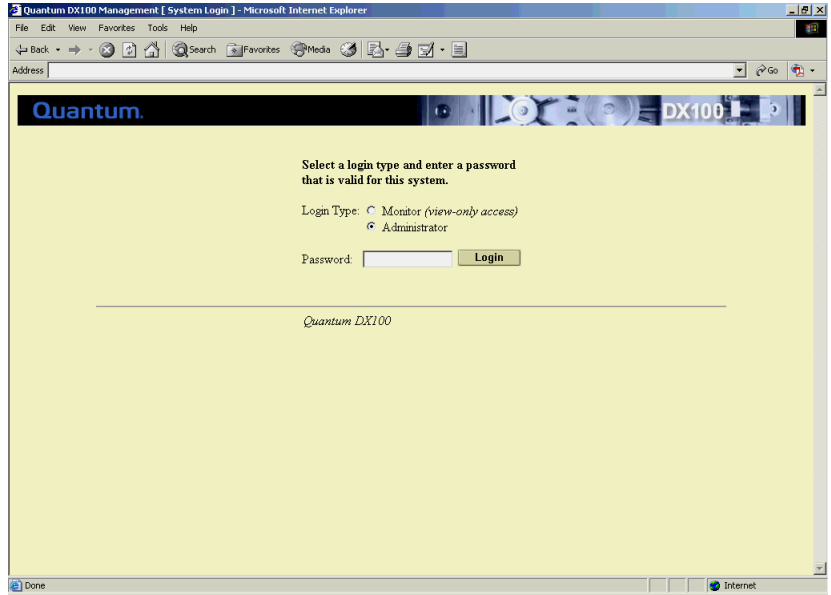
Accessing DX-Series Web Pages

To access the DX-Series web pages:

- 1 On the host computer, open the Internet browser software.
- 2 In the **Address** field, type `http://IPaddress/` where IP address is the IP address for the DX-Series system.

The **Log In** page displays (see [figure 20](#)):

Figure 20 Login Page



- 3 Select the login type and enter the appropriate password.

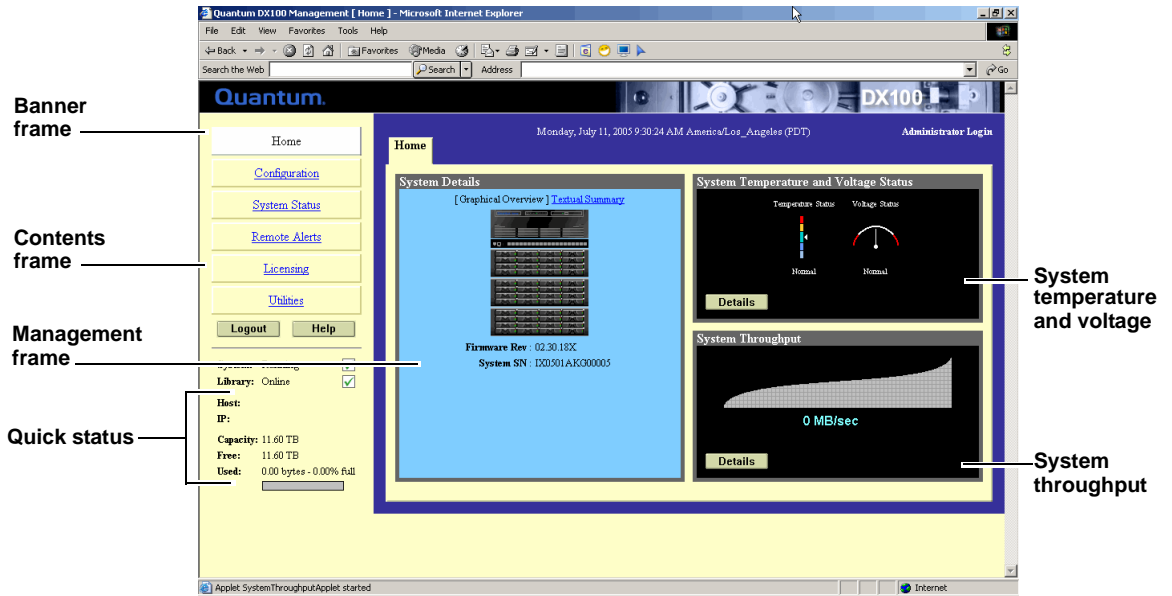
Login Type	Default Password	Description
Monitor	password	The monitor user is allowed to view the DX-Series system management pages, but cannot change them.
Administrator	password	The administrator user can both view and change the management pages.

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

- 4 Click **Login**.

The **Home** page displays (see [figure 21](#)):

Figure 21 Home Page



Using the DX-Series Web Pages

The first page that displays after you login to the DX-Series web pages is the DX-Series system **Home** page (see [figure 21](#)). This page includes information on the DX-Series system status as follows:

- Quantum DX-Series is on-line
- Quantum DX-Series is off-line

The **Home** page is divided into four distinct sections:

- Banner frame
- Contents frame
- Management frame
- Quick status information

Note: The **Home** page display varies depending on the number of storage arrays configured in your DX-Series system.

The banner frame displays the Quantum logo and product name. The contents frame displays a list of the DX-Series web pages. To view a page,

click its corresponding link. The management frame displays the page you selected.

Graphical View vs. Textual View

There are two options for viewing the system details from the **Home** page (see [figure 22](#)):

- Graphical view - system details are displayed in the management frame using graphical representations of the DX-Series components to describe the system status.
- Textual view - system details are displayed in the management frame using text to describe the DX-Series system status.

Figure 22 System Details
(Graphical vs. Textual)



Details Buttons (System Temperature/Voltage and Throughput)

Both the system temperature/voltage and throughput sections of the home page have a details buttons.

- **System Temperature/Voltage Details** button: Click the system temperature/voltage details button to go to the **System Status/Hardware** page. This page provides more detailed information on the system components (see [Viewing Hardware Status](#) on page 65 for more information).
- **Throughput Details** button: Click the throughput details button to go to the **System Status/Performance** page. This page provides more detailed system performance information (see [Viewing System Performance](#) on page 75 for more information).

To return to a previous web page, click the browser's **Back** button.

Configuration

This information was initially configured during the installation of the DX-Series system.

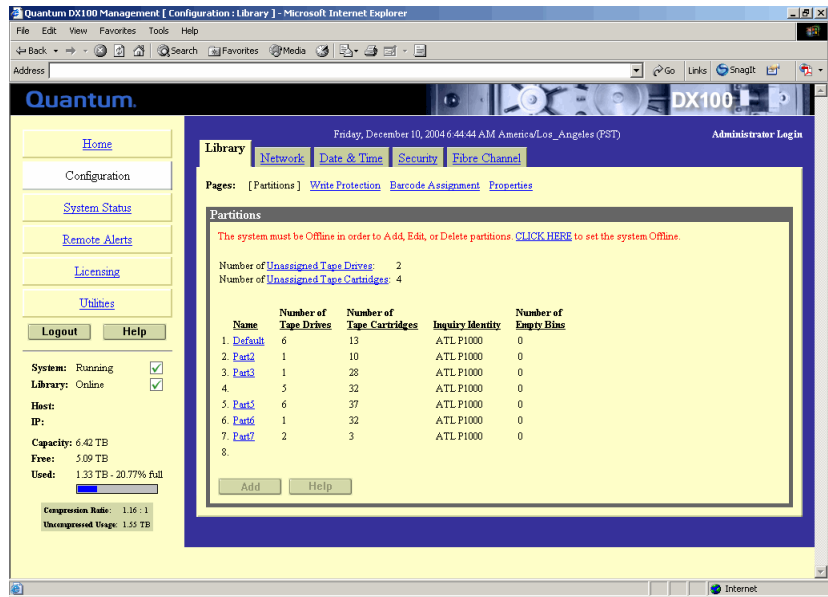
Accessing Library Configuration

To access the **Configuration** page, from the contents frame, click **Configuration**.

The management frame displays the **Configuration** page (see [figure 23](#)).

Note: The DX-Series system must be offline before making any changes to the system configuration. See [Changing Library State](#) on page 90.

Figure 23 Configuration Page

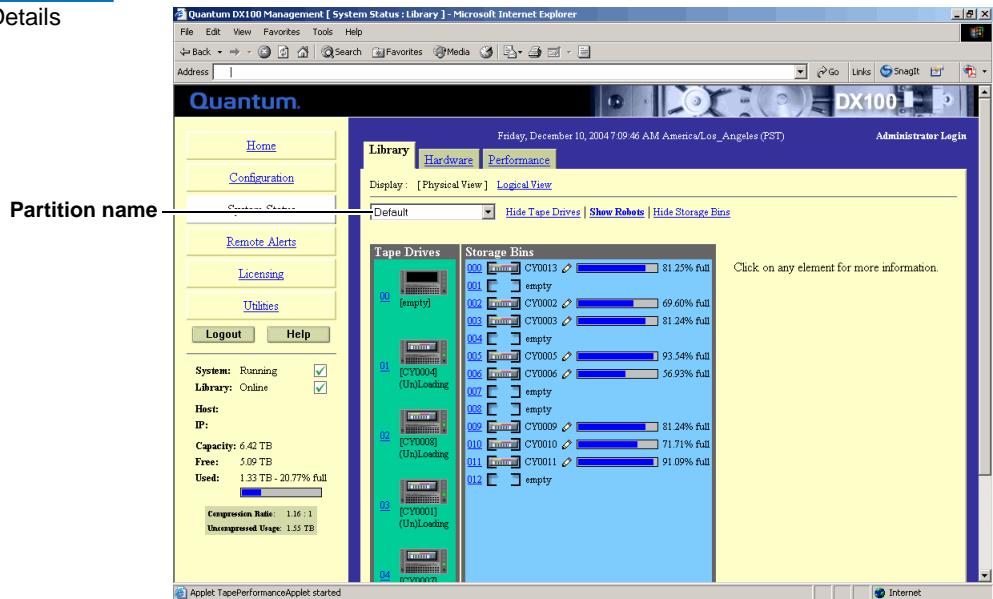


Partitioning

Partitioning provides the capability to divide the DX-Series virtual tape drives and storage elements into separate partitions, usable by separate host computers. 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.

Clicking on a partition name in the **Partition** list displays a detail window listing all details for the selected partition (see [figure 24](#)). Refer to the system status pages for details on the tape drives and tape cartridges.

Figure 24 Partition Details



The library partitioning page is broken up into the following sections:

- [Adding a Partition](#)
- [Editing a Partition](#)
- [Deleting a Partition](#)

Adding a Partition

Up to eight partitions can be added to a DX30 system. Up to thirty two partitions can be added to a DX100 system.

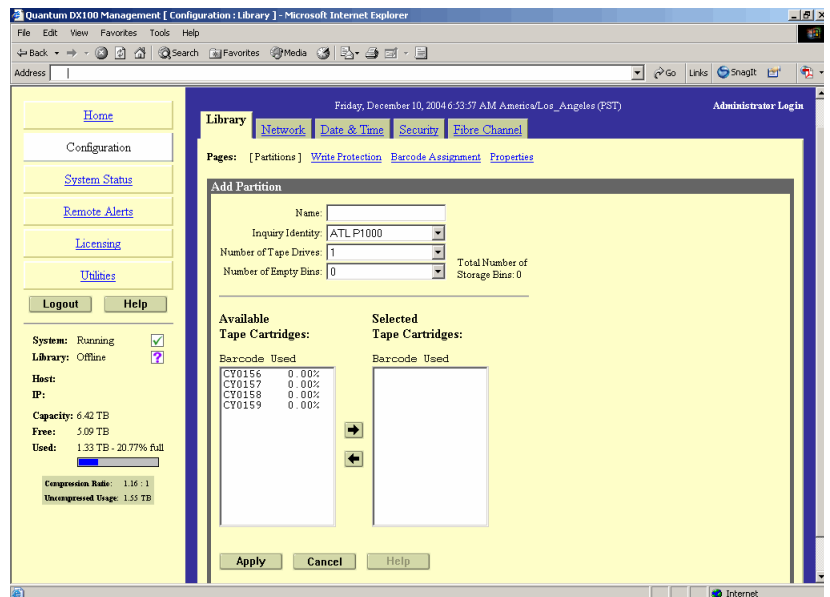
Caution: Ensure that your backup package is properly configured for the correct number of tape drives emulated in the DX-Series system partition. Failure to do so may cause your backup application to malfunction or cease to operate.

To add a partition:

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

- 1 From the **Partition** page, click **Add** to add a partition to the system. The **Add Partition** page displays (see [figure 25](#)).

Figure 25 Adding a Partition



- 2 Enter a partition name that identifies it 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](#) on page 49).

- 3 Select the inquiry identity to determine 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.

- 4 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.

- 5 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.
- 6 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 (see [Creating Cartridges](#) on page 120) are assigned to the Default partition.

- 7 Click **Apply** to create the partition.

Map the Fibre Channel ports as described in [Configuring the Fibre Channel Options](#) on page 55.

- Return the DX-Series system to the on-line state (see [Changing Library State](#) on page 90).

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

Editing a Partition

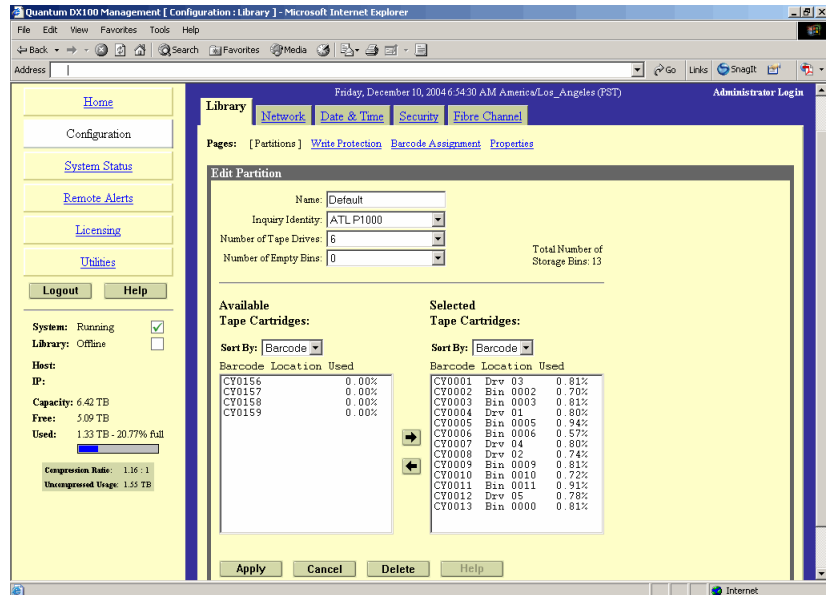
To edit a partition:

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

- From the **Partition** page, click the link for the partition you wish to edit.

The **Edit Partition** page displays (see [figure 26](#)).

Figure 26 Editing a Partition



- Edit the partition information as desired (see [Adding a Partition](#) on page 41 for descriptions of the fields).
- Click **Apply**.

- 4 Return the DX-Series system to the on-line state (see [Changing Library State](#) on page 90).

The partition is updated.

Deleting a Partition

To edit a partition:

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

- 1 From the **Partition** page, click the link for the partition you wish to delete.

The **Edit Partition** page displays (see [figure 26](#)).

- 2 Click **Delete** to delete the partition.

- 3 Return the DX-Series system to the on-line state (see [Changing Library State](#) on page 90).

The partition is deleted.

Write Protection

Write protection, when enabled, prevents any data to be written to the tape cartridge. This protects your important data from being overwritten. The cartridge will remain unavailable for further storage until the write protection has been disabled.

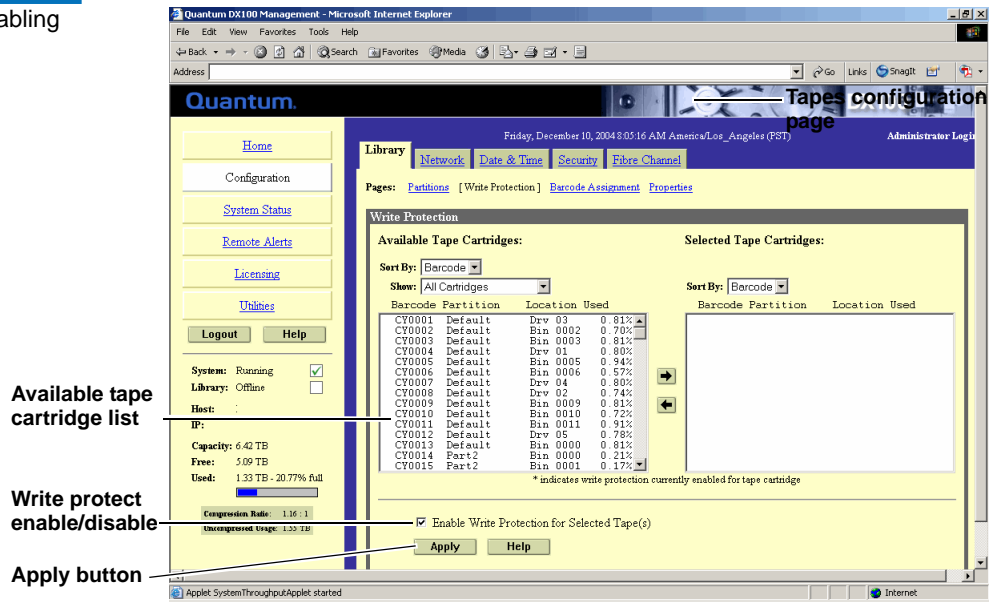
Note: To enable or disable write protection, the system must be offline.

To enable/disable write protection:

- 1 From the **Library** page, click the **Write Protection** link.

The **Write Protection** page displays (see [figure 27](#)).

Figure 27 Enabling/Disabling Write Protection



Available tape cartridge list

Write protect enable/disable

Apply button

- 2 Select the tape cartridges from the **Available Tape Cartridge** list and click the right arrow button to move them into the **Selected Tape Cartridge** list. You can sort the tape cartridges by barcode, partition, location, and used. You can show all cartridges, unassigned cartridges, or by partition assignment.
- 3 Check **Enable Write-Protection Selected Tape(s)** to *ENABLE* write protection on the selected tape cartridges or un-check the Write-Protection Select Tape(s) to *DISABLE* write protection on the selected tape cartridges.
- 4 When you have selected the tape(s) and write protection status, click **Apply**.
Write protection for the selected tapes is enable/disabled.

Barcode Assignment

Barcode labels provide individual identities for each tape cartridge in the system. These labels allow the DX-Series system and third-party backup applications to track and differentiate between the tape cartridges within the system.

Barcode labels are automatically assigned during the DX-Series system initialization. These barcode labels can be over-ridden if necessary.

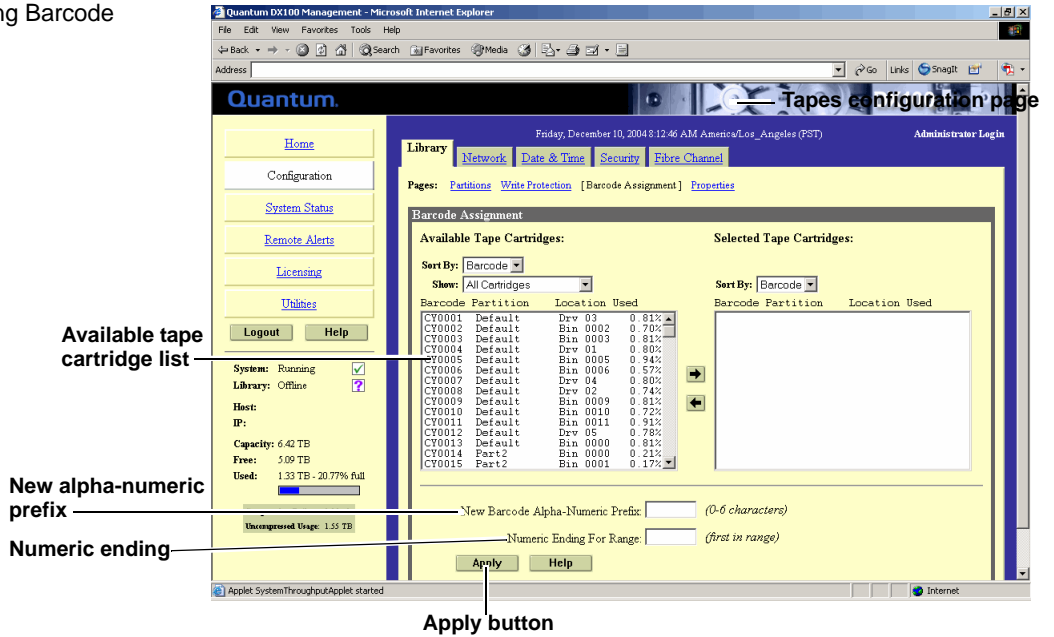
Note: To assign a barcode label, the system must be offline.

To assign a barcode label to a tape cartridge(s):

- 1 From the **Library** link of the **Configuration** page, click the **Barcode Assignment** link.

The **Barcode Assignment** page displays (see [figure 28](#)).

Figure 28 Assigning Barcode Labels



- 2 Select the tape cartridges from the **Available Tape Cartridge** list and click the right arrow button to move them into the **Selected Tape Cartridge** list.

- 3 Enter the alpha characters (0 to 6 characters) in the **New Alpha Prefix** field.

Note: If you are entering alpha characters for the first part of a barcode number and this is the first number in a range, no more than five characters can be used. This allows the system to assign the last character in the field.

- 4 Enter the numeric character in the **Numeric Ending** field.

Note: This number is used as the first number in the range of tape cartridges. The number will increment with each additional cartridge in the field.

- 5 When you have selected the tape(s) and both the alpha and numeric characters, click **Apply**.

Barcode labels are assigned for the selected tape(s).

Properties

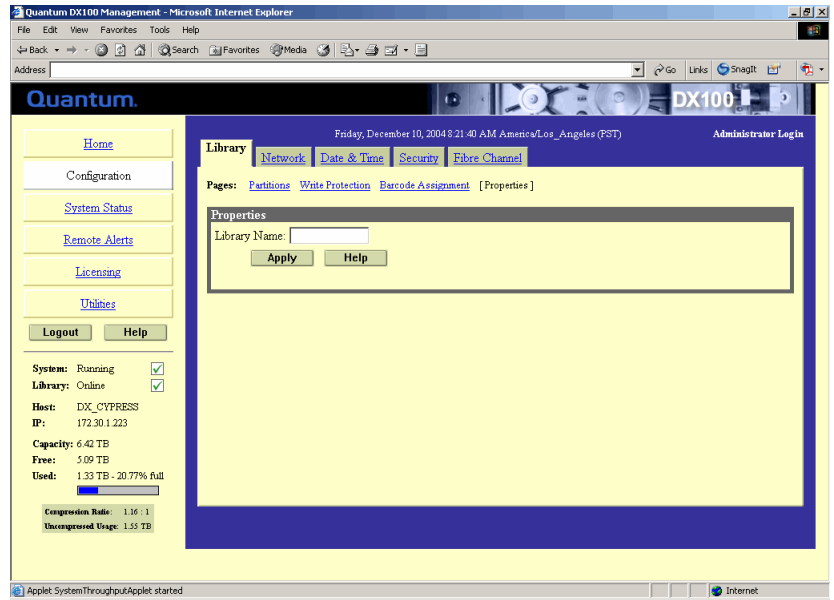
The library name identifies the DX-Series system so it can be distinguished from other devices on the network through the SNMP interface.

To set the library name:

- 1 From the **Library** link of the **Configuration** page, click the **Properties** link.

The **Properties** page displays (see [figure 28](#)).

Figure 29 Assigning a Library Name



- 2 Enter a library name and click **Apply**.

The DX-Series system will use the new library name the next time the system is rebooted.

Note: The library name is independent of the host name in the **Network** tab (see [Configuring the Network](#) on page 49).

Figure 30 Configuring the Network

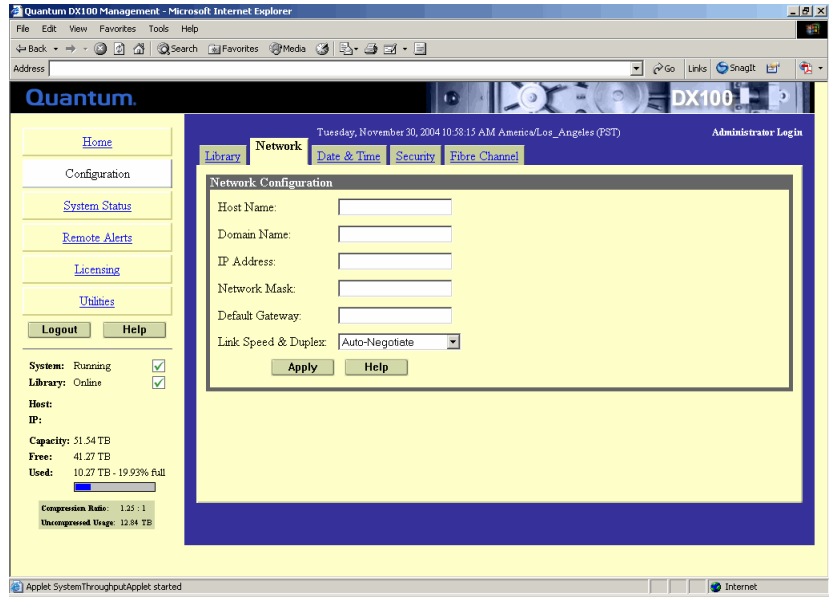
The network configuration information was entered during the initial setup of the DX-Series system. Consult your network administrator prior to changing any of the information.

Viewing/Editing Network Configuration

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

The management frame displays the **Network Configuration** page (see [figure 31](#)).

Figure 31 Network Configuration Page



- 2 Edit the configuration information as desired (see [table 10](#) for a description of the fields).
- 3 Click **Apply**.

Table 10 Network Configuration Fields

Field	Description
Hostname	View or set the hostname for the DX-Series system
Domain Name	View or set the domain name for the DX-Series system.
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 for the DX-Series system (10/100/half/full/auto)

Configuring the Date and Time

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

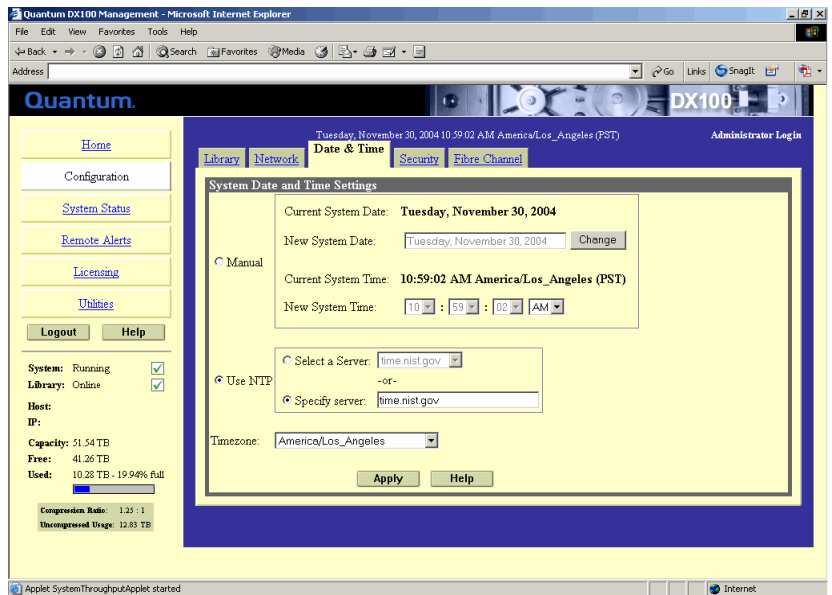
Configuring the Data and Time

To access the **Date and Time Configuration** page:

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

The management frame displays the **Date & Time Configuration** page (see [figure 32](#)).

Figure 32 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](#) to an NTP server. The "Select a Server" selection makes a list of well-known NTP servers such as the U.S.

Naval Observatory Master Clocks in Washington, DC and Colorado Springs, Colorado available. The “Specify server” selection enables you to type the name or IP address of any desired NTP server. NTP sends periodic time requests to [the DX-Series system](#), obtaining time stamps and using them to adjust the system’s clock.

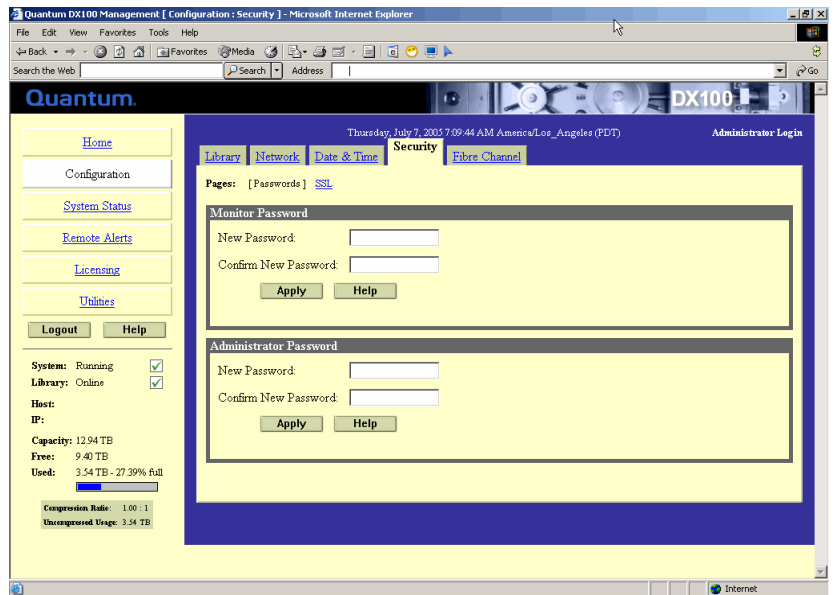
Configuring the Security Options

To access the **Security** page:

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

The management frame displays the **Security** page (see [figure 33](#)).

Figure 33 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.
--

- 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.

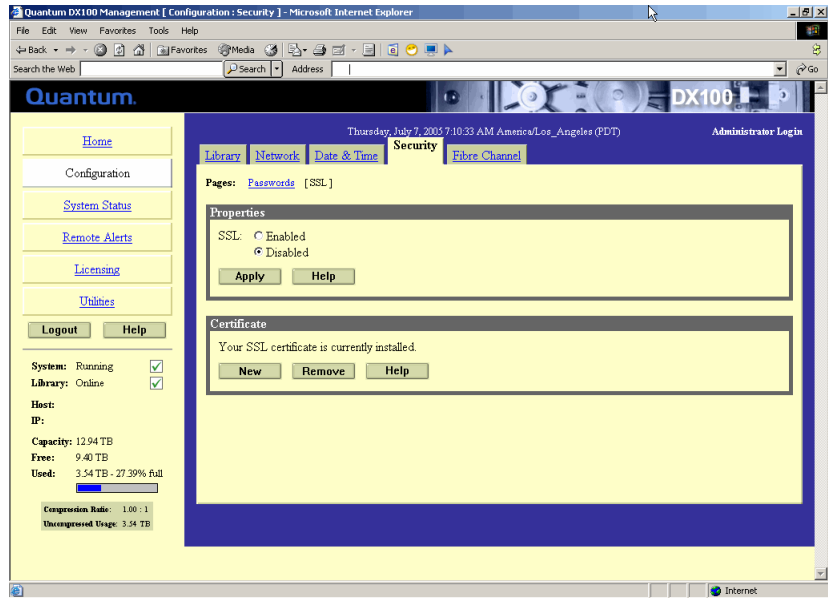
To access the **SSL** page:

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

The management frame displays the **SSL** page (see [figure 34](#)).

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

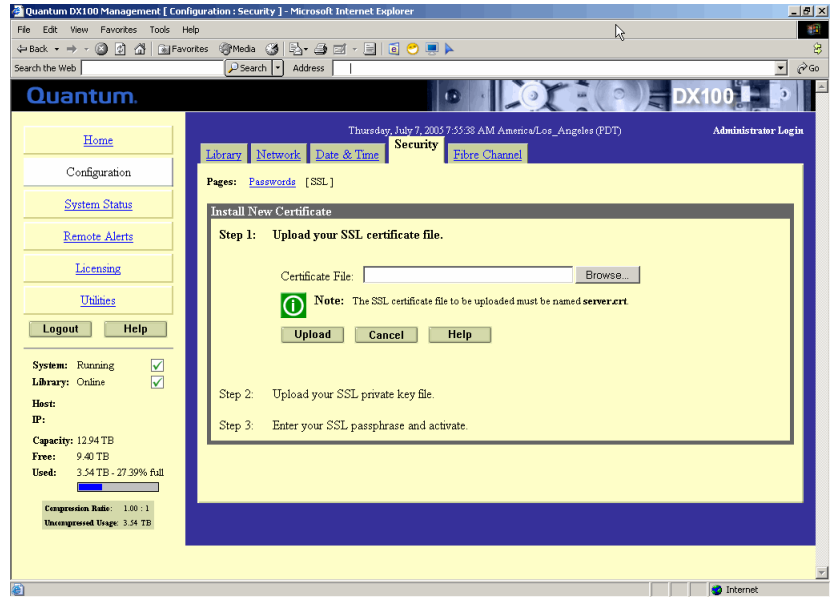
Figure 34 SSL Configuration



- 1 To enable SSL, select **Enable** and click **Apply**.
- 2 To add a SSL certificate, click **New**.

The **Install SSL Certificate** page displays (see [figure 35](#)).

Figure 35 Install SSL Certificate Page



- 3 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**.

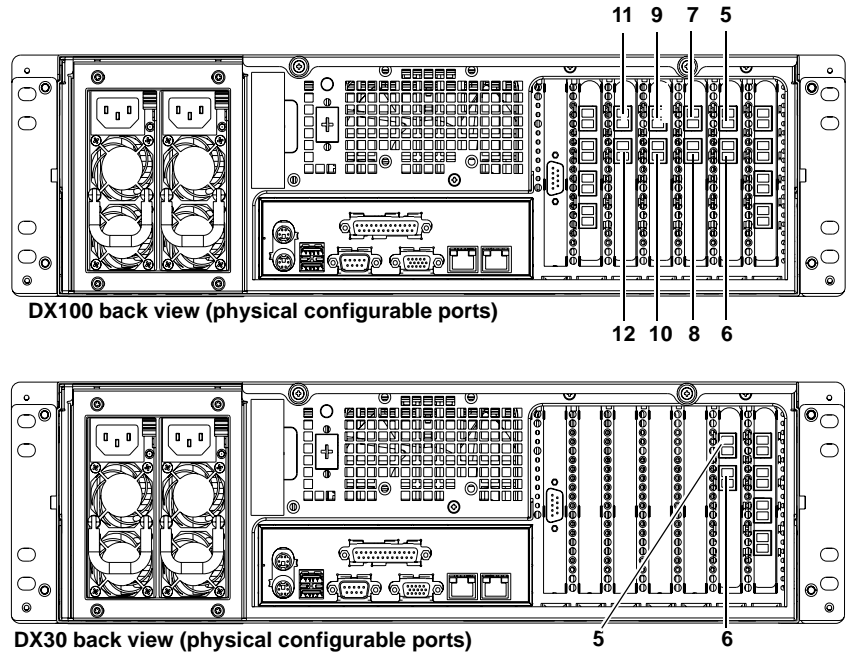
- 4 Click **Upload** to install the SSL certificate file.
- 5 Type your private key and press **Enter**.
- 6 Type your pass phrase and press **Enter**.
- 7 A **Successful Upload** page displays indicating that the SSL certificate file has been installed on the system. Click **OK** to continue.

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

Configuring the Fibre Channel Options

The DX-Series system allows you to control and configure each of the Fibre Channel input ports that connect to the customer SAN. The Fibre Channel input ports are numbered 5 through 12 on the DX100 and 5 through 6 on the DX30 (see [figure 36](#)).

Figure 36 Fibre Channel Input Port Locations

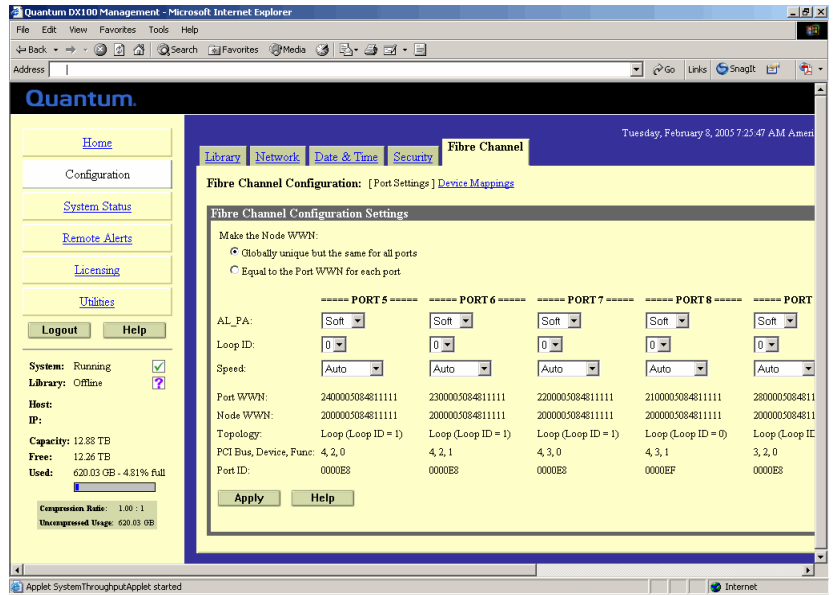


To access the **Fibre Channel** page (see [figure 37](#)):

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

The management frame displays the **Fibre Channel** Port Settings page (see [figure 37](#)).

Figure 37 Fibre Channel Configuration



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

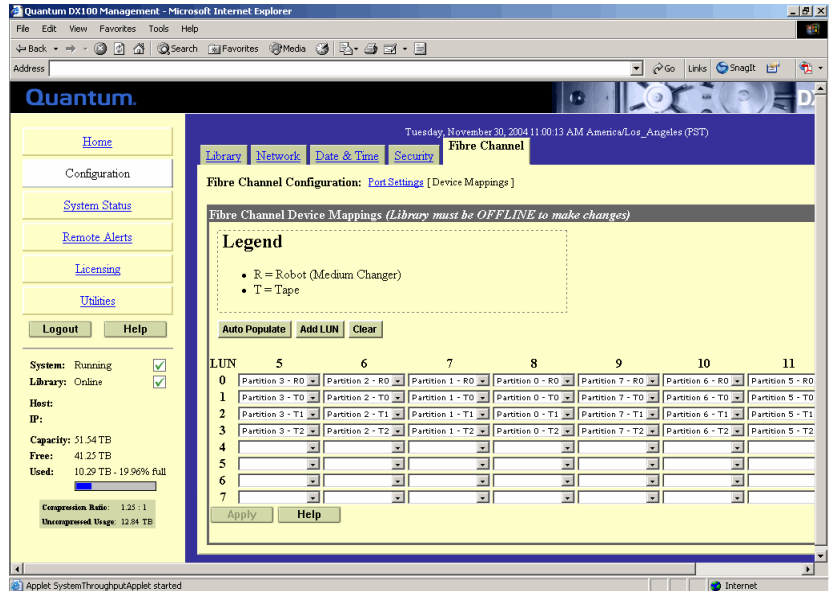
- 2 While the Port WWNs are always unique, the Node WWNs can be set according to the **Make the Node WWN** section as follows:
 - a Selecting **Globally Unique but same for all ports** makes the Node WWNs the same for all Fibre Channel ports.
 - b Selecting **Equal to the Port WWNs for each port** makes the Node WWNs equal to the Port WWNs.
- 3 Selecting The **Port Settings** page (see [table 11](#) for field descriptions) allows you to set the AL_PA, Loop ID and link speed for each 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
Node World Wide Name (WWN)	The node WWN is the overall system identification on the customer SAN. This field allows you to set the WWN in case a controller is replaced so the customer SAN will not require remapping.
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 link speed of the Fibre Channel port (1GB/sec, 2GB/sec, or Automatic). The default setting is Automatic.

- To map specific devices to Fibre Channel ports, click **Device Mapping**. The **Device Mapping** page displays (see [figure 38](#)).

Figure 38 Device Mapping 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.

5 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.

6 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.

System Status

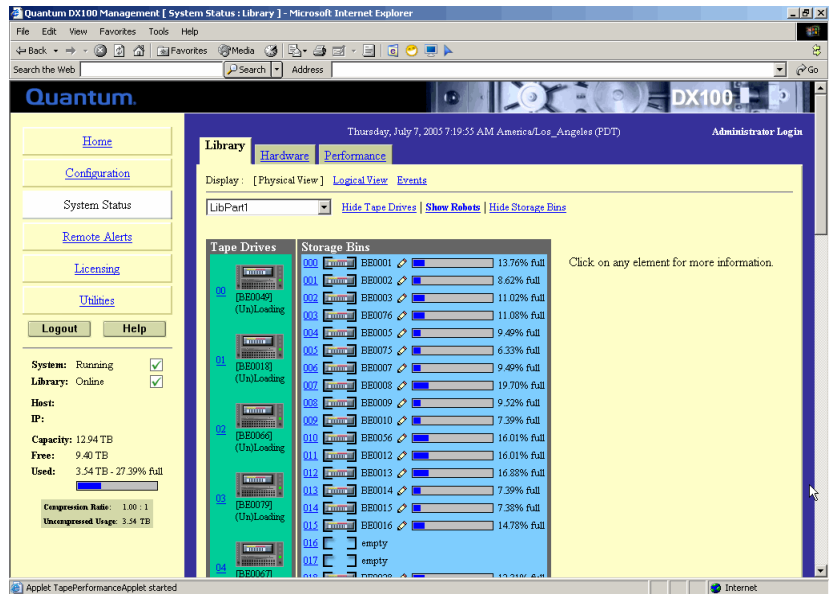
The **System Status** page allows you to view information on the emulated tape drives, robot, storage bins, and DX-Series system hardware.

Accessing System Status

To access the **System Status** page, from the contents frame, click **System Status**.

The management frame displays the **System Status** page (see [figure 39](#)).

Figure 39 System Status Page



The system status page provides two views for the system hardware:

- **Physical View**

The physical view displays the physical representation of the virtual components (tape drives, tape cartridges, and robots) of the emulated tape library. Each drive and tape cartridge is displayed in the tape

drive and storage bin sections. Clicking on a tape drive or cartridge displays the specific details for that device on the right hand side of the page.

Select the partition you wish to view from the drop down list. The Show/Hide links will either display or hide information on the selected tape drive, tape cartridge, or robot. Clicking on a tape drive, tape cartridge, or robot displays detailed information about the selected device.

- **Logical View**

A logical view displays the partitions within the DX-Series system. Clicking on a partition displays the specific details for that partition on the right hand side of the page.

- **Events**

The events list displays all events that have occurred on the DX-Series system.

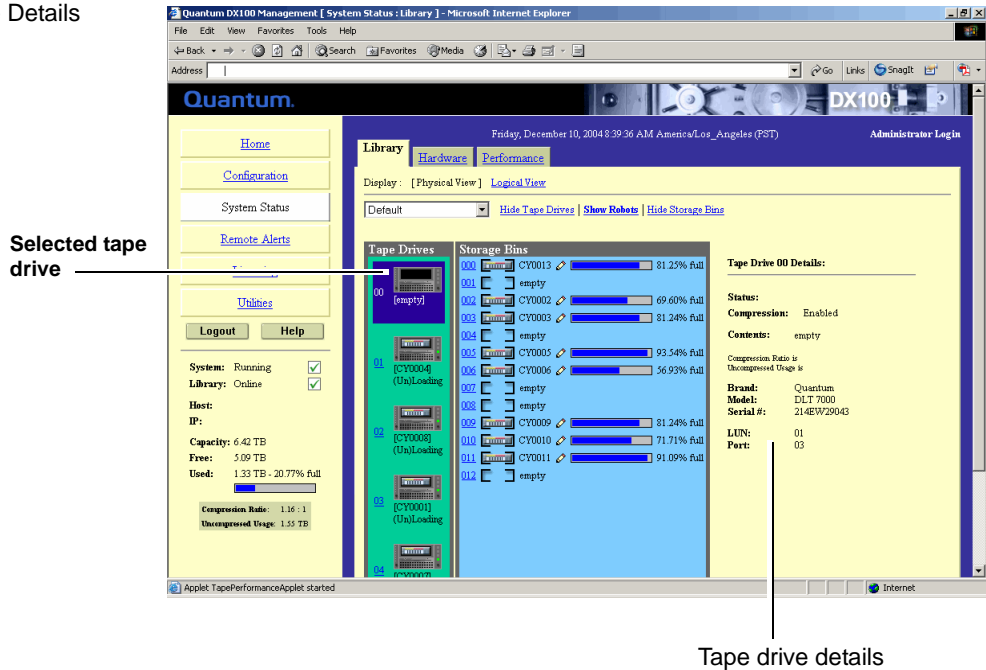
Viewing Tape Drive Details

To view the tape drive details:

- 1 From the **System Status** page, select the partition from the drop down list and click the tape drive you wish to view.

The tape drive details displays (see [figure 40](#)):

Figure 40 Tape Drive Details



The tape drive details are shown in [table 12](#).

Table 12 Tape Drive Details

Field	Description
Status	Displays the current drive status. The drive can be reading, writing, or idle.
Compression	Displays the compression status, either enabled or disabled.
Contents	Displays the current contents of the tape drive. If a tape cartridge is present in the drive, the cartridge label will display in the contents field as well as the write protect status and capacity information.
Brand	Displays the manufacturer of the tape drive.
Model	Displays the model of the tape drive.

Field	Description
Serial Number	Displays the tape drive serial number.
LUN	Displays the logical unit of the tape drive.
Port	Displays the port number assigned to the tape drive.

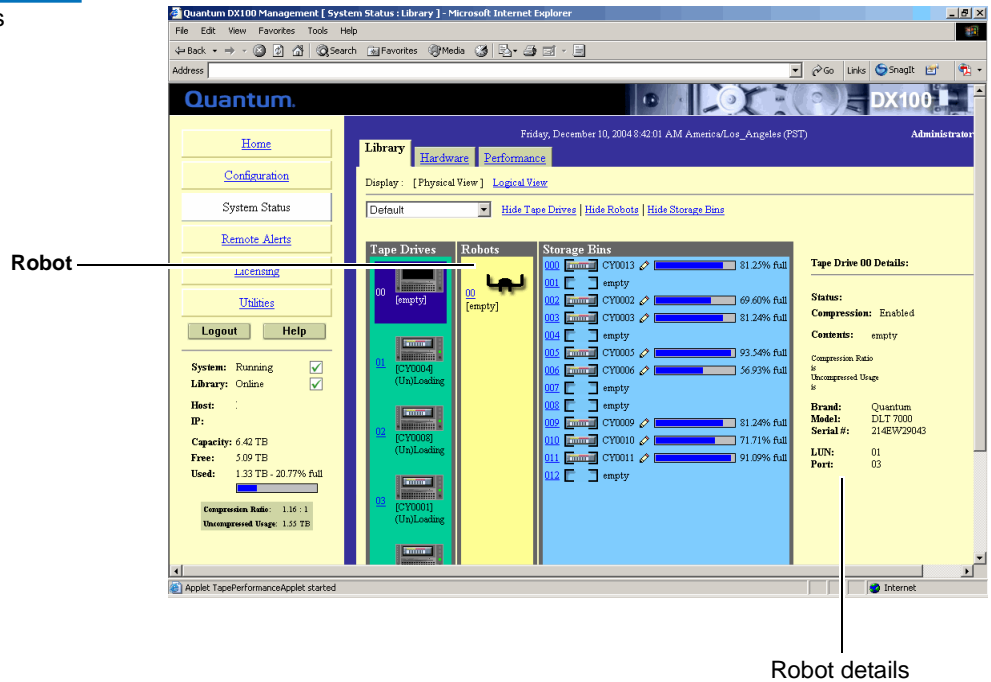
Viewing Robot Details

To view the robot details:

- 1 From the **System Management** page, click **Show Robots** to view the details.

The robot details displays (see [figure 41](#)):

Figure 41 Robot Details



The robot details are shown in [table 13](#).

Table 13 Robot Details

Field	Description
Status	Displays the current status of the robot.
Contents	Displays the current contents of the robot. If a cartridge is present, the bar code label appears in the robot contents.
Brand	Displays the robot brand name.
Model	Displays the robot model number.
Serial Number	Displays the robot serial number.

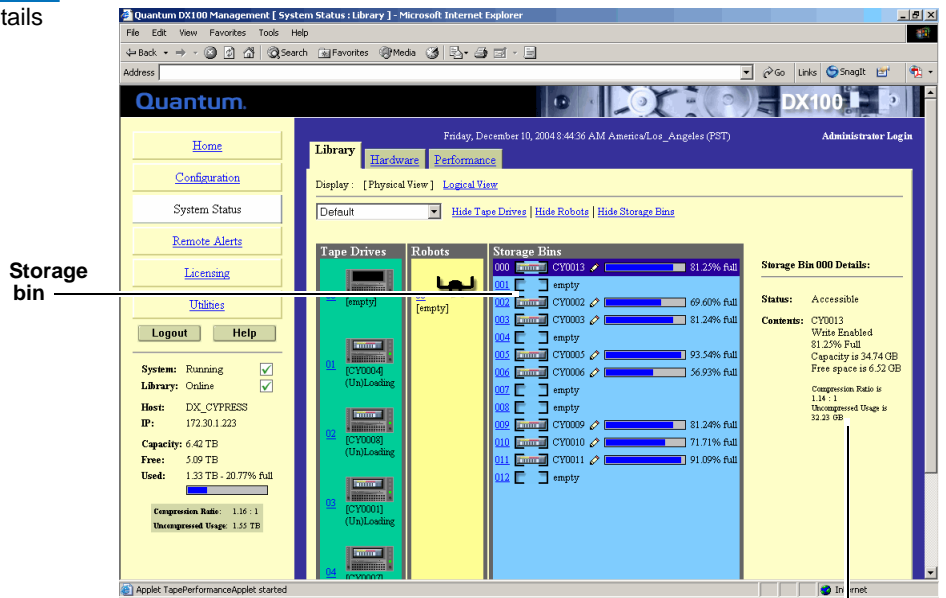
Viewing Storage Bin Details

To view the storage bin details:

- 1 From the **System Management** page, click the storage bin to view the details.

The storage bin details displays (see [figure 42](#)):

Figure 42 Storage Bin Details



Storage bin

Storage bin details

The storage bin details are shown in [table 14](#).

Table 14 Storage Bin Details

Field	Description
Status	Displays the current status of the storage bin. The status is either accessible or not accessible.
Contents	Displays the current contents of a storage bin. If a tape cartridge is present in a bin, the cartridge label will display in the contents field as well as the write protect status and capacity information.
Compression Information	Displays the compression ratio as well as the uncompressed usage.

Viewing Hardware Status

The DX-Series system provides a variety of hardware information from the **Hardware Status** page. The **Hardware Status** page gives the current status of the hard drives, power supplies, fan modules, and temperature of the controller, Fibre Channel switch and storage arrays.

To view the hardware status:

- 1 From the **System Status** page, click **Hardware** tab to view the hardware status.

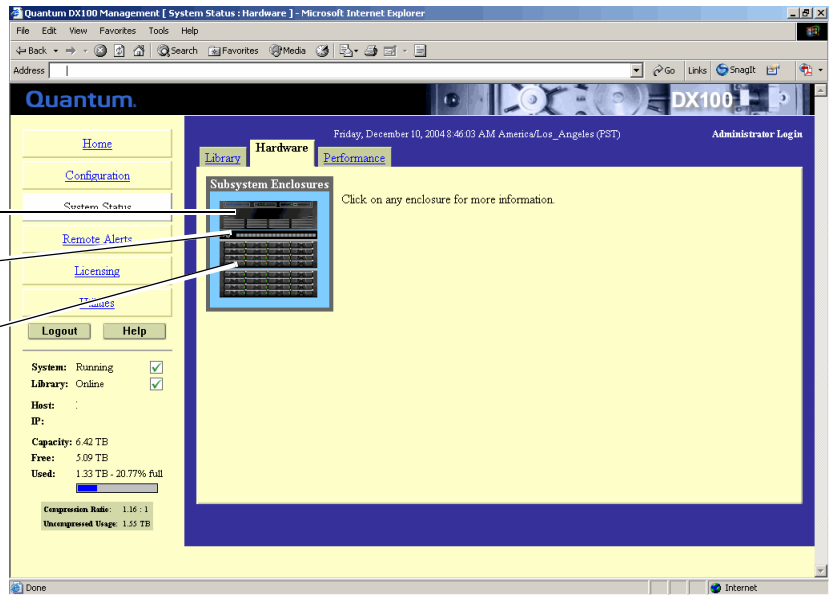
The **Hardware Status** page displays (see [figure 43](#)):

Figure 43 Hardware Status
Page

Controller

Fibre Channel switch
(only present in DX100
systems)

Storage arrays



Controller Details

To view the details or status of the controller hardware, click on the controller icon on the **Hardware Status** screen shown in [figure 43](#).

The **Controller** details display (see [figure 44](#)).

Figure 44 Controller Details

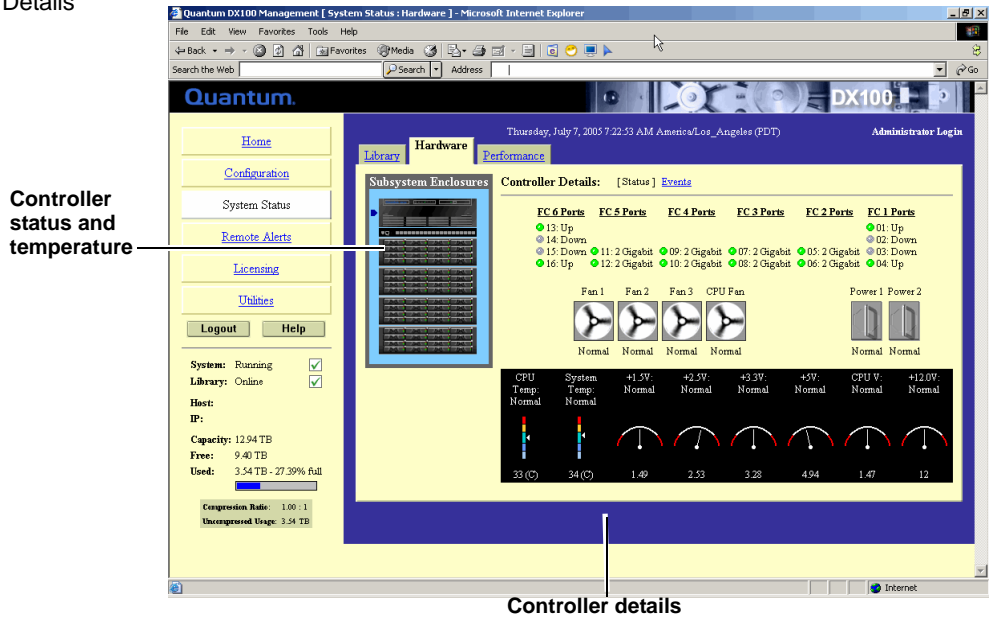


Table 15 Controller Temperature Details

Field	Description	Normal State	Warning State	Failed State
Controller Temperature	Displays the current temperature of the DX-Series system’s internal CPU as well as the external system temperature. There are three states displayed: normal, warning, and failed. The warning and failed states also display a flashing amber box around the temperature gauge for warning and a red box for failed. If the controller reaches 50°C (122°F), a failure is displayed.			

Table 16 Controller Fan and Power Supply Status



Field	Description	Failed State
Power Supplies	Displays the current status of the power supplies. If a power supply has failed, contact Quantum Customer Support (see Customer Support on page xvii).	 Power B: Failed
Fan Modules	Displays the current status of the fan modules. If a fan module has failed, contact Quantum Customer Support (see Customer Support on page xvii).	 Fan B: Failed
Events	Clicking Events displays all log entries for the DX-Series controller. Have this information available prior to contacting Quantum Customer Support.	

Table 17 Controller Fibre Channel Ports Details

Ports	Description
FC 1 and FC 6	Displays the current status of the individual ports on the quad port Fibre Channel HBA(s). These are the Fibre Channel HBA(s) that connect the controller to the storage arrays via the Fibre Channel switch. The status can either be Up (green) or Down (grey).
FC 2 through FC 5	Displays the current status of the individual ports on the dual port Fibre Channel HBA(s). These are the Fibre Channel HBA(s) that connect the controller to the customer Fibre Channel SAN. The status can either be 1 Gigabit/2 Gigabit (green) or Down (grey).

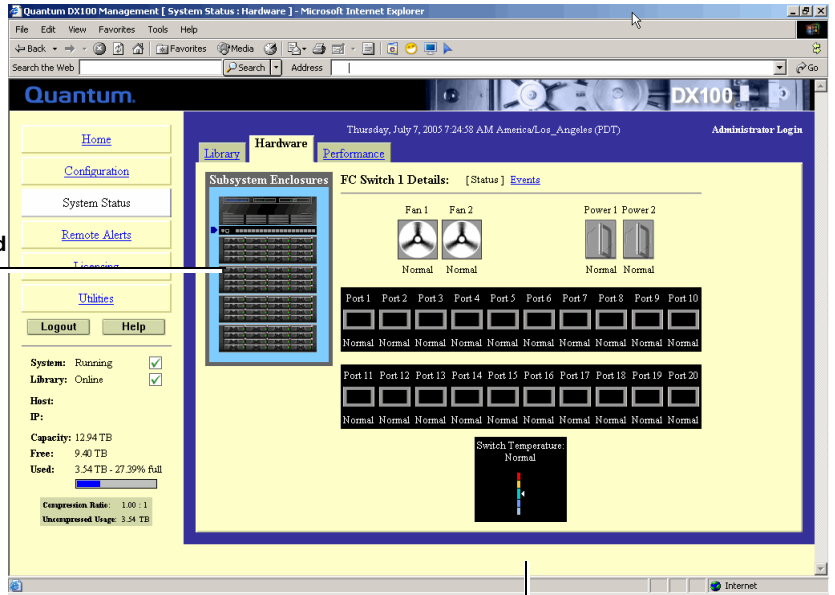
Fibre Channel Switch Details (DX100 Systems Only)

To view the details or status of the Fibre Channel switch, click on the Fibre Channel switch icon on the **Hardware Status** screen shown in [figure 43](#).

The **Fibre Channel Switch** screen display (see [figure 46](#)).

Figure 45 Fibre Channel Switch Details

Fibre Channel switch status and temperature





Fibre Channel switch details

Table 18 Fibre Channel Switch Temperature Details

Field	Description	Normal State	Warning State	Failed State
Temperature	Displays the current temperature of the Fibre Channel switch internal CPU as well as the external system temperature. There are three states displayed: normal, warning, and failed. The warning and failed states also display a flashing amber box around the temperature gauge for warning and a red box for failed. If the controller reaches 50°C (122°F), a failure is displayed.			
Events	Clicking Events displays all log entries for the Fibre Channel switch. Have this information available prior to contacting Quantum Customer Support.			

Table 19 Fibre Channel Switch
Fan and Power Supply Status

Field	Description	Failed State
Power Supplies	Displays the current status of the power supplies. If a power supply has failed, contact Quantum Customer Support (see Customer Support on page xvii).	 Power B: Failed
Fan Modules	Displays the current status of the fan modules. If a fan module has failed, contact Quantum Customer Support (see Customer Support on page xvii).	 Fan B: Failed

Storage Array Details

To view the details or status of a storage array, click on a storage array icon on the **Hardware Status** screen shown in [figure 43](#).

The **Storage Array Details** screen display (see [figure 46](#)).

Figure 46 Storage Array
Details

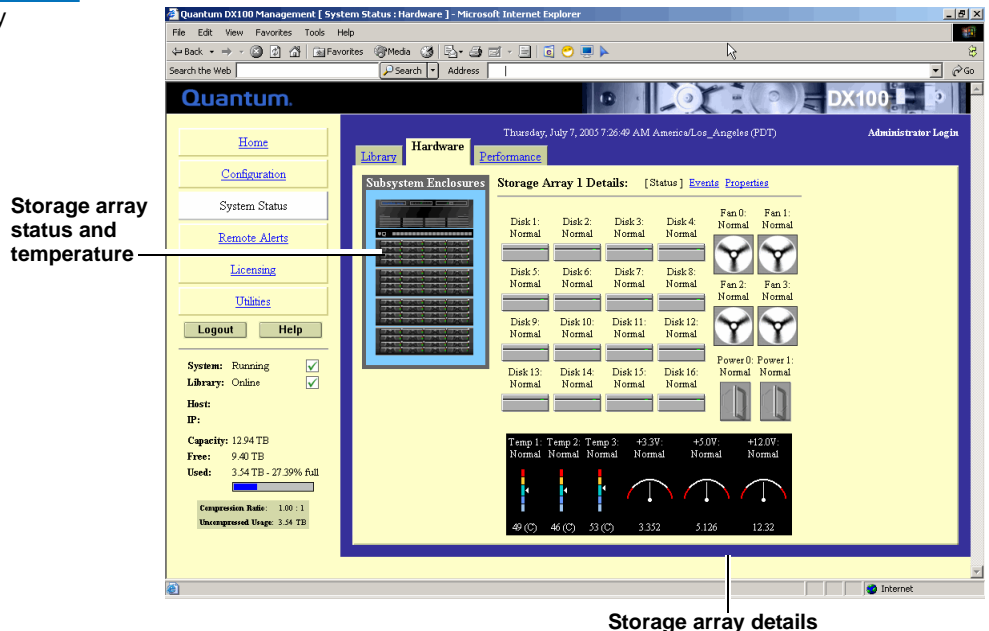


Table 20 Storage Array Hard Drive Status




Field	Description	Normal State	Rebuild State	Failed State
Storage Array Hard Drives	Displays the current status of the hard drives within the DX-Series storage arrays. The hard drive states displayed are: normal, rebuild, and failed. Rebuild indicates the array is currently rebuilding the data on a new storage array hard drive. If a hard drive has failed, contact Quantum Customer Support (see Customer Support on page xvii).			

Table 21 Storage Array Fan and Power Supply Status






Field	Description	Failed State
Power Supplies	Displays the current status of the power supplies. If a power supply has failed, contact Quantum Customer Support (see Customer Support on page xvii).	 Power B: Failed
Fan Modules	Displays the current status of the fan modules. If a fan module has failed, contact Quantum Customer Support (see Customer Support on page xvii).	 Fan B: Failed

Table 22 Storage Array
Temperature Details

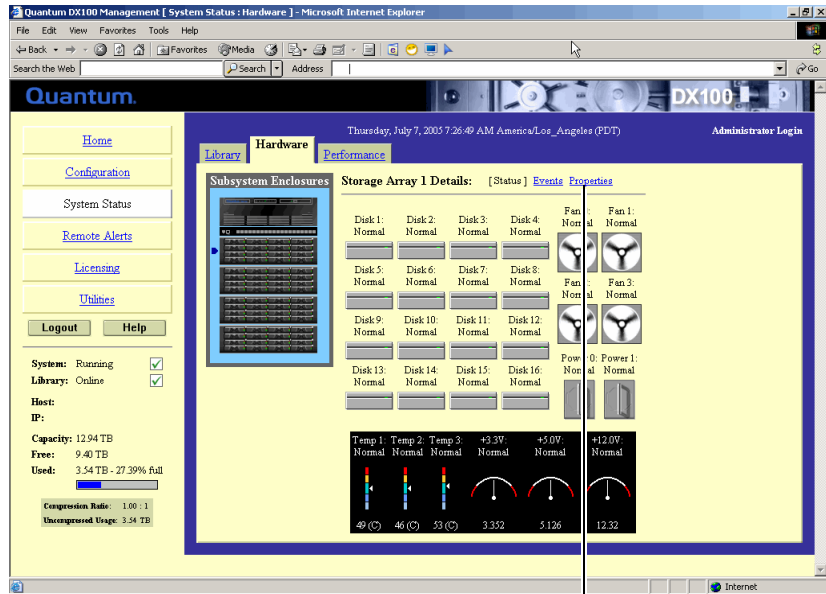
Field	Description	Normal State	Warning State	Failed State
Storage Array Temperature	Displays the current storage array temperature. There are three states displayed: normal, warning, and failed. The warning and failed states also display a flashing amber box around the temperature gauge for warning and a red box for failed. If the array reaches 47°C (117°F), a high temperature warning is displayed. If the array reaches 50°C (122°F), a failure is displayed.			

Storage Array Properties

The **Storage Array Status** screen also provides a link to storage array properties (see [figure 47](#)).

Clicking **Events** displays all log entries for the storage array. Have this information available prior to contacting Quantum Customer Support.

Figure 47 Storage Array Properties Link

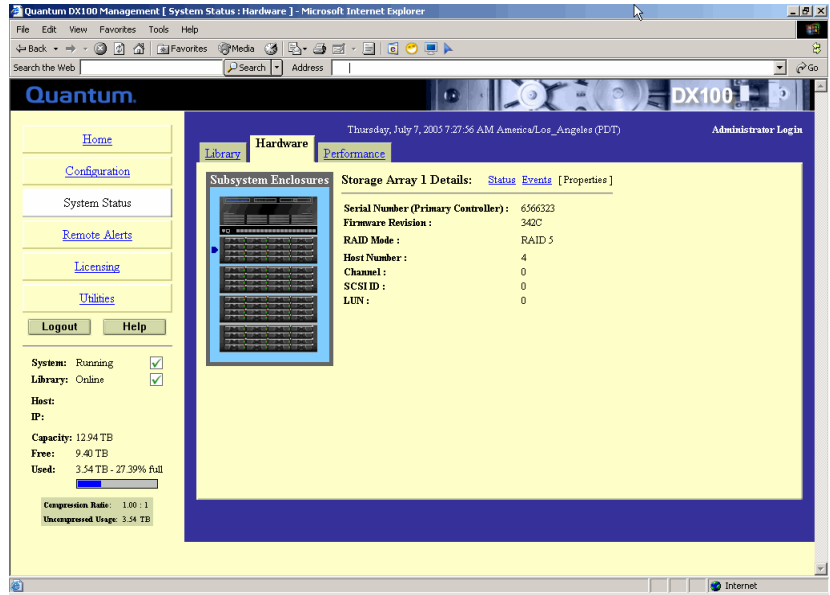


Storage array properties

To view the storage array properties, click **Properties**.

The storage array properties screen displays (see [figure 48](#)).

Figure 48 Storage Array Properties



The storage array properties are shown in [table 23](#).

Table 23 Storage Array Properties

Field	Description
Serial Number	Displays the serial number for the primary controller in the storage array.
Firmware Revision	Displays the firmware revision currently running on the selected storage array.
RAID Mode	Displays the current RAID configuration on the storage array. Only RAID 5 is supported.
Host Number	Displays the host number.
Channel	Displays the controller SCSI channel in which the selected storage array is connected.
SCSI ID	Displays the selected storage array SCSI ID.
LUN	Displays the selected storage array LUN.

Viewing System Performance

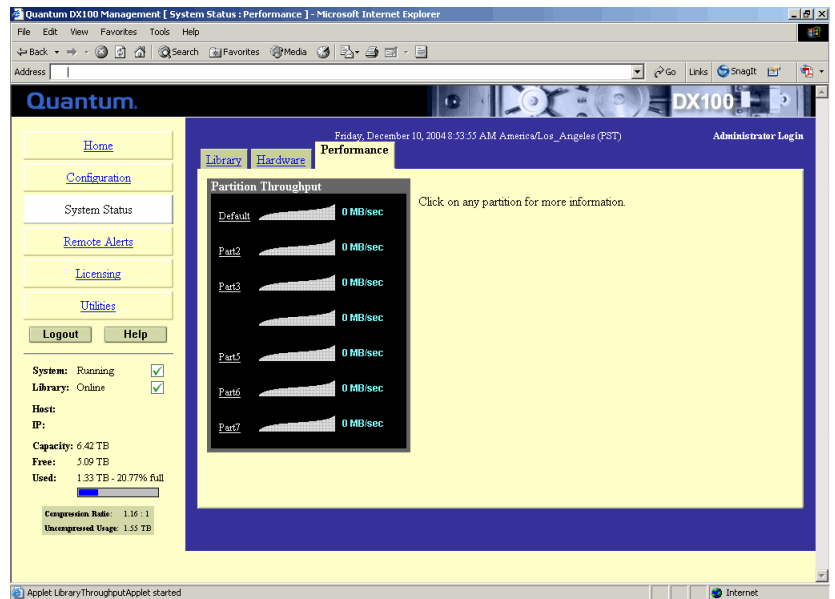
The DX-Series system provides tape drive performance information on the **Performance Status** page. The **Performance Status** page gives the current throughput of the tape drives in use.

To view the performance status:

- 1 From the **System Status** page, click **Performance** tab to view the hardware status.

The **Performance Status** page displays (see [figure 49](#)):

Figure 49 Performance Status Page

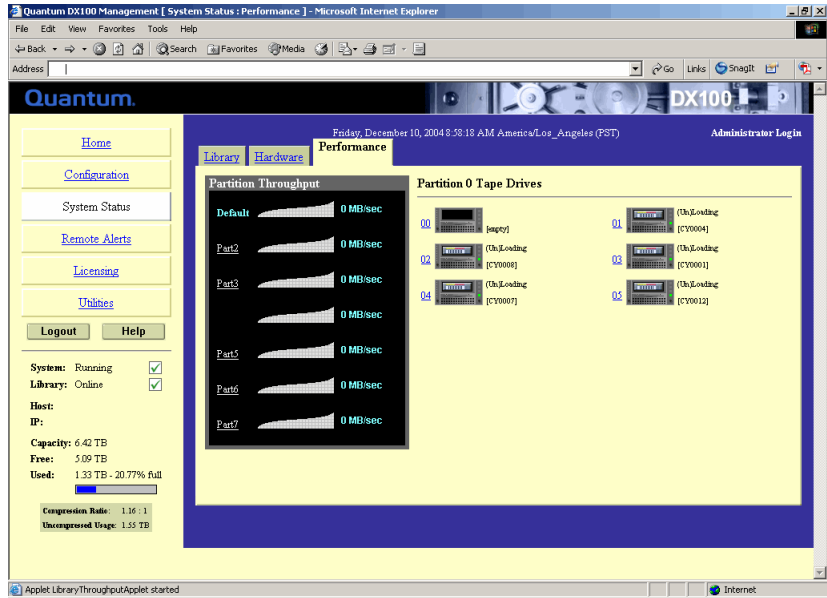


The Performance Status page displays all partitions and their individual performance information.

- 2 Select a partition to view the performance statistics of the individual devices within the partition.

The tape drives within the partition display (see [figure 50](#)).

Figure 50 Tape Drive
Throughput



Remote Alerts

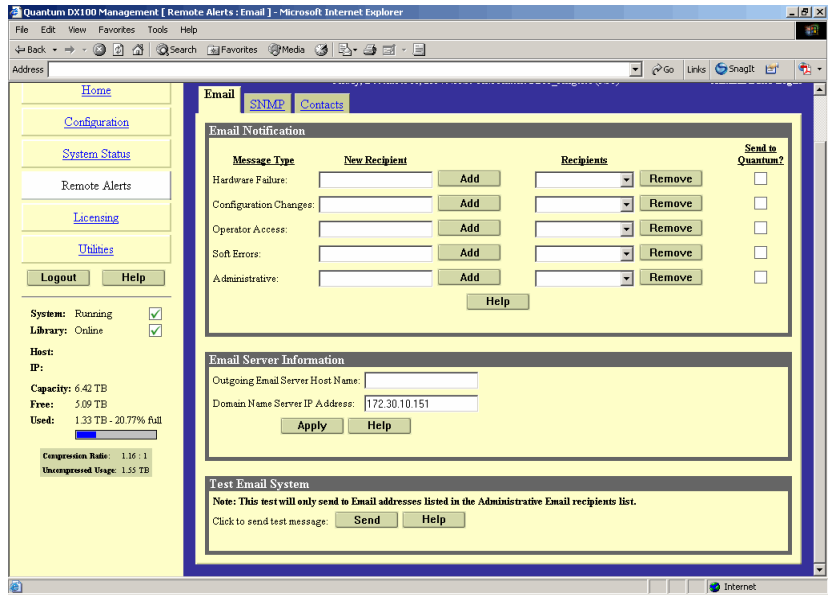
The **Remote Alerts** page allows you to setup the DX-Series system to send email alerts when hardware or software events have occurred on the system.

Accessing Remote Alerts

To access the **Remote Alerts** page, from the contents frame, click **Remote Alerts**.

The management frame displays the **Remote Alerts** page (see [figure 51](#)).

Figure 51 Remote Alerts Page



The **Remote Alerts** page is divided into three sections:

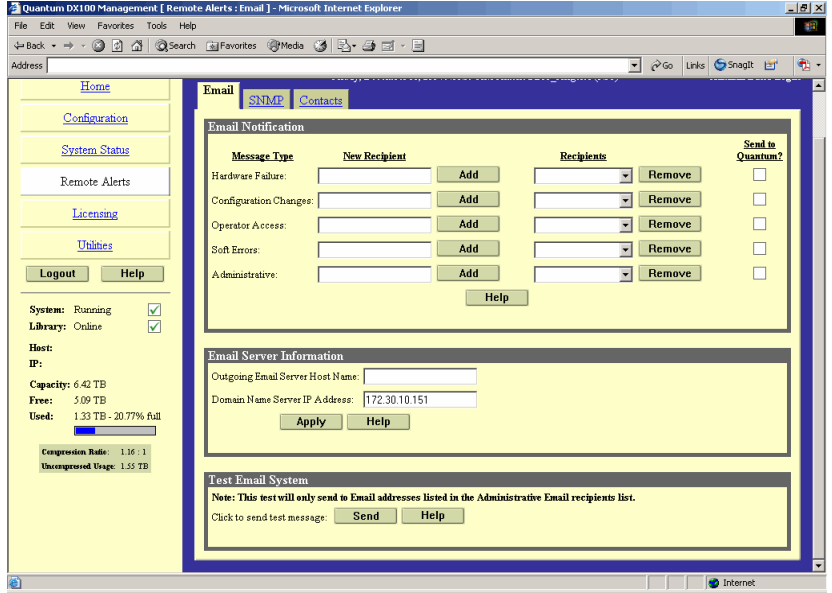
- [Email Page](#)
- [SNMP Page](#)
- [Contacts Page](#)

Email Page

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

The management frame displays the **Email** tab (see [figure 52](#)).

Figure 52 Email Tab



- 2 Edit the Email information as desired (see [table 10](#) for a description of the fields) and click **Apply**.
- 3 After editing the Email information, click the **Send** button to test the notification system. A test email is sent to the administrative recipients. 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 24](#) and [table 25](#).

Table 24 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.

Field	Description
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	Used for testing the e-mail subsystem.
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 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 25 Email Server Information

Field	Description
Outgoing Email Server Host Name	View or set the outgoing email server hostname for the DX-Series system (for example, the DNS name).

Field	Description
Domain Name Server IP Address	View or set the domain name server IP address for the DX-Series system.

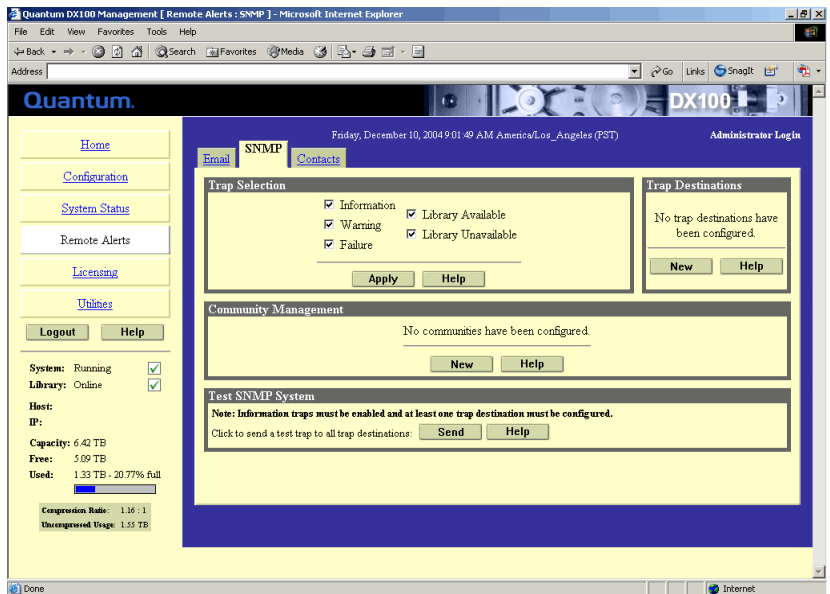
SNMP Page

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.

The management frame displays the **SNMP** tab (see [figure 56](#)).

Figure 53 SNMP Tab



- 2 Enable the trap selections to be reported (see [table 26](#)):

Table 26 SNMP Trap Selections

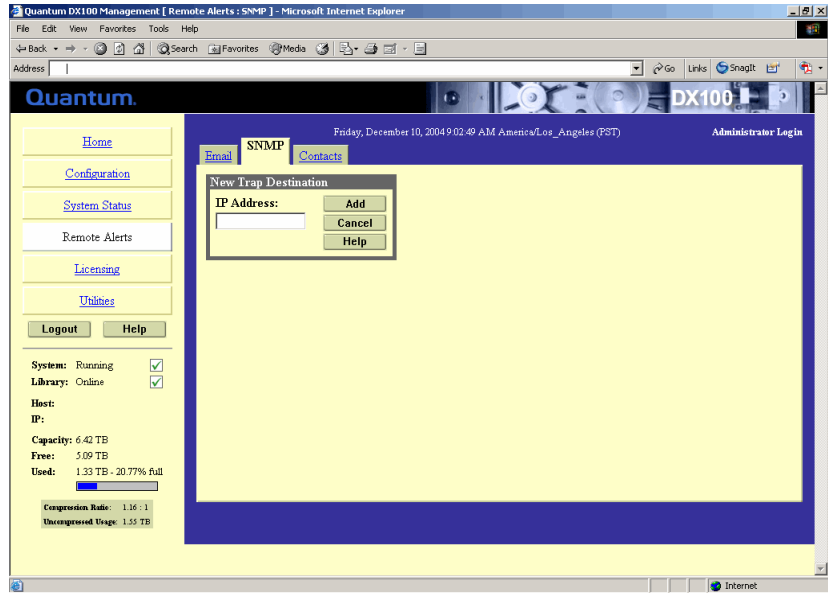
Field	Description
Informational	If selected, Informational Traps are enabled.
Warning	If selected, Warning Traps are enabled.
Failure	If selected, Failure Traps are enabled.
Available	If selected, a trap is generated every time the library transitions from an unavailable to an available state.
Unavailable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

3 Click **Apply**.

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

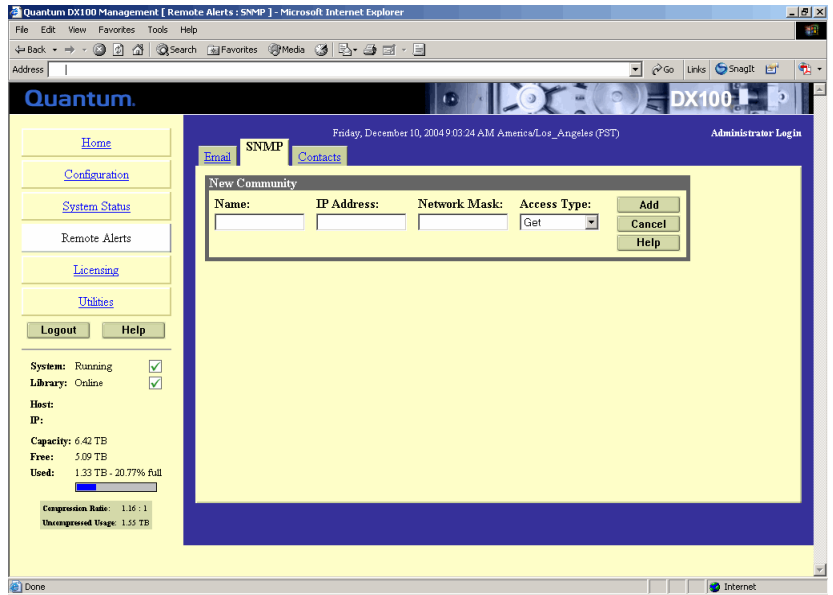
4 Click **New** in the Trap Destination area (see [figure 54](#)), to set the IP addresses that are to receive the traps generated by the DX-Series system, for example, 12.34.56.78. Up to five trap destination addresses may be set. If less than five trap destinations are required, leave unused **Trap Destination** fields blank.

Figure 54 SNMP Trap
Destinations



- 5 Click **Add** to add the IP address to the trap destinations and return to the SNMP tab.
- 6 Click **New** in the Community Management area to edit the SNMP communities (see [figure 55](#)).

Figure 55 SNMP Community Management



7 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.

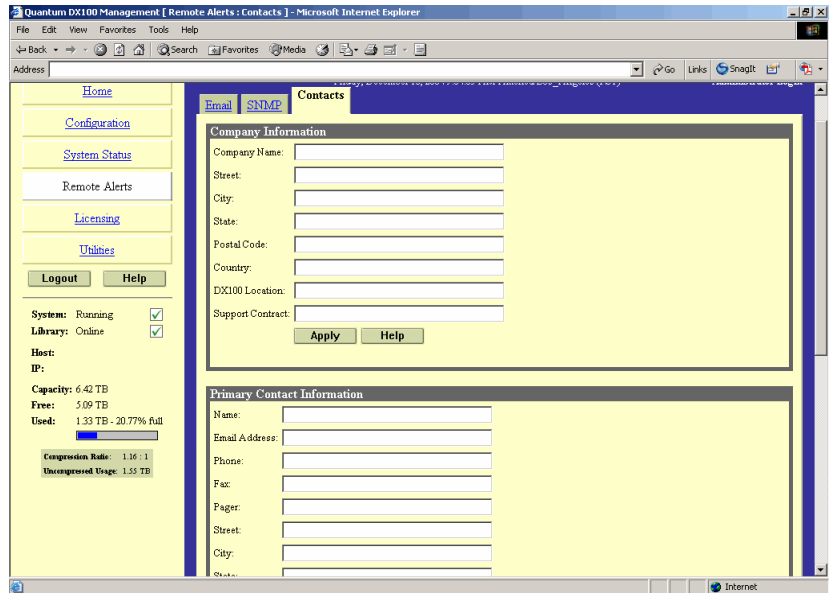
- d Access rights for the new community:
 - **Get** allows SNMP **get** operations:
 - **Get/Set** allows both SNMP **get** and **put** operations
- 8 Click **Add**.
A **Results** page displays indicating the community has been added.
- 9 Click **Send** from the SNMP tab to send a test SNMP trap.

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 56](#)).

Figure 56 Contacts Tab



- 2 Edit the configuration information as desired (see [table 10](#) for a description of the fields) and click **Apply**.

The **Contacts** tab details are shown in [table 27](#) and [table 28](#).

Table 27 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.
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 28 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.

Field	Description
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.

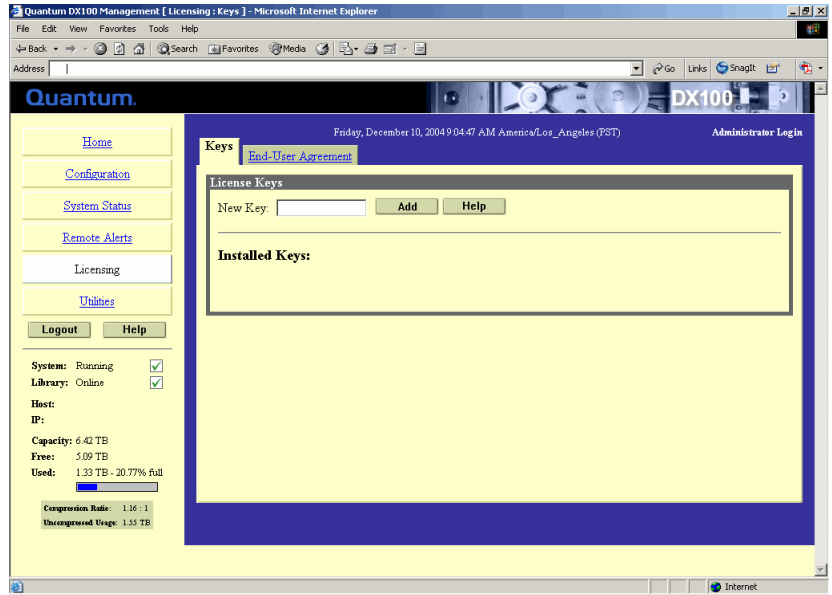
Licensing

The **Licensing** page allows you to add functionality to the DX-Series system through license key activation and also allows you to view the Quantum end user license agreement.

Accessing Licensing

To access the **Licensing** page, in the contents frame, click **Licensing**. The management frame displays the **Licensing** page (see [figure 57](#)).

Figure 57 Licensing Page



The Licensing page contains:

- [Keys Tab](#)
- [End User Agreement Tab](#)

Keys Tab

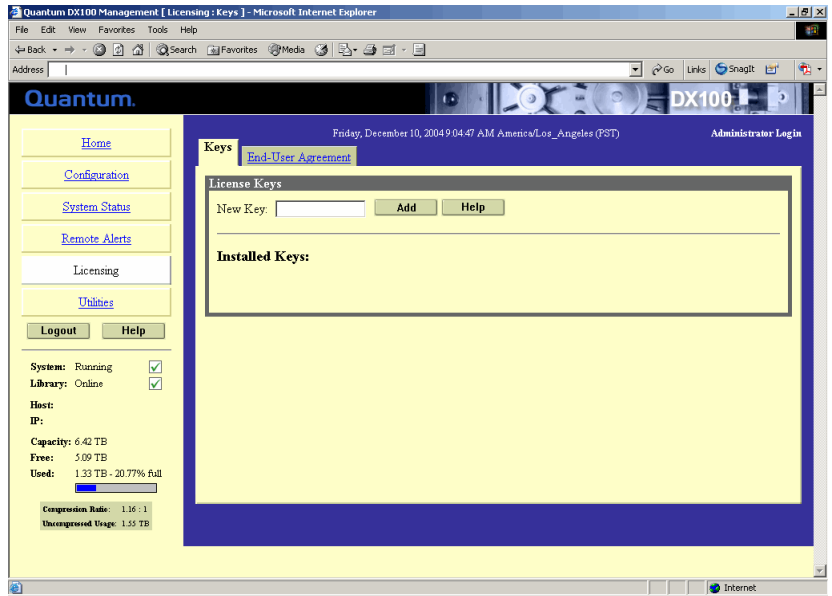
The **Keys** page is used to enable compression on the DX-Series system. If compression is purchased with the DX-Series system, it is enabled at the time of installation. If you wish to purchase a license key to enable compression, contact Quantum to obtain a key for your system.

To activate a license key:

- 1 Access the **Licensing** page (see [Accessing Licensing](#)).
- 2 Click the **Keys** tab.

The **Keys** page displays (see [figure 58](#)).

Figure 58 License Keys Tab



- 3 Enter the license key in the **New Key** edit box and click **Add**.
The license key is added to the installed keys list.

End User Agreement Tab

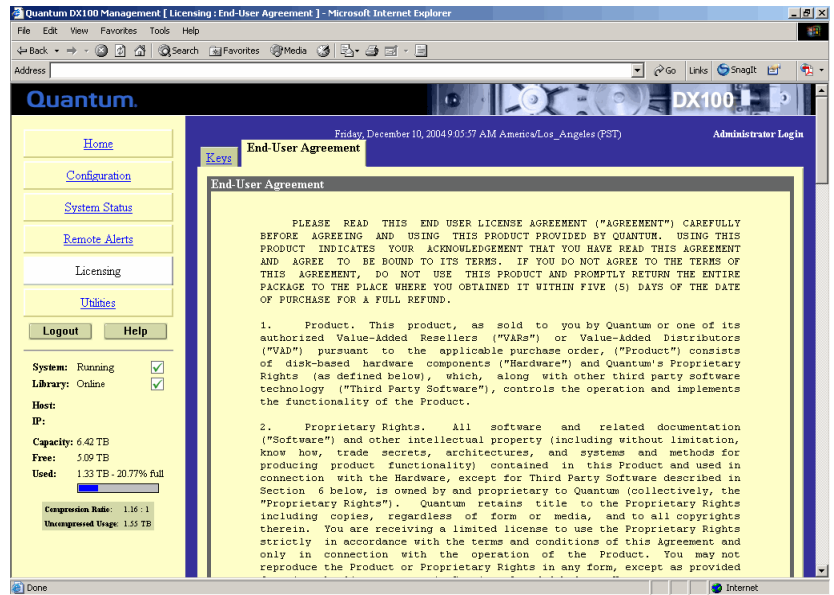
The **End User Agreement Tab** displays the entire end user agreement for the DX-Series system.

To view the end user agreement:

- 1 Access the **Licensing** page (see [Accessing Licensing](#)).
- 2 Click the **End-User Agreement** tab.

The **End-User Agreement** page displays (see [figure 59](#)).

Figure 59 End User Agreement Tab



Utilities

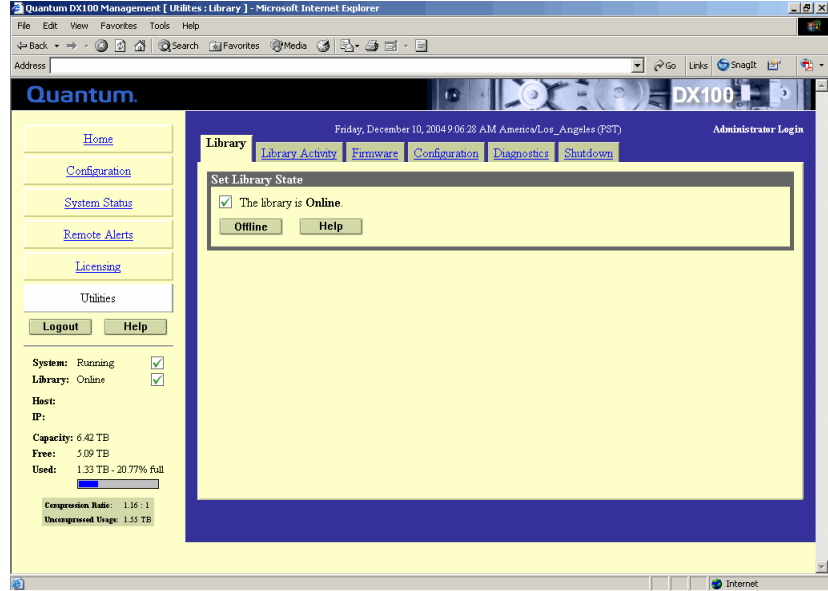
The **Utilities** page allows you to perform maintenance functions on the DX-Series system, including uploading and activating software images, and configuration files. The **Utilities** page also allows you to restart or shut down the DX-Series system.

Accessing Utilities

To access the **Utilities** page, in the contents frame, click **Utilities**.

The management frame displays the **Utilities** page (see [figure 60](#)).

Figure 60 Utilities Page



The utilities page contains:

- [Changing Library State](#)
- [System Log](#)
- [Uploading Firmware](#)
- [System Configuration](#)
- [Rebooting the DX-Series System](#)

Changing Library State

The **Library State** page is used to turn the library either offline or online.

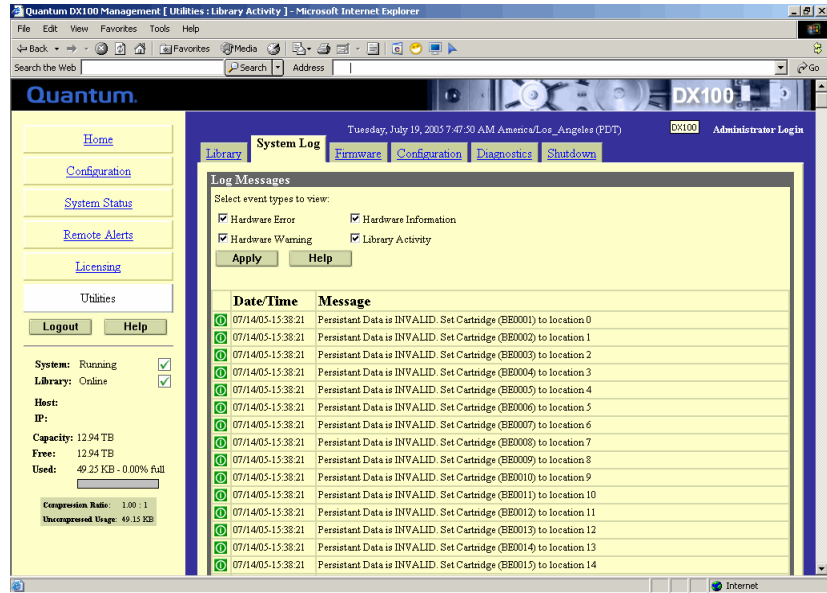
System Log

To view the system log:

- 1 Access the **Utilities** page (see [Accessing Utilities](#)).
- 2 Click **System Log**.

The **System Log** page displays (see [figure 61](#)).

Figure 61 System Log



The system log allows you to sort the following types of log entries displayed:

- **Hardware Information** - Informational events are for informational purposes only and do not require any intervention on the DX-Series system such as the commencement of a hard drive rebuild.
- **Hardware Warning** - Warning events indicate that a possible error condition is imminent. These events may require attention, and give the user a chance to check the system before a failure occurs.
- **Hardware Error** - Error events indicate a failure within the DX-Series system such as a hard drive failure. Immediate attention is required.
- **Library Activity** - Library Activity indicates a change within the DX-Series system such as the recognition of new tape media.

Select the system log type(s) and click **Apply** to display the list.

Uploading Firmware

The **Firmware Upload** page is used to upload a new firmware image to the DX-Series system.

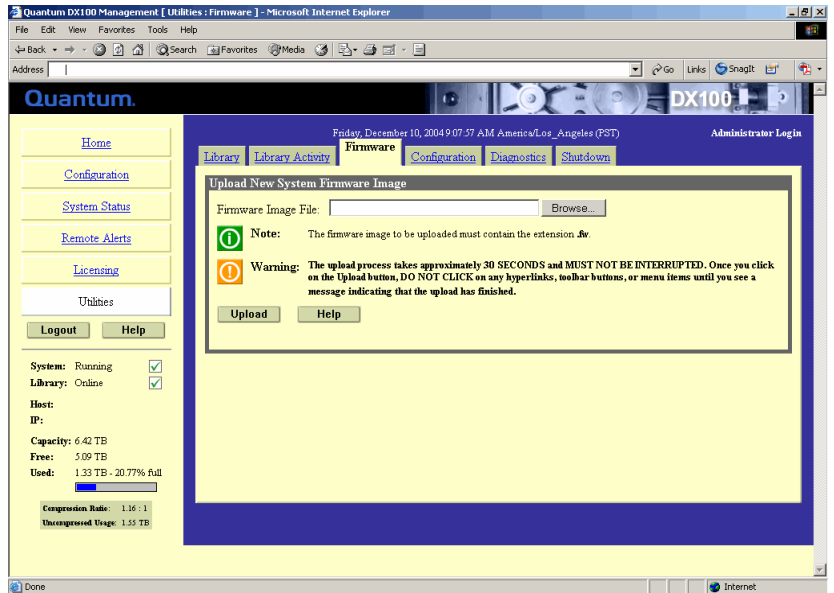
Note: Firmware version 2.30 is only available from the CD installation menu (see [Setup CD and Setup Menu](#) on page 115).

To upload new firmware image:

- 1 Access the **Utilities** page (see [Accessing Utilities](#)).
- 2 Click **Firmware**.

The **Firmware** page displays (see [figure 62](#)).

Figure 62 Uploading Firmware



- 3 Type the location and filename of the new software image.

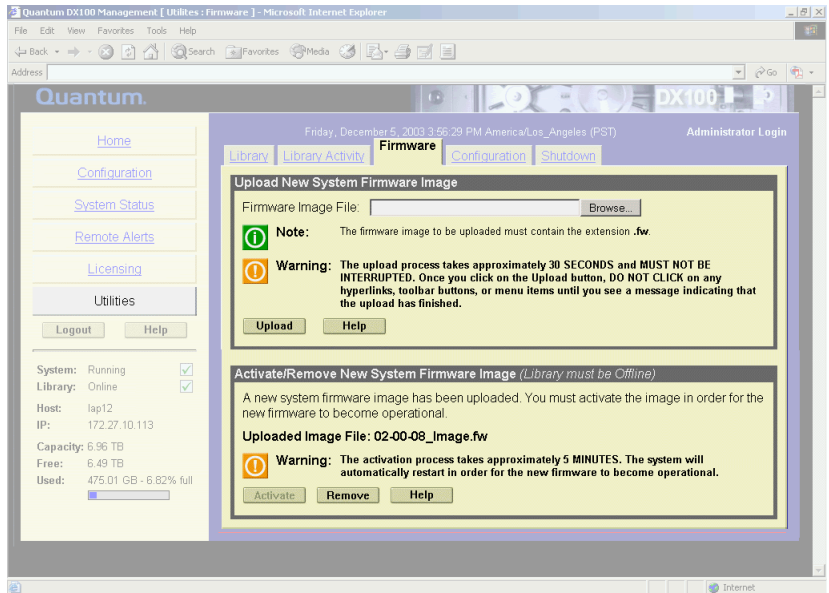
Note: Use the **Browse** button to browse the system and locate the new firmware image.

- 4 Click **Upload** to place the new software image in a temporary area of the system.

An **Successful Upload** page displays indicating that the firmware has been uploaded. Click **OK** to continue.

- 5 Click **Activate** to activate the new firmware image or **Remove** to remove the firmware image from the system (see [figure 63](#)).

Figure 63 Activating/
Removing a Firmware Image



A **Results** page indicates the firmware has been either activated or removed.

- 6 Click **OK** to return to the **Utilities** page.

The DX-Series system will use the new firmware image the next time the system is rebooted (see [Rebooting the DX-Series System](#)).

System Configuration

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

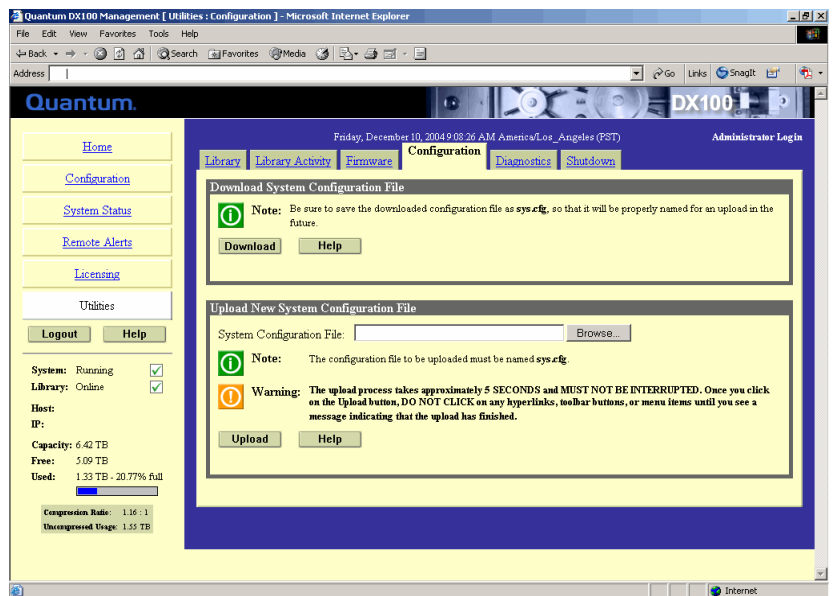
Note: For disaster recovery purposes, download the configuration file whenever there are major changes to the DX-Series system configuration.

Downloading a System Configuration File

To download a system configuration file:

- 1 Access the **Utilities** page (see [Accessing Utilities](#)).
- 2 Click the **Configuration** tab (see [figure 64](#)).

Figure 64 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.

Uploading System Configuration File

This option allows a saved configuration file to be uploaded to the current DX-Series system. The system configuration contains all of the configuration information entered by the DX-Series system administrator including:

- IP configuration
- All other configured features

To upload a system configuration file:

- 1 Access the **Utilities** page (see [Accessing Utilities](#)).
- 2 Click the **Configuration** tab (see [figure 64](#)).
- 3 Under **Upload New System Configuration File**, type the location and filename of the new configuration file.

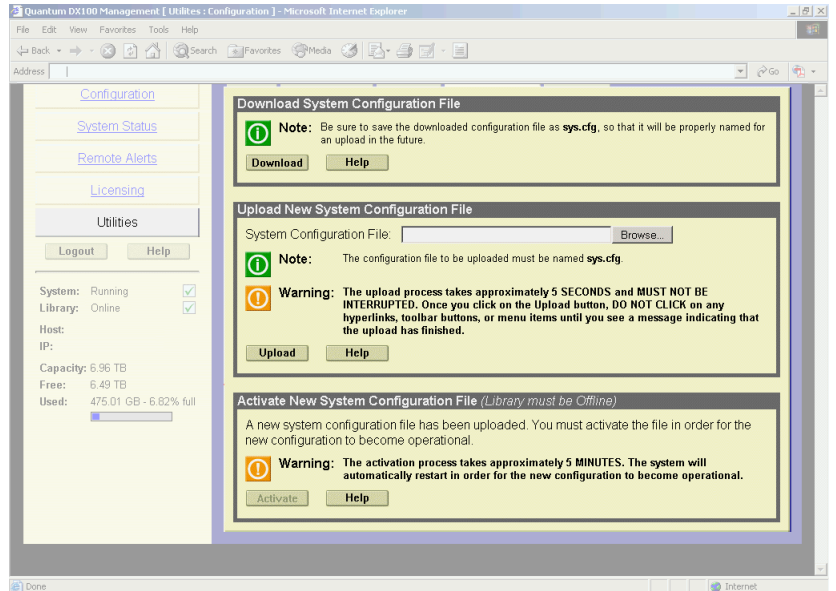
Note: Use the **Browse** button to browse the system and locate the desired system configuration file. The configuration file must be named **sys.cfg**.

- 4 Click **Upload** to load the configuration file.

An **Successful Upload** page displays indicating that the configuration file has been placed in a temporary area of the system. Click **Ok** to continue.

- 5 Click **Activate** to activate the configuration file (see [figure 65](#)).

Figure 65 Activating the Configuration File



- 6 Click **OK** to return to the **Utilities** page.

Note: If the DX-Series system does not recognize the uploaded configuration file as a valid configuration file, the transfer will be aborted.

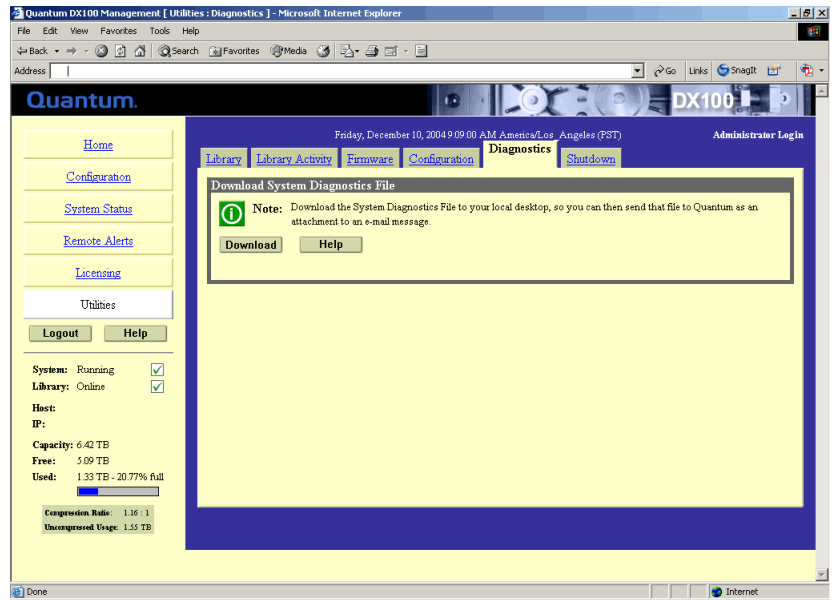
Downloading the System Diagnostics File

The DX-Series system allows you to download a system diagnostics file to your local host which is helpful when troubleshooting problems on the system. Have this file available prior to contacting Quantum customer support.

To download the system diagnostics file:

- 1 Access the **Utilities** page (see [Accessing Utilities](#)).
- 2 Click the **Diagnostics** tab (see [figure 66](#)).

Figure 66 Downloading
Diagnostics Files



- 3 Under **Download System Diagnostics 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 diagnostics file has been downloaded.

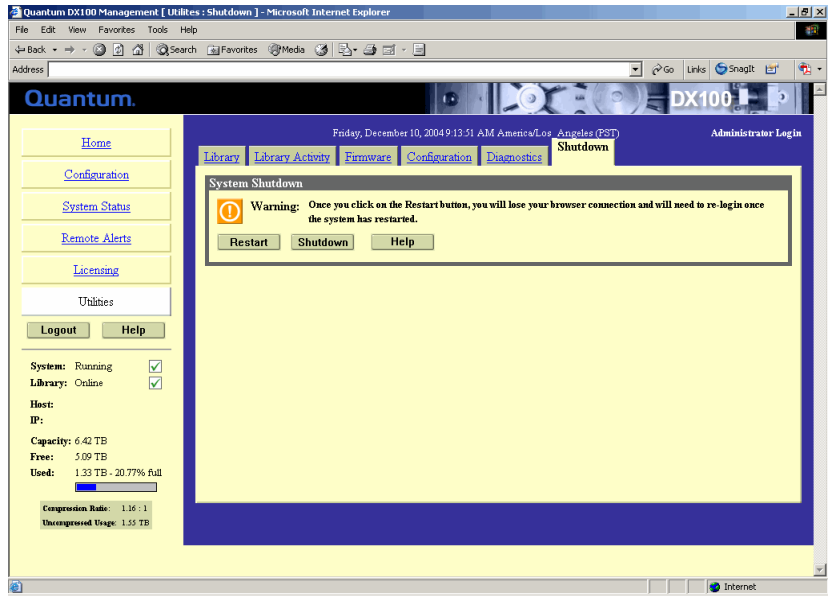
- 5 Click **OK** to return to the **Utilities** page.

Rebooting the DX-Series System

To reboot the DX-Series:

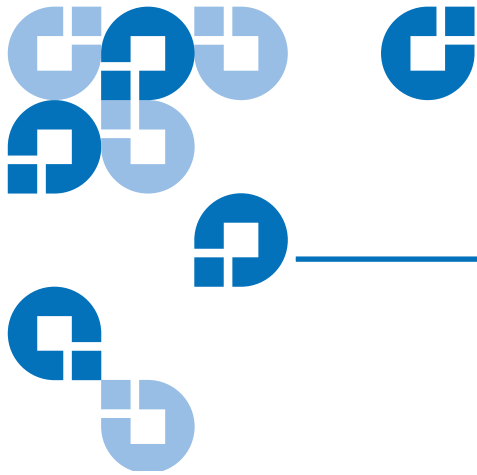
- 1 Access the **Utilities** page (see [Accessing Utilities](#)).
- 2 Click the **Shutdown** tab (see [figure 67](#)).

Figure 67 Shutting Down the DX-Series System



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

The DX-Series system reboots.



Chapter 4 Troubleshooting

This chapter describes problems you may encounter during the setup and operation of the DX-Series system. Corrective information is provided to help you resolve the problems.

Common Problems and Solutions

The troubleshooting information in this section covers the following topics:

- [Hardware Problems](#)
- [Ethernet Network Problems](#)
- [Fibre Channel Network Problems](#)

Hardware Problems

[Table 29](#) describes corrective actions for problems occurring with the system hardware.

Table 29 Hardware Problems

Problem	Corrective Action
The system does not power on.	Make sure the power cords are connected to a grounded electrical outlet and the power switches located on the back of the power supplies are on.
The backup application does not see any tape drives.	You MUST accept the license agreement from the GUI prior to operating the DX-Series system, see Connecting to the Controller on page 115. Also ensure that tape drives are properly mapped in the config, Fibre Channel, Device mappings web page (see Configuring the Fibre Channel Options on page 55).
One power supply is not functioning.	Contact your Quantum Customer Support representative for a power supply replacement.
Both power supplies are not functioning.	Contact your Quantum Customer Support representative for a power supply replacement.
One fan is not operating.	Contact your Quantum Customer Support representative for a fan replacement.
Two fans are not operating.	<p>Caution: Turn the system off immediately! The system will overheat without two fans functioning.</p> <p>Contact your Quantum Customer Support representative for a fan replacement.</p>

Problem	Corrective Action
A hard drive is not responding	Determine which drive has failed by observing the red fault LED on the drive sled. Contact your Quantum Customer Support representative for a drive sled replacement.

Ethernet Network Problems

[Table 30](#) describes corrective actions for problems occurring with the Ethernet network.

Table 30 Ethernet Network Problems

Problem	Corrective Action
The Ethernet link light on the DX-Series controller is not lit when a cable is connected to a hub or switch.	<p>Check to make sure the Ethernet cable is not a cross-over cable. Use only "straight" CAT-5 Ethernet cables.</p> <p>Port on the hub or switch is not active or damaged.</p> <p>Port on the DX-Series controller is damaged. Contact the Quantum Customer Support department (see the Preface for contact information).</p>
The Ethernet link light on the switch or hub is not lit when a cable is connected to DX-Series system.	<p>Check to make sure the Ethernet cable is not a cross-over cable. Use only "straight" CAT-5 Ethernet cables.</p> <p>Port on the hub or switch is not active or damaged.</p> <p>Port on the DX-Series controller is damaged. Contact the Quantum Customer Support department (see the Preface for contact information).</p>

Problem	Corrective Action
DX-Series system is not visible on the Ethernet network.	Try to ping the DX-Series system IP address from a host on the same network. If the ping reports round trip times, the DX-Series system is active. If not, check the cables, switches, or hubs for damaged components. If everything checks out, contact the Quantum Customer Support department (see the Preface for contact information).
Web browser stalls when using Netscape version 4.76 to access the management pages.	Upgrade your version of Netscape to 7.1 or later. You can download this software from http://www.netscape.com .
Java applets do not appear.	Download and install the latest updates for your browser.

Fibre Channel Network Problems

[Table 31](#) describes corrective actions for problems occurring with the Fibre Channel network.

Table 31 Fibre Channel Network Problems

Problem	Corrective Action
The Fibre Channel link lights on the DX-Series controller are not lit when a cable is connected to a hub or switch.	Check to make sure the Fibre Channel cable is not damaged: Replace the cable. Fibre Channel controller, switch, or hub is damaged.
Windows cannot see the robot or tape drives with JNI Fibre Channel HBA.	See Host Bus Adapter Settings for HBA information.

Problem	Corrective Action
Windows cannot see the robot or tape drives with Emulex Fibre Channel HBA.	See Host Bus Adapter Settings for HBA information.

Host Bus Adapter Settings

This section provides additional information on setting up your specific Fibre Channel HBA (Host Bus Adapter).

The following HBAs have specific configuration information that must be set properly to function with the DX-Series system. Refer to your specific HBA documentation for additional information.

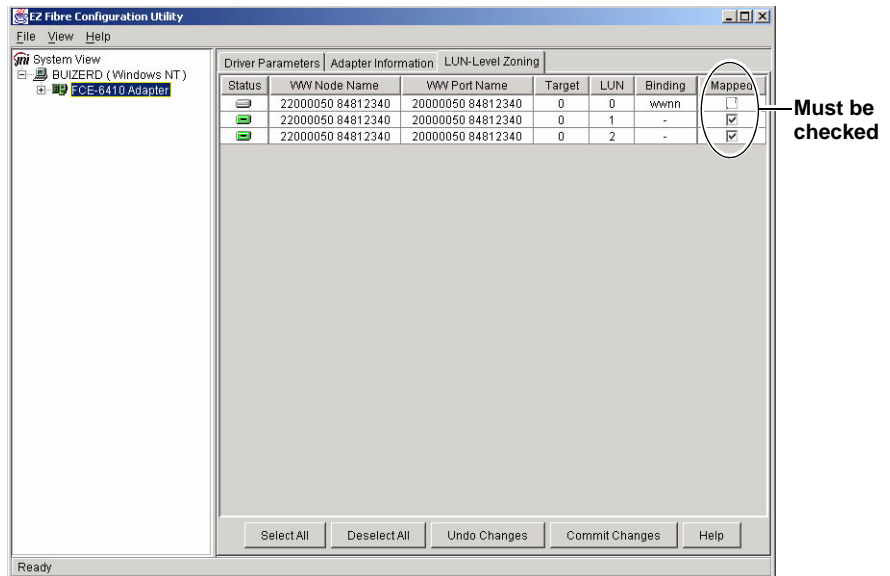
Tech Tip: If your Fibre Channel HBA supports bus resets, this feature must be disabled to operate with the DX-Series controller. Fibre Channel HBAs only support bus resets.

- [JNI™ Fibre Channel HBA](#)
- [Emulex™ Fibre Channel HBA](#)
- [Q-Logic™ Fibre Channel HBA](#)

JNI™ Fibre Channel HBA

For the DX-Series system to communicate with the JNI Fibre Channel HBA, the card must be setup correctly. JNI is configured through EZ-Fibre. Ensure that the drive mapped check boxes for the DX-Series system items are selected in the LUN-Level Zoning tab as shown in [figure 68](#).

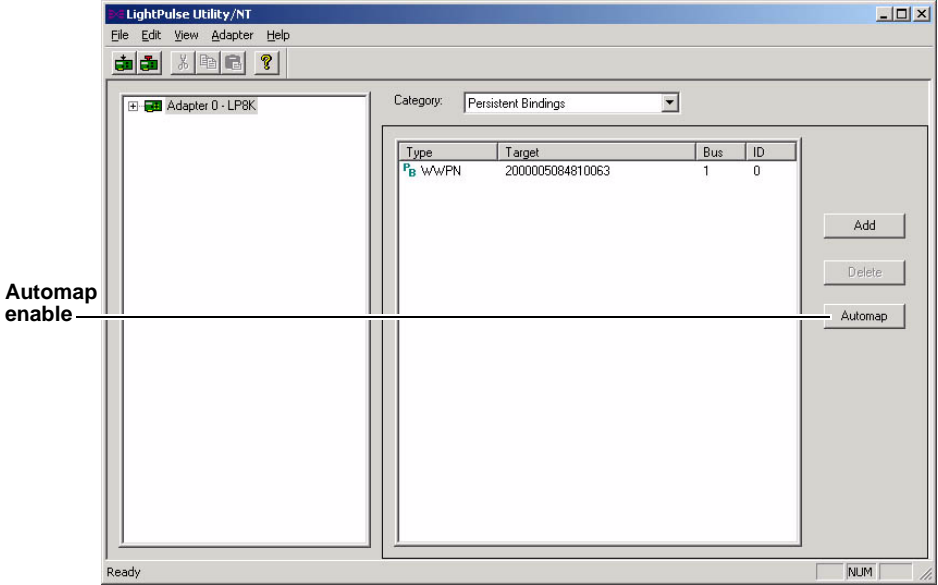
Figure 68 JNI Fibre Channel HBA Configuration



Emulex™ Fibre Channel HBA

For the DX-Series system to communicate with the Emulex Fibre Channel HBA, the card must be setup correctly. Emulex Fibre Channel HBAs are configured through the Lightpulse Utility. Ensure that the Automap function is enabled as shown in [figure 69](#).

Figure 69 Emulex Fibre Channel HBA



Additional Emulex Settings

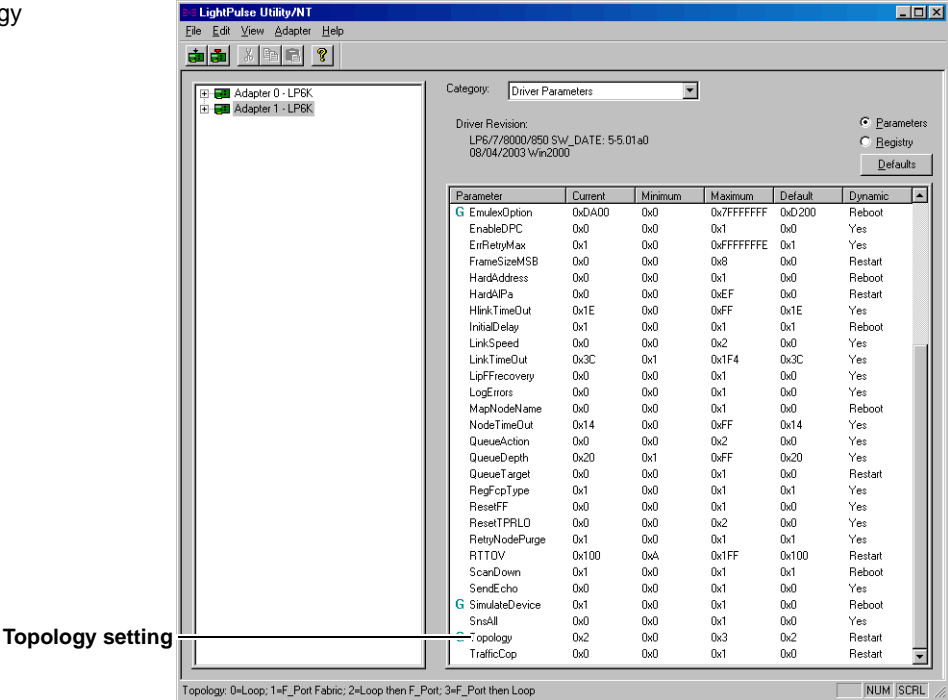
In addition to enabling automap on the Fibre Channel HBA, the following parameters must be modified:

- Topology
- Frame size
- Link speed

To modify the Emulex parameters for topology, frame size, and link speed:

- 1 Using the LightPulse utility, select the Fibre Channel HBA connected to the DX-Series system and scroll down to the **Topology** setting (see [figure 70](#)).

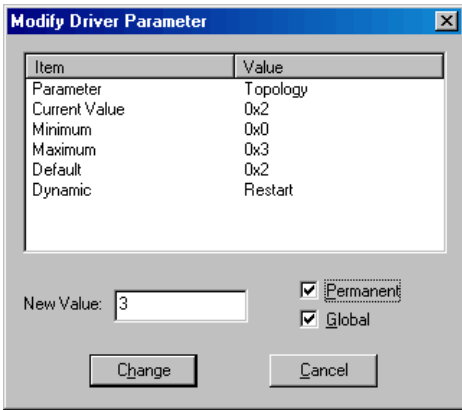
Figure 70 Emulex Topology Setting



2 Double-click **Topology**.

The modify driver parameters screen displays (see [figure 71](#)).

Figure 71 Modify Topology Drivers Screen



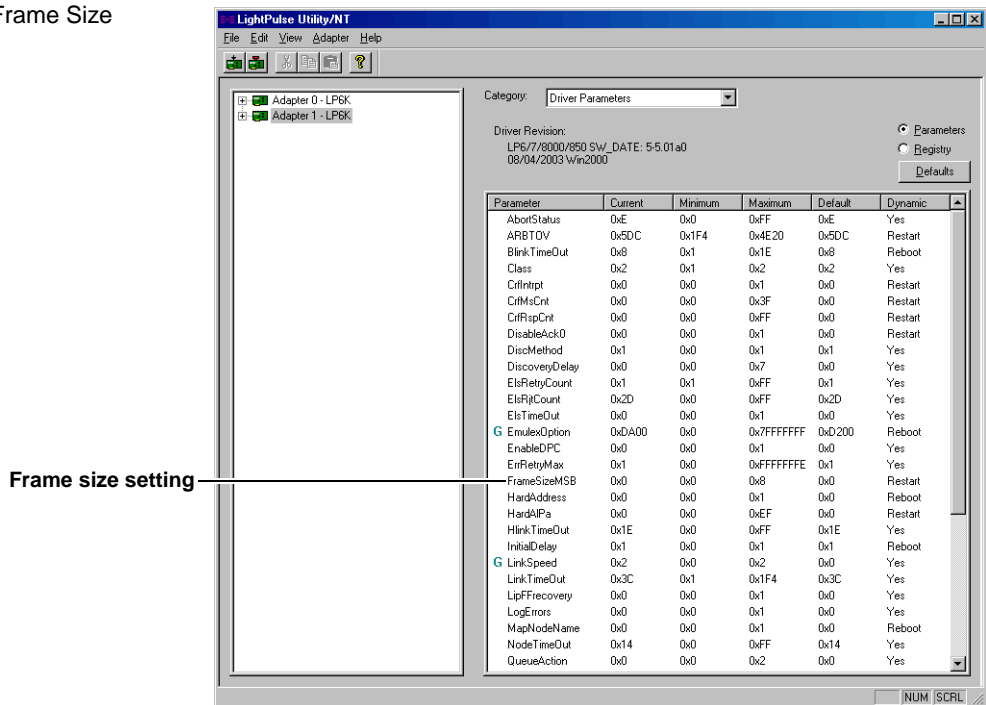
- Enter **3** in the **New Value** edit box, check both the **Permanent** and **Global** check boxes, and click **Change**.

This changes the Emulex Fibre Channel HBA topology to *PT-PT fabric first, then attempt FC-AL*. The HBA will attempt a point-to-point connection (PT-PT) first and if this is unsuccessful, the HBA reverts to loop mode (FC-AL).

Other topology settings are:

- 0 = FC-AL (loop)
 - 1 = PT-PT (fabric)
 - 2 = FC-AL first, then attempt PT-PT (default setting)
- Scroll down to the FramesizeMSB setting (see [figure 72](#)).

Figure 72 Emulex Frame Size Setting



- Double-click **FramesizeMSB**.

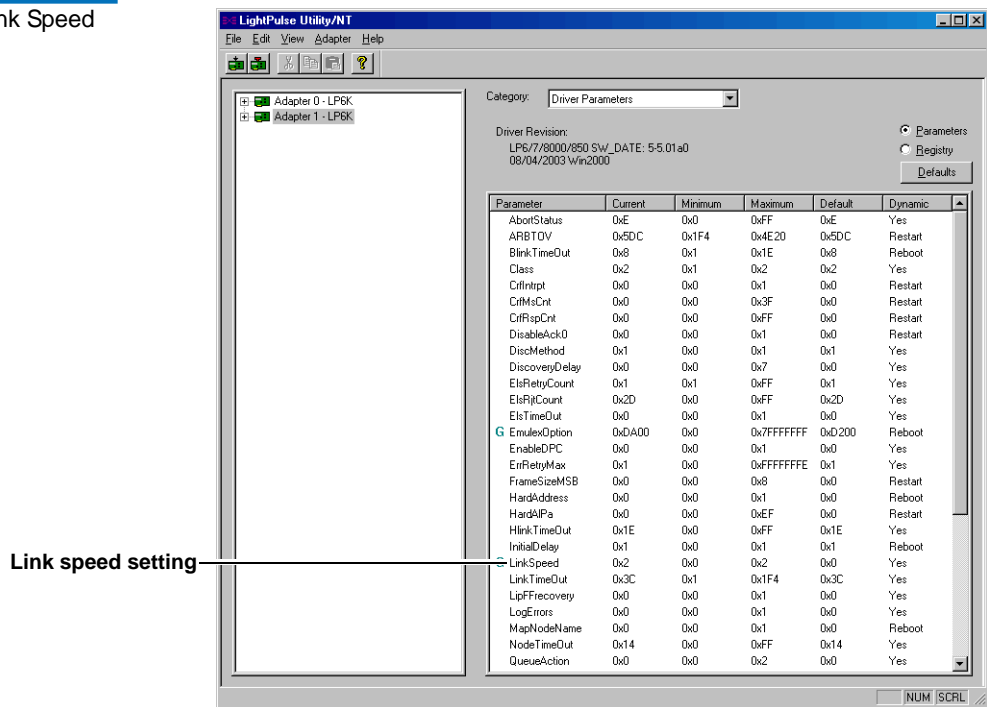
The modify driver parameters screen displays.

- Enter **4** for 1 Gig Fibre Channel HBAs or **8** for 2 Gig Fibre Channel HBAs in the **New Value** edit box, check both the **Permanent** and **Global** check boxes, and click **Change**.

Entering **4** changes the Emulex Fibre Channel HBA frame size to *1024* which is recommended for 1 Gig Fibre Channel HBAs. Entering **8** changes the frame size *2048* which is recommended for 2 Gig Fibre Channel HBAs. 0 is the default setting

- Scroll down to the link speed setting (see [figure 73](#)).

Figure 73 Emulex link Speed Setting



- Double-click **LinkSpeed**.

The modify driver parameters screen displays.

- 9 Enter **1** for 1 Gig Fibre Channel HBAs or **2** for 2 Gig Fibre Channel HBAs in the **New Value** edit box, check both the **Permanent** and **Global** check boxes, and click **Change**.

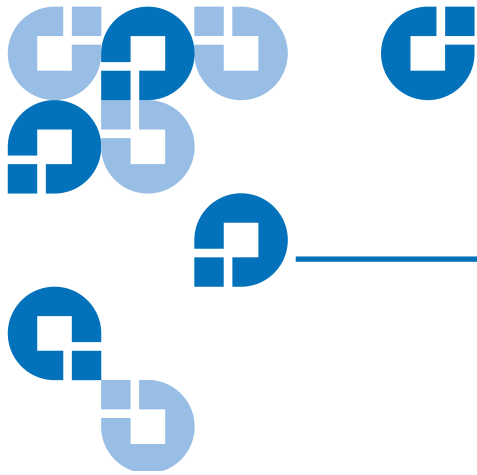
Note: The default setting is 0 for auto speed selection. This setting should **NEVER** be used. This could cause the HBA to fail to initialize.

Q-Logic™ Fibre Channel HBA

For the DX-Series system to communicate with the Q-Logic Fibre Channel HBA, the card must be setup correctly.

To setup the Q-Logic Fibre Channel HBA:

- 1 Power on the host containing the Q-Logic HBA.
- 2 As the host boots, watch for the Q-Logic prompt that tells you to press <Control> Q to enter the HBA setup utility.
- 3 Under **Configuration Settings**, select **Host Adapter Settings**.
- 4 Under **Host Adapter Settings**, set the frame size to 2048.
- 5 Under **Extended Firmware Settings**, set the type of connection to #2 loop preferred, otherwise point-to-point.



Appendix A

DX-Series System Specifications

This appendix lists characteristics and specifications both DX-Series models: DX30 and DX100. These characteristics and specifications are categorized as follows:

- [Physical Characteristics](#)
- [Performance and Reliability Characteristics](#)
- [Environmental Specifications](#)

Note: For hard drive specifications see the appropriate hard drive product manual.

Physical Characteristics

[Table 32](#) provides dimensions and other physical characteristics of the DX-Series Components.

Table 32 Physical Characteristics

Controller		
	DX30	DX100
Bezel width	19.00 in. (482.6 mm)	19.00 in. (482.6 mm)
Chassis width	16.88 in. (428.8 mm)	16.88 in. (428.8 mm)
Chassis height	5.25 in. - 3U (133.4 mm)	8.75 in. - 5U (222.3 mm) includes FC and Ethernet switch
Chassis depth	28 in. (711.2 mm)	28 in. (711.2 mm)

Storage Array		
	DX30	DX100
Bezel width	19.00 in. (482.6 mm)	19.00 in. (482.6 mm)
Chassis width	17.50 in. (444.5 mm)	17.50 in. (444.5 mm)
Chassis height	5.25 in. - 3U (133.4 mm)	5.25 in. - 3U (133.4 mm)
Chassis depth	19.75 in. (501.7 mm)	19.75 in. (501.7 mm)
Overall depth	20.50 in. (520.7 mm)	20.50 in. (520.7 mm)

AC Power Sequencer (DX100 Only)	
Panel height	1.75 in. (1U) pair needed for every four storage arrays

Weight		
	DX30 with One Array	DX100 with Two Arrays
Installed	127 lbs. (57.6 kg)	312 lbs. (141.5 kg)
Shipping	143 lbs. (64.9 kg)	334 lbs. (151.5 kg)

Table 33 Interfaces

Host to Library Interfaces	
Software	SCSI-2 medium changer command set DLT 7000 command set
Power Input	
Power cord	NEMA 5-15P to C13 connector (Qty 4)
Host to DX-Series Interface	
Hardware	Up to eight 2 Gb Fibre Channel (LC connector) 10/100/1000-BaseT Ethernet

Performance and Reliability Characteristics

[Table 34](#) and [table 35](#) list performance and reliability characteristics of the DX-Series system.

Table 34 Performance Characteristics

Average Swap Time	2 seconds, consisting of two Move Medium commands
Inventory	Less than 10 seconds, fully loaded with labeled cartridges

Table 35 Reliability Characteristics

MTBF	Controller - 200,000 power-on hours Storage Array - 2,000,000 power-on hours 99.999% reliability
MTTR	Less than 30 minutes

Environmental Specifications

[Table 36](#) provides various library environmental specifications.

Table 36 Environmental Specifications

Power Environment		
Electrical inputs	Voltage	100 VAC to 240 VAC (DX30) 110 VAC to 240 VAC (DX100)
	Rated Frequency	47 to 63 Hz
	Rated Current	2.4A @230 VAC (DX30)
		4.57A @230 VAC (DX100)

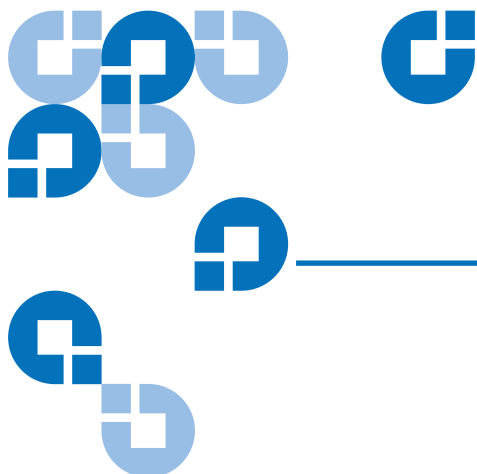
	Consumption	550 Watts (DX30) 1050 Watts (DX100)
--	-------------	--

Climatic Environment

Temperature	Operating	50° F to 95° F (10° C to 35° C)
	Shipping and storage	-4° F to 140° F (-20° C to 60° C)
Relative humidity	Operating	20% to 80%, non-condensing
	Shipping and storage	15% to 95%, non-condensing
Altitude	Operating	0 to 10,000 ft. (0 to 3,048m)
	Shipping and storage	0 to 39,370 ft. (0 to 12,000 m)
Heat	Operating	1,880 Btu/hour (DX30) 3,590 Btu/hour (DX100)

Acoustical Noise

Sound power level	Operating	8.10 Bel
	Idle	7.83 Bel
Sound pressure @ bystander	Operating	63db



Appendix B Setup CD and Setup Menu

This section contains instructions for reinstalling the controller operating system and also for accessing the installation menu available from the controller serial port.

Reinstalling the Controller Operating System

If the Linux based operating system on the controller has become corrupt and unbootable, the controller operating system must be reinstalled using the setup CD included with the accessory kit.

Reinstalling the operating system on the controller consists of the following steps:

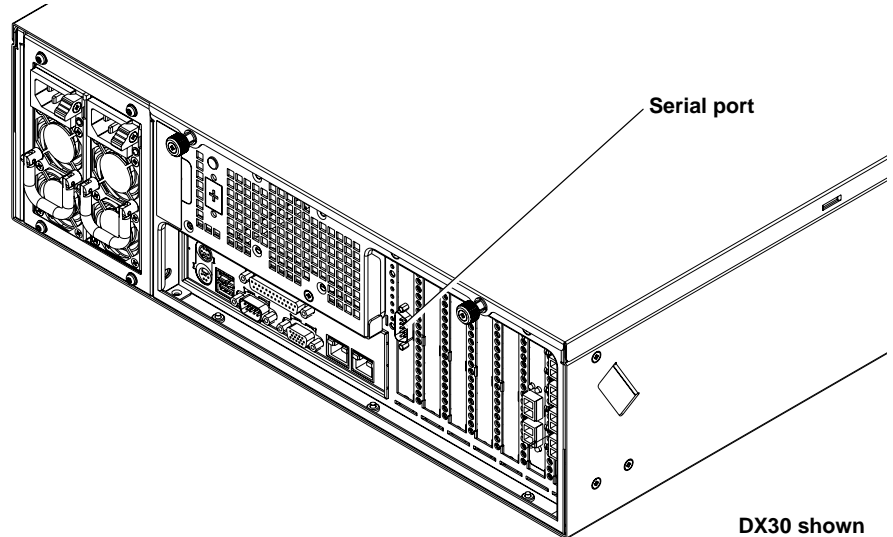
- [Connecting to the Controller](#)
- [Installing System Firmware](#)

Connecting to the Controller

To connect a service PC to the controller:

- 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 serial port on a local host system (see [figure 74](#)).

Figure 74 Connecting the Service PC to the Controller



- 2 Open a terminal emulation program on your host system and set the following properties:
 - Baud rate 115200
 - Data bits 8
 - Parity none
 - Stop bits 1
 - Flow control none
 - Emulation ANSI

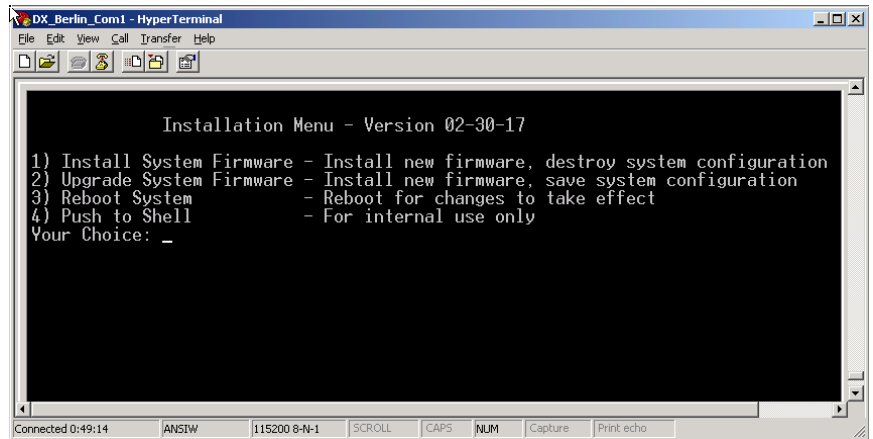
Installing System Firmware

To install the system firmware (Linux operating system):

- 1 Insert the setup CD in the controller CD-ROM drive.
- 2 Reboot the controller by pressing the reset button on the front of the controller.

The controller reboots. The terminal emulation session displays the boot process on the controller. When the boot process completes, the following menu displays (see [figure 75](#)).

Figure 75 DX-Series
Installation Menu



- 3 Type 2 to upgrade the system firmware and save the system configuration.

Caution: Selecting 1) Installing system firmware will destroy the system configuration and require a customer support call to return the DX-Series system to operation.

- 4 The system prompts for a password, enter **password** and press **Enter**.
The setup CD installs the system firmware to the DX-Series controller. When the system firmware installation is complete, the DX-Series Installation Menu displays.
- 5 Type 3 to reboot the DX-Series system.
The system reboots.

DX-Series Setup Menu

The DX-Series operating system contains an embedded installation menu that is available from the DX-Series controller serial port. The DX-Series Setup Menu is used for:

- [Displaying User Options](#)
- [Configuring User Options](#)
- [Creating Cartridges](#)
- [Displaying Diagnostic Data](#)

Displaying User Options

The DX-Series system can display the current user configuration settings through the controller serial port. To view the user options:

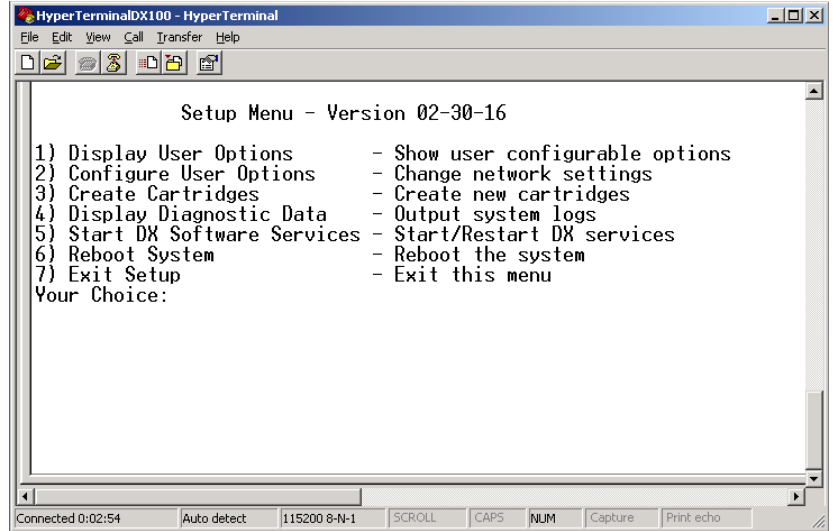
- 1 Connect a local host to the controller as shown in [Connecting to the Controller](#) on page 115.
- 2 At the system login prompt, type **setup** (all lower case characters) and press **Enter**.

The system prompts you for a password.

- 3 Type **password** (all lower case characters) and press **Enter**.

The DX-Series Setup Menu displays (see [figure 76](#)):

Figure 76 DX-Series Setup Menu



- 4 Type 1 to display user options and press **Enter**.

The current user options displays:

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

- 5 Press <Enter> to return to the DX-Series Setup Menu.

Configuring User Options

To configure the user options through the serial port:

- 1 Select 2 from the DX-Series Setup Menu to configure the user options.
- 2 The system prompts you to continue. Type y and the system services are shut down.
- 3 The system prompts you 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 [].

The system displays the information and asks for confirmation.

- 4 If the configuration information is correct, type **y** and press **Enter**.

The DX-Series Setup Menu displays.

- 5 Select **6** to restart the DX-Series system.

The system reboots.

Creating Cartridges

To create cartridges on the storage array(s):

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

- 1 Select **3** from the DX-Series Setup Menu to configure the user options.
- 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 array.

- 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 or 400GB).

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.

- 6 The cartridges are created on the storage arrays. Press **Enter** to continue.

The DX-Series Setup Menu displays.

- 7 Type 5 to restart the DX software services.

Note: Restarting DX software services does NOT reboot the DX-Series system and takes much less time to complete.

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.

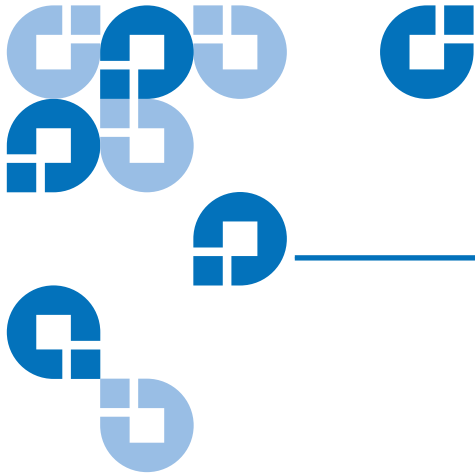
Displaying Diagnostic Data

Displaying diagnostic data 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.

Tech Tip: When trouble shooting any hardware failure within the DX-Series hardware, have the diagnostic data prior to calling Quantum customer support.

To display diagnostic data:

- 1 Connect the service PC to the DX-Series controller (see [Connecting to the Controller](#) on page 115).
- 2 At the system login prompt, type **setup** (all lower case characters) and press <Enter>. The system prompts you for a password.
- 3 Type **password** (all lower case characters) and press **Enter**.
- 4 The **DX-Series Setup Menu** displays (see [figure 76](#)).
- 5 From the **Transfer** menu at the top of Hyper Terminal, select the **Capture Text...**
- 6 Enter a file name and click **Start**.
- 7 Select 4 from the **DX-Series Setup Menu** to display the diagnostic data.
- 8 After the command has executed, select **Stop** from the **Capture Text** menu. Have this text file available when contacting Quantum customer support.



Regulatory Statements

FCC Statement

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.

Any changes or modifications made to this equipment may void the user's authority to operate this equipment.

Operation of this equipment in a residential area may cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following conditions:

- 1 This device may not cause harmful interference, and
- 2 This device must accept any interference received, including interference that may cause undesired operation.

Taiwan (BSMI) Statement

警告使用者:

這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻干擾，在這種情況下，使用者會被要求採取某些適當的對策。

Japan (VCCI) Statement

この装置は、クラスA情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

VCCI- A

DEN-AN Notice (Japan Industry Canada Digital Apparatus)

すべての電源コードが同じ定格電流を使用するとは限りません。同封されている電源コードを他の製品と一緒に使用しないでください。また、家庭用の延長コードをQuantum製品と一緒に使用しないでください。複数の電源コードを必要とする製品の電源を完全に切るには、システムに接続しているすべての電源コードを外してください。

Industry Canada (Digital Apparatus)

Reference: *Interference-Causing Equipment Standard, ICES-003 Issue 2*

This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

CISPR-22 WARNING!

This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

ACHTUNG!

Dieses ist ein Gerät der Funkstörgrenzwertklasse A. In Wohnbereichen können bei Betrieb dieses Gerätes Rundfunkstörungen auftreten, in welchen Fällen der Benutzer für entsprechende Gegenmassnahmen verantwortlich ist.

ATTENTION!

Ceci est un produit de classe A. Dans un environnement domestique, ce produit peut causer des interférences radioélectriques. Il appartient alors à l'utilisateur de prendre les mesures appropriées.

Notice for USA and CANADA Only

If shipped to USA, use the UL LISTED power cord specified below for 100-120 V operation. If shipped to Canada, use the CSA CERTIFIED power cord specified below for 100-120V operation.

Plug Cap Parallel blade with ground pin (NEMA 5-15P configuration)

Cord Type: SJT, three 16 AWG (1.5 mm²) or 18 AWG (1.0 mm²) wires

LengthMaximum 15 feet (4.6 m)

RatingMinimum 10 A, 125 V

ATTENTION

LIRE LA REMARQUE DANS LE MODE D'EMPLOI.

REMARQUE

CETTE REMARQUE NE CONCERNE QUE LES ÉTATS-UNIS ET LE CANADA.

En cas d'envoi aux États-Unis, utiliser le cordon d'alimentation CERTIFIÉ UL et convenant pour 100-120 V.

En cas d'envoi au Canada, utiliser le cordon d'alimentation CERTIFIÉ CSA et convenant pour 100-120 V.

Fiche Broches parallèles avec une broche de mise à la terre (configuration NEMA 5-15P)

Cordon Type: SJT, trifilaire 16 AWG (1.5 mm²) ou 18 AWG (1.0 mm²)

LongueurMaximum 15 pieds (4.6 m)

CapacitéMinimum 10 A, 125 V

Laser Statement

Class 1 Laser Product

CAUTION: This system contains a laser product called an optical link module that complies with DHHS US regulation 21 CFR subchapter J and IEC 825-1.

Klasse 1 Laserprodukt

VORSICHT: Dieses System enthält ein Laserprodukt, das ein optisches Verknüpfungsmodule genannt wird und das der DHHS US Regel 21 CFR, Unterkapitel J und IEC 825-1 entspricht.

Laser de classe 1 Produit

AVERTISSEMENT : ce système contient un produit laser appelé module de liaison optique conforme à la norme 21 CFR DHHS US sous-chapitre J et IEC 825-1.

Clase 1 Láser Producto

ADVERTENCIA: Este sistema contiene un producto láser denominado módulo de enlace óptico, que cumple la normativa 21 CFR, subapartado J del Departamento de Salud y Servicios Humanos de Estados Unidos (DHHS US) y IEC 825-1

Prodotto Laser Classe 1

ATTENZIONE: Il sistema contiene un prodotto laser detto modulo di collegamento ottico conforme con la direttiva 21 CFR DHHS US sotto-capitolo J e con IEC 825-1.

Battery Statement

CAUTION

This product contains a Lithium battery. Risk of explosion if battery is replaced by an incorrect type. Dispose of used batteries according to the instructions. Lithium may be considered a hazardous material. Dispose of this battery in accordance with local, state, and federal laws.

LET OP

Dit product bevat een Lithiumbatterij. Vervanging van de batterij door een ander type batterij kan explosies veroorzaken. Ontdoe u van de batterij in overeenstemming met de bijgeleverde instructies. Lithium kan als gevaarlijke stof worden gekenmerkt. Ontdoe u daarom van de batterij in overeenstemming met de ter plekke geldende wettelijke bepalingen.

VAROITUS

Tuote sisältää litiumpariston. Pariston vaihtaminen väärintyyppiseen paristoon voi aiheuttaa räjähdyksen. Käytetyt paristot on hävitettävä ohjeiden mukaisesti. Litiumia voidaan pitää vaarallisena aineena. Paristo on hävitettävä asianomaisten lakien ja määräysten mukaisesti.

ATTENTION

Ce produit contient une batterie au lithium. Si vous remplacez cette batterie par une batterie inadaptée, une explosion risque de se produire. Débarrassez-vous des batteries usagées en suivant les instructions du fabricant. Le lithium est une matière qui peut être dangereuse. Débarrassez-vous de cette batterie conformément à la législation en vigueur.

ACHTUNG

Dieses Produkt enthält eine Lithiumbatterie. Es besteht ein Explosionsrisiko, wenn die Batterie mit einem falschen Batterietyp ausgetauscht wird. Gebrauchte Batterien nach den Anweisungen entsorgen. Lithium könnte als Gefahrgut betrachtet werden. Diese Batterie nach den lokalen, staatlichen und bundesstaatlichen Gesetzen entsorgen.

Attenzione

Questo prodotto contiene una batteria al litio. Esiste un rischio di esplosione se la batteria viene sostituita con un modello non idoneo. Lo smaltimento delle batterie usate deve essere disposto secondo quanto previsto dalla legge. Il litio può essere considerato un materiale pericoloso. Lo smaltimento della batteria deve essere eseguito in conformità con le leggi locali, statali e federali.

PRECAUCIÓN

Este producto contiene una batería de litio. Existe riesgo de explosión si se sustituye la batería por otra del tipo incorrecto. Deseche las baterías usadas según se indica en las instrucciones. El litio puede ser considerado como un material peligroso. Deseche esta batería según las leyes locales, estatales y federales.

WARNING!

Denna produkt innehåller ett litiumbatteri. Om batteriet byts ut mot ett nytt av fel typ föreligger risk för explosion. Begagnade batterier ska hanteras i enlighet med gällande föreskrifter. Litium kan betraktas som ett riskmaterial. Kassera batteriet i enlighet med gällande lokal och nationell lagstiftning.

Power Cord Statement

Warning

Disconnect all power cords before servicing.

Avertissement

Déconnectez tous les fils électriques avant d'effectuer des réparations.

Warnung

Vor der Wartung alle Netzkabel abziehen.

Attenzione

Prima di effettuare qualsiasi intervento di manutenzione, scollegare tutti i cavi di alimentazione.

Advertencia

Desconecte todos los cables de alimentación antes de dar mantenimiento.

Varning

Koppla bort alla nätsladdar innan service utförs.

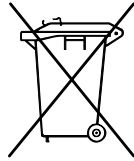
警告 - サービスを開始する前にすべての電源コードを抜いてください。

경고 - 서비스전에 모든 전원 코드를 빼두십시오.

警告: 检修服务前, 应断开所有电源线。

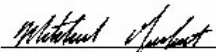

警告 - 請於服務前拔除所有電源連接線

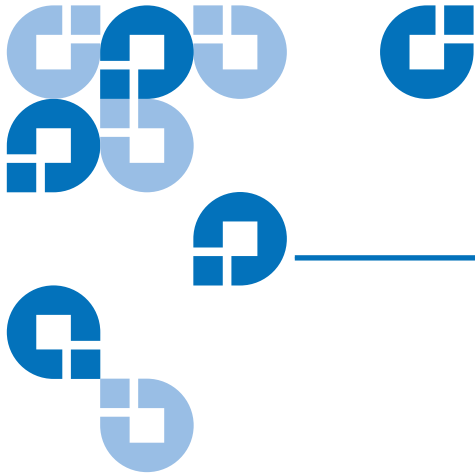
Disposal of Electrical and Electronic Equipment



This symbol on the product or on its packaging indicates that this product should not be disposed of with your other waste. Instead, it should be handed over to a designated collection point for the recycling of electrical and electronic equipment. The separate collection and recycling of your waste equipment at the time of disposal will help to conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment. For more information about where you can drop off your waste equipment for recycling, please visit our website at: <http://qcare.quantum.com> or contact your local government authority, your household waste disposal service or the business from which you purchased the product.

Declaration of Conformity

Quantum	DECLARATION OF CONFORMITY According to EN45014
Manufacturer's Name:	Quantum Corporation
Manufacturer's Address:	141 Innovation Drive Irvine, CA 92612-3040 USA
Declares that the Product(s):	
Product Description	Backup Device
Product Name:	DX Series
Model Number(s):	DX100, DX30, SP100
Product Options:	All
Conforms to the following EC Directives and EC Standards:	
Low Voltage Directive 73/23/EEC	
Product Safety:	EN60950:1992, + A1, A2, A3, A4, A11
EMC Directive 89/336/EEC	
EMC:	EN55022:1997, Class A EN61000-3-2:1995, Class A EN61000-3-3:1994 EN55024:1998 EN61000-4-2:1995 EN61000-4-3:1995 EN61001-4-4:1994 EN61000-4-5:1994 EN61000-4-6:1996 EN61001-4-8:1993 EN61000-4-11:1994
Authorizing Signature:	
 _____ Mitchell Gilbert Manager, Regulatory	Date Issued: 12/01/2003
European Headquarters: 7 Lindenwood, Chincham Business Park Basingstoke, Hampshire RG24 8WD, United Kingdom	
Telephone: +44 (1) 256 848 713 Fax: +44 (1) 256 848 700	



Glossary

B

Bit The basic unit of data in a binary numbering system (*binary digit*), represented by a 0 or a 1. Eight bits equals one byte.

Byte The basic unit of computer memory which is large enough to hold one character.

C

Class A digital device Class A equipment is intended for Commercial installation.

Class I laser product Class 1 lasers are products where the power of the laser beam produced (the accessible emission) is always below the Maximum Permissible Exposure value. Therefore, for Class 1 lasers the output power is below the level at which it is believed eye damage will occur. Exposure to the beam of a Class 1 laser will not result in eye injury. Class 1 lasers may therefore be considered eye safe.

Class II laser product Class 2 lasers are limited to a maximum output power of 1 mW. A person receiving an eye exposure from a Class 2 laser, either accidentally or as a result of someone else's deliberate action (misuse) will be protected from injury by their natural blink reflex. This is a natural involuntary response which causes the individual to blink and avert their head thereby terminating the eye exposure.

D	DLT Digital Linear Tape technology is owned, developed, and manufactured by Quantum Corporation. DLT tape drives use half-inch wide tape.
E	ESD Electro-Static Discharge
G	Gripper A mechanical component of the extension axis assembly (robotics) which grips and holds a tape cartridge in transit
H	Host The device or devices to which the library is connected.
I	IEC The International Electrotechnical Commission is based in Geneva, Switzerland.
M	MSBF Mean Swaps Before Failure MTBF Mean Time Between Failures MTTR Mean Time To Repair
N	NEMA National Electrical Manufacturers Association
P	PCI The PCI bus typically runs at speeds of 33 MHz or 66 MHz and is usually 32 bits wide. This means that it passes 32 bits of data simultaneously as if down 32 separate wires. Some of the most recent computers include "wider" 64-bit PCI buses, and already certain very high-end video capture cards offer improved performance if connected to a 64-bit PCI bus.
R	RAID Redundant Array of Independent Disks is a technology through which several physical storage disks are grouped into an array that appears to an operating system as one or more physical devices. RS-232C Short for Recommended Standard-232C, a standard interface approved by the Electronic Industries Association (EIA) for connecting serial devices. This standard is for ASYNCHRONOUS TRANSFER between computer equipment and accessories. Data is transmitted bit by

bit in a serial fashion. The RS-232 standard defines the function and use of all 25 pins of a DB-25 type connector.

S

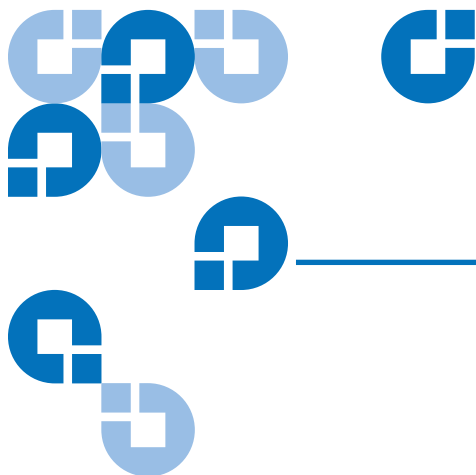
SCSI Small Computer System Interface. An American National Standards Institute (ANSI) communications standard for attaching peripheral equipment to computers.

SCSI-2 A second generation SCSI interface which includes command sets for magnetic and optical disks, tapes, printers, processors, CD-ROMs, scanners, medium changers, and communication devices.

SNMP Short for *Simple Network Management Protocol*, a set of protocols for managing complex networks.

T

Terabyte A unit of measure for digital data equal to approximately 1,000 gigabytes, or 1,099,511,627,776 bytes.



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