

Hardware Guide

StorNext M440 Metadata Appliance



6-67744-01 Rev D

Quantum StorNext M440 Metadata Appliance Hardware Guide 6-67744-01 Rev D, December 2014.

Product of USA.

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Chapter 1 Introduction

About the StorNext M440 Hardware

About the StorNext M440 Metadata Appliance

The StorNext M440 Metadata Appliance offers the powerful file-sharing capabilities of StorNext in an optimized appliance package. The StorNext M440 comes with a pair of metadata controller (MDCs) nodes in a High Availability (HA) configuration and a high-performance metadata array, which is available with HDDs or in a configuration using a combination of both SSDs and HDDs. An optional metadata disk expansion kit add disks to the existing metadata array for additional file systems, performance and capacity. The appliance comes in four models: the StorNext M441D and M441Q and the StorNext M445D SSD and M445Q SSD.

	Note: At times this guide uses StorNext M440 as a generic term that applies to the StorNext M441D and M441Q and the StorNext M445D SSD and M445Q SSD models. When information pertains to a specific StorNext M440 model only, those differences are noted.
	MDCs coordinate SAN file access across clients. Additionally, the standby node can be used as a distributed data mover (DDM) host using the included license.
	During installation, the StorNext M440 is configured for use in StorNext environments operating as a StorNext Metadata Controller (MDC) High Availability (HA) pair with access to both disk and tape libraries.
About this document	This document describes how to maintain the StorNext M440 after initial installation and configuration .
Hardware Specification	Each StorNext M440 MDC node contains the following:
	One 2.4 GHz 6-core CPU
	• 48 GBs of memory (48GB/CPU)
	 Two redundant, hot-swappable system hard drives in a RAID 1 configuration
	 Redundant cooling fans and power
Network Connectivity	The "D" in the M441D and M445D SSD models denotes that the system contains a single dual-port Ethernet card. The "Q" in the M441Q and M445Q SSD models denotes that the system contains two dual-port (or quad) Ethernet cards. Here are the quantity and type of network ports available on the different system models:
	 All StorNext M440 models feature one 2-port 8 Gb FC card for SAN network connectivity.
	 The StorNext M441D and M445D SSD feature three configurable 1 GbE Ethernet ports per node.

• The StorNext M441Q and M445Q SSD feature three configurable 1 GbE Ethernet ports per node.

MDCs coordinate SAN file access across SAN clients. Additionally, the standby node can be used as a distributed data mover (DDM) host.

The StorNext M440 comes configured as a Base System with two Metadata Controller (MDC) nodes which share a common file system located on a single metadata array for storage. The StorNext M441D and M441Q use HDDs in the metadata array. The StorNext M445D SSD and M445Q SSD Base Systems use a combination of HDDs and SSDs in their metadata array.

The M441D and M441Q Base System metadata array contains 9 HDDs which includes a global HDD hot spare and 8 HDD data drives. The M445D SSD and M445Q SSD Base System metadata array contains 10 drives, which includes a single global HDD hot spare, a single global SSD hot spare, and combination of 4 HDD and 4 SSD data drives.

The StorNext M440 can also come configured as a Base System with an Expansion Kit, or the Expansion Kit can be added to the system in the field. The Expansion Kit adds additional disks to the metadata array.

Before You Begin

There are some important items you need to consider about the configuration of the StorNext M440 Metadata Appliance:

- There is a limited set of supported software customers may install on the MDC. See <u>3rd Party Software Support</u>.
- There is now a procedure to be used to update the MDC VIP address. See <u>Changing the MDC VIP Address</u>.

Base System and Expansion Kit Description

3rd Party Software Support	Note: Quantum support for customer-installed 3rd party software is limited to core system drivers.
	Example: "EMC Power Path" (metadata array storage driver).
	Any other software is not supported.
Changing the MDC VIP	To change the Virtual IP address for the M440, do the following:
Autress	Note: This procedure must be used any time the VIP address needs to be changed after initial system configuration.
	1 Open an ssh connection to the M440 using the IP for the MDC node operating as the primary from either the customer's LAN client or Metadata network.
	2 Log on using the stornext credentials. The default password is "password".
	3 Type the sudo rootsh command to grant root user privileges after entering the password for the stornext user account again when prompted.
	4 From the command line, update the VIP Address using the following command (refer to the vip_control man page or the <i>StorNext Man Pages Reference Guide</i> for information on changing the address).
	vip_control
	5 To update the firewall rules for the MDC node operating as the primary, type the following:
	<pre>/opt/DXi/scripts/netcfg.shreset_snvip</pre>
	6 Close the ssh connection for the MDC node operating as the primary.
	7 Open an ssh connection to the M440 using the IP for the MDC node operating as the secondary.

- 8 Log on using the **stornext** credentials. The default password is "password".
- **9** Type the **sudo rootsh** command to grant root user privileges after entering the password for the **stornext** user account again when prompted.
- 10 From the command line, update the VIP Address using the following command (refer to the **vip_control man page** or the *StorNext Man Pages Reference Guide* for information on changing the address).

vip_control

11 To update the firewall rules for the MDC node operating as the primary, type the following:

/opt/DXi/scripts/netcfg.sh --reset_snvip

About StorNext

StorNext is data management software that enables customers to complete projects faster, and confidently store more data at a lower cost. Used in the world's most demanding environments, StorNext is the standard for high-performance shared workflow operations and multitier archives. StorNext consists of two components: StorNext File System (SNFS), which is high-performance data sharing software, and StorNext Storage Manager (SNSM), an intelligent, policy-based data mover.

StorNext File System streamlines processes and facilitates faster job completion by enabling multiple business applications to work from a single, consolidated data set. Using SNFS, applications running on different operating systems (Windows, Linux, Solaris, HP-UX, AIX, and Mac OS X) can simultaneously access and modify files on a common, high-speed SAN storage pool.

This centralized storage solution eliminates slow LAN-based file transfers between workstations, and dramatically reduces delays caused by single-server failures. In high availability (HA) configurations, a redundant server is available to access files, pick up the processing requirements of a failed system, and carry on processing.

	StorNext Storage Manager enhances the StorNext solution by reducing the cost of long-term data retention, without sacrificing accessibility. SNSM sits on top of SNFS and uses intelligent data movers to transparently locate data on multiple tiers of storage. This enables customers to store more files at a lower cost, without having to reconfigure applications to retrieve data from disparate locations. Instead, applications continue to access files normally, and SNSM automatically handles data access – regardless of where a given file resides. As data movement occurs, SNSM also performs a variety of data protection services to guarantee that data is safeguarded both on site and off site.
	StorNext AEL Archive combines data management policies with cost- effective tape storage to deliver data to users through a simple file system interface. The StorNext AEL includes policy-based data integrity checking, which ensures that the data in the archive will be ready when it's needed. StorNext AEL includes a feature called Extended Data Life Management (EDLM) that tests and verifies the media in the archive and provides health reports for all cartridges.
About StorNext M440 Licensing	Separate licenses are required for various StorNext features, as well as to perform an upgrade to a new release. Refer to the current <i>StorNext Licensing Guide</i> for a description of the types of licenses and procedures for obtaining them.
About StorNext Features	This guide includes information about StorNext features that may not initially apply to your StorNext M440, but that could be pertinent in the future. The initial offering of the StorNext M440 is not designed for deduplication, and the standard StorNext deduplication license is not supported with the StorNext M440.

Purpose of This Guide

This guide describes how to identify and operate the key features of the hardware components of the StorNext M440 system.

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- <u>Chapter 1, Introduction</u> provides an overview of this guide, and also includes document conventions, product safety statements, a list of related documents, and supported Internet browsers.
- <u>Chapter 2, Hardware Overview</u> provides an overview of the StorNext M440.
- <u>Chapter 3, Basic System Operations</u> provides basic operating instructions for the StorNext M440 system.
- <u>Chapter 4, Contacting Quantum</u> provides contact information for the Quantum Technical Assistance Center.

Notes, Cautions, and Warnings

How This Guide is

Organized

The following describes important information about Notes, Cautions, and Warnings used throughout this guide.

Note

Note: Emphasizes important information related to the main topic.

Consequences if not followed:

There are no hazardous or damaging consequences.

Caution

Caution: Indicates potential hazards to equipment or data.

Consequences if not followed:

Failure to take or avoid this action could result in loss of data or harm to equipment.

Warning

WARNING: Indicates potential hazards to personal safety.

Consequences if not followed:

Failure to take or avoid this action could result in physical harm to the user or hardware.

Document Conventions

This guide uses the following document conventions to help you recognize different types of information.

When a step includes substantial supporting information, the following document conventions are used to differentiate the supporting information from the procedural content:

Hardware Conventions

Conventions

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.

Software Conventions

Conventions	Examples
For all UNIX-based commands, the # prompt is implied, although it is not shown.	TSM_control stop is the same as # TSM_control stop

Conventions	Examples
For all UNIX-based commands, words in <i>italic</i> are variables and should be replaced with user-defined values.	cvaffinity <i>filename</i> where <i>filename</i> is a variable and should be replaced with a user-defined value.
User input is shown in bold font.	./install.stornext
Computer output and command line examples are shown in monospace font.	./install.stornext
User input variables are enclosed in angle brackets.	http:// <ip_address>/cgi- bin/stats</ip_address>
For UNIX and Linux commands, the command prompt is implied.	TSM_control stop is the same as # TSM_control stop
File and directory names, menu commands, button names, and window names are shown in bold font.	/data/upload
Menu names separated by arrows indicate a sequence of menus to be navigated.	Utilities > Firmware

StorNext M440 Documents A complete list of documentation for the StorNext M440 Metadata Appliance is located on the following web page:

http://www.quantum.com/snmdcdocs/

Supported Internet Browsers

The Internet browser software is not supplied with the StorNext M440; you must obtain and install it independently. Refer to the *Quantum StorNext Compatibility Guide* for the complete list of browsers supported by StorNext.

Product Safety Statements

Quantum will not be held liable for damage arising from unauthorized use of the product. The user assumes all risk in this aspect.

This unit is engineered and manufactured to meet all safety and regulatory requirements. Be aware that improper use may result in bodily injury, damage to the equipment, or interference with other equipment.

WARNING: Before operating this product, read all instructions and warnings in this document and in the system, safety, and regulatory guide.

在使用本产品之前,请先阅读本文档及系统、安全和法规信息指南中所有的说明和 警告信息。

警告	操作本產品前,請先閱讀本文件及系統、安全與法規資訊指南中的指示與 聲告說明。
ADVERSAL	Læs alle instruktioner og advarsler i dette dokument og i Vejledning om syste sikkerheds- og lovgivningsoplysninger, før produktet betjenes.
AVERTISSI	Avant d'utiliser ce produit, lisez la totalité des instructions et avertissement de ce document et du <i>Guide d'informations sur le système, la sécurité et la</i> <i>réglementation</i> .
HINWEIS	Lesen Sie vor der Verwendung dieses Produkts alle Anweisungen und Warnhinweise in diesem Dokument und im System, Safety, and Regulatory Information Guide (Info-Handbuch: System, Sicherheit und Richtlinien).
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ADVERTE	Antes de utilizar este producto, lea todas las instrucciones y advertencias er

VARNING Läs alla anvisningar och varningar i detta dokument och i *System, säkerhet och krav från myndigheter - Informationshandbok* innan denna produkt tas i bruk.



Chapter 2 Hardware Overview

This chapter contains the following sections:

- <u>StorNext M440 Components</u>
- <u>StorNext M440 Connectivity</u> on page 32
- Relocating the StorNext M440 System on page 38

StorNext M440 Components

The StorNext M440 Metadata Appliance consists of the following components:

- <u>StorNext M440 MDC Nodes</u>
- <u>StorNext M440 Metadata Array</u>

Chapter 2: Hardware Overview StorNext M440 Components

Figure 1 shows the StorNext M440 System.

Figure 1 StorNext M440 System Components (Front)



StorNext M440 MDC Nodes

The two StorNext M440 MDC Nodes are servers that provide storage and control for the StorNext M440 platform software (host OS and StorNext software). The MDC Nodes contain redundant hard drives in a RAID 1 configuration, ensuring high availability of the system software.

MDC Node - Front View

<u>Figure 2</u> shows, and <u>Table 1</u> describes the indicators and buttons on the front of the StorNext M440 MDC Node.

Figure 2 StorNext M440 MDC Node – Front View



StorNext Platform Software **Empty Drive Slots**

Table 1StorNext M440 MDCNode – Front View Indicatorsand Buttons

Item	Indicators, Button, or Connector	lcon	Description
1	Power-on indicator/ power button	Ċ	 The power-on indicator lights when the system power is on. The power button controls the power supply output to the system. When the system bezel is installed, the power button is not accessible. Note: To perform a graceful shutdown, press and release the power button. Note: To force an ungraceful/hard stop shutdown, press and hold the power button for 5 seconds.
2	System identification button	0	The identification buttons on the front and back panels can be used to locate a particular system within a rack. When one of these buttons is pushed, the LCD panel on the front and the blue system status indicator on the back blink until one of the buttons is pushed again.
3	LCD menu buttons		Allows you to navigate the control panel LCD menu

ltem	Indicators, Button, or Connector	lcon	Description
4	LCD panel		Provides system ID, status information, and system error messages
			The LCD lights blue during normal system operation. When the system needs attention, the LCD color will change to amber, and will display an error code followed by descriptive text.
			Note: If the system is connected to AC power and an error has been detected, the LCD lights amber, regardless of whether the system has been powered on.
	USB connectors (2)	● ~ • +	To connect USB devices to the system (USB 2.0 compliant)
	System service tag pull tab		A slide-out tab which contains system information including the Express Service tag number, embedded NIC MAC address, and iDRAC Enterprise card MAC address
	Optical drive		SATA optical DVD drive

MDC Node - Hard Drive Indicator Patterns

The two hard drives located on the front of each MDC Node (in drive bays 0 and 1) are used to store the (operating system and StorNext software). Drive bays 2 through 7 are empty, and reserved for Quantum use. Unlabeled indicators, connectors, and buttons are reserved for Quantum Service.

For more information, see <u>MDC Node - Hard Drive Indicator Patterns</u> on page 16.

Figure 3 StorNext M440 MDC Node – Hard-Drive Indicator Patterns



- 1 Hard-drive activity indicator (green)
- 2 Hard-drive status indicator (green or amber)

Table 2StorNext M440 MDCNode – Hard-Drive Activity andStatus Indicators

Drive-Status Indicator Pattern (RAID Only)	Condition
Blinks green two times per second	Identify drive/preparing for removal.
Off	Drive ready for insertion or removal. Note: When system power is applied, the drive status indicator remains off until all hard drives are initialized. Drives are not ready for insertion or removal during this time.
Blinks green, amber, and off	Predicted drive failure.
Blinks amber four times per second	Drive failed
Blinks green slowly	Drive rebuilding
Steady green	Drive online

Drive-Status Indicator Pattern (RAID Only)	Condition
Blinks green three seconds, amber three seconds, and off six seconds	Rebuild aborted

MDC Node - Rear View

The back of each StorNext M440 MDC Node has a series of indicators, connectors, and buttons. Unlabeled indicators, connectors, and buttons are reserved for Quantum Service.

Figure 4 shows the rear indicators, connectors, and buttons of the system.

Figure 4 StorNext M441D and M445D SSD MDC Node – Rear View



<u>Figure 5</u> shows the rear indicators, connectors and buttons of each StorNext M441Q and M445Q SSD MDC node. See <u>Table 3</u> for information on the labeled components. Figure 5 StorNext M441Q and M445Q SSD MDC Node – Rear View



See <u>Table 3</u> for information on the labeled components.

Table 3StorNext M440 MDCNode – Rear Panel Features andIndicators

ltem	Indicator, Connector and Button	lcon	Description	
1	PCIe slot 1		M441D and M445D SSD: Customer facing 2-port 1GbE NIC card	
			M441Q and M445Q SSD : Customer facing 2-port 1GbE NIC card	
2	PCIe slot 2		Dell PERC Dual-Port 6 Gb SAS HBA	
3	PCIe slot 3		M441D and M445D SSD : Not Used M441Q and M445Q SSD : Dual-Port 8 Gb FC HBA	
4	PCIe slot 4		Dual-Port 8 Gb FC HBA	
5	iDRAC port	IDRAC	Reserved for Service	
6	Ethernet Service port	**	Reserved for Service	

ltem	Indicator, Connector and Button	lcon	Description
7	Ethernet Port 2 connector	융	Integrated 1GbE (Customer-Facing) DLC or management
8	USB Port 1 and 2		USB Ports
9	Power supply 2 (PS2)		Secondary Power Supply
10	Power supply 1 (PS1)		Primary Power Supply

MDC Node – NIC Indicator Codes

Figure 6 shows the StorNext M440 MDC Node NIC indicator codes.

Figure 6 MDC Node – NIC Indicators



1 Link indicator

2 Activity indicator

Indicator Status	Indicator Code
Link and activity indicators are off.	The NIC is not connected to the network.
Link indicator is green.	The NIC is connected to a valid network link at 1000 Mbps.
Link indicator is amber.	The NIC is connected to a valid network link at less than the maximum port speed.
Activity indicator is blinking green.	Network data is being sent or received.

Chapter 2: Hardware Overview StorNext M440 Components

MDC Node – Power Supply Indicator Codes

This section describes the StorNext M440 MDC Node power supply indicator codes (see <u>Figure 7</u>). The power supply indicators show if power is present, or if a power fault has occurred.

Figure 7 MDC Node - Power Supply Indicator



Table 4 Power Supply Status Indicator

Indicator Status	Indicator Code	
Not lit	AC power is not connected.	
Green	The handle displays green which indicates that a valid power source is connected to the power supply and that the power supply is operational.	
	When the system is on, a green light also indicates that the power supply is providing DC power to the system.	

Indicator Status	I	Indicator Code		
Flashing Amber	Ir	Indicates a problem with the power supply.		
Flashing green	V p h a tl n	When hot-adding a power supply, this indicates that the power supply is mismatched with the other power supply (a high-output power supply and an energy smart power supply are installed in the same system). Replace the power supply that has the flashing indicator with a power supply that matches the capacity of the other installed power supply.		
	Caution:	When correcting a power supply mismatch, replace only the power supply with the flashing indicator. Swapping the opposite power supply to make a matched pair can result in an error condition and unexpected system shutdown. To change from a High Output configuration to a Low Output configuration or vice versa, you must power down the system.		
	Caution:	The AC power supplies, which come with the system, support both 220 V and 110 V input voltages. When two identical power supplies receive different input voltages, they can output different wattages, and trigger a mismatch.		
	Caution:	Combining AC and DC power supplies is not supported and triggers a mismatch.		
	Note: Ea th wł	ch AC power supply has an illuminated translucent handle at serves as an indicator to show whether power is present or nether a power fault has occurred.		

StorNext M440 Metadata Array

The StorNext M440 features a single Metadata Array.

StorNext M440 Metadata Array

The StorNext M440 Metadata Array features a partially-populated 24drive 2U storage enclosure. The StorNext M440 24-drive Metadata Array connects to the StorNext M440 (all models) MDC nodes via 6 Gb SAS.

The first drive slot for all M440 systems is an HDD global hot spare. Slot 2 is left empty for future disk expansion in M441D and M441Q systems and contains 1 SSD global hot spare in M445D SSD and M445Q SSD systems. The M441D and M441Q Base system contains 8 HDDs in slots 3-10. The M445D SSD and M445Q SSD Base system add 4 HDDs in slots 3-6 and 4 SSDs in slots 7-10.

The eight data drives in slots 3-10 are configured into four 1+1 RAID-1 mirrors. Drive slots 3-6 are divided into two stripe groups (SG): SG0 combines two LUNs into the metadata and journal stripe group for the shared file system. SG1 combines two LUNs into the shared HA file system stripe group. Drive slots 7-10 are combined into two 1+1 RAID-1 mirror allocated to user file system metadata, as shown in Figure 8.

The Metadata Array also contains redundant power supplies and dual Snowmass controllers. Each controller provides two 6 Gb Serial Attached SCSI (SAS) host ports. StorNext Metadata Arrays connect to StorNext MDC nodes via 6 Gb SAS.

Additional storage can be added to the Metadata Array by purchasing an expansion kit.

Hard drives are supplied in hot-swappable drive carriers that fit in the hard-drive bays.

The StorNext M440 Metadata Array has a series of indicators and buttons located on the front and back of the array:

- Metadata Array Front LEDs on page 25
- <u>Metadata Array Rear View</u> on page 27

Metadata Array – Front View

The front of the StorNext M440 Metadata Array contains the left end cap, which contains the drive tray LEDs; the right end cap; and the drives (see Figure 8).

Figure 8 StorNext M440 Metadata Array – Front View



Item	Description
1	HDD Global Hot Spare
2	Empty Drive Bay - M441D and M441Q SSD Global Hot Spare - M445D SSD and M445Q SSD
3	2 x 1+1 HDD RAID 1 HA File System Metadata and Journal
4	2 x 1+1 HDD RAID 1 for User File System Metadata - M440 2 x 1+1 SSD RAID 1 for User File System Metadata - M445D SSD and M445Q SSD
5	Empty Drive Bays - contain drive blanks

Metadata Array – Front LEDs

The front of the StorNext M440 Metadata Array contains the left end cap, which contains the drive tray LEDs (see <u>Figure 9</u>).

Chapter 2: Hardware Overview StorNext M440 Components

Figure 9 Metadata Array Left End Cap LEDs



Item	lcon	LED Description	Color	On	Off
1		Drive Tray Locate	White	Identifies a drive tray that you are trying to find.	Normal status
2	\land	Service Action Required	Amber	A component within the drive tray needs attention.	Normal status
3		Drive Enclosure Over- Temperature	Amber	The temperature of the drive tray has reached an unsafe level.	Normal status
4		Power	Green	Power is present.	Power is not present.
5	C	Standby Power	Green	The drive tray is in Standby Power mode.	The drive tray is not in Standby Power mode.

Metadata Array – Rear View

The StorNext M440 Metadata Array contains dual controller canisters for host connectivity and redundancy (see <u>Figure 10</u>).

Figure 10 Metadata Array – Rear View



<u>Figure 11</u> shows the storage controller's connectors, displays and LEDs. Unlabeled connectors are reserved for Quantum Service.

Figure 11 The Metadata Array Controller Connectors and LEDs



Table 5 Metadata Array Controller – Rear Features and	Item	Description
Indicators	1	Serial Port (For Service Only)

Item	Description
2	Host Fault LED
3	Host Active LED
4	Host Port Connector 1 (SFF-8088)
5	Host Port Connector 2 (SFF-8088)
6	Battery Service Action Required LED
7	Battery Charging LED
8	Controller Service Action Allowed LED
9	Controller Service Action Required LED
10	Cache Active LED
11	Seven-Segment Displays

Metadata Array — General LED Behavior

For more information about the Metadata Array LED locations and general behavior, see <u>Table 6</u>.

Table 6 Metadata Array – LED Locations and Behavior

LED	lcon	Location	General Behavior
Power		Drive enclosureController canisterPower-fan canister	 On – Power is applied to the drive tray or the canister. Off – Power is not applied to the drive tray or the canister.
Locate		• Front bezel on the drive tray	On or blinking – Indicates the drive tray that you are trying to find.
Over- Temperature	Ê	• Front bezel on the drive tray	On – The temperature of the drive tray has reached an unsafe condition. Off – The temperature of the drive tray is within operational range.

LED	lcon	Location	General Behavior
Standby Power	C	• Front bezel on the drive tray	On – The drive tray is in Standby mode, and the main DC power is off. Off – The drive tray is not in Standby mode, and the main DC power is on.
Service Action Allowed		 Controller canister Power-fan canister Drive 	 On – It is safe to remove the Controller canister, the power-fan canister, or the drive. Off – Do not remove the Controller canister, the power-fan canister, or the drive. Note: The drive has an LED, but no symbol.
Service Action Required (Fault)		 Controller canister Power-fan canister Drive 	 On – When the drive tray LED is on, a component within the drive tray needs attention. On – The Controller canister, the power-fan canister, or the drive needs attention. Off – The Controller canister, the power-fan canister, and the drive are operating normally. Note: The drive has an LED, but no symbol.
AC Power		Controller canisterPower-fan canister	On – AC power is present. Off – AC power is not present.
DC Power		• Power-fan canister	On – Regulated DC power from the power-fan canister is present. Off – Regulated DC power from the power-fan canister is not present.

LED	lcon	Location	General Behavior
Link Service Action Required (Fault)	\bigwedge	Controller canister	On – The cable is attached, and at least one lane has a link-up status, but one lane has a link-down status. Off – The cable is not attached, and all
			lanes have a link-up status, or the cable is attached, and all lanes have a link- down status.
Link Up	Two LEDs above	Controller canister	On – The cable is attached, and at least one lane has a link-up status.
	each expansion connector		Off – The cable is not attached, or the cable is attached and all lanes have a linkdown status.

StorNext M440 Metadata Expansion Kit

The M441D and M441Q Expansion Kits add an HDD global hot spare in drive slot 2 and 8 HDDs in slots 11-18. The M445D SSD and M445Q SSD Expansion Kits add 4 HDDs in slots 11-14 and 4 SSDs in slots 15-18. The data drives share the same RAID configuration as the base system's metadata array. Drives in slots 11-18 are divided into two new stripe groups: SG2 and SG3. SG2 adds two new **metadata-only** LUNs to the shared HA file system metadata and journal stripe group. SG3 adds two new LUNs to the shared HA file system stripe group.

The Expansion Kit can be included with a new M440 system or purchased separately and added to the existing Metadata Array as a field upgrade.

The HDDs and SSDs are supplied in hot-swappable drive carriers that fit in the drive bays.

Metadata Expansion Kit – Front View

<u>Figure 12</u> shows the additional drives provided in the Metadata Expansion Kit.

Figure 12 StorNext M440 Metadata Expansion Kit – Front View



Item #	Description	
1	* HDD Global Hot Spare	
2	** HDD Global Hot Spare - M441D and M441Q	
	* SSD Global Hot Spare - and M445D SSD and M445Q SSD	
3	* 2 x 1+1 RAID 1 HA File System Metadata and Journal	
4	* 2 x 1+1 RAID 1 for User File System Metadata	
5	** 2 x 1+1 RAID 1 HDD HA File System Metadata (Stripe Group 2)	
6	** 2 x 1+1 RAID 1 HDD for User File System Metadata (Stripe Group 3) - M441D and M441Q	
	** 2 x 1+1 RAID 1 SSD for User File System Metadata (Stripe Group 3) - M445D SSD and M445Q SSD	
7	Empty Drive Bays	
 * - StorNext M440 Base System Metadata Array items ** - Expansion Kit items 		

StorNext M440 Connectivity

This section covers:

- <u>StorNext M440 Power Cabling</u>
- StorNext M440 SAS Cabling
- <u>StorNext M440 SAN Cabling</u>
- <u>StorNext M440 LAN Cabling</u>

StorNext M440 Power Cabling	Connect the power cables for each component into an available power outlet (see <u>Figure 13</u> on page 33).	
	Note: Quantum recommends attaching the primary and secondary power connections to alternate power sources for resiliency. Quantum also recommends that one of these power sources be an uninterruptible power source, such as battery backup or generator, or be connected to redundant AC power supplies to avoid system interruption in the case of a power failure.	

Figure 13 StorNext M440 Power Connections

MDC Node 1



StorNext M440 SAS Cabling

Connect the Serial Attached SCSI (SAS) ports cables between the nodes and the Metadata Array as shown in Figure 14.

Figure 14 StorNext M440 SAS Cabling

MDC Node 1



StorNext M440 LAN Cabling

The number of customer-facing network ports depends on the model type. Each MDC node also contains an iDRAC port and a dedicated service port. By default, each StorNext M440 model ships with one bonded network interface: Bond 0. All ports, excluding the service and iDRAC ports, are customer-configurable. Instructions for changing the

default configuration are located in the "Step 3: System" section of the latest version of the *StorNext User's Guide*.

The default M440 network interface configuration is as follows:

Note: Ethernet port configuration is identical on all M440 models.

- Ethernet Port 1 (Eth1) is configured as the GUI/management network port.
- Two interfaces, Ethernet Port 2 (Eth2) and Ethernet Port 3 (Eth3), are bonded together by default into Bond 0 for the Metadata network. Bond 0 can be broken in the GUI. In this case, Eth2 will be configured as a standalone port, and Eth3 will be disabled.

<u>Figure 15</u> shows the 3 1GbE customer-facing Ethernet ports on the StorNext M441D and M445D SSD.

Figure 15 StorNext M440 Network Ports



<u>Table 7</u> identifies the logical port configuration, port function and default bonding for the StorNext M440.

Table 7StorNext M440Network Configuration

Ethernet Port Number	Logical Ethernet Port Number	Physical Port Location	Port Function	Bond
D	N/A	iDRAC Port	Sonvico	NI/A
S	eth0	Integrated Port 1	Service	N/A
1	eth1	Integrated Port 2	GUI and Management (Configurable from Service Menu)	N/A
2	eth2	Left Expansion Port	Metadata (Configurable from	Bond 0 When not bonded, eth2 is usable and eth3 is not usable
3	eth3	Right Expansion Port	Service Menu)	Bond 0 When not bonded, eth3 is not used

StorNext	M440	SAN
Cabling		

Each StorNext M441D and M445D SSD MDC node contains one 2-port 8Gb Fibre Channel (FC) host bus adapter (HBA) card in PCIe expansion slot 3. The StorNext M441Q and M445Q SSD includes an additional 2port 8Gb Fibre Channel (FC) host bus adapter (HBA) cards in PCIe expansion slot 4.

Note: If small form-factor pluggable (SFP) FC adapters are needed, use only Intel-based SFP adapters. SFP adapters from other vendors are not compatible with the FC HBA card used in the StorNext M440. Twinax cables have the adapters built into the end of the cable, so they do not require SFP adapters.

Fibre Channel Zoning

Each Fibre Channel port supports dual-port tape drives and libraries. StorNext clients should not be zoned to access the tape drives/libraries unless they are acting as a Distributed Data Mover host.

Separate Fibre Channel zoning is required for tape and disk. If the system has a tape library, use FC port 1 for disk, and FC port 2 for tape (this also applies to the second FC card on the StorNext M441Q and M445Q SSD). The actual zoning configuration for these devices is

dependent on variables such as the Fibre Channel switch vendor, the WWPN of the HBA ports, and the external hardware.

Connect the FC host ports to your SAN as shown in <u>Figure 16</u> on page 37.

Figure 16 StorNext M441D and M445D SSD SAN Cabling



Chapter 2: Hardware Overview Relocating the StorNext M440 System

Figure 17 StorNext M441Q and M445Q SSD SAN Cabling



Relocating the StorNext M440 System

If you ever need to relocate the StorNext M440 system to a different location, please contact Quantum Customer Support for additional information. The StorNext M440 system must be relocated by a qualified Quantum field service engineer.



Chapter 3 Basic System Operations

This chapter is divided into the following sections:

- <u>Powering On the StorNext M440</u> on page 40
- Shutting Down the StorNext M440 on page 41
- System Serial Numbers and Service Tag on page 43
- <u>Upgrading Firmware</u> on page 44
- <u>Converting to HA</u> on page 50
- <u>Additional Common Operations</u> on page 55, which includes the following:
 - Changing the MDC VIP Address on page 55
 - <u>StorNext Operations</u> on page 56

Powering On the StorNext M440

<u>Figure 18</u> on page 41 illustrates the location of the power switches, and the specific order to follow when powering on the StorNext M440 system components.

Note: Before continuing, verify that all power switches on every component are in the **OFF** position.

- 1 Turn on both power switches on the back of the Metadata Array.
 - **Note:** Before powering up the MDC Nodes, make sure that the Metadata Array drive LEDs are all green, and the seven-segment display on the Metadata Array indicates "85". This indicates that the Metadata Array is ready for I/O. The system is then ready for powering up the MDC Nodes.
- 2 Turn on the power switch on the front of each of the MDC Nodes. Callout number 3 in Figure 18 on page 41 shows the location of the power switches.

Figure 18 StorNext M440 Power-On Sequence



Shutting Down the StorNext M440

To cleanly shut down the StorNext M440 Operating System and software and power off the hardware:

- 1 Halt all I/O access to SAN and/or LAN clients.
- 2 For each SAN and/or LAN client, unmount and/or unshare the file systems. Refer to that client's operating system administrator's guide for instructions.
- **3** Open an **ssh** connection to the MDC node currently acting as the secondary node, and log in as the **stornext** user.
- **4** To log in to the MDC node currently acting as the secondary node enter:
 - User: stornext
 - Password: enter the customer-supplied password (the default password is **password**)
- 5 Enter sudo rootsh.
- 6 Enter the password for the stornext user account a second time.
- 7 Enter /sbin/poweroff. Both the operating system and the StorNext software are gracefully shut down, and then the system powers off.
- 8 Open an **ssh** connection to the MDC node currently acting as the primary node.
- **9** To login to the MDC node currently acting as the primary node enter:
 - User: stornext
 - Password: enter the customer-supplied password (the default password is **password**)
- 10 Enter sudo rootsh.
- 11 Enter the password for the **stornext** user account a second time.
- **12** Enter /**sbin**/**poweroff**. Both the operating system and the StorNext software are gracefully shut down, and then the system will powers off.
- **13** Turn off the Metadata Array module power switches.

System Serial Numbers and Service Tag

The StorNext M440 Metadata Appliance system serial number and the service tag number may be needed when contacting Quantum Support.

Locating the System Serial Number

The System Serial Number is located in the following locations:

- In a sleeve on the back of each MDC node, and the metadata array.
- Scrolling on the LCD panel on the front of each MDC node.
- From the Service Menu of each MDC node.
- In the title bar and on the Help > About page of the StorNext M440 Metadata Appliance GUI as shown here:

Figure 19 Locating the System Serial Number on the GUI

Quantum. St	torNext M44	SV1248CKD15421	<u> </u>	🔰 Log Off
Configuration Tools	Service Reports	Help		
Fi	le System Storage	Manager Tickets (1 open)	Admin Alerts (10.40.163.103) PrimarySecondary	admin
P Help > About				? ^
Software Gateways	Firmware			
Component	Version		Build	
StorNext	4.3.2	29536	Serial Number	
File System Server	4.3.2	29536		
File System Client	4.3.2	29536		
Library Manager	4.3.2	29536		
Policy Manager	4.3.2	29536		
User Interface	4.3.2	29536		=
Database	4.3.2	29536		
Perl	5.8.3_3.0.0	27		
Toncat	4.3.2	29536		
Platform	4.3.2.056-9062	9062		
		S	Serial Number	
		SV	1248CKD15421	
		Ор	perating System	
Linux hydroxide-a	2.6.32-220.el6	x86_64 #1 SMP Tue D	Dec 6 19:48:22 GMT 2011 x86_64 x86_64 x86_64 GNU/Linux	
			Patents	
Quantum Corporatio	on. All Rights F	leserved.	an in the UC and/on athen another	-

Serial Number Format

System serial numbers are alpha-numeric (example: CX1234CKD5678).

Locating the Service Tag Number

The Service Tag Number is located on the service tag, which is located on a pullout tray on the front of each MDC Node of the StorNext M440 Metadata Appliance.

Upgrading Firmware

The Firmware Upgrade option allows you to perform a firmware upgrade on StorNext M440 Metadata Appliances. Upgrading the firmware also upgrades StorNext, if applicable.

Note: Use the StorNext M440 Metadata Appliance GUI to perform all firmware upgrades and HA conversions.

Upgrade Considerations	Before you begin the upgrade you should note the following considerations so you can plan accordingly:
	Consider the following prior to upgrading the Metadata Appliance:
	 Not all StorNext releases may be upgraded to a given StorNext release. As a result, an upgrade to the current version of StorNext may require multiple, incremental upgrades, depending on the version of StorNext currently installed on the StorNext M440.
	For information about supported upgrade paths for StorNext, consult the <i>StorNext Compatibility Guide</i> . If your system is running a StorNext release prior to the supported upgrade releases for a given StorNextrelease, consult an earlier version of the <i>StorNext</i> <i>Compatibility Guide</i> that applies to your specific upgrade, and the dependencies for StorNext Clients in the environment.

• Firmware upgrade installation files must first be acquired from Quantum.

To obtain the firmware files (both are required) you wish to install for the Metadata Appliance from CSWeb:

Note:	The two files are large - around 2 GB total, so plan time to download the files into your upgrade/installation.
a	Navigate to the StorNext Products page on CSWeb for the appliance (on the lefthand side of CSWeb pages, look for the appropriate link under the StorNext Products section).

The first section of the page contains Downloads for the given appliance.

- **b** Scroll down to the Current Software section, and download both firmware Image files.
- Firmware upgrade installation files, which contain the .fw suffix, must be uploaded to the system prior to beginning the upgrade process. Uploading the firmware upgrade files in a network with low latency should only take a matter of minutes. High network latency in your environment can slow the upload of these files onto the Metadata Appliance.
- When using the firmware upgrade process from the StorNext GUI, the license for the system will be automatically applied to the StorNext M440.

For StorNext 5 and Later Upgrades Only:

• The upgrade is applied to both nodes sequentially, beginning with the secondary node. When the secondary node has completed its upgrade, the system will failover from the primary to the secondary, and begin upgrading the primary system. While the node firmware upgrade is being applied, metadata operations are not interrupted. However, if a metadata array firmware upgrade is required, the downtime is approximately 30 minutes, since both nodes will need

	to reboot after the FW update is applied. The StorNext GUI is available on the node acting as primary during the upgrade of the node acting as secondary.
	 The secondary node of the MDC no longer requires an HA conversion, since both nodes are left in the HA configuration.
	 Storage Manager components no longer require a restart as part of the firmware upgrade procedure.
	For Upgrades Prior to StorNext 5 Only:
	• Each StorNext firmware upgrade requires a reboot of both nodes. In some cases, multiple reboots of the nodes are required. The StorNext GUI is not available during reboots which can each take 30 minutes or longer per node. The GUI for the secondary node should not be started during this process.
	• Each time the firmware upgrade is done, the secondary node of the Metadata Appliance is left out of the HA configuration. As a result, you will need to convert the StorNext M440 to an HA system after each upgrade in order to regain failover operations. After the HA conversion, both nodes will reboot, which can take 30 minutes or longer per node.
	 The Storage Manager components will need to be restarted after the HA conversion is complete by clicking the Start button in the Storage Manager panel of the Tools > System Control page.
Upgrade Procedure	To upgrade the StorNext M440.
	 Download the required firmware file(s) from Quantum CSWeb for the StorNext release needed.
	2 Log into the StorNext GUI.

3 Choose Tools > Firmware Upgrade.

The Firmware Upgrade page appears.

Figure 20 Firmware Upgrade Page

Quantum. StorNext M330 CX1120CKA00573		C 0 .	og Off
Configuration Tools Service Reports Help			
File System Storage Manager Tickets (280 open) Admin Alerts (106)		up 🥑 🤣 (10.20.232.54) PrimarySecondary 👬 a	admin
X Tools > Firmware Upgrade			?
Upload a New File Auto Upload 🗹			
0 %	Browse.		
Uploaded Files			
File	Size	Upload Time	^
Delete Validate Apply Refresh 6		Row	vs: 1

- 4 Do one of the following:
 - **a** Select **Auto Upload** to upload the file immediately after you select it.
 - **b** Do not select Auto Upload.
- 5 Click **Browse**..., and then navigate to the directory where the file resides. Firmware files are identifiable by the **.fw** extension.
 - Note: There are two .fw files required for updating firmware. The filenames are similar to QTM-DXiSNA-upd-4.6.x.OS6-9599-0.1of2.fw and QTM-DXiSNA-upd-4.6.x.OS6-9599-0.2of2.fw. Since it is a two-part upgrade, upload both files to the GUI. To begin activation of the upgrade, select either of the uploaded files and then click **Apply**. Both parts are applied to the system.

If you selected the **Auto Upload** option, the file is immediately uploaded. Proceed to <u>Step 7</u>.

6 If you did not select the **Auto Upload** option and want to validate the file before uploading, click **Validate**. After a message informs you that the file is valid, click the **Upload** button located to the right of the **Browse...** button.

Note: Files are automatically validated after you click **Apply** (<u>Step 7</u>), but you won't receive a message telling you the file is valid.

7 Click **Apply** to begin the upgrade.

The green status indicator at the top of the page indicates upload progress, not the upgrade progress. To monitor upgrade progress, check the logs available under the Reports menu.

If Upgrading to StorNext 5 from StorNext 4.7.0:

The upgrade process is complete. There is no interruption of metadata operations during or after the upgrade.

If Upgrading to StorNext 5 from StorNext Releases Prior to StorNext 4.7.0:

Note: After the upgrade to the primary MDC node completes, metadata operations will be interrupted for 30 minutes or more, and both MDC nodes will reboot, which could take an additional 30 minutes to complete, before you are able to log back in, so plan upgrade times accordingly.

If Upgrading to StorNext Releases Prior to StorNext 5:

- Note: After the upgrade to the primary MDC node completes, metadata operations will be interrupted for 30 minutes or more, and both MDC nodes will reboot, which could take an additional 30 minutes to complete. It could be a long time before you are able to log back in, so plan upgrade times accordingly.
- 8 Convert the system to HA, according to <u>Converting to HA</u> on page 50. (Not necessary when upgrading to StorNext 5).

GUI Feedback During Upgrades

There are some indications within the GUI that the system is being upgraded. Here are some notes about this visual feedback:

If Upgrading to StorNext 5 from StorNext 4.7.0:

• For systems without a defined virtual IP, the secondary MDC nodes is upgraded first, followed by a fail over to the secondary MDC node, which takes the role of the primary MDC node. The GUI will run on the primary MDC node until the secondary MDC node completes its upgrade, and the system fails over to the secondary MDC node. At that point you will need to bring up the GUI for the secondary MDC node, while the primary MDC node completes its upgrade. At the end of updating the primary MDC node, the system will not automatically fail over again, it only fails over once.

• If a virtual IP is used, the GUI will need to be refreshed to display the GUI once the secondary MDC node upgrade and failover is complete. The assumes the role of the primary when the failover occurs. Once the original primary MDC node completes its upgrade, it will assume the role of the secondary MDC node.

If Upgrading to StorNext Releases Prior to StorNext 5:

- On the primary MDC node, the GUI will display different status messages throughout the installation, including messages that the system will reboot, and red icons indicating that the primary MDC node, secondary MDC node, File System, and Storage Manager are also disabled.
- The current user account will eventually time out and the GUI will stop functioning when the power to Metadata Appliance is removed during reboot. Status updates will cease and the GUI will not be fully-functional again until the system completes rebooting both MDC nodes.

Deleting Uploaded Files

Follow these steps to delete uploaded files you no longer need:

- **1** Log into the StorNext GUI.
- 2 Choose Tools > Firmware Upgrade.
- 3 The Firmware Upgrade page appears
- 4 Select from the list the file you want to delete, and then click **Delete**. (If you want to delete multiple files, you must delete them one at a time.)
- 5 When a confirmation appears, click Yes to proceed or No to abort.

When a message informs you that the file was successfully deleted, click **OK**.

Converting to HA

Note: If you are upgrading to StorNext 5 or later from StorNext 4.7 or later, and have previously converted your system to HA configuration, the conversion process is unnecessary. Previously-converted systems will not be taken out of HA configuration, so the option to convert to HA is unavailable.

This section describes the configuration steps necessary to convert two StorNext MDC nodes into a High Availability MDC pair connected to a shared file system. Converting to HA consists of selecting the dedicated unmanaged StorNext file system for use as the controlling shared file system, and then instructing StorNext to convert each MDC node to operate as one MDC node of the HA pair.

• The UIDs for the **quantumdb** and **tdlm** users and the **adic** group **must** be identical on both MDC nodes of an HA pair. If the UIDs are not identical, the MySQL database will not start (due to file permission errors), which in turn prevents storage manager from fully starting up.

HA Conversion	
Procedure	

Follow these steps to configure HA:

1 Choose Tools > High Availability > Convert.

Figure 21 Tools > HA > Convert

Quantum. StorNext M330 CX1120CKA00573	ĥ	🕜 Log Off
Configuration Tools Service Reports Help		
File System Storage Manager Tickets (280 open) Admin Alerts (106)	up 🔒 😣 (10.20.232.54) PrimarySecondary	service
Information: System 10.20.232.55 is eligible to convert to HA secondary.		
Tools > High Availability		?
Primary System System Name up Status Converted MDC Address 10 20 232.54		
Secondary System * System Name 10.20 232 55 * Port 81 San Host MDC Address 10.20 232 55		
Shared File System shared		
Convert Refresh * Required Field		

Note: The primary MDC node Status displays "Converted".

- 2 The IP address of the secondary MDC node of the StorNext M440 will appear in the System Name field along with a port number. Click **Scan Host**. The system should resolve the secondary MDC node the MDC Address will auto-fill with a value.
- 3 Click **Convert** to convert the secondary MDC node.

Note: Both MDC nodes will reboot, which can take 30 minutes or more per node to complete.

4 Storage Manager may need to be started following the HA conversion if the system was in config mode at the time that HA conversion was initiated. To restart the Storage Manager components, click the Start button in the Storage Manager panel of the Tools > System Control page.

GUI Feedback During HA Conversion

There are some indications within the GUI that the system is being upgraded. Here are some notes about this visual feedback:

 After the StorNext upgrade has completed, and the HA configuration has been done, the GUI for the secondary MDC node provides a message stating it is not the primary MDC node and a link to launch the primary MDC node.

Caution: Do not login to the GUI of the secondary MDC node at any point during the upgrade/HA conversion process. System configuration and licensing for the system could be compromised.

- When you are able to log into the primary /node, after accepting the EULA, the system will automatically display the Tools > System Control page. Click the Start button to restart the Storage Manager components.
- Wait until the system icons for both MDC nodes of the system as well as File System and Storage Manager are green, which indicates normal operation.

Post-Conversion Steps

If you are using the DDM feature, do the following:

• If you use the secondary MDC node as a DDM mover, make sure the file systems are mounted.

Initiating a Graceful System Failover

To initiate the failover of a system for verification after converting to HA or any other time a failover is desired:

- 1 Open an SSH connection to the MDC node operating as the **primary**.
- 2 Login to the command line of the **primary** MDC node.
 - User: stornext
 - Password: (the customer should have the password for the **stornext** account)
- **3** Type **sudo rootsh** to gain root user access.
- 4 Enter the password a second time.

5 Confirm that the MDC node is operating as the **primary** by entering the following at the command line:

snhamgr -m status

6 Verify the output is (bold used for clarification):

:default:primary:default:running:

7 On the system operating as the **primary**, initiate an HA failover to the system operating as the **secondary** MDC node.

service cvfs stop

- 8 Wait until the secondary MDC node becomes the primary.
- **9** Open an SSH connection to the MDC node now operating as the **primary**.
- **10** Login to the command line of the **primary** MDC node.
- **11** Confirm that the MDC node is operating as the **primary** by entering the following at the command line:

snhamgr -m status

12 Verify the output is:

:default:primary:default:running:

- **13** From an SSH connection on the MDC node now operating as the **secondary**, login to the command line of the **secondary** MDC node.
- **14** Enter the following:

service cvfs start

15 Confirm that the MDC node is operating as the **secondary** by entering the following at the command line:

```
snhamgr -m status
```

16 Verify the output is:

:default:running:default:primary:

- **17** Repeat if desired to fail over to the original system operating as the **primary**.
- **18** Once the failover has completed, restart SNFS services on any clients that were stopped earlier.
- **19** Mount the SNFS file systems on each client machine, if needed.
- **20** Verify that all clients have full access.
- **21** Test access to all file systems and move files to/from disk and tape.

Additional Common Operations

Changing the MDC VIP Address	To change the Virtual IP address for the M440, do the following:	
	Note: This procedure must be used any time the VIP address needs to be changed after initial system configuration.	
	1 Open an ssh connection to the M440 using the IP for the MDC node operating as the primary from either the customer's LAN client or Metadata network.	
	2 Log on using the stornext credentials. The default password is "password".	
	3 Type the sudo rootsh command to grant root user privileges after entering the password for the stornext user account again when prompted.	
	4 From the command line, update the VIP Address using the following command (refer to the vip_control man page or the <i>StorNext Man Pages Reference Guide</i> for information on changing the address).	
	vip_control	
	5 To update the firewall rules for the MDC node operating as the primary, type the following:	
	<pre>/opt/DXi/scripts/netcfg.shreset_snvip</pre>	
	6 Close the ssh connection for the MDC node operating as the primary.	
	7 Open an ssh connection to the M440 using the IP for the MDC node operating as the secondary.	
	8 Log on using the stornext credentials. The default password is "password".	

- **9** Type the **sudo rootsh** command to grant root user privileges after entering the password for the **stornext** user account again when prompted.
- 10 From the command line, update the VIP Address using the following command (refer to the **vip_control man page** or the *StorNext Man Pages Reference Guide* for information on changing the address).

vip_control

11 To update the firewall rules for the MDC node operating as the primary, type the following:

/opt/DXi/scripts/netcfg.sh --reset_snvip

StorNext Operations

For more information on performing advanced StorNext operations, refer to the following within this document or by accessing documents from the StorNext M440 GUI:

- For information on how to monitor the hardware components for both MDC nodes, refer to the "The Hardware Status Report" section of the latest version of the *StorNext User's Guide*.
- For instructions on how to capture system state logs and support bundles, refer to the "The Capture State Function" section of the latest version of the *StorNext User's Guide*.
- For instructions on how to capture DSET logs, refer to the "Capture DSET" section of the latest version of the *StorNext User's Guide*.
- For information on changing the network configuration, refer to the "Step 3: System" section of the latest version of the *StorNext User's Guide*.
- For information on setting up the distributed data mover (DDM) feature, refer to "Distributed Data Mover (DDM)" section of the latest version of the *StorNext User's Guide*.
- For information on StorNext Advanced Reporting, refer to the *StorNext Advanced Reporting User's Guide*.

The *StorNext User's Guide* also contains chapters such as these, which you will find useful:

- StorNext File System Tasks
- StorNext Storage Manager Tasks
- StorNext Reports
- Service Menu Functions

Chapter 3: Basic System Operations Additional Common Operations



Chapter 4 Contacting Quantum

More information about StorNext is available on the Quantum Service and Support website at <u>http://www.quantum.com/ServiceandSupport</u>. The Quantum Service and Support website contains a collection of information, including answers to frequently asked questions (FAQs).

To request a software upgrade, visit <u>http://www.quantum.com/</u> <u>ServiceandSupport/Upgrade/Index.aspx</u>. For further assistance, or if training is desired, contact the Quantum Technical Assistance Center.

|--|

Quantum company contacts are listed below.

Quantum Home Page

Visit the Quantum home page at:

http://www.quantum.com

Getting More Information or Help

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