Quantum.

Hardware Guide

StorNext M660
Metadata Appliance

TIP: How to Navigate this PDF

Quantum StorNext M660 Metadata Appliance Hardware Guide 6-67639-01 Rev G, October 2014.

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Introduction

How This Guide is Organized

This guide describes how to identify and operate the key features of the hardware components of the StorNext M660.

How This Guide is Organized

This guide contains the following chapters:

- Chapter 1, Introduction provides an overview of this StorNext M660 Hardware Guide, and also includes document conventions, product safety statements, a list of related documents, and supported Internet browsers.

- Chapter 2, Hardware Overview provides an overview of the StorNext M660 system.

- Chapter 3, Basic System Operations provides basic operating instructions for the StorNext M660 system.

- Chapter 4, Contacting Quantum- provides information on contacting Quantum support.

Chapter Contents

Navigating This Document With Adobe Reader

Have you ever clicked on a link, or a bookmark in a PDF and then needed to go back to the place you were before you clicked? You might have thought that the link you clicked stranded you somewhere in the document without a way to get back. Actually, Adobe Reader provides a number of ways to navigate backward and forward within a PDF that you might find useful:

Navigate using the keyboard shortcuts (Windows)

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Enable "Previous View" and "Next View" navigation buttons

Note: The steps enable these buttons in Acrobat XI. The steps you use may be different for older versions of Reader. Refer to the Adobe Reader help if needed.

1 Open Adobe Reader.

2 Go to **View > Show/Hide > Toolbar Items > Page Navigation** and click "Previous View".

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The Previous and Next View buttons are now shown:
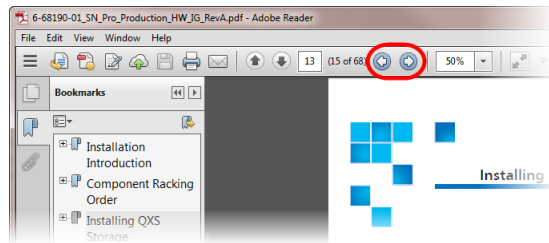
Note: If your Reader window is scaled too small horizontally, the items on the "toobars" can become hidden, including the options you just enabled. If this happens, just scale your window width until the hidden buttons are displayed.

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- **<Right click>** + **Previous View** to navigate backward
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Navigate using View menu options

- **View > Page Navigation** > **Previous View** to navigate backward

• **View > Page Navigation** > **Next View** to navigate forward

About the StorNext M660 Hardware

About the StorNext M660 Metadata Appliance

The StorNext M660 Metadata Appliance offers the powerful file-sharing capabilities of StorNext in an optimized appliance package. The StorNext M660 comes with a pair of metadata controller (MDCs) nodes in a High Availability (HA) configuration and a high-performance metadata array. An optional metadata disk expansion unit adds another metadata array to the system for additional file systems, performance and capacity. The appliance comes in two models: the StorNext M661 and M662.

Note: At times this guide uses StorNext M660 as a generic term that applies to the StorNext M661 and the StorNext M662 models. When information pertains to a specific StorNext M660 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, or both MDC nodes can be used as LAN client gateways in non-Lattus systems.

During installation, the StorNext M660 can be configured for use in different storage environments - in StorNext environments operating as a StorNext Metadata Controller (MDC) High Availability (HA) pair with access to both disk and tape libraries, or as a StorNext MDC HA pair with access to disk, tape, and Lattus storage.

Note: Access to Lattus storage is available on M662 Metadata Appliances only.

> **Note:** Content in this document applies to both Lattus and non-Lattus systems unless otherwise noted.

Hardware Specification

Each StorNext M660 MDC node contains the following:

- Two redundant, hot-swappable system hard drives in a RAID 1 configuration
- Redundant cooling fans and power

Network Connectivity

Here are the quantity and type of network ports available on the different system models:

- All StorNext M660 models feature one 4-port 8 Gb FC card for SAN network connectivity.
- The StorNext M661 feature 11 configurable 1GbE Ethernet ports per node.
- The StorNext M662feature two 10 GbE and seven 1 GbE configurable 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. Both MDC nodes can be used as StorNext gateways (in non-Lattus systems only).

Base System and Expansion Unit Description

The StorNext M660 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.

M660UnitUnitUnitanmetadata arraysystemThe different M660 models support different numbers of file systems, as described here:

- In M661 and M662 systems: the base system supports up to four file systems. The base system with the optional expansion unit supports up to eight file systems.

**StorNext M660
Gateway Licensing**

There are several items to note about the Gateway Appliance license used on the StorNext M662 Metadata Appliance with Gateway functionality enabled:

- The StorNext StorNext M662 Metadata Appliance with Gateway functionality enabled has a "per Gateway" DLC license model. This license allows you to add clients without having to purchase additional individual licenses.

- For new customers with no existing StorNext components, the license comes from the factory pre-installed, but must first be enabled for use on StorNext M662 Metadata Appliances.

Note: Do not enable gateway functionality for StorNext M662 Metadata Appliances connected to Lattus systems. While there are no functional issues in enabling the LAN gateway functionality within a Lattus environment, observed throughput when moving data to Lattus through the 10GbE ports will be slower than expected if this feature is enabled.

- If you choose to install the StorNext M662 Metadata Appliance with Gateway functionality enabled into the same StorNext network as a customer-configured DLC gateway, you will be limited to the existing DLC client license count.

- To determine whether the Gateway license is enabled, look for a green check next to the **Gateway Licensed MDC**license on the License page in the GUI of the M662 Metadata Appliance.

**StorNext M660
Documents**

A complete list of documentation for the StorNext M660 Metadata Appliance is located on the following web page:

http://www.quantum.com/snmdcdocs

Purpose of This Guide

This guide describes how to identify and operate the key features of the hardware components of the StorNext M660.

Notes, Cautions, and Warnings

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
For all UNIX-based commands, words in *italic* are variables and should be replaced with user-defined values.	**cvaffinity** *filename* where *filename* 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**

Conventions	Examples

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**

Supported Internet Browsers

The Internet browser software is not supplied with the StorNext M660; 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警告說明。

ADVERSAL　Læs alle instruktioner og advarsler i dette dokument og i *Vejledning om system-sikkerheds- og lovgivningsoplysninger*, før produktet betjenes.

AVERTISSEMENT　Avant d'utiliser ce produit, lisez la totalité des instructions et avertissements de ce document et du *Guide d'informations sur le système, la sécurité et la réglementation*.

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).

אזהרה　לפני ההפעלה של מוצר זה, קרא את כל ההוראות והאזהרות הכלולות במסמך זה וכן במדריך מידע בנושאי מערכת, בטיחות ותקינה

警告　この製品を使用する前に、本文書、および『システム、安全、規制に関する情報ガイド』に記載しているすべての警告と指示をお読みください。

경고　이 제품을 작동하기 전에 이 문서 및 시스템, 안전, 및 규제 정보 안내서에 수록된 모든 지침과 경고 표지를 숙지하십시오.

ПРЕДУПРЕЖДЕНИЕ	всеми инструкциями и предупреждениями, приведенными в данном документе и в *Справочном руководстве по устройству, технике безопасности и действующим нормативам*.

ADVERTENCIA	Antes de utilizar este producto, lea todas las instrucciones y advertencias en este documento y en la Guia informativa sobre sistema, seguridad y normas.

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:

- StorNext M660 Components
- StorNext M660 Connectivity on page 34
- Relocating the StorNext M660 System on page 47

StorNext M660 Components

The StorNext M660 Metadata Appliance consists of the following components:

- StorNext M660 MDC Nodes
- StorNext M660 Metadata Array

Figure 1 shows the StorNext M660 Base System with optional expansion unit.

Figure 1   StorNext M660 Base System Components (Front)
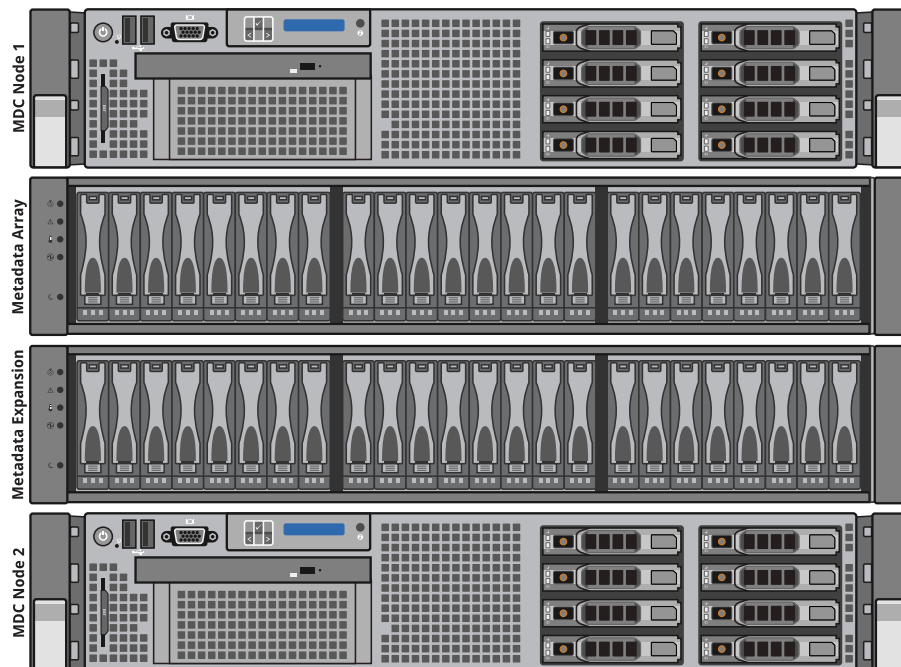
StorNext M660 MDC Nodes

The two StorNext M660 MDC Nodes are servers that provide storage and control for the StorNext M660 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

Figure 2 shows, and Table 1 describes the indicators and buttons on the front of the StorNext M660 MDC Node.

Figure 2 StorNext M660 MDC Node – Front View
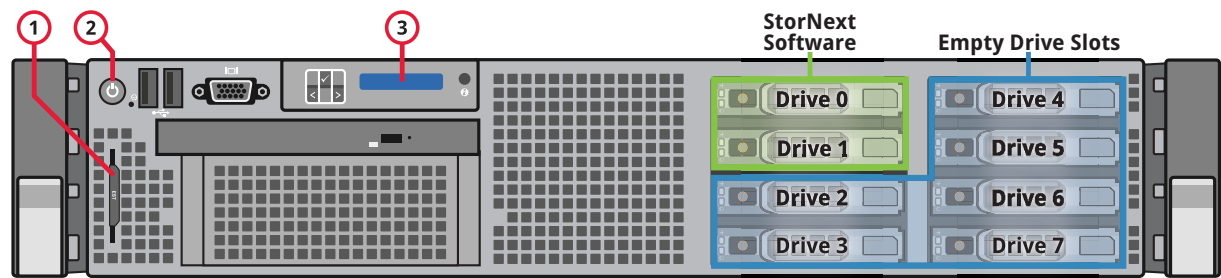
Table 1 StorNext M660 MDC Node – Front View Indicators and Buttons

Item	Indicators and Buttons	Description
1	Service tag	The slide-out tab for the system information including information such as the Service Tag and Express Service Code.
2	Power-On Indicator	The power-on indicator lights when the system power is on. The power button controls the DC power supply output to the system. When the system bezel is installed, the power button is not accessible.

Item	Indicators and Buttons	Description
3	LCD panel	The LCD panel shows the system ID, status information, and system error messages.
		The LCD lights blue during normal system operation. When the system needs attention, the LCD lights amber, and the LCD panel displays 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.

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 MDC Node - Hard Drive Indicator Patterns on page 16.

Figure 3 StorNext M660 MDC
Node – Hard-Drive Indicator
Patterns
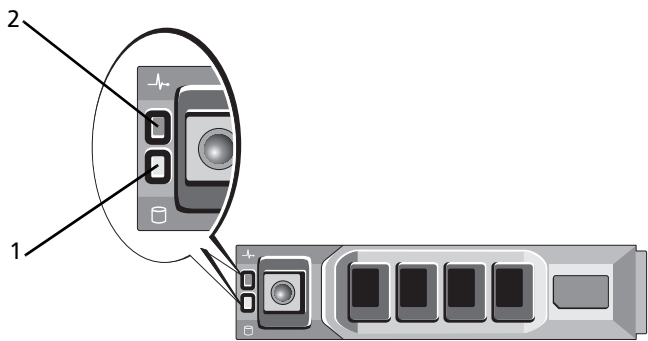
1 Hard-drive activity indicator (green)

2 Hard-drive status indicator (green or amber)

Table 2 StorNext M660 MDC
Node – Hard-Drive Activity and
Status 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

MDC Node - Rear View

The back of each StorNext M660 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 M661 MDC Node – Rear View
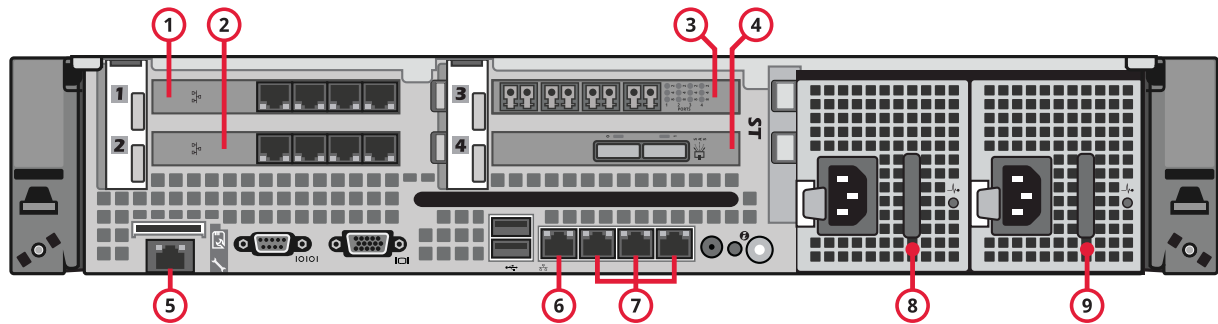
Figure 5 shows the rear indicators, connectors and buttons of each StorNext M662 MDC node. See Table 3 for information on the labeled components.

Figure 5   StorNext M662 MDC Node – Rear View
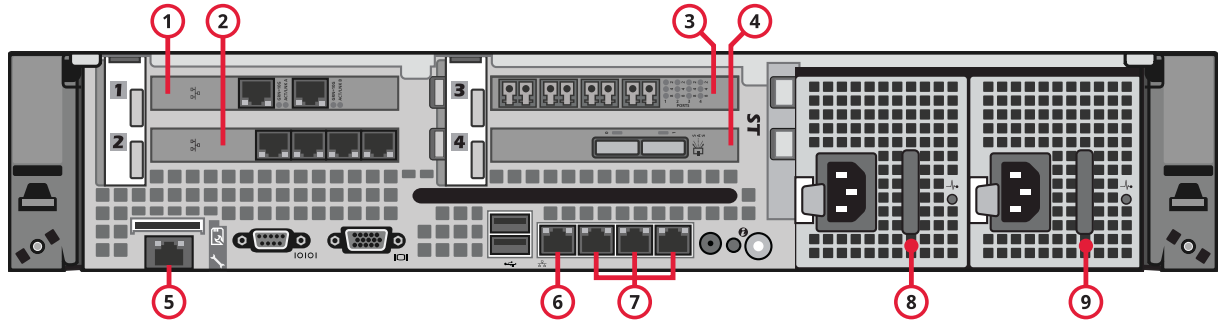
See [Table 3](#) for information on the labeled components.

Table 3 StorNext M660 MDC
Node – Rear Panel Features and
Indicators

Item	Indicator, Connector and Button	Icon	Description
1	PCIe slot 1		**M661M661**: 4-port 1 GbE Ethernet HBA **M662**: 2-port 10 GbE Ethernet HBA
2	PCIe slot 2		4-port 1 GbE Ethernet HBA
3	PCIe slot 3		4-port 8Gb FC HBA
4	PCIe slot 4		2-port 6Gb SAS HBA
5	iDRACport	🔧	Reserved for Quantum Service Each node has a unique IP address: Node 1 IP address: 10.17.21.51 Node 2 IP address: 10.17.21.52
6	Ethernet Service port		Reserved for Quantum Service Each node has a unique IP address: Node 1 IP address: 10.17.21.1 Node 2 IP address: 10.17.21.2
7	Ethernet Port 2 connectors (3 configurable ports)		Integrated 10/100/1000 NIC ports (Customer-Facing) DLC or management
8	Power supply 1 (PS1)		870-W Power Supply
9	Power supply 2 (PS2)		870-W Power Supply

MDC Node – NIC Indicator Codes

Figure 6 shows the StorNext M660 MDC Node NIC indicator codes.

Figure 6 MDC Node – NIC
Indicators
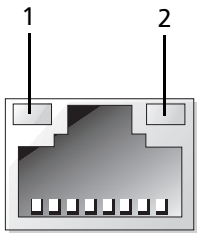
1 Link indicator

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 (10/100 Mbps).
Activity indicator is blinking green.	Network data is being sent or received.

MDC Node – Power Supply Indicator Codes

This section describes the StorNext M660 MDC Node power supply indicator codes (see Figure 7). The power supply indicators show if power is present, or if a power fault has occurred.

Figure 7 MDC Node - Power Supply Indicator
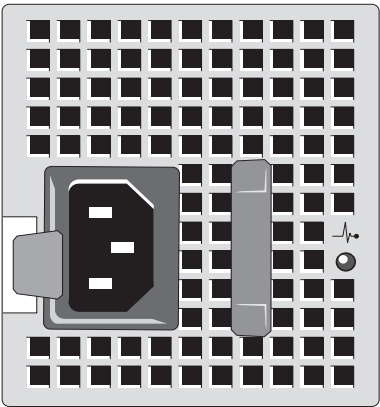
Table 4 Power Supply Status Indicator

Indicator Status	Indicator Code
Not lit	AC power is not connected.
Green	In standby mode, a green light indicates that a valid AC 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.
Amber	Indicates a problem with the power supply.

Indicator Status	Indicator Code
Alternating green and amber	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 an Energy Smart 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.

StorNext M660 Metadata Array

The StorNext M660 features the following Metadata Arrays:

- StorNext M660 Metadata Array on page 22
- StorNext M660 Metadata Expansion Unit on page 31

StorNext M660 Metadata Array

The StorNext M660 Metadata Array features a fully- 24-drive 2U storage enclosure. The first two drives are global hot spares. The next six are configured into three 1+1 RAID-1 mirrors. These mirrored sets are split

into two stripe groups (SGs): SG0 combines three LUNs into the metadata and journal for the shared file system. SG1 combines three LUNs into the shared HA file system, and includes the StorNext Storage Manager database.

The Metadata Array also contains redundant power supplies and dual Tahoe or Snowmass controllers. Each Tahoe controller provides two 12 Gb Serial Attached SCSI (SAS) host ports. Each Snowmass 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 M660 Metadata Array has a series of indicators and buttons located on the front and back of the array:

-
-

Note: There are two generations of Metadata Array controller currently in use. While both generations of the controller use the same SAS connection order, from left to right, different cables are used for the connections. The Tahoe controller is connected with a cable containing both a 12Gb SAS (square) connection, which is attached to the Tahoe controller, and a 6Gb SAS (rectangular) connection, which is attached to the MDC nodes and the Expansion Unit (if used). The previous generation Snowmass Controller cable contains 6Gb connections on both ends. Use the appropriate SAS cables for the controllers in your Metadata Array.

Caution: Do not mix and match different generation controllers. Use only Tahoe controllers in systems which originally contained Tahoe controllers, and use only Snowmass controllers in systems which originally contained Snowmass controllers.

Metadata Array – Front View

The front of the StorNext M660 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 M660
Metadata Array – Front View

Metadata Array – Front LEDs

The front of the StorNext M660 Metadata Array contains the left end cap, which contains the drive tray LEDs (see Figure 9).

Figure 9 Metadata Array Front
LEDs
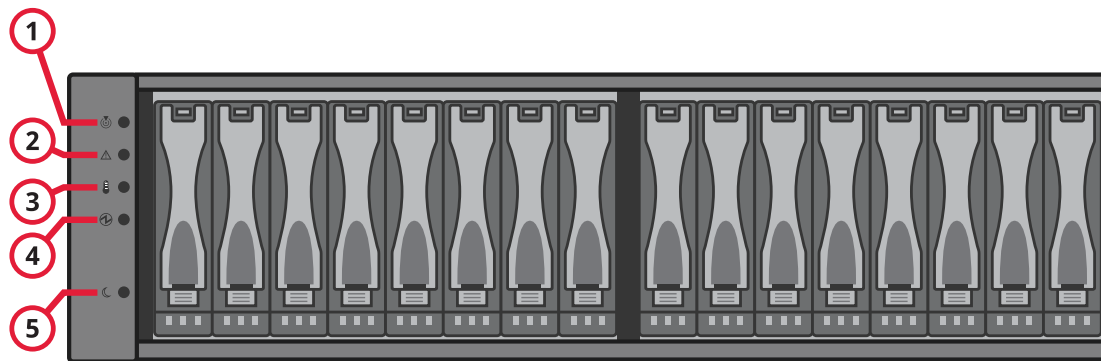
Item	Icon	LED Description	Color	On	Off
1		Drive Tray Locate	White	Identifies a drive tray that you are trying to find.	Normal status
2		Service Action Required	Amber	A component within the drive tray needs attention.	Normal status
3		Drive Enclosure Over-Temperature	Amber	The temperature of the drive tray has reached an unsafe level.	Normal status
4		Power	Green	Power is present.	Power is not present.
5		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 M660 Metadata Array contains dual controller canisters for host connectivity and redundancy (see Figure 10).

Determining the Controller Used in the Array

Two controllers are currently used in StorNext M660 Metadata Arrays, the Snowmass Controller, and the Tahoe controller.

Here are a few simple ways you can identify the Tahoe controller from the Snowmass Controller:

Tahoe Controller
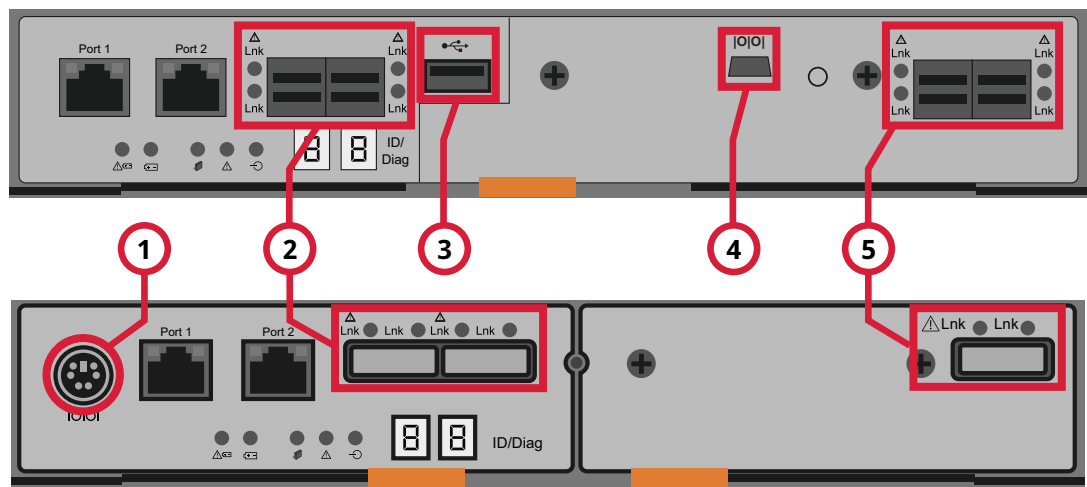
Snowmass Controller

Item	Description	Found in Controller
1	Serial Port	Snowmass-only
2	12 Gb SAS Port (square)	Tahoe-only
	6 Gb SAS Port (rectangle)	Snowmass-only
3	USB Connection	Tahoe-only
4	Mini USB	Tahoe-only
5	12 Gb SAS Port (square)	Tahoe-only
	6 Gb SAS Port (rectangle)	Snowmass-only

Figure 10 Metadata Array –
Rear View Canister Locations
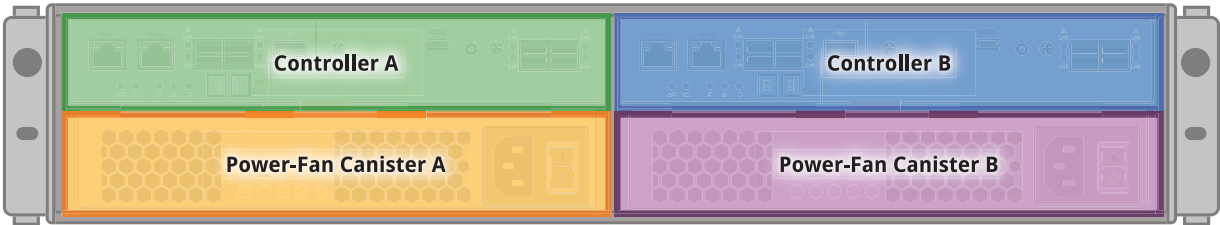
There are numerous connectors, displays and LEDs on the back of the Metadata Array controller (see Figure 11 and Figure 12). Unlabeled connectors are reserved for Quantum Service.

Figure 11 Rear Features and
Indicators - Metadata Array
with Tahoe Controllers
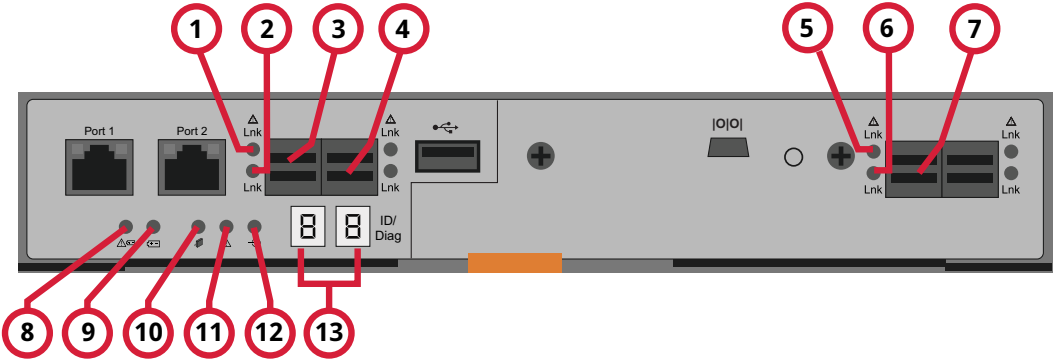
Figure 12 Rear Features and
Indicators - Metadata Array
with Snowmass Controllers
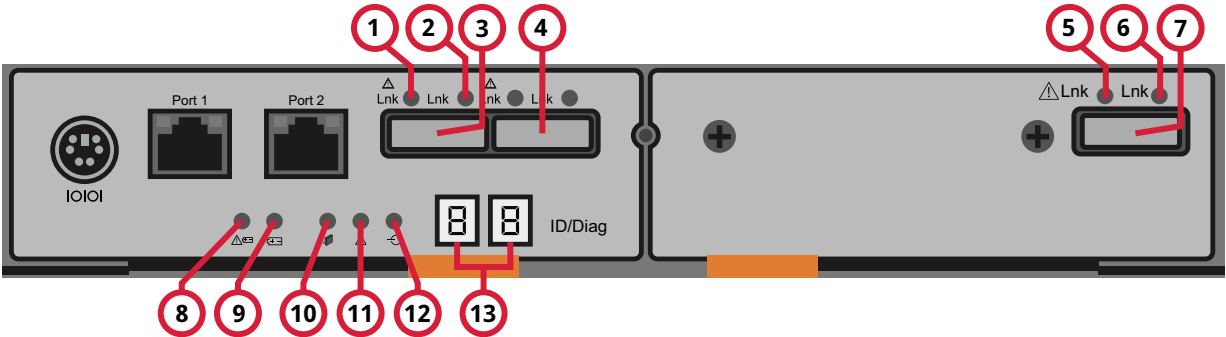
Table 5 Rear Features and
Indicators - Metadata Array
Controllers

Item	Description
1	Host Fault LED
2	Host Active LED
3	Host Port SAS Connector 1 (12 Gb - Tahoe Controller, 6 Gb - Snowmass Controller)
4	Host Port SAS Connector 2 (12 Gb - Tahoe Controller, 6 Gb - Snowmass Controller)
5	Expansion Fault LED
6	Expansion Active LED
7	Expansion Port SAS Connector (12 Gb - Tahoe Controller, 6 Gb - Snowmass Controller)
8	Battery Service Action Required LED
9	Battery Charging LED
10	Controller Service Action Allowed LED
11	Controller Service Action Required LED
12	Cache Active LED

Item	Description
13	Seven-Segment Displays

Metadata Array — General LED Behavior

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

Table 6 Metadata Array – LED Locations and Behavior

LED	Icon	Location	General Behavior
Power		• Drive enclosure • Controller • Power Supply/Cooling Fans	**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		• 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.
Standby Power		• 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.

LED	Icon	Location	General Behavior
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	AC	• Controller canister • Power-fan canister	**On** – AC power is present. **Off** – AC power is not present.
DC Power	DC	• 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.
Link Service Action Required (Fault)	⚠	• 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 each expansion connector	• Controller canister	**On** – The cable is attached, and at least one lane has a link-up status. **Off** – The cable is not attached, or the cable is attached and all lanes have a linkdown status.

StorNext M660 Metadata Expansion Unit

The StorNext M660 Metadata Expansion Unit adds an additional Metadata Storage Array to the M660 system that features a fully populated 24-drive 2U storage enclosure. The first two drives are global hot spares. The next six are configured into three 1+1 RAID-1 mirrors. These mirrored sets are split into two stripe groups (SGs): SG0 combines three 12-GB LUNs into the metadata and journal for the shared file system. SG1 combines three 888-GB LUNs into the shared HA file system. The Metadata Expansion Unit includes the StorNext Storage Manager database.

The Expansion Unit is supplied with dual Snowmass controllers. Each controller provides two 6Gb Serial Attached SCSI (SAS) host ports with 2 GB of system cache. The HDDs and SSDs are supplied in hot-swappable drive carriers that fit in the drive bays.

The Expansion Unit consists of the following:

- Metadata Expansion Unit – Front View
- Metadata Expansion Unit – Rear View on page 32

Metadata Expansion Unit – Front View

The front of the StorNext M660 Metadata Expansion Unit contains the left end cap, which contains the drive tray LEDs, the right end cap, and the drives (see Figure 13).

Figure 13 StorNext M660 Metadata Expansion Unit – Front View
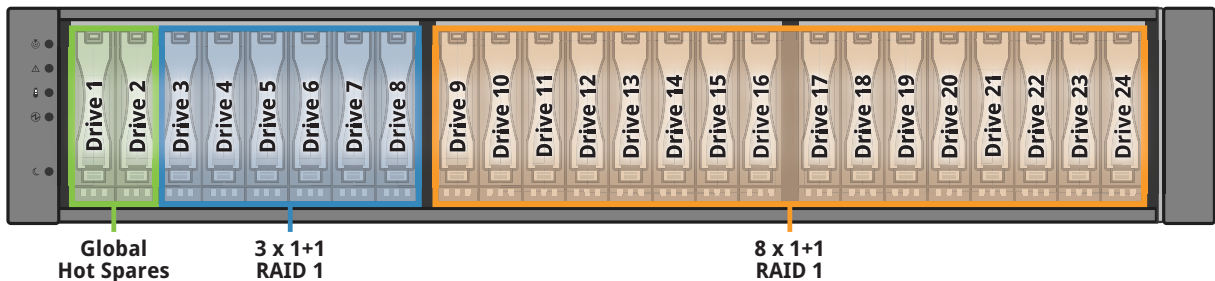
The StorNext M660 Metadata Expansion Unit has a series of indicators and buttons located on the front and back of the array.

Metadata Expansion Unit – Enclosure Tray LEDs

The enclosure LEDs on the front of the unit are identical to those on the front of the Metadata Array. To monitor the current status pertaining to the enclosure and the components within the enclosure, refer back to Metadata Array Canister Locations and Rear Features and Indicators on page 38.

Metadata Expansion Unit – Rear View

The Metadata Expansion Unit contains dual environmental service monitor (ESM) canisters for connectivity to the Metadata Array. Each ESM features LED indicators and connectors.

Figure 14 shows the location of the ESMs ans Power-Fan Canisters.

Figure 14 Metadata Expansion Unit – Rear View
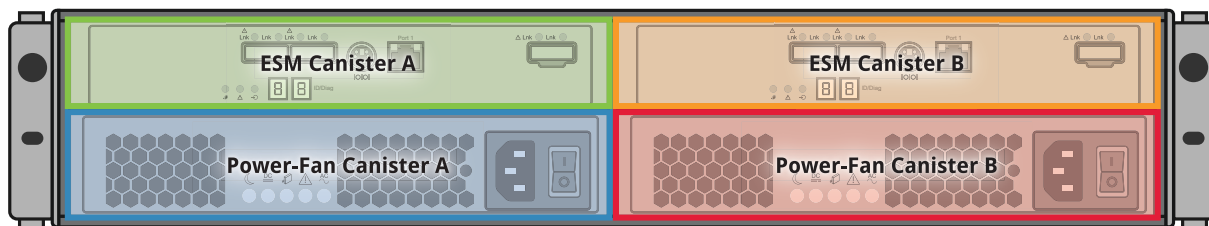
Figure 15 shows the location of LEDs and SAS connectors on the ESM Canister.

Figure 15 Metadata Expansion
Unit Rear Features and
Indicators - ESM Canister

.
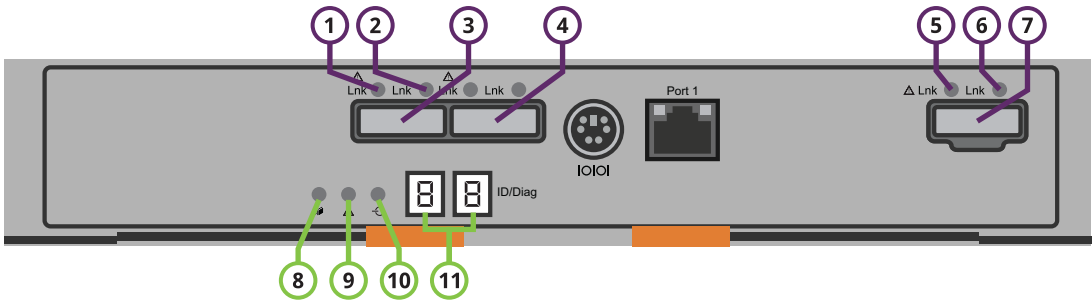
Table 7 describes the ESM connectors, displays, and LEDs. Unlabeled connectors are reserved for Quantum Service.

Table 7 Metadata Expansion
Unit – Rear Panel Features and
Indicators

Item	Description
1	Host Link 1 Fault LED
2	Host Link 2 Fault LED
3	SAS IN Connector
4	SAS IN Connector
5	ESM Expansion Fault LED
6	ESM Expansion Active LED
7	SAS Expansion Connector
8	Controller A Service Action Allowed LED
9	Controller A Service Action Required LED
10	Cache Active LED
11	Seven-Segment Displays

Metadata Expansion Unit — General LED Behavior

The drive enclosure is the same type as the Metadata Array. For more information about the Metadata Expansion Unit LED locations and general behavior, refer back to Metadata Array — General LED Behavior on page 29.

StorNext M660 Connectivity

This section covers:

- StorNext M660 Power Cabling

- StorNext M660 SAS Cabling

- StorNext M660 SAN Cabling

- StorNext M660 LAN Cabling

- StorNext M662 Lattus Cabing

StorNext M660 Power Cabling

Connect the power cables for each component into an available power outlet (see Figure 16 on page 35).

> **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 16 StorNext M660
Power Connections
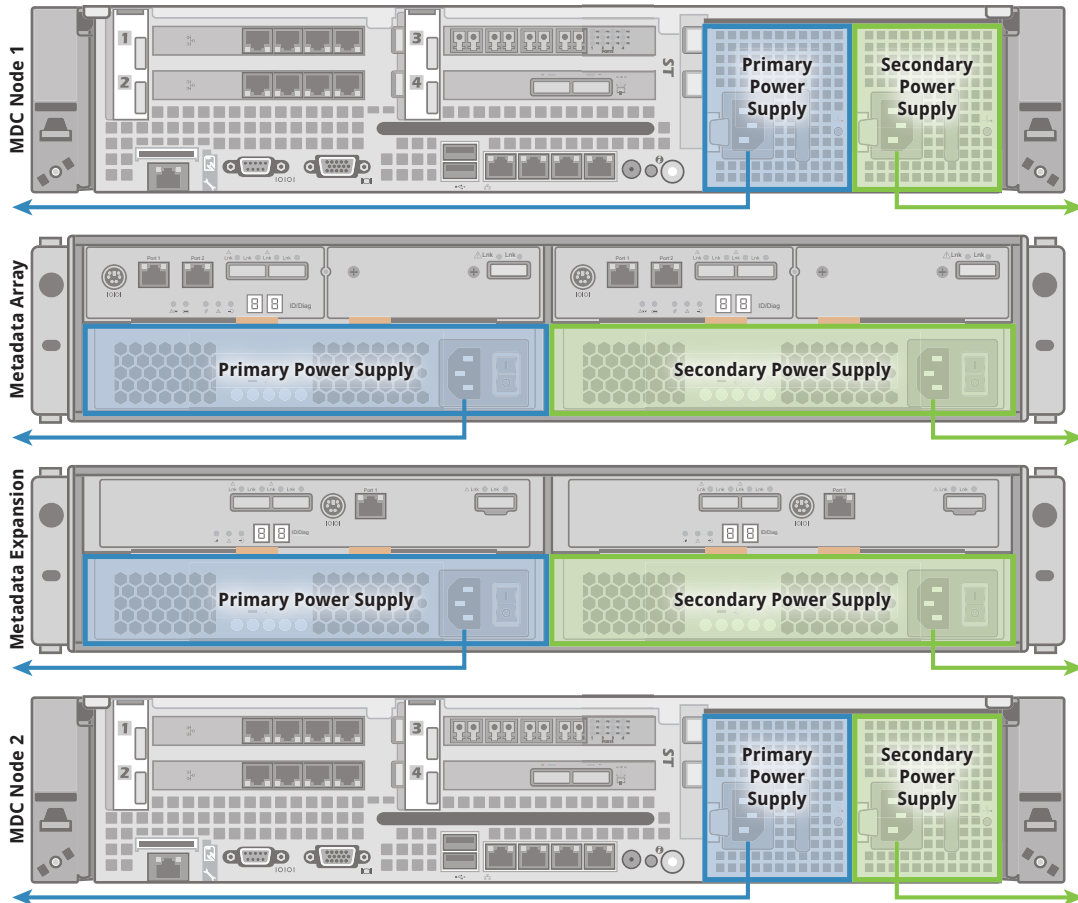
StorNext M660 SAS Cabling

Connect the Serial Attached SCSI (SAS) ports cables between the nodes and the Metadata Array as shown in . SAS connectivity between the Expansion Unit and the Metadata Array only occurs when installing an Expansion Unit.

Note:

Note: To make it easier to connect the cables, release the sliding rails and slide the MDC nodes out the front of the rack so that the rear of the MDC nodes is flush with the rear of the Metadata Array and the Expansion Unit (if used).

Note: There are two generations of Metadata Array controller currently in use. While both generations of the controller use the same SAS connection order, from left to right, different cables are used for the connections. The Tahoe controller is connected with a cable containing both a 12Gb SAS (square) connection, which is attached to the Tahoe controller, and a 6Gb SAS (rectangular) connection, which is attached to the MDC nodes and the Expansion Unit (if used). The previous generation Snowmass Controller cable contains 6Gb connections on both ends. Use the appropriate SAS cables for the controllers in your Metadata Array.

Figure 17 StorNext M660 SAS
Cabling - Tahoe Controller

Figure 18 StorNext M660 SAS
Cabling - Tahoe Controller -
Without Expansion Unit

MDC Node #1 - Rear

Metadata Array - Rear

MDC Node #2 - Rear
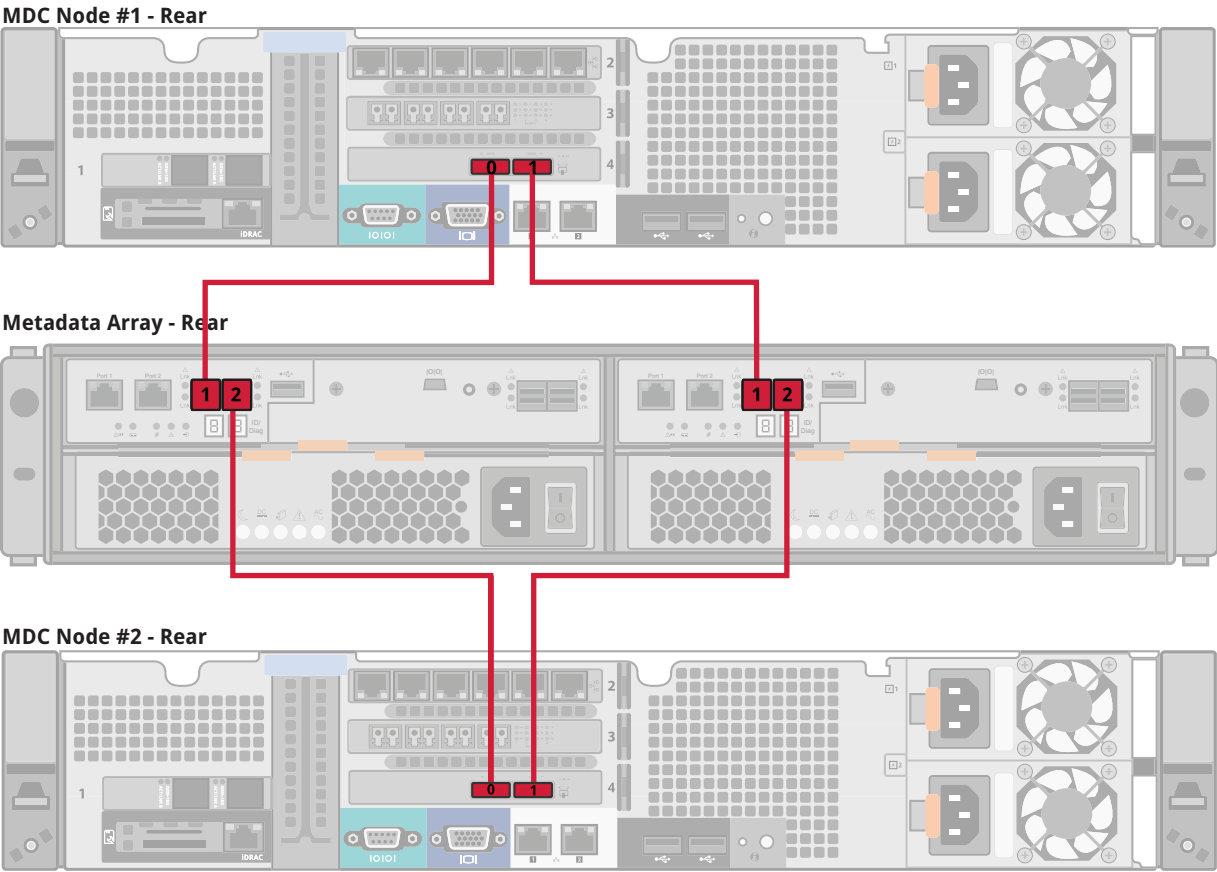
Figure 19 StorNext M660 SAS
Cabling - Snowmass Controller
with Expansion Unit
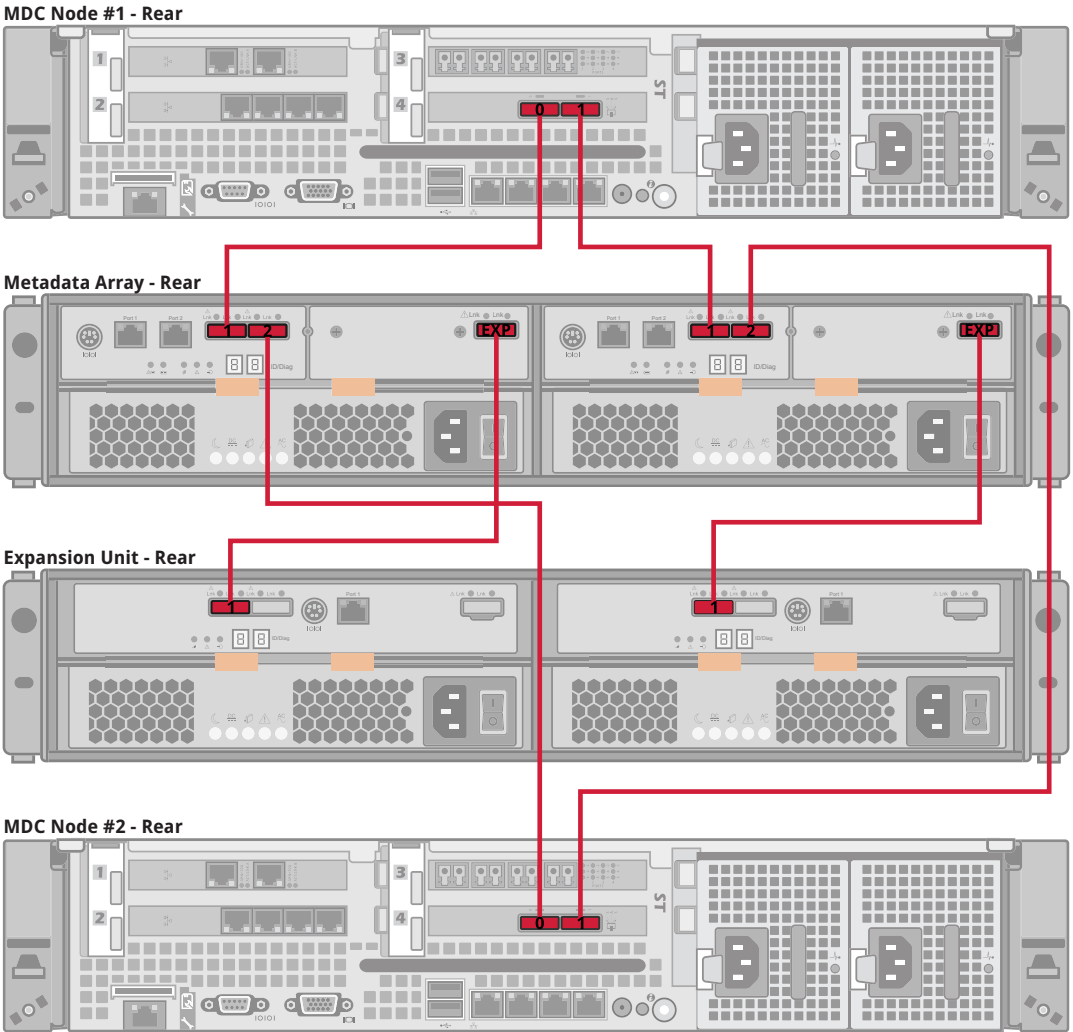
StorNext M660 LAN Cabling

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 M660 model ships with two bonded network interfaces: Bond 0 and Bond 1. The number of customer-facing network ports and port speeds depends on the M660 model. 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 M661 network interface configuration is as follows:

- Two interfaces, Eth2 and Eth3, are bonded together by default into bond0 for the Metadata network. This bond can be broken in the GUI and the Service menu. When not bonded, Eth2 will be configured as a standalone port, and Eth3 will be de-configured and not used by the system.

- Two interfaces, Eth1 and Eth4, are bonded together into bond1 for GUI/management. This bond can be broken in the GUI and the Service Menu. When not bonded, Eth1 will be configured as a standalone port and Eth4 will be de-configured and not used by the system.

- The remaining seven ports can be configured through the GUI in various combinations and bonds for gateway port access.

Figure 20 shows the 11 1GbE customer-facing Ethernet ports on the StorNext M661.

Figure 20 StorNext M661 Network Ports
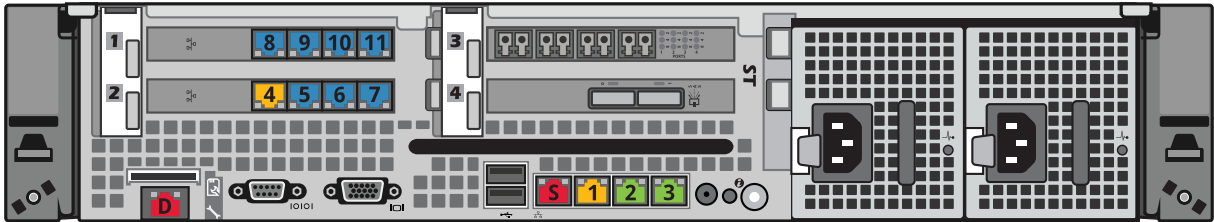
Table 8 identifies the logical port configuration, port function and default bonding for the StorNext M661.

Table 8 StorNext M661
Network Configuration

Ethernet Port Number	Logical Ethernet Port Number	Physical Port Location	Port Function	Bond
D	N/A	iDRAC Port	Service	N/A
S	eth0	Integrated Port 1		
1	eth1	Integrated Port 2	GUI and Management (Configurable from Service Menu)	Bond 1 When not bonded, eth1 is usable and eth4 is not usable
2	eth2	Integrated Port 3	Metadata (Configurable from Service Menu)	When not bonded, eth2 is usable and eth3 is not usable
3	eth3	Integrated Port 4		Bond 0 When not bonded, eth3 is not used
4	eth4	Slot 2, Port 1	GUI and Management (Configurable from Service Menu)	Bond 1 When not bonded, eth4 is not used
5	eth5	Slot 2, Port 2	Gateway	User Configurable from GUI
6	eth6	Slot 2, Port 3		
7	eth7	Slot 2, Port 4		
8	eth8	Slot 1, Port 1		
9	eth9	Slot 1, Port 2		
10	eth10	Slot 1, Port 3		
11	eth11	Slot 1, Port 4		

The default StorNext M662 network interface configuration is as follows:

- Two interfaces, Eth2 and Eth3, bonded together into bond0 for the Metadata network. This bond can be broken in the GUI and the service menu. When not bonded, Eth2 will be configured as a standalone port and Eth3 will be de-configured and not used by the system.

- Two interfaces, Eth1 and Eth4, are bonded together into bond1 for GUI/management. This bond can be broken in the GUI and the service menu. When not bonded, Eth1 will be configured as a standalone port and Eth4 will be de-configured and not used by the system.

- The remaining five ports can be configured through the GUI in various combinations and bonds for gateway port access.

Figure 21 shows the two 10GbE and seven 1GbE customer-facing Ethernet ports on the StorNext M662 .

Figure 21 StorNext M662
Network Ports

Table 9 identifies the logical port configuration, port function and default bonding for the StorNext M662.

Table 9 StorNext M662
Network Configuration

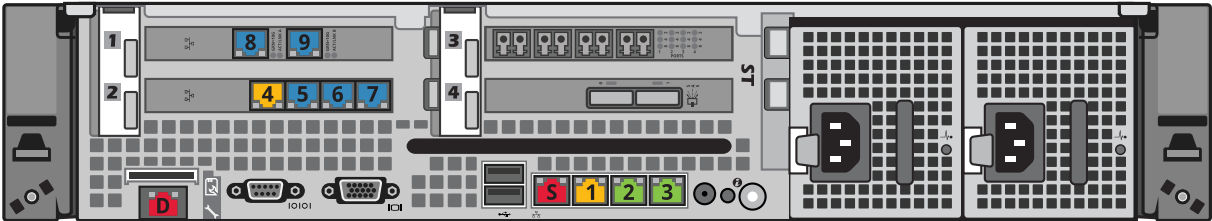| Ethernet Port Number	Logical Ethernet Port Number	Physical Port Location	Port Function	Bond
D	N/A	iDRAC Port	Service	N/A
S	eth0	Integrated Port 1	Service	N/A
1	eth1	Integrated Port 2	GUI and Management (Configurable from Service Menu)	Bond 1 When not bonded, eth1 is usable and eth4 is not usable
2	eth2	Integrated Port 3	Metadata (Configurable from Service Menu)	When not bonded, eth2 is usable and eth3 is not usable
3	eth3	Integrated Port 4	Metadata (Configurable from Service Menu)	Bond 0 When not bonded, eth3 is not used
4	eth4	Slot 2, Port 1	GUI and Management (Configurable from Service Menu)	Bond 1 When not bonded, eth4 is not used
5	eth5	Slot 2, Port 2	Gateway	User Configurable from GUI
6	eth6	Slot 2, Port 3	Gateway	User Configurable from GUI
7	eth7	Slot 2, Port 4	Gateway	User Configurable from GUI
8	eth8	Slot 1, Port 1 (10 GbE)	Gateway	User Configurable from GUI
9	eth9	Slot 1, Port 2 (10 GbE)	Gateway	User Configurable from GUI

StorNext M660 SAN Cabling

Each StorNext M660 MDC node contains one 4-port 8Gb Fibre Channel (FC) host bus adapter (HBA) card in PCIe expansion slot 3.

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 M660. 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 ports 1 and 2 for disk, and FC ports 3 and 4 for tape . 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

Figure 22 StorNext M660 SAN Cabling
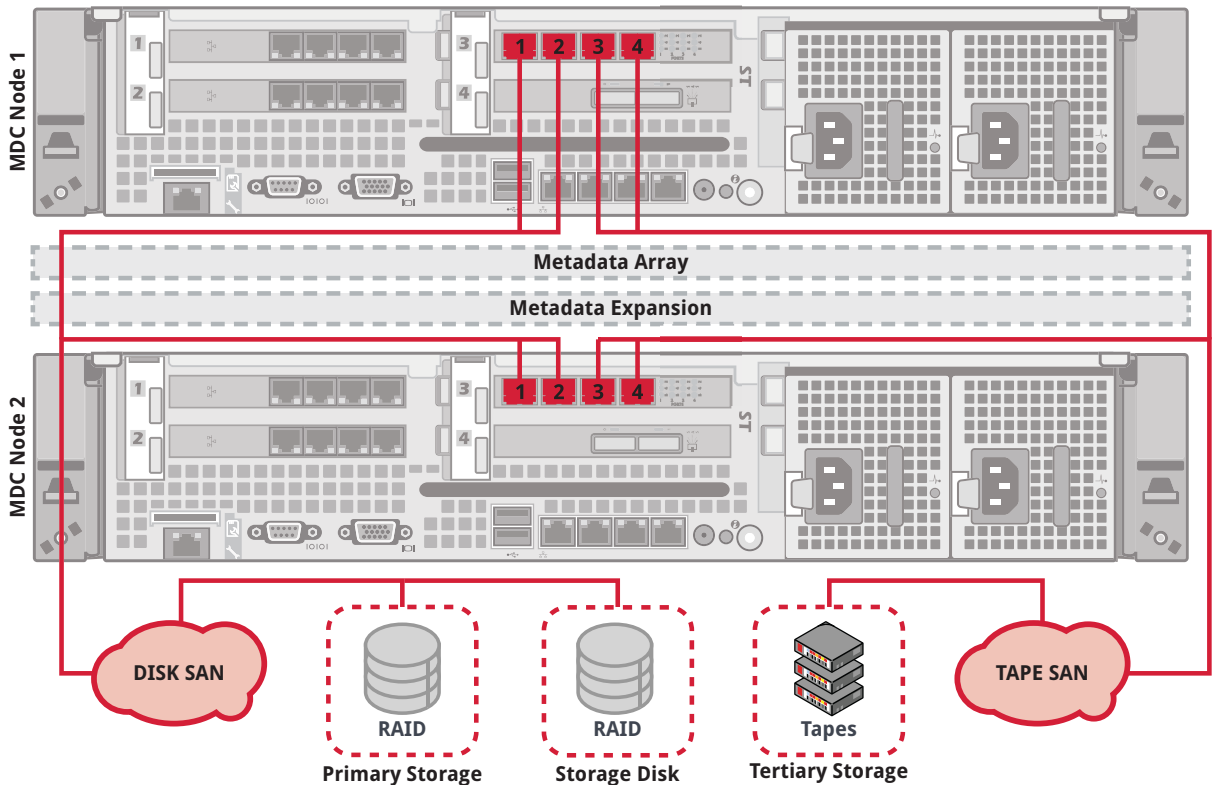
StorNext M662 Lattus Cabing

Interconnect switches are used to connect the components within a Lattus system, and are also used to connect the M662 to the Lattus system. Two different interconnect configurations are currently supported, a configuration with a single interconnect switch (Figure 23), and another configuration with two interconnect switches for redundancy (Figure 24 on page 46).

Connecting the M662 to the Lattus system involves cabling Eth8 and Eth9 10GbE ports on both MDC Nodes to the Lattus interconnect switch.

Note: Connect to the Lattus system only after both the Lattus system installation and configuration is complete, and the M662 installation is complete, and the ethernet ports have been configured in the StorNext GUI.

Note: You must first configure Eth8 and Eth9 ports on the rear of the M662 prior to cabling the M662 to the Lattus interconnect switch(es).

Figure 23 StorNext M662
Single Lattus Interconnect
Switch Cabling
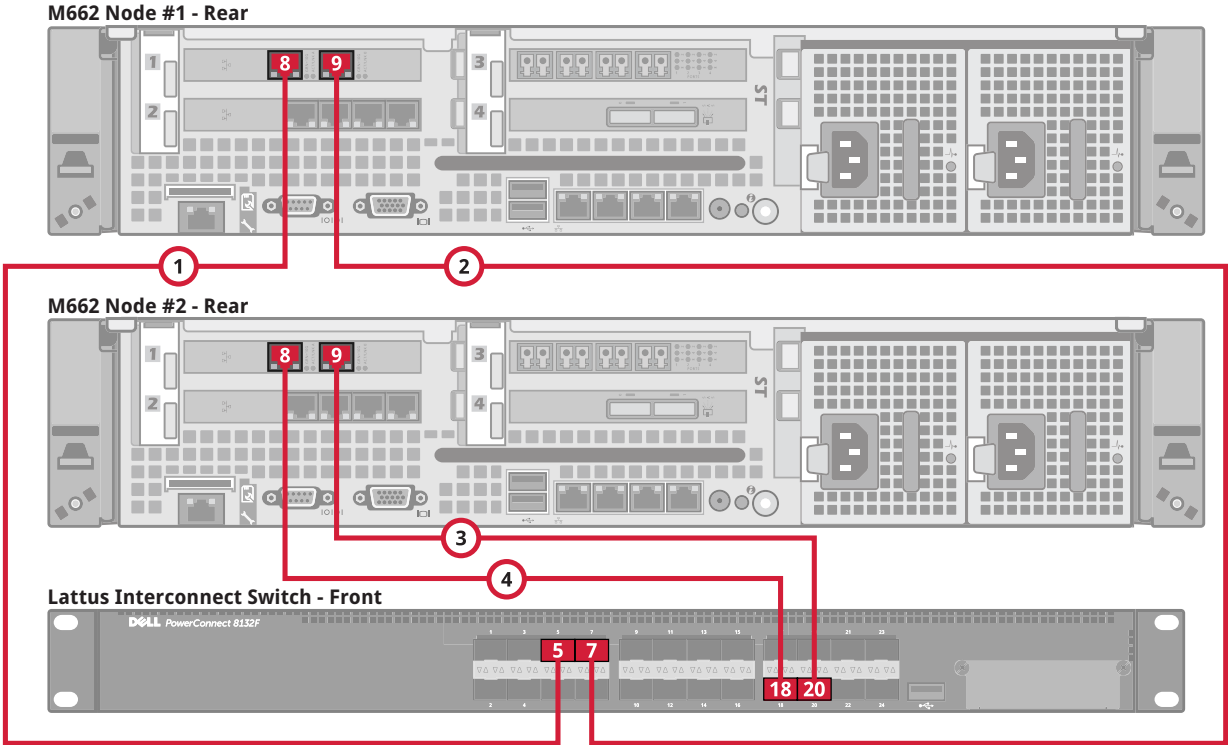
Figure 24 StorNext M662
Redundant Lattus Interconnect
Switches Cabling

M662 Node #1 - Rear

M662 Node #2 - Rear

Lattus Interconnect Switch #2 - Front

Lattus Interconnect Switch #1 - Front
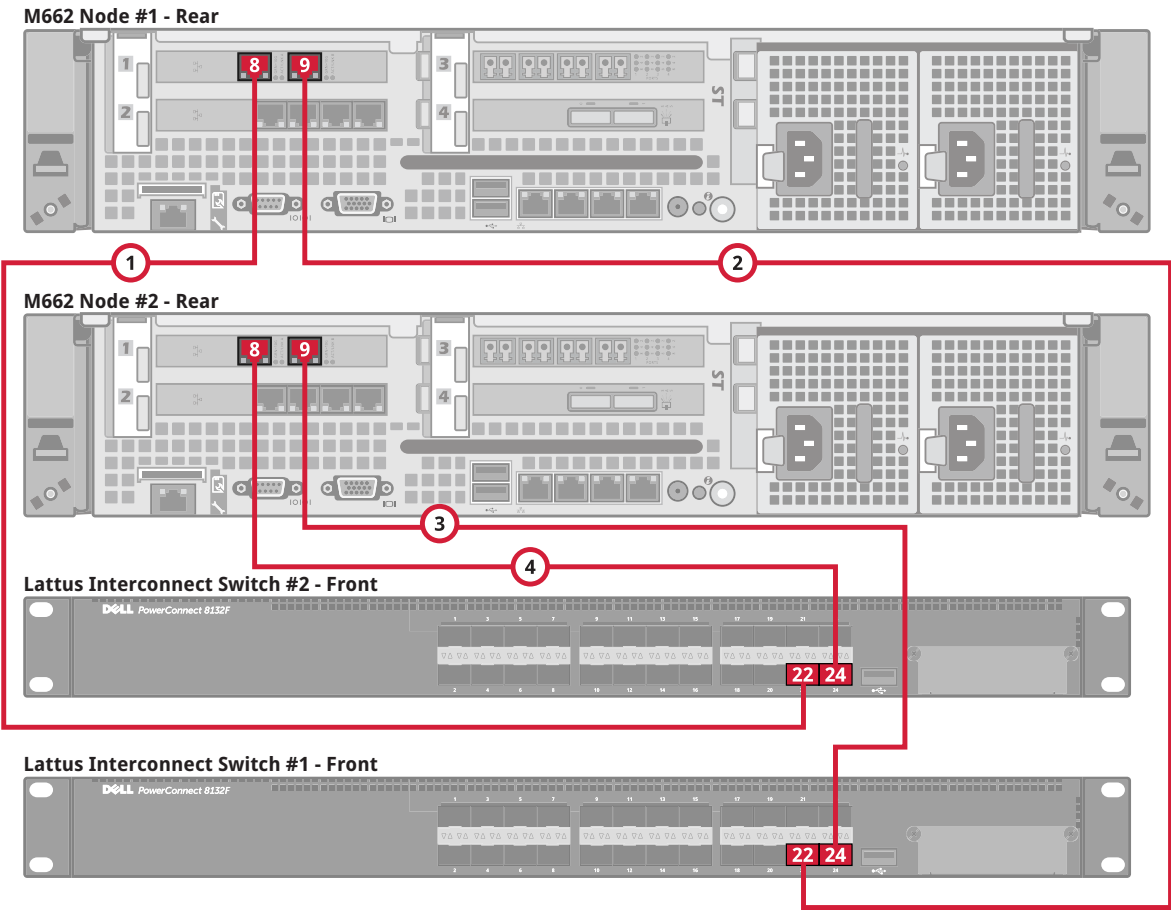
Relocating the StorNext M660 System

If you ever need to relocate the StorNext M660 system to a different location, please contact Quantum Customer Support for additional information. The StorNext M660 system must be relocated by a qualified Quantum field service engineer.

This chapter is divided into the following sections:

Powering On All StorNext M660 System Components

on page 52 illustrates the location of the power switches, and the specific order to follow when powering on the StorNext M660 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 Expansion Unit, if used. Call out number 1 in on page 52 shows the location of the power switch of the power supply for both Expansion Unit power supplies.

Note: Before powering up the Metadata Array, make sure that the Expansion Unit drive LEDs are all green, and the seven-segment display on both Expansion Unit controllers indicates "0". This indicates that the Expansion Unit array is ready for I/O. This process takes approximately one to two minutes. The system is then ready for powering up the Metadata Array.

---

2 Turn on both power switches on the back of the Metadata Array Callout number 2 in on page 52 shows the location of the power switch for both Metadata Array power supplies.

Note: Before powering up the MDC Nodes, make sure that the Metadata Array drive LEDs are all green, and the seven-segment LCD displays on both controllers of the Metadata Array indicate "85". This indicates that the Metadata Array is ready for I/O. The system is then ready for powering up the MDC Nodes.

The seven-segment LCD displays are located on each controller on the back of the array as shown here:

Metadata Array - rear
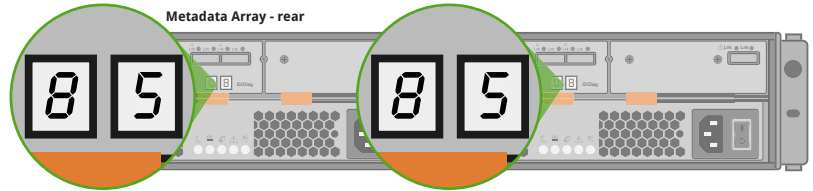
3 Turn on the power switch on the front of each of the MDC Nodes. Callout number 3 in shows the location of the power switches and the power on sequence.

Figure 25 StorNext M660
Power-On Sequence
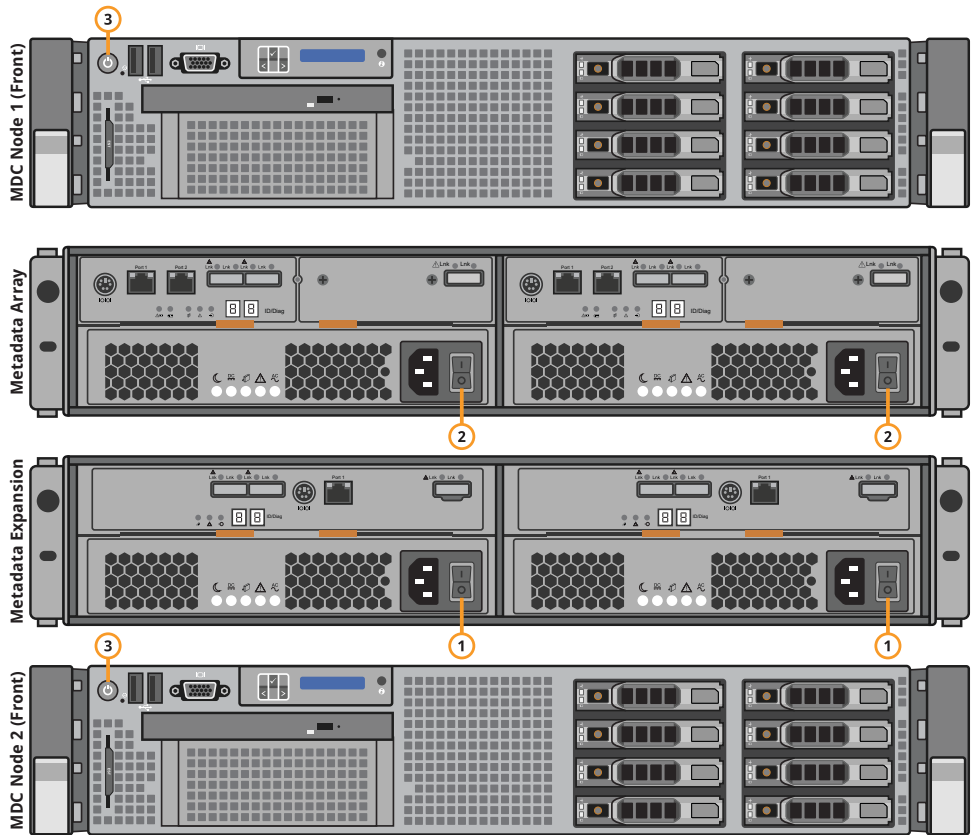
Shutting Down All StorNext M660 System Components

To cleanly shut down the StorNext M660 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.

Powering On a Single MDC Node of the StorNext M660

To turn on power to the system:

1 Push the power switch on the front of the MDC node you wish to power on (see Figure 26 on page 54).

Figure 26 Turning On Single MDC Node Power

System (Front)

Power Button
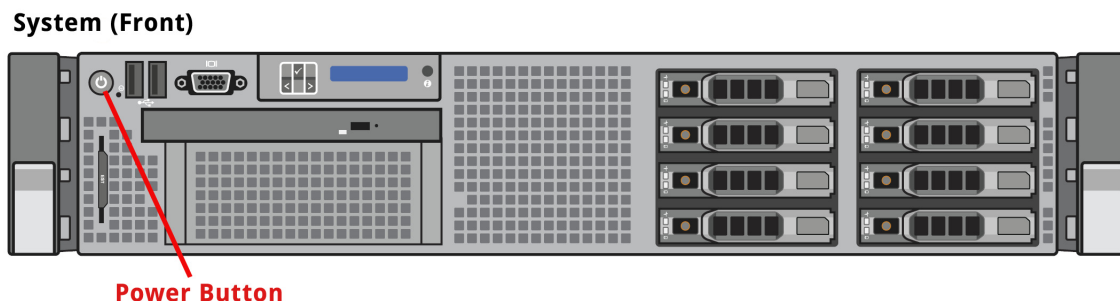
2 If you are powering on MDC Node 1, and MDC Node 2 is currently operating as the primary, perform a system failover after MDC Node 1 comes back online (see Initiating a Graceful System Failover on page 70), if desired, to set MDC Node 1 to act as the primary node.

3 On each LAN client, mount the file systems on clients.

4 Restart I/O access to all LAN clients.

Shutting Down a Single MDC Node of the StorNext M660

To shut down a single MDC node:

1 Open an SSH connection to the MDC node you wish to access using either IP address **10.17.21.1** or **10.17.21.2** on the MDC/Metadata network.

> **Note:** Use the IP addresses assigned within the network if different from the defaults used here.)

2 Enter `stornext` for the username at the prompt.

3 Enter the `stornext` password. The default password is "password", but may have been changed after initial configuration.

4 At the command prompt enter the following to gain root user access:

```
sudo rootsh
```

5 Enter the password for the **stornext** user account again when prompted.

6 Press Enter.

7 If you are connected to the MDC node currently acting as the primary, enter the following (if you are connected to the MDC node currently acting as the secondary, issue the command provided in Step 11):

```
service cvfs fullstop
```

8 Wait until the MDC node currently acting as primary becomes the **secondary**, and leave your SSH connection to this node open. (Time may vary.)

9 Open an SSH connection to the MDC node now operating as the **primary**. Confirm that the MDC node is operating as the **primary** by entering the following at the command line:

```
snhamgr -m status
```

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

```
:default:primary:default:stopped:
```

11 Go to the SSH terminal session for the **secondary** MDC node (may have previously been running as **primary**), and enter the following:

```
/sbin/poweroff
```

Note: You will know the system is shut down when your monitor goes blank, or you lose your connection with the system.

12 Remove power cables from the MDC node.

Note: For systems running a release of StorNext prior to StorNext 5 release 5.1, a RAS ticket on systems with open manage prior to 7.4 may be generated when one of the MDC nodes is powered off. This RAS ticket, which indicates a failure of the appliance, is incorrect. There is no loss of functionality if one node is shut down during the servicing of that node.

System Serial Numbers and Service Tag

The StorNext M660 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, the metadata array, and the expansion unit.

- 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 M660 Metadata Appliance GUI as shown here:

Figure 27 Locating the System Serial Number on the GUI
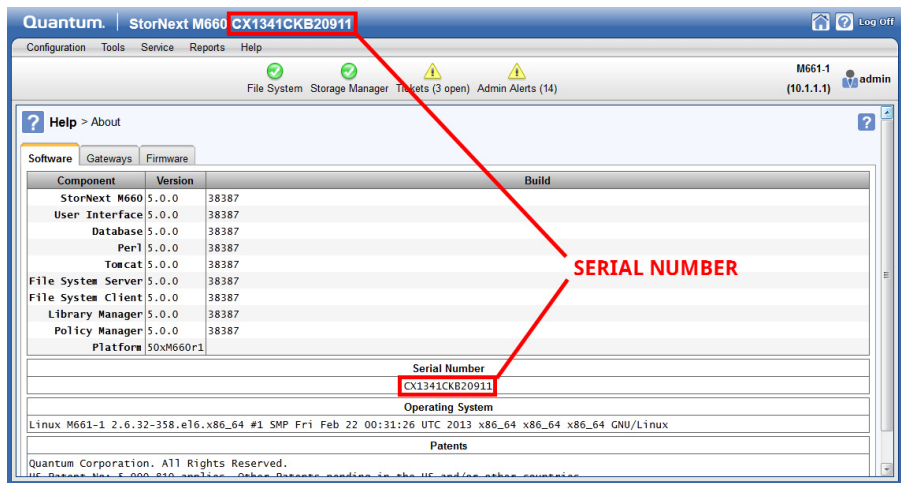
Serial Number Format

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 M660 Metadata Appliance.

Before Upgrading Firmware

TSM Indexing Delay for Large Databases

A database index named `classndxatimeme` will be automatically added to the tmdb.tier000files% and tmdb.tier001files% tables upon starting TSM for the first time after upgrading to specific StorNext 5 releases.

StorNext 5 Releases affected: 5.0.1, 5.1, and 5.1.1

Upgrading from: 4.3.2, 4.3.3, 4.7.0, 4.7.0.1, 4.7.1, 4.7.2, and the initial release of StorNext 5.

Note: This does not apply to direct upgrades from StorNext 5 Release 5.0.1 to StorNext 5 Release 5.1 or later. So do not use the script below for these upgrades.

This index improves the performance of certain operations such as truncation policies. However, the creation of this index can take multiple hours for very large databases. TSM will be unavailable after upgrading until the indexing has completed.

Running the Script

To minimize TSM downtime after upgrade, the `classndxatimeme` index can be created prior to performing the upgrade using the `index_tierfiles.pl` script availablefrom the StorNext Metadata Appliances page on CSWeb. The script can be run while TSM is running, although it may impact the performance of other operations while the index is being added to the database.

Caution: The following script should only be executed against StorNext release as indicated in the previous section.

To manually add the index:

1 Download the `index_tierfiles.pl` file from CSWeb.

2 Login to the primary MDC, and access the command line of the system.

- User: **stornext**

- Password: (enter the password for the **stornext** account)

3 Type **sudo rootsh** to gain root user access.

4 Enter the password a second time.

5 Copy the `index_tierfiles.pl` file downloaded from CSWeb to the **/tmp** directory on the primary MDC node.

6 Source the profile:

`. /usr/adic/.profile`

7 Verify that the database is up by running:

`mysql_control start`

8 Execute:

`/tmp/index_tierfiles.pl`

Upgrading Firmware

The Firmware Upgrade option allows you to perform a firmware upgrade on StorNext M660 Metadata Appliances. Upgrading the firmware also upgrades StorNext, if applicable.

> **Note:** Use the StorNext M660 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 M660 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 M660.

  For information about supported upgrade paths for StorNext, consult the *StorNext Compatibility Guide*. If your system is running a

StorNext release prior to the supported upgrade releases for a given StorNext release, consult an earlier version of the *StorNext Compatibility Guide* 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.

Obtain the Firmware Upgrade Files

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

Note: The two files are large - around 2 GB total, so plan time to download the files for the upgrade.

   a Go to the CSWeb site and log in.

   b Navigate to the StorNext Products page for your appliance (on the lefthand side of the CSWeb site, look for the appropriate link under the StorNext Products section).

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

   c 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 M660.

Firmware Upgrade Process and Time Estimates

There are several factors that affect the availability of the system and metadata operations during upgrades. StorNext appliance firmware upgrades (contained in the .fw file downloaded earlier in this process) always include an update to the StorNext software in the release, and can also includes updates to MDC node firmware and metadata array firmware. The way in which these updates are applied and the impacts to system availability vary, depending on which firmware upgrade being applied, as described here:

StorNext Releases/Downtime Requirements

Note: Metadata array operations and the StorNext file system are unavailable while metadata firmware is installed. We refer to suspension of metadata operation as a **downtime upgrade**, since no array I/O may take place during this time.

Note: The upgrade of metadata appliance firmware also, once installed, initiates a reboot of both MDC nodes prior to 5.1.1, requiring additional time. Plan upgrade times accordingly.

StorNext Releases requiring suspension of metadata operations during upgrades occur any time a newer release contains a newer metadata array firmware version than the version currently installed on the appliance.

The following table contains examples of firmware upgrade versions. Upgrading StorNext Release with a newer firmware will be a **downtime upgrade**:

StorNext Release*	Array Firmware Version
5.1.1	08.10.13
5.1	07.84.46
5.0.1	07.84.46
5	07.84.46
4.7.1	07.84.46

StorNext Release*	Array Firmware Version
4.7.0.1	07.84.46
4.7.0	07.84.46
4.6.1	07.80.55
4.6	07.80.55
4.3.3	07.80.55
4.3.2	07.80.55
4.3.1	07.80.55
4.3.0	07.80.55
4.2.2.0.1	07.75.17

* Note: Some StorNext releases are not supported upgrade paths to StorNext 5 releases. Please consult the StorNext 5 Compatibility Guides and/or older StorNext Compatibility Guides applicable for the StorNext Release you wish to upgrade to, in order to determine upgrade availability.

Example (based on the previous table): If you were upgrading the StorNext firmware from 4.6.1 to StorNext 5 Release 5.1.1, the array firmware would be upgraded from 07.80.55 to 08.10.13. This is a **downtime upgrade**.

Components and Upgrade Time Estimates

Component	Upgrade Time Estimate (approx. minimum)
MDC node	30 to 60 minutes per node*
Metadata Array	20 minutes**

* Reboot times could vary widely, depending on the size of the SAN in your environment, whether or not MDC node firmware needs to be upgraded, and the StorNext Release installed prior to the upgrade.

** Since metadata array operations, and the StorNext file system will be suspended during the array firmware upgrade, this is a **downtime upgrade**.

Note: See sections below for information on additional reboots that may be required for specific StorNext Releases.

For All Firmware Upgrades

• Full access to all GUI features are not available during the upgrade. The GUI should not be started until the upgrade is complete.

For StorNext 5 and Later Upgrades

• The upgrade is applied to each node in reverse order, 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. Access to a limited StorNext GUI is available on the MDC node acting as primary during the upgrade of the node acting as secondary.

• Both MDC nodes will need to reboot after the metadata array firmware update is applied.

Note: As of StorNext 5 Release 5.1.1, MDC node reboots after metadata array firmware updates are no longer required.

For Upgrades Prior to StorNext 5

• Each StorNext firmware update requires a reboot of both nodes. In some cases, multiple reboots of the nodes are required.

- Each time the firmware update 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 M660 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.

- All upgrades prior to StorNext 5 are **downtime upgrades**.

Upgrade Procedure

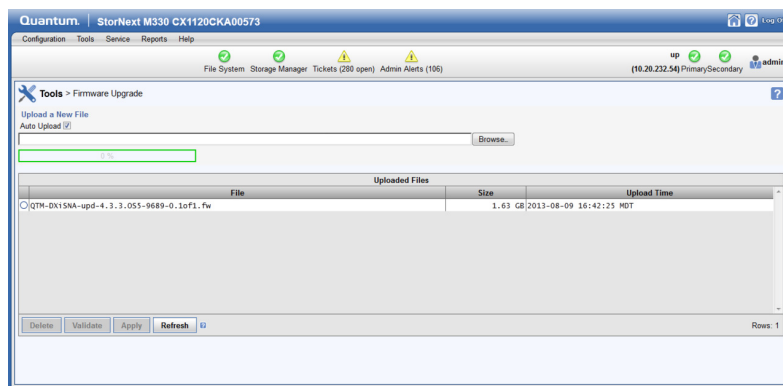To upgrade the StorNext M660:

1 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 28 Firmware Upgrade Page

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-5.1.0.OS6-15147-15110.1of2.fw and QTM-DXiSNA-upd-5.1.0.OS6-15147-15110.2of2.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 .

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** (), 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 67. (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.

Post-Upgrade Failover

If you desire to failover your system after the upgrade, see Initiating a Graceful System Failover on page 70.

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. However, for StorNext releases prior to 4.7, an HA conversion is necessary after StorNext software upgrades.

Please note the following:

- 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.

Follow these steps to configure HA:

1 From the StorNext GUI on MDC Node 1, choose **Tools > High Availability > Convert**.

Figure 29 Tools > HA > Convert
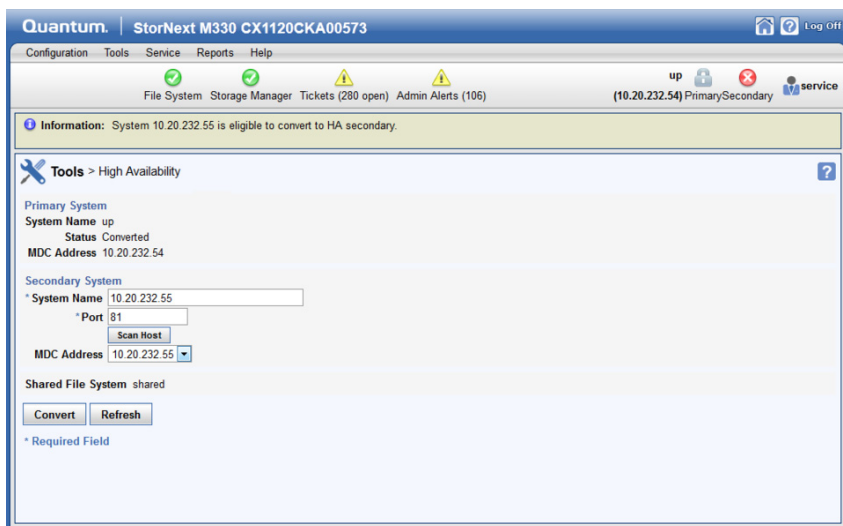
Caution: On the **Tools > High Availability** page, it is critical that you assign the Metadata network IP address in the **MDC Address** field and NOT the Management network IP address.

Caution: Double-check that the **Shared File System** option is set to the shared file system on the metadata array for the metadata appliance/HA pair and **NO OTHER** shared file system on the list before applying changes. The file system selection on this page may only be done once, so make sure you select the shared file system on the metadata array.

Note: A virtual IP (VIP) may also be set at this time. The VIP should be added to management IP, not the metadata IP.

2 Click **Convert** to convert MDC Node 1 (primary) to HA.

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

3 The IP address of the secondary MDC node of the StorNext M660 will appear in the System Name field along with a port number.

4 Click **Scan Host**. The system should resolve the secondary MDC node - the MDC Address will auto-fill with a value.

5 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.

6 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

During StorNext 5 release 5.0 or later upgrades, the Metadata Appliance fails over once. Because of this single failover, the MDC node originally operating as primary is set as the secondary after the upgrade. This procedure provides the steps necessary to set the MDC nodes back to the system state prior to the upgrade for this scenario.

To initiate the failover of a Metadata Appliance after converting to HA or any 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 MDC node operating as the **primary**, initiate an HA failover to the MDC node operating as the **secondary**.

```
service cvfs stop
```

8 Wait until the **secondary** MDC node becomes the **primary**, and leave your SSH connection to this node open. (Time may vary.)

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.

  • User: **stornext**

  • Password: (the customer should have the password for the **stornext** account)

11 Type **sudo rootsh** to gain root user access.

12 Enter the password a second time.

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

```
snhamgr -m status
```

14 Verify the output is:

```
:default:primary:default:stopped:
```

15 From the SSH connection to the MDC node now operating as the **secondary**, enter the following:

```
service cvfs start
```

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

```
snhamgr -m status
```

17 Verify the output is:

```
:default:running:default:primary:
```

18 Repeat if desired to fail over to the original system operating as the **primary**.

19 Verify that all clients have full access.

20 Test access to all file systems.

Additional Common Operations

Changing the MDC VIP Address

To change the Virtual IP address for the M660, 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 M660 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 *StorNext Man Pages Reference Guide* 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:

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

6 Close the ssh connection for the MDC node operating as the primary.

7 Open an ssh connection to the M660 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 M660 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 4
Contacting Quantum

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

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

Contacts

Quantum company contacts are listed below.

Quantum Home Page

Visit the Quantum home page at:

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