



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

# Quantum DXi6500 and DXi6700

DXi-Series

6-66639-03 Rev C

DXi6500 and DXi6700 User's Guide, 6-66639-03 Rev C, August 2010, Product of USA.

Quantum Corporation provides this publication "as is" without warranty of any kind, either express or implied, including but not limited to the implied warranties of merchantability or fitness for a particular purpose. Quantum Corporation may revise this publication from time to time without notice.

#### **COPYRIGHT STATEMENT**

© 2010 Quantum Corporation. All rights reserved.

Your right to copy this manual is limited by copyright law. Making copies or adaptations without prior written authorization of Quantum Corporation is prohibited by law and constitutes a punishable violation of the law.

#### TRADEMARK STATEMENT

Quantum, the Quantum logo, DLT, DLTtape, the DLTtape logo, Scalar, and StorNext are registered trademarks of Quantum Corporation, registered in the U.S. and other countries.

Backup. Recovery. Archive. It's What We Do., the DLT logo, DLTSage, DXi, DXi-Series, Dynamic Powerdown, FastSense, FlexLink, GoVault, MediaShield, Optyon, Pocket-sized. Well-armored, SDLT, SiteCare, SmartVerify, StorageCare, Super DLTtape, SuperLoader, and DXi Advanced Reporting are trademarks of Quantum.

LTO and Ultrium are trademarks of HP, IBM, and Quantum in the U.S. and other countries. All other trademarks are the property of their respective companies.

Specifications are subject to change without notice.



Preface

Chapter 1



xxi

## DXi6500 and DXi6700 System Description 1 Network Attached Storage (NAS) (DXi6500 Only).....12 Virtual Tape Storage (DXi6700 Only) .....13 DXi Advanced Reporting ......15

Chapter 2 Bas	ic Operations	17
DXi	b500 and DXi6700 Node       Node         Node Front Panel Features and Indicators       Node Rear Panel Connectors         Node Rear Panel Connectors       Node Motherboard Connectors	17 18 20 27
DXi	5500 and DXi6700 Expansion Modules	28 29 31
Har	d Drive Carrier Indicators	32
Ethe	rnet Port Indicators	33 34
Ром	er Supply Indicators	36
Turr	ing On and Shutting Down the System	37
Loca	ating Serial Numbers	38

Chapter 3

## DXi6500 and DXi6700 Concepts

Data Storage Presentation.       4         Network Attached Storage (NAS)       4         OpenStorage (OST)       4         Virtual Tape Library (VTL)       4	1 2 3
Data Deduplication Policy       4         Adaptive In-line Data Deduplication (Backup Window Not Defined)       4         Deferred Processing Data Deduplication (Backup Window Defined)       4         Deferred Processing Data Deduplication (Backup Window Defined)       4	3 3 4
Data Replication       4         Data Replication Requirements       4         Data Replication Processes       4         New DXi6500 and DXi6700 Installations       4         Directory/File Based Replication       4         OpenStorage (OST)       4	5 6 7 7 8
Recovering Data       4         Recovery Processes       4         Recovery Requirements       4         Recovery Features       5	8 9 9 0

Network Segmentation	. 50
General Recommendations	. 51
DXi6500 and DXi6700 Segmentation Options	. 52
DXi6500 Performance Guidelines	. 56

Chapter 4	DXi6500 and DXi6700 Remote Management 5	57
	DXi6500 and DXi6700 Web Pages DXi6500 and DXi6700 Web Page Menu Items	58 58
	Accessing DXi6500 and DXi6700 Web Pages	67
	Using the DXi6500 and DXi6700 Web Pages	69
	Disk Usage	74
	Model Number	75
	Data Reduction Statistics	76
	Cumulative Replication Statistics	76

## Chapter 5

## DXi6500 and DXi6700 Configuration

VTL Configuration (DXi6700 Only).80Default VTL Partition.80Creating Partitions81Creating Media88Media Actions.90Partition Actions97Configuring Host Access102
NAS & OST Configuration (DXi6500 Only)112NAS Configuration113OST Configuration120OST Optimized Duplication130Windows Domain Configuration132Access Control Configuration138Advanced Setting141
PTT Configuration       142         Physical Device Discovery       143         Backup Application Specific       146         Initiators and Ports       149
Network Configuration

General
Date and Time Configuration163
Security Configuration.164Passwords.164SSL166Login Session169
Email Configuration170Recipients170Server173Test173Email Home173
SNMP Configuration175Destinations175Community177Test180
Contacts Configuration

## Chapter 6

### DXi6500 and DXi6700 Status

Hardwa	re
	Summary
	Details
System.	
-	CPU
	RAID
	Ethernet
	Data Deduplication
	Ingest
	Disk Usage
VTL (DX	i6700 Only)
·	Physical View
	Logical View
	Performance View

Chapter 7

DXi6500 and DXi6700 Alerts

Admin Alerts	 
Service Tickets	 

Chapter 8	DXi6500 and DXi6700 Data Services	209
	Space Management	209 210 212
	Data Replication Configuring Replication for the First Time Replication Configuration Steps Cartridge Based Replication VTL Configuration Steps Only) Directory/File Based Replication (DXi6500 Only) Directory/File Based Replication NAS Configuration St (DXi6500 Only) Replication Requirements Accessing Replication	
	Source Role Configuration. Source Role Performance Source Role VTL Configuration (DXi6700 Only). Source Role NAS Configuration (DXi6500 Only). Source Role Actions	
	Target Role ConfigurationReplicated SnapshotsTarget Role VTL Configuration (DXi6700 Only)Target Role NAS Configuration (DXi6500 Only)Target Role Actions PageReports	
Chapter 9	DXi6500 and DXi6700 Utilities	241

Xi6500 and	DXi6700	Utilities
------------	---------	-----------

Software	241 242
Diagnostics	243 243 244 245

	Analyzer	
	Node Management	250
	License Keys	
Chapter 10	Troubleshooting	255
	DXi6500 and DXi6700 Problem Reporting	255
	Using DXi6500 Status Page for Troubleshooting Downloading the System Diagnostics File	256 257
	Common Problems and Solutions Start-up Problems Hardware Problems Ethernet Network Problems Replication Problems Temperature Problems	
	Service Tickets	264
Chapter 11	Implementing a Data Replication Plan	267
	Setting Up Data Replication Setting Up the Target DXi System Setting Up the Source DXi System Enabling and Running Replication	
	Recovering Replicated Data	275 275 279
Appendix A	DXi6500 and DXi6700 System Specifications Physical Characteristics	<b>285</b> 

Glossary	293
Index	297

Contents

# **Figures**

Figure 1	DXi6500 and DXi6700 Systems9
Figure 2	DXi6500 and DXi6700 Node Drive Slot Numbering 10
Figure 3	DXi6500 and DXi6700 Expansion Module Drive Slot Number- ing
Figure 4	DXi6500 and DXi6700 Drive Carrier
Figure 5	NAS Backup using CIFS and NFS
Figure 6	DXi6500 and DXi6700 Node RAID Sets15
Figure 7	DXi6500 and DXi6700 Expansion Module RAID Sets 15
Figure 8	DXi6500 and DXi6700 Node Front View
Figure 9	Node Rear View - 651021
Figure 10	Node Rear View - 652022
Figure 11	Node Rear View - 653023
Figure 12	Node Rear View - 654024
Figure 13	Node Rear View - 655025
Figure 14	Node Rear View - DXi6700
Figure 15	Node Rear View - Motherboard Connectors
Figure 16	Expansion Module Front View
Figure 17	Expansion Module Rear View

C

Figure 18	Hard Drive Carrier LEDs
Figure 19	Ethernet Port LEDs
Figure 20	LEDs for 10GbE Adapter With Dual CX4 Ports35
Figure 21	LEDs for 10GbE Adapter With Dual Optical Ports 36
Figure 22	Power Supply LED
Figure 23	Power Buttons
Figure 24	Login Page
Figure 25	Home Page
Figure 26	Partitions Page
Figure 27	Adding a Partition Page
Figure 28	Editing a Partition Page86
Figure 29	Deleting a Partition Page87
Figure 30	Create Media Page
Figure 31	Media Actions Page91
Figure 32	Summary Media Page92
Figure 33	Virtual Actions Page
Figure 34	Mode Page
Figure 35	Move Page
Figure 36	Unload Page
Figure 37	Host Access
Figure 38	Groups Page
Figure 39	Add Page
Figure 40	Edit Page
Figure 41	Delete Page
Figure 42	Hosts Page
Figure 43	Target Page111
Figure 44	Target Usage Page   112
Figure 45	NAS Shares Summary Page114
Figure 46	Add NAS Share Page

Figure 47	Edit NAS Share Page118
Figure 48	Delete NAS Shares Page
Figure 49	Storage Servers Summary Page121
Figure 50	Add Storage Server Page122
Figure 51	Delete Storage Servers Page
Figure 52	LSU Summary Page
Figure 53	Create LSU Page
Figure 54	Delete LSU Page
Figure 55	OST Client Plug-In Page129
Figure 56	Windows Domain Page132
Figure 57	Access Control Page
Figure 58	Add Workgroup User Page
Figure 59	Advanced Setting Page142
Figure 60	Physical Device Discovery Page
Figure 61	Backup Application Specific Summary Page146
Figure 62	Backup Application Specific Add Page147
Figure 63	Backup Application Specific Edit Page148
Figure 64	Backup Application Specific Delete Page149
Figure 65	Initiators & Ports Page150
Figure 66	Network General Page151
Figure 67	Network IP Page
Figure 68	Network Segmentation and Bonding Page155
Figure 69	System Date and Time Settings Page163
Figure 70	Passwords Page165
Figure 71	SSL Page
Figure 72	Install New Certificate Page168
Figure 73	Session Configuration Page169
Figure 74	Email Recipient Configuration Page
Figure 75	Trap Destination Configuration Page

Figure 76	SNMP Community Configuration Page
Figure 77	Company Information Page
Figure 78	Summary Page
Figure 79	CPU Page
Figure 80	RAID Page
Figure 81	Ethernet Page
Figure 82	Data Deduplication Page 193
Figure 83	Ingest Page
Figure 84	Disk Usage Page
Figure 85	VTL Page
Figure 86	Administration Alerts Page
Figure 87	Service Tickets Page
Figure 88	Ticket Details
Figure 89	Recommended Actions Window207
Figure 90	General Page
Figure 91	Schedule
Figure 92	Source Role General Page217
Figure 93	Source Role VTL Page
Figure 94	Editing the Source Role Partition Settings
Figure 95	Source Role NAS Page
Figure 96	Source Role NAS Settings
Figure 97	Source Role Actions Page
Figure 98	Target Role General Page
Figure 99	Target Role VTL Page232
Figure 100	Editing the Target Role VTL Cartridge Based Replication Set- tings
Figure 101	Target Role NAS Page
Figure 102	Directory/File Based Targets Page
Figure 103	Target Role Actions Page238

Figure 104	Software Page242
Figure 105	System Diagnostics Page244
Figure 106	Storage Array Page
Figure 107	Healthchecks Page246
Figure 108	Analyzer Page
Figure 109	Node Management Page250
Figure 110	License Keys Page
Figure 111	Hardware Summary Page
Figure 112	System Diagnostics Page258
Figure 113	Service Tickets Page264
Figure 114	Ticket Details
Figure 115	Recommended Actions Window266
Figure 116	Major Replication Setup Steps
Figure 117	Target Role General Page   269
Figure 118	Source Role General Page
Figure 119	Source Role VTL Page
Figure 120	Editing the VTL Replication Page272
Figure 121	Source Role NAS Page
Figure 122	Source Role NAS Settings Page
Figure 123	Major Steps for Recovering a VTL Partition
Figure 124	Target Role VTL Page   277
Figure 125	Major Steps for Recovering a NAS Share
Figure 126	Target Role NAS Page   279
Figure 127	Major Steps for Failing Back a VTL Partition
Figure 128	Target Role VTL Page   281
Figure 129	Major Steps for Failing Back a NAS Share
Figure 130	Target Role NAS Page

Figures

# **Tables**

Table 1 Buttons, an	1 DXi6500 and DXi6700 Node - Front Panel LED Indicators, ns, and Connectors		
Table 2	Rear Panel Connectors - 651021		
Table 3	Rear Panel Connectors - 652022		
Table 4	Rear Panel Connectors - 653023		
Table 5	Rear Panel Connectors - 654024		
Table 6	Rear Panel Connectors - 655025		
Table 7	Rear Panel Connectors - DXi6700		
Table 8	DXi6500 and DXi6700 Node - Motherboard Connectors . 28		
Table 9	Number of Expansion Modules by Model28		
Table 10 Indicators, I	DXi6500 and DXi6700 Expansion Module - Front Panel LED Buttons, and Connectors		
Table 11	Rear Panel Connectors - Expansion Module		
Table 12	DXi6500 NFS Performance Guidelines56		
Table 13	DXi6500 and DXi6700 Web Page Menu Items		
Table 14	Contents Section70		
Table 15	Quick Status Section		
Table 16	Data Reduced By Section71		
Table 17	System Details Section		

C

Table 18	NAS Data Services Section73	
Table 19	System Status Information	
Table 20	DXi6500 Model Number75	
Table 21	Summary Information92	
Table 22	Media States93	
Table 23	Virtual Actions	
Table 24	NAS Shares Summary Information114	
Table 25	Add NAS Share Fields	
Table 26	Edit NAS Share Fields119	
Table 27	Storage Server Fields123	
Table 28	LSU Fields	
Table 29	Workgroup User Fields	
Table 30 tion)	Network Configuration Information (2 x 1GbE Configura-	
Table 31 tion)	Network Configuration Information (6 x 1GbE Configura-	
Table 32 2 x 10GbE (	Network Configuration Information (2 x 1GbE and Configuration)	
Table 33	SNMP Trap Selections	
Table 34	Company Information	
Table 35	Primary and Secondary Contact Information182	
Table 36	Administration Alerts Columns	
Table 37	Service Tickets	
Table 38	Start-up Problems	
Table 39	Hardware Problems259	
Table 40	Ethernet Network Problems	
Table 41	Replication Problems	
Table 42	Physical Characteristics	
Table 43	Storage Capacity	
Table 44	Cable Drops	

Table 45	Interfaces
Table 46	Software Capabilities
Table 47	Power Requirements
Table 48	Performance Characteristics
Table 49	Environmental Specifications

Tables



- <u>Chapter 3, DXi6500 and DXi6700 Concepts</u> discusses key concepts and terminology used in the DXi6500 and DXi6700.
- <u>Chapter 4, DXi6500 and DXi6700 Remote Management</u> discusses using the DXi6500 and DXi6700 systems management pages to control the system remotely.
- <u>Chapter 5, DXi6500 and DXi6700 Configuration</u> discusses the configuration of the DXi6500 and DXi6700 systems.
- <u>Chapter 6, DXi6500 and DXi6700 Status</u> discusses DXi6500 and DXi6700 status information.
- <u>Chapter 7, DXi6500 and DXi6700 Alerts</u> discusses the DXi6500 and DXi6700 alert information and service tickets.
- <u>Chapter 8, DXi6500 and DXi6700 Data Services</u> discusses the DXi6500 and DXi6700 data services such as space reclamation and remote replication.
- <u>Chapter 9, DXi6500 and DXi6700 Utilities</u> discusses DXi6500 and DXi6700 utilities such as diagnostic tools and rebooting the system.
- <u>Chapter 10, Troubleshooting</u> discusses problems you may encounter during the setup and operation of the DXi6500 and DXi6700 systems.
- <u>Chapter 11, Implementing a Data Replication Plan</u> discusses the common ways to implement a data replication plan.
- <u>Appendix A, DXi6500 and DXi6700 System Specifications</u> provides system specifications for the DXi6500 and DXi6700.
- <u>Glossary</u> provides definitions of terms used in this guide.

 Notational Conventions
 This manual uses the following conventions:

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

 Caution: Caution indicates potential hazards to equipment or data.

WARNING: Warning indicates potential hazards to personal safety.

- 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.
- Data sizes are reported in base 1000 rather than base 1024. For example:
  - 1 MB = 1,000,000 bytes
  - 1 GB = 1,000,000,000 bytes
  - 1 TB = 1,000,000,000,000 bytes

duct Safety ements	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.	
	<b>WARNING:</b> Before operating this product, read all instructions and warnings in this document and in the system, safety, and regulatory guide.	
	警告   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.	

## Prod State

<b>AVERTISSEMENT</b> Avant d'utiliser ce produit, lisez la totalité des instructions et avertissements de ce document et du <i>Guide d'informations sur le système, la sécurité et la réglementation.</i>		
Lesen Sie vor der Verwendung dieses Produkts alle Anweisungen und HINWEIS Warnhinweise in diesem Dokument und im System, Safety, and Regulatory Information Guide (Info-Handbuch: System, Sicherheit und Richtlinien).		
לפני ההפעלה של מוצר זה, קרא את כל ההוראות והאזהרות הכלולות במסמך זה וכן ב <i>מדריך מידע בנושאי מערכת, בטיחות ותקינה</i>		
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 警告 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。		
<b>경고</b> 이 제품을 작동하기 전에 이 문서 및 시스템, 안전, 및 규제 정보 안내서에 수록된 모든 지침과 경고 표지를 숙지하십시오.		
<b>ПРЕДУПРЕЖДЕНИЕ</b> всеми инструкциями и предупреждениями, приведенными в данном документе и в <i>Справочном руководстве по устройству, технике безопасности и действующим нормативам.</i>		
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.		

## **Related Documents**

The following Quantum documents are also available for DXi6500 and DXi6700 systems:

Document No.	Document Title	Document Description
6-00618	<i>System Safety and Regulatory Information - Quantum Products</i>	Lists all safety and regulatory information for all Quantum products.
6-66638	<i>DXi6500 and DXi6700 Site Planning Guide</i>	Provides site planning information for the DXi6500 and DXi6700.
6-66755	<i>Symantec Veritas NetBackup OST Configuration Guide</i>	Provides information for setting up the DXi6500 and DXi6700 for OST operation with NetBackup
6-66910	<i>Symantec Backup Exec OST Configuration Guide</i>	Provides information for setting up the DXi6500 and DXi6700 for OST operation with Backup Exec
6-66770	<i>DXi6500 and DXi6700 Command Line Interface (CLI) Guide</i>	Provides information on the DXi6500 and DXi6700 command line interface.

For the most up to date information on the DXi6500 and DXi6700, see:

http://www.quantum.com/ServiceandSupport/Index.aspx

#### Contacts

Quantum company contacts are listed below.

### Quantum Corporate Headquarters

To order documentation on the DXi6500 or other products contact:

Quantum Corporation *(Corporate Headquarters)* 1650 Technology Drive, Suite 700 San Jose, CA 95110-1382

## **Technical Publications**

To comment on existing documentation send e-mail to:

doc-comments@quantum.com

## **Quantum Home Page**

Visit the Quantum home page at:

http://www.quantum.com

### Getting More Information or Help

StorageCare<sup>™</sup>, Quantum's comprehensive service approach, leverages advanced data access and diagnostics technologies with cross-environment, multi-vendor expertise to resolve backup issues faster and at lower cost.

Accelerate service issue resolution with these exclusive Quantum StorageCare services:

# Quantum. Global Services

• Service and Support Web site - Register products, license software, browse Quantum Learning courses, check backup software and operating system support, and locate manuals, FAQs, software downloads, product updates and more in one convenient location. Benefit today at:

#### http://www.quantum.com/ServiceandSupport/Index.aspx

• **eSupport** - Submit online service requests, update contact information, add attachments, and receive status updates via e-mail. Online Service accounts are free from Quantum. That account can also be used to access Quantum's Knowledge Base, a comprehensive repository of product support information. Sign up today at:

http://www.quantum.com/osr

• StorageCare Guardian - Securely links Quantum hardware and the diagnostic data from the surrounding storage ecosystem to Quantum's Global Services Team for faster, more precise root cause diagnosis. StorageCare Guardian is simple to set up through the internet and provides secure, two-way communications with Quantum's Secure Service Center. More StorageCare Guardian information can be found at:

http://www.quantum.com/ServiceandSupport/Services/ GuardianInformation/Index.aspx

For further assistance, or if training is desired, contact Quantum Customer Support Center:

United States	800-284-5101 (toll free) 949-725-2100
EMEA	00800-4-782-6886 (toll free) +49 6131 3241 1164
APAC	+800 7826 8887 (toll free) +603 7953 3010

For worldwide support:

http://www.quantum.com/ServiceandSupport/Index.aspx

Worldwide End-User Product Warranty For more information on the Quantum Worldwide End-User Standard Limited Product Warranty:

http://www.quantum.com/pdf/QuantumWarranty.pdf

Preface

# Chapter 1 DXi6500 and DXi6700 System Description

This chapter describes the DXi6500 and DXi6700 systems and their components. The chapter consists of:

- Overview
- <u>Features and Benefits</u>
- Data Reduction
- Space Reclamation
- <u>Remote Replication</u>
- DXi6500 and DXi6700 Systems
- Hard Drive Storage
- <u>Supported RAID Configurations</u>
- DXi Advanced Reporting

# Overview

The DXi6500 and DXi6700 are Quantum's midrange Enterprise disk backup solution that integrates data deduplication and replication technology to connect backup and DR (disaster recovery) protection across distributed corporate environments. The DXi6500 and DXi6700 disk-based backup appliances use Quantum's patented data deduplication technology to increase disk capacities by 10 to 50 times, and make WAN replication a practical, cost-effective part of disaster recovery planning. Scalable to 56TB usable capacity, the DXi6500 and DXi6700 are designed for departmental and medium business customers.

Major features of the DXi6500 and DXi6700 include:

- Data deduplication and multi-site remote replication compatible with DXi2500-D, DXi3500, DXi4500, DXi5500, and DXi7500 models
- Performance of up to 370–1900 GB/hr ingest rate in adaptivededuplication mode with NAS attachment (depending on configuration and assuming sufficient network bandwidth and minimal network latency).

# Advanced Data Deduplication Increasing Disk Retention for Backup Data

The DXi6500 and DXi6700 leverage Quantum's patented data deduplication technology (U.S. Pat. No. 5,990,810) to dramatically increase the role that disk can play in the protection of critical data. With the DXi6500 and DXi6700 solutions, users can retain 10 to 50 times more backup data on fast recovery disk than with conventional arrays.

# Remote Replication of Backup Data Providing Automated Disaster Recovery Protection

With the DXi6500 and DXi6700, users can transmit backup data from a remote site to a central, secure location to reduce or eliminate media handling. DXi<sup>™</sup>-Series replication is asynchronous, automated, and operates as a background process.

## **Enterprise Features Provide Secure Repository**

The DXi6500 and DXi6700 feature up to 56TB usable capacity and up to 2.0TB/hour ingest performance (depending on configuration). Policybased data deduplication lets users select either in-line or postprocessing techniques. Presents storage as NAS shares (CIFS and NFS) or OST storage servers.

# **Features and Benefits**

The DXi6500 and DXi6700 systems provide the following features and benefits:

- Industry-unique, policy-based data deduplication matches different data deduplication methods to different backup tasks
- NAS or OST presentation layer (DXi6500 models ONLY)
- Virtual Tape Library (VTL) presentation layer (DXi6700 ONLY)
- 10 source to one target LAN/WAN replication
- OST Optimized Duplication support with Symantec NetBackup<sup>™</sup> 6.5.3 or later or Symantec Backup Exec<sup>™</sup> 2010 or later (DXi6500 models ONLY).
- OST direct path to tape support with Symantec NetBackup<sup>™</sup> 6.5.4 or later (DXi6500 models ONLY).
- Supported by every major backup software vendor
- Rack space requirements: 3U for node and 2U for each expansion module (JBOD)
- Installs in a standard rack with a minimum depth of 29.79 in (75.68 cm)

**Note:** Quantum recommends installing the DXi6500 and DXi6700 systems in a controlled or restricted area to prevent access by untrained personnel. In addition, Quantum recommends that system installation be performed only by qualified IT personnel.

# **Data Reduction**

Data reduction is the process of reducing the amount of storage capacity required to store your data. The DXi6500 and DXi6700 systems provide two techniques to optimize the storage space required on your system:

- Data Deduplication
- <u>Compression</u>

## **Data Deduplication**

The DXi-Series disk backup and replication systems use Quantum's patented data deduplication technology to dramatically increase the role that disk can play in data protection. With DXi-Series solutions, users can retain 10 to 50 times more backup data on fast recovery disk than with conventional arrays. This advantage allows IT departments to cost-effectively retain months of backup data on disk for faster, more reliable restores and more data recovery points. Quantum's innovative implementation of this core technology means that users do not have to compromise on performance to take advantage of extended retention capability. DXi solutions support both in-line and post-processing data deduplication methodologies—allowing users to realize optimal use of disk resources and achieve the performance needed to complete critical jobs during short backup windows.

The DXi6500 system can reduce the amount of storage capacity required through a data deduplication process. The term data deduplication refers to the elimination of redundant data. Data deduplication works by recognizing repeated variable-length blocks of data in a stream of data. Only a single instance of each blocklet is stored and references (tags) are made for all of the duplicate variable-length blocks of data. These references or tags are stored in an index for use later to reconstitute the deduplicated data. By only storing one instance of the blocklet, a great deal of capacity is saved. For a NAS share, the DXi system waits for 60 seconds of inactivity before a file can be deduplicated. For more information on enabling data deduplication, see NAS Configuration on page 113.

### Compression

The DXi6500 and DXi6700 systems use compression technology after duplicate blocks have been identified and replaced as part of the deduplication process. With compression, unique data that has been through the data deduplication process can be compressed at a typical ratio of approximately 2:1. This enables you to maximize the storage capacity of your system.

# **Space Reclamation**

The space reclamation process performs multiple functions on the DXi6500 and DXi6700.

When data is deduplicated it is stored in what we refer to as a block pool—a pool of all unique data blocks that were captured during the data deduplication cycle. When subsequent backup jobs occur, the data deduplication engine searches for new data entering the DXi and uses a "variable length compression type algorithm" to compare this to existing data in the block pool. Unique blocks are added to the block pool and known blocks are indexed.

The space reclamation function searches the block pool for data blocks that are not referenced by any pointers (that is, the files associated with the block have been expired and removed). Once such a data block is identified, the index count is decremented, and the block is removed to make the space reusable.

Note that the space reclamation process can use a significant amount of CPU processing and disk I/O. Therefore it is important to know when to schedule the space reclamation process. By default the process will commence every Sunday at 12:00pm. However, to maximize performance and capacity utilization, it is highly recommended that this process is performed on a daily basis. As best practice it is recommended that this process commences at least two hours after your backup job has completed on a daily basis. It is far more efficient to process a day's worth of new data than a week's worth.

# **Remote Replication**

Today most backup occurs on isolated devices, making it difficult to deploy disk backup when disaster recovery protection is required. DXi-Series solutions use data deduplication and replication to decrease by up to 100 times the bandwidth required to move backup data over networks and between sites. This dramatic gain makes it practical and cost-effective for users to replicate backup data over WANs for secure, network-based disaster recovery protection, and it lets users combine rapid, local restores with sound disaster recovery protection.

With DXi-Series replication, users can transmit data from a single site or multiple sites to a central location using any DXi model. DXi-Series replication is an asynchronous, automated background process that includes encryption of data in transit. This model for protecting the distributed enterprise allows users to combine disk, replication, and tape for an optimal combination of performance, simplicity, and security.

For more information on implementing a replication plan, see <u>Chapter 11, Implementing a Data Replication Plan</u>.

# DXi6500 and DXi6700 Systems

The DXi6500 product family includes the following models:

- <u>DXi6500 6510</u>
- <u>DXi6500 6520</u>
- <u>DXi6500 6530</u>
- <u>DXi6500 6540</u>
- <u>DXi6500 6550</u>
- <u>DXi6700</u>

### DXi6500 - 6510

This configuration provides a base amount of connectivity and data storage. It includes the following features:

- 1 node with 24GB RAM
- 1 RAID controller card
- 2 x 1GbE ports
- 8TB usable capacity

### DXi6500 - 6520

This system provides increased network throughput and data storage. It includes the following features:

- 1 node with 48GB RAM
- 2 RAID controller cards
- 0 to 3 expansion modules (JBODs)
- 6 x 1GbE ports
- 8 TB to 32 TB usable capacity

### DXi6500 - 6530

This system provides increased network throughput and maximal data storage. It includes the following features:

- 1 node with 48GB RAM
- 4 RAID controller cards
- 2 to 6 expansion modules (JBODs)
- 6 x 1GbE ports
- 24 TB to 56 TB usable capacity

### DXi6500 - 6540

This system provides increased network throughput and maximal data storage as well as path-to-tape capability. It includes the following features:

- 1 node with 48GB RAM
- 4 RAID controller cards
- 2 to 6 expansion modules (JBODs)
- 6 x 1GbE ports
- 2 x 8Gb Fibre Channel ports (for OST path to tape only, not ingest)
- 24 TB to 56 TB usable capacity

### DXi6500 - 6550

This system provides the fastest network throughput and maximal data storage as well as path-to-tape capability. It includes the following features:

- 1 node with 48GB RAM
- 4 RAID controller cards
- 2 to 6 expansion modules (JBODs)
- 2 x 1GbE ports
- 2 x 10GbE ports (CX4 or optical)
- 2 x 8Gb Fibre Channel ports (for OST path to tape only, not ingest)
- 24 TB to 56 TB usable capacity

### DXi6700

This system provides the fastest network throughput and maximal data storage as well as path-to-tape capability. It includes the following features:

- 1 node with 48GB RAM
- 4 RAID controller cards
- 2 to 6 expansion modules (JBODs)
- 2 x 1GbE ports
- 4 x 8Gb Fibre Channel ports (VTL and Backup Application path to tape)
- 24 TB to 56 TB usable capacity


# Hard Drive Storage

The DXi6500 and DXi6700 systems are based upon high speed disk drives instead of tape drives. The usable capacity is 8–56TB. The drive storage area is presented as NAS shares or OST LSUs (Logical Storage Units) (see <u>Network Attached Storage (NAS) (DXi6500 Only)</u> on page 12).

By making use of high speed drives, the DXi6500 and DXi6700 greatly reduces the time required for backup/restore functions and improves confidence in completing the backup in the time allowed.

To optimize performance, the DXi6500 and DXi6700 uses both hard disk drives (HDDs) and solid state drives (SSDs).

The DXi6500 and DXi6700 node supports four solid state drives and twelve hard disk drives (Figure 2):

• HDDs - High capacity (1 TB) hard disk drives are used for data storage, the operating system, and system software.

• **SSDs** - Solid state drives are used to increase DXi system performance when writing or reading the indexes of the deduplicated content. This includes data deduplication, replication, space reclamation, and read operations from deduplicated data.

The DXi6500 and DXi6700 expansion modules supports two solid state drives and ten hard disk drives (Figure 3):

- HDDs High capacity (1 TB) hard disk drives are used for data storage.
- **SSDs** The indexes stored on SSDs in the DXi6500 and DXi6700 node are extended into the expansion modules

Both types of drives (HDD and SSD) are mounted and pre-assembled in drive carriers (see Figure 4). All drives are hot swappable.

Figure 2 DXi6500 and DXi6700 Node Drive Slot Numbering

	ī		,	
			::::::::::::::::::::::::::::::::::::::	П
ы	F			
				ļþ
	L			
	ľ			
	ŀ			

HDD Slot 3	HDD Slot 7	HDD Slot 11	HDD Slot 15
HDD Slot 2	SSD Slot 6	SSD Slot 10	HDD Slot 14
HDD Slot 1	SSD Slot 5	SSD Slot 9	HDD Slot 13
HDD Slot 0	HDD Slot 4	HDD Slot 8	HDD Slot 12

#### Figure 3 DXi6500 and DXi6700 Expansion Module Drive Slot Numbering

HDD Slot 2	HDD Slot 5	HDD Slot 8	HDD Slot 11
SSD Slot 1	HDD Slot 4	HDD Slot 7	HDD Slot 10
SSD Slot 0	HDD Slot 3	HDD Slot 6	HDD Slot 9



#### Network Attached Storage (NAS) (DXi6500 Only)

The DXi6500 system has the ability to serve as a NAS backup system (see <u>Figure 5</u>) where the following protocols are supported:

- <u>CIFS Protocol</u>
- NFS Protocol

#### **CIFS Protocol**

The CIFS (Common Internet File System) protocol defines a standard for remote file access from many computers at a time. This protocol allows users with different platforms to share files without installing additional software. This protocol is used with Windows networks.

#### **Active Directory Support**

The DXi6500 supports ADS (Active Directory Services) as well as ACLs (Access Control Lists). This provides the following benefits:

- **Compatibility with CIFS domains** NAS shares are able to join CIFS domains and use domain authentication.
- Precise control of file system permissions Administrators can specify which users and groups can perform what actions.
- **Robust administrative support** Administrators have the same implicit permissions as they do in Windows operating systems.
- Note: When you create a CIFS share, the initial permissions are the same as the default permissions for a Windows 2003 share with the addition of an ACE (Access Control Entry) that permits full access to the share for all authenticated users. Administrators can choose to remove this full access ACE, set up custom permissions, or leave the ACL (Access Control List) as is if the server is set up in a fully trusted environment.

#### **NFS Protocol**

The NFS (Network File System) protocol was originally designed by Sun<sup>™</sup> Microsystems and allows all network users to access shared files stored on computers of different types. NFS provides access to shared files through an interface called the Virtual File System (VFS) that runs on top of TCP/IP. Users can manipulate shared files as if they were stored locally on the user's own hard disk. With NFS, computers connected to a

network operate as clients while accessing remote files, and as servers while providing remote users access to local shared files. This protocol is used with UNIX and Linux networks. It can also be used with Windows networks.



Virtual Tape Storage (DXi6700 Only) Virtual tape storage or virtual tape library (VTL) allows the storage space on these hard drives to appear to the backup application as tape cartridges (SDLT or LTO). Data is stored on the hard drives through an interface that appears as a DXi6700 system. This allows backup applications to recognize and integrate a DXi6700 system into a data center environment just like a physical tape library.

# **Supported RAID Configurations**

RAID is short for Redundant Array of Independent (or Inexpensive) Disks, which is a category of storage that employs two or more drives in combination for fault tolerance and performance. There are a number of RAID levels in use today such as 0, 1, 3, 5, 6 and 10.

The DXi6500 and DXi6700 uses the following RAID levels:

<u>RAID 1 Configuration</u>

#### <u>RAID 6 Configuration</u>

#### **RAID 1 Configuration**

RAID 1 provides redundancy and fault tolerance by mirroring disks. Each disk in the RAID set contains a copy of the same data. For example, in a RAID set with two disks, if one disk fails, all of the data still exists on the other disk.

The DXi6500 and DXi6700 uses RAID 1 sets for the boot disk (operating system) as well as for blookpool index and cluster header files.

- The node contains the following RAID 1 sets (Figure 6):
  - SSD1 SSD slots 5–6 (block pool index and cluster header files)
  - SSD2 SSD slots 9–10 (block pool index and cluster header files)
  - BOOT HDD slots 0–1 (operating system, metadata, journal files)
- Each expansion module contains the following RAID 1 set (Figure 7):
  - SSD SSD slots 0–1 (block pool index and cluster header files)

#### **RAID 6 Configuration**

RAID 6 uses block-level striping with two parity blocks distributed across all member disks. Dual parity provided by a RAID 6 configuration ensures that your data retains full integrity even in the event of two hard drive failures. Since single parity RAID levels are vulnerable to data loss until the failed drive is rebuilt: the larger the hard drive, the longer the rebuild will take and the longer the system is vulnerable to possible data loss.

The DXi6500 and DXi6700 uses RAID 6 volumes for data storage.

- The node contains the following RAID 6 set (Figure 6):
  - DATA HDD slots 2–4, 7–8, and 11–15 (data storage)
- Each expansion module contains the following RAID 6 set (Figure 7):
  - **DATA** HDD slots 2–11 (data storage)

#### Figure 6 DXi6500 and DXi6700 Node RAID Sets

		•	
d			

DATA	DATA	DATA	DATA
DATA	SSD1	SSD2	DATA
BOOT	SSD1	SSD2	DATA
BOOT	DATA	DATA	DATA

Figure 7 DXi6500 and DXi6700 Expansion Module RAID Sets

b			N
• I : 1 :			

DATA	DATA	DATA	DATA
SSD	DATA	DATA	DATA
SSD	DATA	DATA	DATA

## **DXi Advanced Reporting**

Quantum DXi Advanced Reporting works with all DXi-Series disk backup systems. DXi Advanced Reporting combines comprehensive performance data logging with powerful visual reporting and analysis tools to help you identify potential problems and optimize system operation. For more information, refer to the *DXi Advanced Reporting Software and Documentation CD* included with your system. Chapter 1: DXi6500 and DXi6700 System Description DXi Advanced Reporting



# Chapter 2 Basic Operations

Most DXi6500 and DXi6700 systems operations are performed using the remote management pages (see <u>Chapter 4</u>, <u>DXi6500 and DXi6700</u> <u>Remote Management</u>). This chapter describes the features and basic operation of the DXi6500 and DXi6700 hardware, including:

- DXi6500 and DXi6700 Node
- DXi6500 and DXi6700 Expansion Modules
- Hard Drive Carrier Indicators
- <u>Ethernet Port Indicators</u>
- Power Supply Indicators
- <u>Turning On and Shutting Down the System</u>

### DXi6500 and DXi6700 Node

The DXi6500 and DXi6700 node is a computer server that provides control for the DXi6500 and DXi6700 software (host OS and software applications). The node also provide storage (backup data storage) for the DXi6500 and DXi6700 systems. The node contains 16 drive carriers.

All DXi6500 and DXi6700 systems include one node.

#### Node Front Panel Features and Indicators

<u>Figure 8</u> shows the controls, indicators, and connectors located behind the optional rack bezel on the front panel of the node. <u>Table 1</u> describes each item.



Table 1 DXi6500 and DXi6700 Node - Front Panel LED Indicators, Buttons, and Connectors

Item	Indicator, Button, or Connector	lcon	Description
1	DVD-ROM drive		Accepts CD and DVD discs.
2	USB connectors (2)		Connects USB 2.0 compliant devices to the node.
3	COM port 2		Connects a serial device to the node.
4	Power failure indicator		Indicates a power failure in the power supply when flashing. (See <u>Hardware Problems</u> on page 259.)

Item	Indicator, Button, or Connector	lcon	Description	
5	Overheat/fan fail indicator	~0~	When flashing, indicates a fan failure. When continuously on, indicates an overheat condition. (See <u>Temperature Problems</u> on page 263.)	
6	LAN 1 indicator		Indicates network activity on Ethernet port 1 when flashing.	
7	LAN 0 indicator		Indicates network activity on Ethernet port 0 when flashing.	
8	Drive activity indicator		Indicates disk drive activity when flashing.	
9	Power indicator	÷Ϋ:	Indicates the node is powered on.	
10	Reset button	$\bigcirc$	Reboots the node.	
11	Power button		<ul> <li>Turns the node on or off.</li> <li>Warning: Turning off the power removes the main power but keeps standby power supplied to the node. Because of this, you must unplug the node before servicing.</li> <li>Caution: Turning off the power without properly shutting down the system may result in loss of data (see <u>Turning On and Shutting Down the System</u> on page 37).</li> <li>Note: To shut down the node in the event of an emergency, press and hold the power button for 4 seconds. Warning: This may result in data loss and may cause a delay on next startup due to a block pool verify operation.</li> </ul>	

#### Node Rear Panel Connectors

The node rear panel connectors differ depending on the DXi6500 and DXi6700 configuration. See the following subsections for information about the rear panel connectors available in each possible configuration:

- <u>DXi6500 Model 6510</u>
- <u>DXi6500 Model 6520</u>
- <u>DXi6500 Model 6530</u>
- <u>DXi6500 Model 6540</u>
- <u>DXi6500 Model 6550</u>
- <u>DXi6700</u>
- **Note:** Refer to the port numbering label on the back of the node and expansion module chassis to help you determine the correct port connections.
- **Caution:** Do not disconnect any SAS cables from the node or expansion modules during normal system operation. Unplugging a SAS cable while the system is powered on may result in data loss.

#### DXi6500 - Model 6510

Figure 9 shows the connectors located on the rear panel of the node. Table 2 describes each item. Figure 9 Node Rear View -6510



Table 2 Rear Panel Connectors - 6510

ltem	Description
1	Power supply 1
2	Power supply 2
3	Motherboard connector panel (see <u>Node Motherboard</u> <u>Connectors</u> on page 27)
4	Service port (for Quantum use only) Note: The port above the service port has no function.
5	The SAS connector shown is not used in this configuration.

#### DXi6500 - Model 6520

Figure 10 shows the connectors located on the rear panel of the node. Table 3 describes each item.

# Chapter 2: Basic Operations DXi6500 and DXi6700 Node

Figure 10 Node Rear View -6520



Table 3 Rear Panel Connectors - 6520

Item	Description
1	Power supply 1
2	Power supply 2
3	Motherboard connector panel (see <u>Node Motherboard</u> <u>Connectors</u> on page 27)
4	Service port (for Quantum use only) Note: The port above the service port has no function.
5	RAID controller cards (2) with SAS connectors
6	Gigabit Ethernet port 2
7	Gigabit Ethernet port 3
8	Gigabit Ethernet port 4
9	Gigabit Ethernet port 5

#### DXi6500 - Model 6530

Figure 11 shows the connectors located on the rear panel of the node. Table 4 describes each item. Figure 11 Node Rear View -6530



Table 4 Rear Panel Connectors - 6530

Item	Description
1	Power supply 1
2	Power supply 2
3	Motherboard connector panel (see <u>Node Motherboard</u> <u>Connectors</u> on page 27)
4	Service port (for Quantum use only) Note: The port above the service port has no function.
5	RAID controller cards (4) with SAS connectors
6	Gigabit Ethernet port 2
7	Gigabit Ethernet port 3
8	Gigabit Ethernet port 4
9	Gigabit Ethernet port 5

#### DXi6500 - Model 6540

Figure 12 shows the connectors located on the rear panel of the node. Table 5 describes each item.

# Chapter 2: Basic Operations DXi6500 and DXi6700 Node

Figure 12 Node Rear View -6540



Table 5 Rear Panel Connectors - 6540

ltem	Description	
1	Power supply 1	
2	Power supply 2	
3	Motherboard connector panel (see <u>Node Motherboard</u> <u>Connectors</u> on page 27)	
4	Fibre Channel port 1	
5	Fibre Channel port 0	
6	Service port (for Quantum use only) Note: The port above the service port has no function.	
7	RAID controller cards (4) with SAS connectors	
8	Gigabit Ethernet port 2	
9	Gigabit Ethernet port 3	
10	Gigabit Ethernet port 4	
11	Gigabit Ethernet port 5	

#### DXi6500 - Model 6550

<u>Figure 13</u> shows the connectors located on the rear panel of the node. <u>Table 6</u> describes each item.

#### 10 GbE Cable Types

Depending on the configuration, Quantum DXi6500, Model 6550 systems support one of the following 10 GbE cable types:

- **10 GbE CX4 cable lengths of up to 15 meters** Due to cable quality variations, Quantum recommends using the approved 10 meter CX4 cable type that is shipped with the DXi6500, Model 6550 system.
- 10 GbE optical cable lengths of up to 300 meters with OM3 cables and up to 100 meters with OM2 cables Quantum recommends using the two 10 meter LC to LC type optical cables that are shipped with the DXi6500, Model 6550 system. Consult your 10GbE optical switch/SFP documentation for additional information on optical cable requirements.



Figure 13 Node Rear View - 6550

Table 6 Rear Panel Connectors - 6550	Item	Description
	1	Power supply 1
	2	Power supply 2

Item	Description
3	Motherboard connector panel (see <u>Node Motherboard</u> <u>Connectors</u> on page 27)
4	Fibre Channel port 1
5	Fibre Channel port 0
6	Service port (for Quantum use only) Note: The port above the service port has no function.
7	RAID controller cards (4) with SAS connectors
8	10 Gigabit Ethernet port 5 (CX4 or optical)
9	10 Gigabit Ethernet port 4 (CX4 or optical)

#### DXi6700

Figure 14 shows the connectors located on the rear panel of the node. Table 7 describes each item.



 Table 7 Rear Panel Connectors
 Item
 Description

 - DXi6700
 1
 Power supply 1

Figure 14 Node Rear View - DXi6700

Item	Description
2	Power supply 2
3	Motherboard connector panel (see <u>Node Motherboard</u> <u>Connectors</u> on page 27)
4	Fibre Channel port 1 (Used only for VTL)
5	Fibre Channel port 0 (Used only for PTT)
6	Service port (for Quantum use only) Note: The port above the service port has no function.
7	RAID controller cards (4) with SAS connectors
8	Fibre Channel port 3 (Used only for VTL)
9	Fibre Channel port 2 (Used only for PTT)

#### Node Motherboard Connectors

<u>Figure 15</u> shows the motherboard connectors located on the rear panel of the node. <u>Table 8</u> describes each item.

Figure 15 Node Rear View -Motherboard Connectors



Node - Motherboard	ltem	Description
Connectors	1	PS/2 mouse
	2	PS/2 keyboard
	3	COM port 1
	4	VGA monitor
	5	IPMI port (not used)
	6	USB 0 and 1
	7	USB 2, 3, 4, and 5
	8	Gigabit Ethernet port 0
	9	Gigabit Ethernet port 1
	10	Audio connector panel

### DXi6500 and DXi6700 Expansion Modules

The DXi6500 and DXi6700 expansion modules (JBODs) are used to provide additional capacity (backup data storage) for the DXi6500 and DXi6700 systems. Each expansion module contains 12 drive carriers and provides 8 TB of storage.

The number of expansion modules in the system depends on the model (see <u>Table 9</u>).

Table 9 Number of Expansion Modules by Model	DXi6500 Model	Number of Supported Expansion Modules
	DXi6500 - 6510 (1 RAID controller, 2 x 1GbE)	0

DXi6500 Model	Number of Supported Expansion Modules
DXi6500 - 6520 (2 RAID controllers, 6 x 1GbE)	0 to 3
DXi6500 - 6530 (4 RAID controllers, 6 x 1GbE)	2 to 6
DXi6500 - 6540 (4 RAID controllers, 6 x 1GbE, 2 x FC)	2 to 6
DXi6500 - 6550 (4 RAID controllers, 2 x 1GbE, 2 x 10GbE, 2 x FC)	2 to 6
DXi6700 (4 RAID controllers, 2 x 1GbE, 4 x FC)	2 to 6

#### Expansion Module Front Panel Features and Indicators

<u>Figure 16</u> shows the controls, indicators, and connectors located behind the optional rack bezel on the front panel of the expansion module. <u>Table 10</u> describes each item.

#### Chapter 2: Basic Operations DXi6500 and DXi6700 Expansion Modules

Figure 16 Expansion Module Front View



Table 10 DXi6500 and DXi6700 Expansion Module -Front Panel LED Indicators, Buttons, and Connectors

Item	Indicator, Button, or Connector	lcon	Description
1	Power button		<ul> <li>Turns the expansion module on or off.</li> <li>Caution: Turning off the power removes the main power but keeps standby power supplied to the expansion module. Because of this, you must unplug the expansion module before servicing.</li> <li>Note: To shut down the expansion module in the event of an emergency, press and hold the power button for 4 seconds. Warning: This may result in data loss and may cause a delay on next startup due to a block pool verify operation.</li> </ul>
2	Reset button	$\bigcirc$	Not used.

Item	Indicator, Button, or Connector	lcon	Description
3	Power indicator	= []=	Indicates the expansion module is powered on.
4	Drive activity indicator		Not used.
5	LAN 1 indicator		Not used.
6	LAN 0 indicator		Not used.
7	Power failure indicator		Not used.
8	Overheat/fan fail indicator	~0~	Not used.

Expansion Module Rear Panel Features and Indicators	Figure 17 shows the connectors located on the rear panel of the expansion module. Table 11 describes each item.			
	Note: Ret exp po	er to the port numbering label on the back of the node and bansion module chassis to help you determine the correct rt connections.		
	Caution:	Do not disconnect any SAS cables from the node or expansion modules during normal system operation. Unplugging a SAS cable while the system is powered on may result in data loss.		

#### Chapter 2: Basic Operations Hard Drive Carrier Indicators

Figure 17 Expansion Module Rear View



#### Table 11 Rear Panel Connectors - Expansion Module

ltem	Description
1	Power supply 1
2	Power supply 2
3	(Top port) SAS connector (Bottom port) Not used

**Caution:** Never connect more than one SAS cable to an expansion module. Only connect a SAS cable to the top SAS port.

# **Hard Drive Carrier Indicators**

Each hard drive carrier has two LED indicators (see Figure 18):

- Drive activity indicator (blue)
  - Flashing Indicates hard disk drive activity.
- Drive failure indicator (red)
  - Continuously lit Indicates hard disk failure.

• Flashing - Indicates the RAID set is rebuilding.

**Note:** If a drive fails, you will be notified by an admin alert in the remote management pages (see <u>Admin Alerts</u> on page 201).

**Caution:** All drives are hot swappable. When replacing drives, never remove more than one drive at a time from a RAID set. After removing a drive, first wait one minute. Then insert a working drive and wait for the RAID set to finish rebuilding (red indicator light is off) before removing another drive. For information about RAID sets, see <u>Supported RAID Configurations</u> on page 13.

**Caution:** SSD drives can take up to 30 minutes to rebuild per drive. Do not remove an SSD drive or restart the system while an SSD drive is rebuilding.



### **Ethernet Port Indicators**

Each Ethernet port on the back panel has two LED indicators (see Figure 19):

• Link Indicator (green)

- **Continuously lit** Indicates the port is connected to the network.
- Off Indicates the port is not connected to the network.
- Activity indicator (amber)
  - Blinking Indicates network data is being sent or received.

Figure 19 Ethernet Port LEDs

#### 10GbE Ethernet Card LEDs

Depending on the configuration, Quantum DXi6500, Model 6550 systems include a 10GbE adapter card with dual CX4 ports or dual optical ports.

#### **10GbE Adapter With Dual CX4 Ports**

The 10GbE adapter with dual CX4 ports has two LED indicators, one corresponding to each 10GbE port (see <u>Figure 20</u>):

- Green Indicates the port is connected to the network.
- Yellow Indicates network data is being sent or received.
- Off Indicates the port is not connected to the network.



#### **10GbE Adapter With Dual Optical Ports**

The 10GbE adapter with dual optical ports has two LED indicators, one corresponding to each 10GbE port (see Figure 21):

- Green Indicates the port is connected to the network.
- Blinking Yellow Indicates network data is being sent or received.

The rate of blinking varies with the amount of data traffic. If a large amount of data is being sent or received, the LED may blink so rapidly it appears to be solid yellow.

• Off - Indicates the port is not connected to the network.

Figure 20 LEDs for 10GbE Adapter With Dual CX4 Ports Chapter 2: Basic Operations Power Supply Indicators

Figure 21 LEDs for 10GbE Adapter With Dual Optical Ports



## **Power Supply Indicators**

Each power supply has one LED indicator (see Figure 22):

- **Green** Indicates the power supply is turned on and operating correctly.
- Amber Indicates the power supply is turned off.
- Red Indicates power supply failure.

- Note: If a power supply fails, there are two different alert mechanisms. If the node power supply fails, there is an admin alert notification in the remote management pages (see Admin Alerts on page 201). If an expansion module power supply fails, the power supply emits an audible warning and the power supply LED turns red (no admin alert notification occurs). Expansion module power supplies should be checked periodically for audible and LED warnings.
- Caution: All power supplies are hot swappable. When replacing power supplies, never remove more than one power supply at a time from the node or an expansion module. Also, before you remove one power supply, make sure the other power supply is operating correctly (indicator LED is green).



#### Figure 22 Power Supply LED

### **Turning On and Shutting Down the System**

To turn on the system, first press the power button located on the front panel of all expansion modules in the system. (All expansion modules may be turned on in parallel.) After you have turned on all expansion

modules, wait 10 seconds, then press the power button located on the front panel of the node to turn on the node (see Figure 23).



To shut down the DXi6500 and DXi6700, you must use the remote management pages (see <u>Node Management</u> on page 250). Shutting down the system can take up to 15 minutes.

After the node shuts down, press the power button located on the front panel of all expansion modules to power down the expansion modules.

### **Locating Serial Numbers**

You will need the system serial number, the node serial number, and the expansion module serial number at various times:

- System Serial Number You need this number to contact Quantum Support or to add a licensed feature.
- Node Serial Number You need this number for a node replacement.
- Expansion Module Serial Number You need this number for an expansion module replacement.

You can locate the system serial number on the **Home** page of the remote management pages. It is located in the **System Details** section.

You can also locate the system serial number, the node serial number, and the expansion module by looking at the physical components.

- The system serial number is located on the label holder affixed to the lip on the rear of the node. The text **Service Call System Serial Number** appears on the label. The system serial number includes the letters **BVE**.
- The node serial number is located on the power supply blank below the two power supplies on the rear of the node. The text **Quantum Internal Use Only** appears on the label. The node serial number includes the letters **BSC**.
- The expansion module serial number is located on the lip of the rear of the expansion module. The text **Quantum Internal Use Only** appears on the label. The expansion module serial number includes the letters **BWA**.

**Note:** The system serial number also appears on the location ID label that is affixed to the lip on the rear of the node and each expansion module.

Chapter 2: Basic Operations Locating Serial Numbers



This chapter provides detailed explanations for several DXi6500 and DXi6700 concepts such as:

- Data Storage Presentation
- Data Deduplication Policy
- Data Replication
- <u>Recovering Data</u>
- <u>Network Segmentation</u>

### **Data Storage Presentation**

The DXi6500 can present itself to your host computers in the following ways:

- <u>Network Attached Storage (NAS)</u>
- OpenStorage (OST)

The DXi6700 can present itself to your host computers in the following way:

• Virtual Tape Library (VTL)

#### Network Attached Storage (NAS)

The DXi6500 can present itself to your host computers as Network Attached Storage (NAS). A NAS share can be configured on the DXi6500 so it can be used as a NAS appliance for backup purposes.



**OpenStorage (OST)** 

For Symantec NetBackup and Backup Exec users, another replication option is available for DXi6500 models through the Symantec Open Storage (OST) API. Specific versions of NetBackup and Backup Exec are required. For more details, refer to the *Symantec Veritas NetBackup OST Configuration Guide* or the *Symantec Backup Exec OST Configuration Guide*.



#### Virtual Tape Library (VTL)

A VTL can be configured on the DXi6700 to emulate or "appear" to your host computer as a tape library with tape drives and storage slots.



# **Data Deduplication Policy**

To enable data deduplication when you create a NAS share, select the **Enable Data Deduplication** check box on the **Add NAS Share** page. (The check box is selected by default.) After the NAS share is created, you cannot disable data deduplication for the share.

When data deduplication is enabled for a NAS share, there are two data deduplication policies to consider:

- Adaptive In-line Data Deduplication (Backup Window Not Defined)
- Deferred Processing Data Deduplication (Backup Window Defined)

Adaptive In-line Data Deduplication (Backup Window Not Defined) If you do not define a backup window for the NAS share or VTL partition, data deduplication is running all of the time. Backup data is sent to the DXi6500 and DXi6700 and deduplication is performed on

data as it is ingested. Data deduplication begins when the backup begins.

To use adaptive in-line data deduplication, clear the **Enable Backup Window** check box on the **Add NAS Share** or **Add VTL** page. (By default, **Enable Backup Window** is not enabled.)

**Note:** The data deduplication setting for OST storage servers is not configurable. It is always adaptive in-line data deduplication.

**Advantages** - The advantage of selecting adaptive in-line data deduplication is that there is no need to reserve any extra disk space for the backup, minimizing disk requirements, and replication of new blocks takes place while the backup is in progress.

**Disadvantages** - Because the system resources are always performing data deduplication while ingest is going on, there are situations in which the backup window can be negatively affected.

Deferred Processing Data Deduplication (Backup Window Defined) If you define a backup window for the NAS share or VTL partition, data deduplication is disabled for a specific time period which can boost ingest speeds and shorten the backup window. All of the backup data is sent to the DXi6500 and DXi6700 immediately in its raw form without deduplication. After the backup window is closed and data deduplication is re-enabled, the data that was moved during the backup windows is now deduplicated on the DXi6500 and DXi6700.

To use deferred processing data deduplication, select the **Enable Backup Window** check box on the **Add NAS Share** or **Add VTL** page, then specify the start and end times for the backup window.

Advantages - When all the system resources are dedicated to ingest, and data deduplication is deferred, ingest speeds can be boosted.

**Disadvantages** - The downside to any post processing approach is that some disk space must be reserved to hold the backup, and the replication of unique blocks will be delayed until data deduplication is begun.

Since the DXi6500 and DXi6700 allows users to select either mode on a share-by-share basis, it allows them to match the right data deduplication approach to specific jobs. For most user share and e-mail backup, for example, the adaptive approach makes the most sense, but when backing up a large, active database where the primary concern is
the shortest possible backup window, the deferred approach makes more sense.

## **Data Replication**

**Note:** The information in this section applies to native DXi6500 and DXi6700 replication. OST optimized duplication using NetBackup or Backup Exec is described separately (see <u>OST</u> <u>Optimized Duplication</u> on page 130).

Data replication is the process of creating and managing duplicate versions of your data. The replication process not only copies the data but also allows you to schedule the replication process so it can run automatically. For optimization purposes, the underlying data is continuously updated and will become available when the replication is either run manually or via a scheduled replication. When replication is configured on the DXi6500 and DXi6700, copies of data in a NAS share or VTL partition can be copied to a remote DXi system (see <u>Data</u><u>Replication</u> on page 213).



Dataset

This concept consists of the following sections:

- Data Replication Requirements
- Data Replication Processes

- <u>New DXi6500 and DXi6700 Installations</u>
- Directory/File Based Replication
- <u>OpenStorage (OST)</u>

## Data Replication Requirements

For data replication to operate:

- Only NAS shares, VTL partitions, or OST storage servers with data deduplication enabled can be replicated to another DXi system.
- Multiple source DXi systems can replicate to a single target; however, a source DXi system cannot replicate to multiple targets.

## Data Replication Processes

Data replication consists of two processes:

- <u>Continuous Replication</u>
- <u>Namespace Replication</u>

## **Continuous Replication**

**Continuous Replication** is the process of replicating deduplicated, unique data. Once configured, when backup data is ingested into the system, it is automatically (and continuously) replicated from the source to the target system.

## Namespace Replication

**Namespace Replication** is the process of sending the metadata associated with data at the start of each replication. The metadata is what is used to retrieve the data if its ever needed for a restore operation. Namespace replication begins when a replication is started either manually or during a scheduled replication. It is NOT automatic or part of the **Continuous Replication** process.

	Caution:	Restoring replicated data is dependant on the metadata stored in the namespace file. This file is updated after each replication that is completed successfully. You must schedule replication to occur regularly and often or manually run replication often enough to keep the namespace file up to date.
New DXi6500 and DXi6700 Installations	For a new share or V the on-der created an	DXi6500 or DXi6700 installation, or immediately after a new IL has been created, be sure to replicate the namespace (via nand <b>Replicate Now</b> function) for each share as soon as it is d before any data is written to it.
	This action namespace replication	establishes the namespace file on the target. Establishing the e file before any data is written will expedite the first that occurs after the first backup.
	Failure to r the first re you did rep important	eplicate the empty namespace is not fatal, but the speed of plication after the first backup will be up to twice as fast if plicate the empty namespace. This could be especially when backing up a significant amount of data.
Directory/File Based Replication	Directory/ replicates f replication This greath directory s	File Based Replication, when configured, automatically file data without user intervention or a schedule. The is "triggered" by a CLI command for file data (NAS share). y enhances replication performance since only the file or pecifically mentioned in the command is replicated.
	After a <b>Dir</b> automatica synchroniz shares that This will re date files c	ectory/File Based Replication, NAS share files are ally Recovered on the target system. You may also initiate a ation from the Source system to the Target system on NAS t have been configured for Directory/File Based Replication. place all files on the Target NAS share with the most up-to- on the Source system.
	Directory	/File Based Replication Process

The process for directory/file based replication is as follows:

- 1 Directory/File Based Replication is configured on both the Source and Target. Configuring the directory/file based replication consists of enabling Directory/File Based Replication on both the source and target systems and setting the Sync ID. The Sync ID is used to identify the corresponding target share that will receive the data replicated from this source share (see Source Role NAS Directory/File Based Replication Configuration on page 226 for more information).
- 2 Data is backed up to the NAS share.
- **3** A post backup script is executed that triggers the replication of specified files or directories in the NAS share.
- Note: For examples of post backup scripts, see <u>Directory/File Based</u> <u>Replication Post Backup Scripts</u> on page 237

**OpenStorage (OST)** 

For Symantec NetBackup or Backup Exec users with specific versions of the software, another replication option is available for DXi6500 models through the Symantec OpenStorage (OST) API. For more details, see <u>OST</u> <u>Optimized Duplication</u> on page 130 and refer to the *Symantec Veritas NetBackup OST Configuration Guide* or the *Symantec Backup Exec OST Configuration Guide*.

Note: For more information, see <u>OST Optimized Duplication</u> on page 130.

## **Recovering Data**

When replication is enabled and configured, two copies of the data exist, the original on the source system and a copy on the target system. If the data on the source is destroyed or corrupted, the replicated copy on the target system can be accessed through the **Recover** process or through the **Failback** and **Recover** process (for more detailed information on data recovery, see <u>Recovering Replicated Data</u> on page 275).

This section is divided into the following sections:

- <u>Recovery Processes</u>
- <u>Recovery Requirements</u>
- <u>Recovery Features</u>

#### **Recovery Processes**

The differences between these two data recovery processes are explained in the following sections:

- <u>Recover Process</u>
- <u>Failback and Recover Process</u>

#### **Recover Process**

The **Recover** process is used when the source system where the original data stored is unavailable or the original data is corrupted. The **Recover** process takes the metadata on the target system and creates a copy of this data in a new NAS share. This new NAS share will now be accessible for use on the Target system.

## **Failback and Recover Process**

The **Failback** and **Recover** process is used when the source system has been replaced or the original data on the source system has been corrupted or destroyed. This process takes the data from the target system and copies it back to the source system. This data once copied to the source system must be recovered before it can be accessible.

## **Recovery Requirements**

The following items are required for recovering data:

- CIFS NAS shares can only be recovered to identical CIFS shares.
- NFS NAS shares can only be recovered to identical NFS shares.
- VTL partitions can only be recovered to VTL partitions.
- Recovered VTL partitions must have tape drive types that are identical to those in the original partition so that the media is compatible.

• For VTL partitions, you cannot recover media with barcodes that duplicate barcodes in an already-active partition on the source.

#### **Recovery Features**

Up to 24 replicated versions of a NAS share can exist on the target system.

- Up to 24 replicated versions of a VTL partition or NAS share can exist on the target system.
- The 24 versions represent the 24 most recent replications.
- You can selectively delete versions to keep some longer than the default 24 replications.
- You can failback and recover any one of those 24 versions.

Note: Replication of VTL partitions to DXi6500 is not supported.

## **Network Segmentation**

Network segmentation provides the ability to split your network into subnetworks or segments. There are two main purposes for segmenting your network:

- Separate Physical Interfaces If your network is physically partitioned with no connectivity between the partitions, the DXi6500 and DXi6700 needs the ability to communicate with each partition individually.
- Combine or Separate Network Traffic Network traffic is either separated according to specific network needs or combined on a single IP address for simplicity. The DXi6500 and DXi6700 has the capability of separating data traffic, replication traffic, and management traffic. Each traffic type can have its own IP address or they can be combined on a single IP address.

Some DXi network settings and configuration combinations can have wide ranging and subtle effects throughout the server and storage ecosystem. Possible negative effects of improper configuration range from sub-optimal performance to "silent" network problems that are hard to diagnose. In general, the simplest configuration that meets your requirements is preferred. The guidelines below are presented in sequence from basic through advanced.

All configuration items described are located in the DXi6500 and DXi6700 remote management pages, on the **Configuration > Network** > **IP** page and the **Configuration > Network > Segmentation and Bonding** page.

The recommendations and configurations presented below assume that the DXi6500 or DXi6700 system is being deployed in an environment that is not VLAN managed, or in a VLAN managed environment that is properly configured for visibility to the DXi.

If your specific requirements cannot be met using any of the configurations described below, please contact Quantum Customer Support for additional options.

<u>Chapter 5, DXi6500 and DXi6700 Configuration</u> contains descriptions of the network segmentation options, however, refer to the following sections for network segmentation recommendations:

- General Recommendations
- <u>DXi6500 and DXi6700 Segmentation Options</u>
- DXi6500 Performance Guidelines

## General Recommendations

When considering the use of network segmentation, refer to the following general recommendations:

## **Avoid Segmentation Where Possible**

Segmentation options are provided for use in environments where it is required to separate management, data, and replication traffic, but in most cases this is not necessary and simply introduces unneeded configuration complexity.

## Avoid LACP

While the use of LACP (Link Aggregation Control Protocol) to manage the allocation of traffic across bonded DXi ports is supported as an advanced configuration option, its use is discouraged. LACP configuration can be complex, and improper configuration can render your system inaccessible.

## **Use Round Robin**

Where possible, use of balanced Round Robin (Mode zero) bonds is preferred for simplicity. Round Robin refers to the method used by the DXi system to balance outbound data transmission. It has no effect on data reception inbound to the DXi system. Inbound traffic is controlled by the load balancing algorithm within the upstream Ethernet switch. Based on the switch algorithm in use, traffic observed inbound to the DXi system may or may not appear balanced. This is normal.

## DXi6500 and DXi6700 Segmentation Options

The following network segmentation recommendations are listed in order of complexity:

- <u>Basic Network Recommendations</u>
- Intermediate Network Recommendations
- <u>Advanced Network Recommendations</u>

## **Basic Network Recommendations**

Basic network configurations do not include network segmentation, do not require switch re-configuration, and conform to the <u>General</u> <u>Recommendations</u> on page 51. No Segmentation means that data, replication, and management traffic may use the same network. If your network policies require separation of replication or management traffic, continue to the <u>Advanced Network Recommendations</u> on page 54.

# DXi6500, Model 6510 (2 x 1GbE Ports) and DXi6500, Models 6520, 6530, and 6540 (6 x 1GbE Ports) and DXi6700 (2 x 1GbE Ports)

If less than 1Gb per second (~450GB/hr) of performance is required, follow these steps. Otherwise proceed to the <u>Intermediate Network</u> <u>Recommendations</u> on page 53.

- 1 For Segmentation, select BOND ALL (Not segmented).
- 2 For Bonding, select Round Robin (Mode 0).

**3** Connect a single DXi Ethernet port (ETH0 preferred) to your switch and configure IP information appropriately on the **IP** page.

# DXi6500, Model 6550 (2 x 1GbE Ports and 2 x 10GbE Ports) -10GbE Connectivity Not Available

If single 1Gb port connectivity meets requirements, follow these steps. Otherwise proceed to the <u>Intermediate Network Recommendations</u> on page 53.

- 1 For Segmentation, select BOND ALL 1Gb (Not segmented).
- 2 For Bonding, select Round Robin (Mode 0).
- **3** Connect a single DXi 1Gb Ethernet port (ETH0 preferred) to your switch and configure IP information appropriately on the **IP** page.

# DXi6500, Model 6550 (2 x 1GbE Ports and 2x 10GbE Ports) - 10GbE Connectivity Is Available

If single 10Gb connectivity is desired and meets requirements, follow these steps. Otherwise proceed to the <u>Intermediate Network</u>. <u>Recommendations</u> on page 53. Use of multiple 10Gb connections is currently not recommended.

- 1 For Segmentation, select BOND ALL 10Gb (Not segmented).
- 2 For Bonding, select Round Robin (Mode 0).
- **3** Connect a single DXi 10Gb Ethernet port (ETH4 preferred) to your switch and configure IP information appropriately on the **IP** tab.

## **Intermediate Network Recommendations**

Intermediate network configurations do not include segmentation, but do require switch re-configuration and conform to the <u>General</u> <u>Recommendations</u> on page 51. No Segmentation means that data, replication, and management traffic may use the same network. If your network policies require separation of replication or management traffic, continue to the <u>Advanced Network Recommendations</u> on page 54.

# DXi6500, Model 6510 (2 x 1GbE Ports) and DXi6500, Models 6520, 6530, and 6540 (6 x 1GbE Ports) and DXi6700 (2 x 1GbE Ports)

If multiple 1Gb port connectivity is required, follow these steps:

1 For Segmentation, select BOND ALL (Not segmented).

- 2 For Bonding, select Round Robin (Mode 0).
- **3** Connect multiple DXi Ethernet ports (ETH0–ETH1 for DXi6500 Model 6510, or ETH0–ETH5 for DXi6500 Models D6520, 6530, and 6540) to your switch based on your requirements. Configure IP information appropriately on the **IP** page.
- 4 Contact your network administrator to create a **Round Robin** compatible Link Aggregation Group on the switch encompassing all connected ports.

## DXi6500, Model 6550 (2 x 1GbE Ports and 2 x 10GbE Ports) -10GbE Connectivity Not Available

If dual 1Gb port connectivity meets requirements, follow these steps:

- 1 For Segmentation, select BOND ALL 1Gb (Not segmented).
- 2 For Bonding, select Round Robin (Mode 0).
- **3** Connect both DXi 1Gb Ethernet ports (ETH0 and ETH1) to your switch and configure IP information appropriately on the **IP** page.
- 4 Contact your network administrator to create a **Round Robin** compatible Link Aggregation Group on the switch encompassing the ports connected to ETH0 and ETH1.

# DXi6500, Model 6550 (2 x 1GbE Ports and 2x 10GbE Ports) - 10GbE Connectivity Is Available

For simplicity, use of both 10GbE ports simultaneously is discouraged. Configuration recommendations for the use of bonded 10GbE ports are unique to the type of 10Gb switch used. Contact Quantum Customer Support for specific guidance if you require dual-10GbE connectivity.

## Advanced Network Recommendations

Advanced configurations include segmentation for separation of data, management, and replication traffic, but otherwise conform to the <u>General Recommendations</u> on page 51. Switch configuration changes may be required. Note that segmentation is discrete. For example, if an option indicates **ETH0 (Replication) BOND ALL-1 (Management/Data)**, replication traffic will exclusively traverse port ETH0, and Management and Data traffic will exclusively traverse ETH1.

## DXi6500, Model 6510 (2 x 1GbE Ports) and DXi6500, Models 6520, 6530, and 6540 (6 x 1GbE Ports) and DXi6700 (2 x 1GbE Ports)

For advanced network configuration, follow these steps:

- 1 For **Segmentation**, select the appropriate configuration option to isolate traffic as necessary.
- 1 For Bonding, select Round Robin (Mode 0).
- 2 Connect the required Ethernet ports (ETH0–ETH1 for DXi6500 Model 6510, or ETH0–ETH5 for DXi6500 Models 6520, 6530, and 6540) to your switch. Configure IP information appropriately on the IP page.
- **3** If a **Bonded** configuration was selected under **Segmentation**, contact your network administrator to create a Round Robin compatible Link Aggregation Group on the switch encompassing the bonded ports.

## DXi6500, Model 6550 (2 x 1GbE Ports and 2 x 10GbE Ports) -10GbE Connectivity Not Available

For advanced network configuration, follow these steps:

- 1 For Segmentation, select BOND ALL 1Gb (Replication/ Management/Data).
- 2 Connect both DXi 1Gb Ethernet ports (ETH0 and ETH1) to your switch and configure IP information appropriately on the IP page.
- **3** Switch configuration changes are required. Contact your network administrator to create a Round Robin compatible Link Aggregation Group encompassing the bonded ports.

# DXi6500, Model 6550 (2 x 1GbE Ports and 2x 10GbE Ports) - 10GbE Connectivity Is Available

For advanced network configuration, follow these steps:

- 1 For **Segmentation**, select the appropriate configuration option to isolate traffic as necessary.
- 2 For Bonding, select Round Robin (Mode 0).
- **3** Connect the required Ethernet ports to your switch and configure IP information appropriately on the **IP** page.

For simplicity, use of both 10GbE ports simultaneously is discouraged. Configuration recommendations for the use of

bonded 10GbE ports are unique to the type of 10Gb switch used. Contact Quantum Customer Support for specific guidance if you require dual-10GbE connectivity.

4 Contact your network administrator to create a Round Robin compatible Link Aggregation Group on the switch corresponding to each group of bonded ports.

## DXi6500 Performance Guidelines

When connecting to a DXi6500 using NFS, each backup file/job written concurrently to the DXi6500 is considered a stream. For optimal performance, Quantum recommends 6–8 streams per host (media server).

The recommended number of hosts (media servers) varies by model (see <u>Table 12</u>).

Table 12DXi6500 NFSPerformance Guidelines

DXi6500 Model	Network Connectivity	Hosts/Streams
Model 6510	2 x 1GbE	2–4 hosts / 6–8 streams per host
Model 6520	6 x 1GbE	6–12 hosts/ 6–8 streams per host
Model 6530 and 6540	6 x 1GbE	6–12 hosts/ 6–8 streams per host
Model 6550	2 x 10GbE	6–12 hosts (1Gb) / 6–8 streams per host

# Chapter 4 DXi6500 and DXi6700 Remote Management

The DXi6500 and DXi6700 systems utilizes a Web-based interface which allows you to configure and manage the system from a remote workstation on the same network. The DXi6500 and DXi6700 systems are managed through the following Web pages (accessible using Internet browser software installed on the host computer):

- <u>Chapter 4, DXi6500 and DXi6700 Remote Management</u> allows you to configure and view the status of all system components.
- <u>Chapter 5, DXi6500 and DXi6700 Configuration</u> allows you to set up information about the DXi6500 and DXi6700 systems such as NAS shares, VTL partitions, network configuration, date and time settings, and passwords.
- <u>Chapter 6, DXi6500 and DXi6700 Status</u> allows you to view the status of the hardware components and system performance.
- <u>Chapter 7, DXi6500 and DXi6700 Alerts</u> allows you to view admin alerts, required actions, and service tickets.
- <u>Chapter 8, DXi6500 and DXi6700 Data Services</u> allows you to view and configure the space management options replication services.
- <u>Chapter 9, DXi6500 and DXi6700 Utilities</u> allows you to upload software, download diagnostic files, and shutdown or restart the system.

## DXi6500 and DXi6700 Web Pages

The Internet browser software is not supplied with the DXi6500 and DXi6700 systems; you must obtain and install it independently. The DXi6500 and DXi6700 systems support the following Internet browsers:

**Note:** For correct operation of the software, disable any pop-up blockers and enable JavaScript in your Web browser.

#### Windows

- IE 6.x or later
- Firefox 2.x or later

## Linux

• Firefox 2.x or later

## Solaris

• Firefox 2.x or later

## DXi6500 and DXi6700 Web Page Menu Items

<u>Table 13</u> lists the menu items, commands, and information available from the DXi6500 and DXi6700 Web pages. The menus below are valid for both the DXi6500 and DXk6700 systems except where noted.

Table 13 DXi6500 and DXi6700 Web Page Menu Items

Home Menu	
System Details	Version
	Serial Number

	Model Number	
	Data Reduction Statistics	Total Data Reduced
		Total Reduction Ratio
		Reduced Size
	Cumulative Replication Statistics	Total Data Sent
		Total Bytes Sent
		Average Send Rate
		Total Bytes Received
		Average Receive Rate
Quick Status	Hostname	
	IP Address	
	Capacity	
	Available	
	Used	
Data reduced by		
NAS Data Services (DXi6500 Only)	Total shares	
	Data Deduplication	Status
		Enabled on
		Disabled on
	Replication	Status
		Scheduled on
		Not scheduled on

VTL Data Services	Total partitions			
	Data Deduplication	Status		
		Enabled on		
		Disabled on		
	Replication	Status		
		Scheduled on		
		Not scheduled on		
Configuration Menu				
NAS & OST (DXi6500 Only)	NAS	Summary		
		Add		
		Edit		
		Delete		
	OST	Storage Servers	Summary	
			Add	
			Edit	
			Delete	
		LSU	Summary	
			Add	
			Edit	
			Delete	
		OST Client Plug-In		
	Windows Domain	Domain Type	Active Directory	
			Workgroup	
		Domain/Workgroup Name		

	Primary Domain Controller	
	Organizational Unit	
	Administrator Name	
	Administrator Password	
Access Control	Summary	
	Add	
	Edit	
	Delete	
Advanced Setting	Enable Opportunistic Locking	

VTL (DXi6700 Only)	VTL	Summary
		Add
		Edit
		Delete
	Create Media	
	Media Actions	Summary
		Virtual Actions
	Partition Actions	Mode
		Move
		Unload
	Host Access	Groups
		Add
		Edit
		Delete
		Hosts
		Targets
		Target Usage
PTT (Available only on DXi6500 Model 6540 Model 6550, and DXi6700)	Physical Device Discovery	
	Backup Application Specific	Summary
		Add
		Edit
		Delete
	Initiator and Ports	
Network	General	Hostname

		Domain Search Path
	IP	IP Address
		Netmask
		Default Gateway IP Address
		Primary DNS IP Address
		Secondary DNS IP Address
		Tertiary DNS IP Address
	Segmentation and Bonding	Segmentation
		Bonding
Date & Time	Manual	
	Use NTP	
	<b>T</b> :	
	limezone	
	Time Format	
Security	Time Format Passwords	Monitor Password
Security	Time Format Passwords	Monitor Password Administrator Password
Security	Time Format Passwords	Monitor Password Administrator Password CLI Monitor Account
Security	Time Format Passwords	Monitor Password Administrator Password CLI Monitor Account CLI Administrator Account
Security	Time Format Passwords SSL	Monitor Password Administrator Password CLI Monitor Account CLI Administrator Account Properties
Security	Time Format Passwords SSL	Monitor Password Administrator Password CLI Monitor Account CLI Administrator Account Properties Certificate
Security	Time Format Passwords SSL Login Session	Monitor Password         Administrator         Password         CLI Monitor Account         CLI Administrator         Account         Properties         Certificate         Session Configuration
Security	Time Format Passwords SSL Login Session Recipients	Monitor Password Administrator Password CLI Monitor Account CLI Administrator Account Properties Certificate Session Configuration Summary
Security	Time Format Passwords SSL Login Session Recipients	Monitor Password         Administrator         Password         CLI Monitor Account         CLI Administrator         Account         Properties         Certificate         Session Configuration         Summary         Add

		Delete	
	Server	Host Name or IP Address	
		From Email Address	
	Test	Send	
	Email Home	Schedule	
		On Demand	
SNMP	Destinations	Summary	
		Add	
		Edit	
		Delete	
	Community	Summary	
		Add	
		Edit	
		Delete	
	Test	Send	
Contacts	Company	Company Information	
	Primary	Primary Contact Information	
	Secondary	Secondary Contact Information	
Status Menu			
Hardware	Summary	Node 1	System Board
			Network Ports
		Common	Storage Arrays
	Details	Node 1	System Board
			Network Adapters

## Chapter 4: DXi6500 and DXi6700 Remote Management DXi6500 and DXi6700 Web Pages

		Common	Storage Arrays
System	CPU		
	RAID		
	Ethernet		
	Data Deduplication		
	Ingest		
	Disk Usage		
VTL	Physical View		
	Logical View		
	Performance View		
Alerts Menu			
Alerts	Admin Alerts		
	Service Tickets		
Data Services Menu			
Space Management	General	Start	
		Stop	
		Refresh	
	Schedule	No Schedule	
		Daily at	
		Weekly on	
Replication	Source Role	General	Host Name or IP Address
		NAS (or VTL on DXi6700 Only)	Edit
			Check Readiness
			Replicate/Abort

			Synchronize/Abort
			File Based Queue
		Actions	Replication Service
			Replication State
			Replication Performance
	Target Role	General	Host Name or IP Address
			Replicated Snapshots
		NAS (or VTL on DXi6700 Only)	Replicated Shares (Partitions on DXi6700)
			Recovery Jobs
			Failback Jobs
			Directory/File Based Targets (Cartridge Based on DXi6700)
		Actions	Replication Performance
	Reports	<b>Replication Report</b>	
Utilities Menu			
Software	Browse		
	Upload		
	Activate		
Diagnostics	System		
	Storage Array		
	Healthchecks	General	
		Status	
		Schedule	

Analyzer	Network	Performance
		Settings
	Disk	
Node Management	Reboot	
	Shutdown	
	Reset Diagnostic State	
License Keys	New Key	

## Accessing DXi6500 and DXi6700 Web Pages

To access the DXi6500 and DXi6700 web pages:

**Note:** If the DXi6500 and DXi6700 system web pages are idle for more than 10 minutes, the system logs off the user.

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

The default IP address is: **10.1.1.1**. This IP address can be changed during installation using the Setup Wizard.

The Login page displays (see Figure 24):

Chapter 4: DXi6500 and DXi6700 Remote Management Accessing DXi6500 and DXi6700 Web Pages



## **3** Select the login type and enter the appropriate password.

Login Type	Default Password	Description
Monitor	password	The monitor user is allowed to view the DXi6500 and DXi6700 system management pages, but cannot change them.
Administrator	password	The administrator user can both view and change the management pages.
		Multiple administrators can log on to the system at the same time, so it is possible for the actions of one administrator to overwrite the actions of another.

**Note:** The passwords are limited to 15 characters. All alpha numeric characters, \_ and - are allowed.

4 Click Login.

The Home page displays (see Figure 25):





## Using the DXi6500 and DXi6700 Web Pages

The first page that displays after you login to the DXi6500 and DXi6700 web pages is the system **Home** page (see <u>Figure 25</u>).

**Note:** Disk statistics are not maintained on a "moment-to-moment" basis and should be used for planning purposes only.

**Caution:** When using the remote management pages, never doubleclick the **Apply**, **OK**, or any other button. Doing so could result in performing an action twice, for example, creating two NAS shares instead of one. Make sure to click buttons only once.

The Home page contains the following sections:

- <u>Contents Section</u>
- Quick Status Section
- Data Reduced By Section
- System Details Section
- NAS Data Services Section
- <u>System Status Information</u>

Table 14 Contents Section

## **Contents Section**



## Table 15 Quick Status Section

## **Quick Status Section**

\_

Status: Normal	Info	The quick status section displays the system status, hostname, IP address, and provides storage capacity
Hostname:	volante	information (see Disk Usage on
IP address:	10.40 100.208	page 74). The <b>Status</b> information
Capacity:	32.00 TB	describes the current state of the
Available:	29.81 TB 🕐	system. Clicking the Info button links
Used:		you to the <b>Hardware Status</b> page.
2.18 T	B (6.83%)	, , , , , , , , , , , , , , , , , , , ,

# Table 16 Data Reduced By Section

## Data Reduced By Section

Data reduced by: 8.17%	The data reduced by section displays the current data reduction status. The percentage reduced indicates the total amount of data reduction through both compression and data deduplication.
------------------------	---

Table 17 System Details Section

## **System Details Section**

/stem Details 😢	
DXi6	500
Version: 1.3_65 (Build 3229-32233)	
Serial Number :	SV0
Model Number :	6520
Data Reduction St	atistics 2
Total Data Reduced:	81.10 TB
Total Reduction Ratio:	39.31x
Reduced Size:	2.06 TB
Cumulative Replic	ation Statistics 🕐
Total Data Sent :	123.37 TB
Total Bytes Sent :	1.77 TB
Average Send Rate :	1.71 MB/sec
Total Bytes Received :	492.51 GB
Augusta Deseive Dete	2.76 MB/000

The **System Details** section displays general system information such as the software version, serial number, and model number (see <u>Model</u> <u>Number</u> on page 75)

Note: Disk statistics are not maintained on a "moment-tomoment" basis and should be used for planning purposes only.

The **Data Reduction Statistics** area displays the amount of data ingested before reduction and after reduction, as well as the reduction ratio (see <u>Data Reduction Statistics</u> on page 76).

#### The Cumulative Replication

**Statistics** area displays the total data sent and received, as well as the average send and receive rates (see <u>Cumulative Replication Statistics</u> on page 76).

## Table 18NAS Data ServicesSection

#### NAS Data Services Section

Status : Norma	I Statu		
	Jun	s:	Pause
Enabled on: 12 share	es Sche	duled on :	8 share
Disabled on : 2 share:	s Not s	cheduled (	on: 6 share
Info	Info		

The **NAS Data Services** section displays the NAS data deduplication and replication status.

#### **Data Deduplication**

The **Data Deduplication** area displays the following information:

- Status The data deduplication status.
- Enabled on The number of NAS shares that have data deduplication enabled.
- **Disabled on** The number of NAS shares that do not have data deduplication enabled.

Click the **Info** button in the **Data Deduplication** area to display the **NAS Configuration** page.

#### Replication

The **Replication** area displays the following information:

- Status The replication status.
- Enabled on The number of NAS shares that have replication scheduled.
- Disabled on The number of NAS shares that do not have replication scheduled.

Click the Info button in the Replication area to display the NAS Source Role Replication page. Table 19 System Status<br/>InformationSystem Status ButtonsAdminTicket

The system status buttons display at the top of the **Home** page.

- Admin The Admin button turns yellow when an administrator alert has occurred. The administrator alert description displays on the Alerts page.
- Ticket The Ticket button turns yellow when open service tickets are present. The service ticket description displays on the Alerts page.

## Disk Usage

The quick status section displays the following disk usage information:

- Capacity Total raw storage minus space reserved for system use.
- Used Total space occupied by all of the following:
  - Deduplicated data
  - Data waiting to be deduplicated
  - Data not intended for deduplication
  - Data eligible for reclamation
  - System metadata
- Available Capacity minus Used space.

**Note:** Note that the **Used** space includes data eligible for reclamation. Therefore, it may appear that your system is using more space than expected. Space is only reclaimed as necessary to allow for optimal performance in the event you need to restore your data.

## **Model Number**

The **Model Number** displays in the **System Details** section on the **Home** page. The model number indicates the specific hardware configuration of the DXi6500.

<u>Table 20</u> describes the DXi6500 and DXi6700 hardware configuration that is indicated by each model number.

Table 20 DXi6500 Model Number	DXi6500 Model Number	DXi6500 Configuration
	6510	1 RAID controller card
		2 x 1GbE Ethernet ports
	6520	2 RAID controller cards
		6 x 1GbE Ethernet ports
	6530	4 RAID controller cards
		6 x 1GbE Ethernet ports
	6540	4 RAID controller cards
		6 x 1GbE Ethernet ports
		2 x 8Gb Fibre Channel ports
	6550	4 RAID controller cards
		2 x 1GbE Ethernet ports
		2 x 10GbE Ethernet ports
		2 x 8Gb Fibre Channel ports
	DXi6700 Configuration	
	4 DAID constraller conde	

4 RAID controller cards

- 2 x 1GbE Ethernet ports
- 4 x 8Gb Fibre Channel ports

## **Data Reduction Statistics**

The **Data Reduction Statistics** area displays the following information:

- **Total Data Reduced** The original, native size of all existing data that has been processed by the data deduplication and compression engines.
- Total Reduction Ratio The total reduction ratio of all existing data that has been processed by the data deduplication and compression engines (Total Data Reduced by Reduced Size).
- **Reduced Size** The final, reduced size of all existing data that has been processed by the data deduplication and compression engines.
- **Note:** Because these values are calculated as data is deduplicated and compressed, they will not be completely up-to-date until all data that is eligible for deduplication is processed by the data deduplication and compression engines.

## **Cumulative Replication Statistics**

The **Cumulative Replication Statistics** area displays the following information:

- **Total Data Sent** The original, native size of the data transferred during replication or failback. This value does not indicate the amount of bytes that actually crossed the network during replication or failback.
- Total Bytes Sent, Total Bytes Received The number of bytes actually transferred over the network during replication or failback. These values are usually much less than the native size due to the benefits of data deduplication.
- Average Send Rate, Average Receive Rate The average number of bytes actually transferred over the network during replication or failback. These values are calculated as the total number of bytes

sent or received (in MB/ second) divided by the amount of time required to complete replication or failback.

**Note:** The Cumulative Replication Statistics can be cleared on the **Source Role Actions** and the **Target Role Actions** pages (see <u>Source Role Actions</u> on page 227 and <u>Target Role Actions Page</u> on page 238).

Chapter 4: DXi6500 and DXi6700 Remote Management Cumulative Replication Statistics

# DXi6500 and DXi6700 Configuration

Use the Configuration pages to set or configure the following areas of the DXi6500 and DXi6700:

- VTL Configuration (DXi6700 Only)
- <u>NAS & OST Configuration (DXi6500 Only)</u>
- PTT Configuration
- Network Configuration
- Date and Time Configuration
- <u>Security Configuration</u>
- Email Configuration
- SNMP Configuration
- Contacts Configuration

To access the **Configuration** pages, from the contents frame, click the Configuration menu.

Chapter 5

## VTL Configuration (DXi6700 Only)

The VTL page is divided into five areas:

- Default VTL Partition
- <u>Creating Partitions</u>
- Creating Media
- Media Actions
- Partition Actions
- <u>Configuring Host Access</u>

Default VTL Partition The DXi6700 c

The DXi6700 comes pre-configured with a default VTL partition that is ready for immediate use. The default partition information is as follows:

- Partition Name: DXi6700vtl
- Model: Quantum DXi6700
- Drive Model: IBM LTO-4
- Drives: 6
- Storage Slots: 100
- Starting Barcode: AA0000
- Media Type: LTO-4
- Media Size: 50 GB
- Number of Media: 100
- De-Duplication: Enabled

If you wish to modify or delete this partition, refer to the following sections.
# **Creating Partitions**

Partitioning provides the capability to divide the DXi6700 virtual tape drives and storage elements into separate partitions, usable by separate host computers. The **Partitions** page contains a list of assigned tape drives as well as all user defined partitions currently configured on the system. This page also contains the ability to add, edit, and delete partitions.

To access the **Partitions** page:

1 Click **Partitions** located at the top of the **VTL** page.

The Partitions page displays (see figure 26).

#### Figure 26 Partitions Page



The Partitions page is divided into the following sections:

- <u>Summary</u>
- Adding a Partition
- Edit a Partition
- Delete a Partition
- <u>General</u>

#### Summary

The **Summary** page displays the maximum number of partitions, the total number of tape drives, and the number of assigned tape drives. The **Summary** page also provides a list of configured partitions on the system. Click the link in the **Name** column to edit the specific partition.

**Note:** Clicking the Information button displays a window that provides additional partition information such as policy based backup window start and end time as well as the replication schedule.

# **Adding a Partition**

Up to 64 partitions can be added to a DXi6700 system.

- **Caution:** Ensure that your backup package is properly configured for the correct number of tape drives emulated in the DXi6700 system partition. Failure to do so may cause your backup application to malfunction or cease to operate.
- **Note:** If you are planning to replicate partitions to another DXi system, you must ensure that every partition name and barcode number on the system is unique. You can NOT have duplicate partition names or barcode numbers on a DXi6700 system or on a system receiving a replicated partition.

To add a partition:

**Note:** To edit or delete a partition, the partition must be off-line.

1 From the **Partition** page, click **Add** to add a partition to the system.

The Add Partition page displays (see figure 27).

Figure 27 Adding a Partition Page

Quantum.	Admin Ticket DX; 6700
	Monday, July 19, 2010 6:17:11 AM America/Los_Angeles (PDT) Administrator Login Logout 2. Help
Home	VTL PTT Network Date & Time Security Email SNMP Contacts
Configuration	Partitions Create Media Media Actions Partition Actions Host Access
Status	Partition Configuration
Alerts	Summary Add Edit Delete General
Data Services	Add Partition
Utilities	Maximum Storage Slots per Partition: 9000
Status: Normal Info	Maximum Allowed Virtual Tape Drives: 80     Virtual Tape Drives: 84signed: 6     Available Virtual Tape Drives: 74
IP address:	Partition Settings
Capacity: 24.00 TB Available: 23.97 TB	Name:
Used:	Library Model: Quantum DXi6/00 V
54.25 60 (0.1470)	Virtual Tape Drive Model: Quantum DLT-S4
Data reduced by: 35.19%	Number of Virtual Tape Drives:
,	Policy Based Data Deduplication Settings <ul> <li>Enable Data Deduplication - Cannot enable/disable Data Deduplication once partition is created.</li> <li>Enable Backup Window - Data Deduplication is Disabled daily during this time window.</li> <li>Backup Window Start Time: 09              <ul></ul></li></ul>

2 Enter a Name that identifies it so it can be distinguished from other partitions on the DXi6700 system.

**Note:** The partition name is independent of the host name in the **Network** tab (see <u>Network Configuration</u> on page 150).

- **3** Select a Library Model to determine the inquiry string returned from the DXi6700 system.
  - **Note:** Selecting a library model does not restrict the number of slots or drives in a partition. Library emulation is not a representation of a physical library.

**Note:** If you have created a partition with the library emulation string of DXi6700, this partition cannot be recovered on another DXi-Series product unless that target system is running software version 1.4.1 or later.

The following library models are available:

- ATL P1000, ATL P7000, or ATL M2500
- Quantum PX500 or Quantum PX720
- ADIC Scalar 100, ADIC Scalar i500, or ADIC Scalar i2000
- ADIC Pathlight VX
- Quantum DXi6700 or Quantum DXi7500
- Quantum DX3000 or Quantum DX5000

If you select a library such as the **ATL P1000 or ATL P7000**, the DXi6700 appears as the appropriate library to the host and backup application. If you select **Quantum DXi6700** the host and backup application recognize the devices as a **Quantum DXi6700**.

Note: Quantum recommends that the device configuration be set to Quantum DXi6700 inquiry strings for improved performance. If your backup application does NOT support DXi6700, the next best choice would be ATL P1000 or ATL P7000.

4 Select the Number of Storage Slots for this partition.

**Note:** The number of I/E slots created will equal the number of storage slots created, up to 240 I/E slots.

**Caution:** Ensure that your backup package is properly configured for the correct number of storage slots in the DXi6700 system partition. Failure to do so may cause your backup application to malfunction or cease to operate.

**5** Select the **Virtual Tape Drive Model** available to the host and backup application in this partition.

The following tape drives are available:

- Quantum DLT7000, SDLT 320, SDLT 600, or DLT-S4
- HP LTO-1, LTO-2, LTO-3, and LTO-4
- IBM LTO-1, LTO-2, LTO-3, and LTO-4
- Certance LTO-2, and LTO-3

Note: Only one drive type can be configured per partition.

6 Enter the Number of Drives for this partition.

**Note:** If all tape drives are assigned to other partitions, you must unassign one or more tape drives to make them available for a new partition.

- 7 Select Enable De-Duplication (Adaptive In-line de-duplication) to enable de-duplication for this partition. By default, de-duplication is not enabled. Once the partition has been created, de-duplication cannot be enabled or disabled for this partition.
- 8 Select Enable Backup Window (Deferred Processing de-duplication) to enable de-duplication for a particular time period. By default, Enable Backup Window is not enabled.

Note: De-Duplication will NOT occur during the backup window.

- **a** Using the drop down boxes, select the start time for the backup window.
- **b** Using the drop down boxes, select the end time for the backup window.
- 9 Click Apply to create the partition.

Confirm the partition is properly configured on the **Confirmation** screen.

10 Click Yes to continue.

After confirming the partition configuration, the process to add the partition begins. A progress indicator is displayed until the partition creation action is complete.

After the partition has been created, map the Ethernet/Fibre Channel ports as described in <u>Configuring Host Access</u> on page 102.

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

# **Edit a Partition**

To edit a partition:

Note: If the partition is online, a button is displayed to take the partition offline.

1 From the **Partition** page, click the link for the partition you wish to edit or select the Edit tab.

The Edit Partition page displays (see figure 28).

Figure 28 Editing a Partition	Quantum.	Admin Ticket DX; 6700
raye		Friday, June 18, 2010 8:47:13 AM America/Los_Angeles (PDT) Administrator Login Code
	Home	VTL PTT Network Date & Time Security Email SNMP Contacts
	Configuration	Partitions Create Media Media Actions Partition Actions Host Access
	Status	Partition Configuration 2
	Alerts	Summary Add Edit Delete Deneral
	Data Services	Edit Partition
	Utilities	Maximum Allowed Partitions: 64     Partitions Defined: 0     Maximum Strange Slids are Partition: 9000
	Status: Normal Info	Maximum Allowed Virtual Tape Drives: 80     Virtual Tape Drives: Assigned: 0     Available Virtual Tape Drives: 80
	Hostname: grumpy IP address: 10.40.166.149	
	Capacity: 56.00 TB Available: 55.98 TB 2	Partition Settings Name:
	17.79 GB (0.03%)	Library Model: Quantum DX07500
		Vidual Tana Drive Medel: UDA 170 4
	Data reduced by: 0.00%	Number of Virtual Tape Drives:
		Policy Based Data Deduplication Settings
		Enable Data Deduplication - Cannot enable/disable Data Deduplication once partition is created.
		Enable Backup Window - Data Deduplication is Disabled daily during this time window.
		Backup Window Stati Time: 12 Y : 00 Y AM Y
		Apply Reset Cancel

- 2 Edit the partition information as desired (see Adding a Partition on page 82 for descriptions of the fields).
  - **Note:** You cannot change a partition name, drive type, or deduplication policy. To edit a different partition, select the partition from the **Name** box.

**Note:** If you want to reduce or delete slots from the partition, they must be removed or deleted from the end of the slot range. Example: for a partition with 30 slots and you want to remove 10 slots, they must be slots 20 through 30.

3 Click Apply.

Confirm the partition is properly configured on the **Confirmation** screen.

- 4 Click **Yes** to continue. Click **No** to if the partition information is incorrect.
- 5 Return the partition to the on-line state (see Mode on page 97).

The partition is updated.

# **Delete a Partition**

To delete a partition:

**Note:** If the partition is online, a button is displayed to take the partition offline.

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

The **Delete Partition** page displays (see <u>figure 29</u>).

Chapter 5: DXi6500 and DXi6700 Configuration VTL Configuration (DXi6700 Only)

Figure 29 Deleting a Partition Page



2 Select the partition you want to delete.

**Note:** Tape drives must be empty before a partition can be deleted and all media must be deleted. Partitions containing media cannot be deleted.

3 Click **Delete** to delete the partition.

Confirm the partition deletion action on the **Confirmation** screen.

4 Click **Yes** to continue. Click **No** to cancel the partition deletion action.

After confirming the delete partition action, the process to delete the partition begins. A progress indicator is displayed until the partition deletion action is complete.

**Note:** Clicking the **Information** button displays a window that provides additional partition information such as policy based backup window start and end time as well as the replication schedule.

The partition is deleted.

# General

When a tape is moved from a Storage Slot to an I/E Slot, depending on the **Auto Export** setting, the media:

- will be removed from the virtual I/E slot, if **Auto Export** is enabled. (default)
- will remain in the virtual I/E slot, if **Auto Export** is disabled.

# **Creating Media**

The **Create Media** page allows you to create virtual media for a specific partition. Once created, these cartridges are available for backing up data. The media type, capacity, starting barcode, and initial location are also configured from this page.

**Note:** It is possible to oversubscribe space on the DXi6700 system. The sum total of capacity for all media could be more than the capacity of the system.

To access the Create Media page:

1 Click Create Media located at the top of the VTL page.

The Create Media page displays (see figure 30).

Chapter 5: DXi6500 and DXi6700 Configuration VTL Configuration (DXi6700 Only)

Figure 30 Create Media Page

Quantum.	Admin Ticket	DX <i>i</i> 6700
	Friday, June 18, 2010 9:12:53 AM America/Los_Angeles (PDT) Administrator Login	Logout ? Help
Home	VTL PTT Network Date & Time Security Email SNMP Contacts	
Configuration	Partitions Create Media Media Actions Partition Actions Host Access	
Status		
Alerts	Create Virtual Media for vtl01	
Data Services	Partition : vtl01	
Utilities	Virtual Library Model: Quantum DX7500 Virtual Tape Drive Model: Quantum DLT-S4 Total Media: 0	
Status: Normal Info Hostname: IP address:	Total Storage Stots:     10       Empty Storage Stots:     10       Total IE Stots:     10       Empty I/E Stots:     10	
Capacity: 56.00 TB Available: 55.98 TB 2 Used: 17.74 GB (0.03%) Data reduced by: 0.00%	Initial Location: Storage Slot   Number of Media:  (1 to 10) Starting Barcode:  (A-Z, 0-9) Media Type: SDLT   Media Capacity:  Native Size: SDLT1, 160 GB Custom Size:  Apply Reset	

- 2 Select the Partition where the media will be created.
- **3** Select the tape cartridge **Initial Location**. The initial location is where the cartridge is stored when created. The location can be configured for either an import/export slot or storage slot.

**Note:** You cannot initially create more cartridges than the number of available slots. Example: If 50 I/E slots are available, you cannot create 60 cartridges with the initial location of I/E slots.

- 4 Enter the Number of Media to create for this partition.
- 5 Enter the Starting Barcode.
  - **Note:** Any alpha-numeric string can be entered for the starting barcode and will be incremented accordingly. AA will become AA0000, AA0001, AA0002, and so forth. Starting barcode values with less than 6 characters will be padded with 0's. Alpha characters must be capitalized. Lower case alpha characters are not accepted.
- 6 The **Media Types** available are determined by the type of drive selected when the partition was added.

7 The Media Capacity is determined by the cartridge type selected. Custom Capacity can be selected for any cartridge type. To enter a custom capacity, select Custom Size and enter the capacity required for each tape cartridge.

Note: Minimum and maximum values are displayed when the cartridge type is selected.

8 Click Apply to create the media.

The cartridges are created and are available on the DXi6700 system.

### **Media Actions**

The Media Actions page allows you to import, export, and remove virtual cartridges from a virtual library. This page also provides access control over virtual cartridges.

To access the Media Actions page:

1 Click Media Actions located at the top of the VTL page.

The Media Actions page displays (see figure 31).

Figure 31 Media Actions Page	Quantum.	Admin Ticket DX;6700
		Friday, June 18, 2010 9:14:57 AM America/Los_Angeles (PDT) Administrator Login
	Home	VTL PTT Network Date & Time Security Email SNMP Contacts
	Configuration	Partitions Create Media Media Actions Partition Actions Host Access
	Status	
	Alerts	Summary Virtual Actions
	Data Services	Media Summary
	Utilities	Barcode Partition Type State Pool Used (%) Capacity No media found .
	Status: Normal Info Hostname: IP address: Capacity: 55.00 TB Available: 55.98 TB ? Used: 17.74 GB (0.03%)	
	Data reduced by: 0.00%	

The **Media Actions** page is divided into the following sections:

- <u>Summary</u>
- Virtual Actions

#### **Summary**

The **Summary** page allows you to view all virtual cartridges in the system.

To access the Summary page:

1 Click **Summary** located at the top of the **Media Actions** page.

The **Summary** page displays (see <u>figure 32</u>).



Note: You can click the Barcode, Partition, Media Type, Access, Pool, Used (%), and Capacity (GB) column headings to sort the rows in the media by the data in the respective column. Click the column heading again to invert the sorting sequence from ascending order to descending order.

**Note:** Clicking the **Information** button displays a window that provides additional cartridge information such as previous and current position.

#### Table 21 Summary Information

Column	Description
Barcode	This column list the barcode number for the tape cartridge.
Partition	This column lists the partition name where the tape cartridge is located.
Туре	This column lists the tape cartridge type, LTO or SDLT.
State	This column lists the tape cartridge state (see <u>table 22</u> ).
Pool	This column lists the type of cartridge pool such as application, cleaning, service, or unknown.
Used (%)	This column lists the percentage of the tape cartridge that is used.
Capacity (GB)	This column lists the total capacity of the tape cartridge.

## Table 22 Media States

Column	Description
Scratch	Newly created virtual media or virtual media that has been recycled with no data on it.
Virtual	Virtual media with data on it.
Virtual, Mounte d	Virtual media with data that is mounted on a tape drive.
Vaulted	Virtual media with data that has been exported from a virtual partition. Data is still intact on the virtual media.
Exported	Virtual media with no data that has been exported from a virtual partition. Media has to be in this state before it can be deleted from the DXi6700 system.

-----

1 4 11

# **Virtual Actions**

The **Virtual Actions** page allows you to perform specific actions on the pure virtual media in the DXi6700 system.

To access the Virtual Actions page:

1 Click Virtual Actions located at the top of the Media Actions page.

The Virtual Actions page displays (see figure 33).

Home       Configuration         Status       Alerts         Data Services       Utilities         Status       Security (Intal Actions)         Utilities       Security (Intal Actions)         Status       Recycle - Recycle media for thick you with to imagorite date.         Pattorn: Work Protect (WP) - Sected media rouble or which you with to change the write protect attribute.         Status       Recycle - Recycle media for which you with to change the write protect attribute.         Write Protect (WP) - Sected media rouble or write you with to change the write protect attribute.         Tr.74 GB (00.3%)         Tr.74 GB (00.3%)         Bate nedword (P) 0.0%         Bate nedword (P) 0.0%	Home       VIL PTT letwork Date & Time Security Email SMMP Contacts         Configuration       Status         Aterts       Data Services         Utilities       Status:         Itematication Security Email SMMP Contacts       Particle Total Actions         Status:       Alerts         Data Services       Utilities         Status:       Detete Selected media must be in exported table.         Detete Selected media must be in exported table.       Export of tables.         Detete Selected media must be in exported table.       Export of tables.         Detete Selected media for which you wish to change the write protect attitude.       Betted media must be in exported table.         Detete Selected media for which you wish to change the write protect attitude.       Betted media must be in exported table.         Detete Selected form each you wish to change the write protect attitude.       Betted media must be in exported table.         Detete Selected form each you wish to change the write protect attitude.       Betted media must be in exported table.         Detete Selected form each you wish to change the write protect attitude.       Betted media must be in exported table.         Detete Selected for media to write you wish to change the write protect table.       Betted media must be in exported table.         Better Total Actions       Better Total Actions       Better Total Action you you with to modia ana	Figure 33 Virtual Actions Page	Quantum.	Admin Ticket DX/6700
			Home Configuration Status Alerts Data Services Utilities Utilities Normal info Hostname: IP address: Capacity: 56 00 TB Available: 55 99 TB 12 Used: 17.74 GB (0.03%)	Priday.June 18. 2010 9.17.12 AM AmericaLos_Angeles (PDT)       Administrator Login       Lozod       * Held         VIL PTT       Network       Date & Time       Security       Email       SNMP       Contacts         Partitions       Create Redia       Media Actions       Partition Actions       Host Access         Partition:       virual Actions       Partition Actions       Host Access         Select Action to Apply to Media:         Delete Selected media must be in exported state.         Select Action to Apply to Media:         Select Action to Apply to Media:         Selected media must be in exported state.   <

See <u>Table 23</u> for a list of actions that can be performed on pure virtual media in the DXi6700 system

Note: You can click the Barcode, Partition, WP, Access, Used (%), and Capacity column headings to sort the rows in the media by the data in the respective column. Click the column heading again to invert the sorting sequence from ascending order to descending order. **Note:** Clicking the **Information** button displays a window that provides additional cartridge information such as previous and current position.

Field	Description
Deleting Media	The <b>Delete</b> action deletes media from the partition (see <u>Deleting Media with Data</u> on page 96 for more information). <i>Selected media must be in exported state</i> .
Exporting Media	The <b>Export</b> action removes a cartridge from the virtual media changer and lists it in an exported state (see <u>Exporting Media</u> on page 96).
Recycling Media	The <b>Recycle</b> action recycles (erases) media so they can be reused by the partition.
Write Protecting (WP) Media	The <b>Write Protect</b> action allows you to enable or disable write protection for media.
Importing Virtual Media	Select media that you wish to import into the selected partition. <i>Media in exported or vaulted states may be imported from any partition with compatible media type and de-duplication settings.</i> (see Importing Media on page 97).

- 1 To reduce the number of media displayed on the Virtual Actions page, enter a barcode that the system can use to filter the media. For example, entering LTO\* in the Barcode Filter edit box would only display media with barcode beginning with LTO. If more than 500 barcodes are in the partition, the list of media will be displayed over several pages.
- 2 Click Apply.

Confirm the virtual action on the **Confirmation** screen.

Table 23 Virtual Actions

- 3 Click Yes to continue. Click No to cancel the virtual action.
- 4 After confirming the virtual action, the process to execute the virtual action begins. A progress indicator is displayed until the virtual action is complete.

The selected virtual actions are performed.

### **Deleting Media with Data**

To delete media with data:

- 1 From the Virtual Actions page, select the cartridges you want to delete.
- 2 Select Recycle from the Action to Apply to Media list.
- 3 Click Apply.

The selected cartridges are recycled for reuse.

- 4 Select the cartridges you just recycled and select **Export** from the **Action to Apply to Media** list.
- 5 Click Apply.

The selected cartridges are exported.

- 6 Once the cartridges are exported, you can now delete the data from the cartridges. Select the cartridges you just exported and select **Delete** from the **Action to Apply Media** list.
- 7 Click Apply.

The data is now deleted from the selected cartridges.

# **Exporting Media**

The **Export** action is used when the backup application is unable to export the cartridge(s)

To export a cartridge:

- 1 Select the cartridges to export and select **Export** from the **Action to Apply to Media** list.
- 2 Click Apply.

The selected cartridges are exported.

# **Importing Media**

**Importing Virtual Media** brings cartridges (exported or vaulted) into the partition.

To import media into a partition:

1 Select the cartridges that you want to import into a partition and select **Import Virtual Media** from the **Action to Apply to Media** list.

**Note:** The cartridges must be in an exported or vaulted state before they can be imported into a partition.

2 Click Apply.

The cartridges are imported into the partition.

# **Partition Actions**

The Partition Actions page is divided into the following sections:

- Mode
- Move
- <u>Unload</u>

### Mode

The **Mode** page allows you to turn individual partitions online or offline. To access the **Mode** page:

1 Click Mode located at the top of the Partition Actions page.

The **Mode** page displays (see <u>figure 34</u>).

Chapter 5: DXi6500 and DXi6700 Configuration VTL Configuration (DXi6700 Only)

Figure 34 Mode Page



The **Mode** page lists all of the configured partitions on the DXi6700 system. The **Name**, **Current Mode** (online or offline), and **Serial Number** is displayed.

**Note:** Clicking the Information button displays a window that provides additional partition information such as policy based backup window start and end time as well as the replication schedule.

To turn a partition online or offline:

1 Select the partition checkbox to turn the partition online or leave un-selected to turn the partition offline.

The partition mode is changed to reflect the new online or offline status.

### Move

The **Move** page allows you to move a tape cartridge from a source (slot, port, or drive) to a destination (slot, port, or drive). The destination can only be in the same partition.

To access the Move page:

1 Click Move located at the top of the Partition Actions page.

#### Chapter 5: DXi6500 and DXi6700 Configuration VTL Configuration (DXi6700 Only)

The Move page displays (see <u>figure 35</u>).

Figure 35 Move Page	Quantum.	Admin Ticket DX; 6700
		Friday, June 18, 2010 9:21:29 AM America/Los_Angeles (PDT) Administrator Login Logout ? Help
	Home	VTL PTT Network Date & Time Security Email SNMP Contacts
	Configuration Status	Partitions Create Media Media Actions Partition Actions Host Access
	Alerts	Mode Move Unload
	Data Services Utilities	Move Media       • Cannot move media if partition is Online.       Partition:       VID1       Partition:
	Status: Normal info Hostname: mufasa IP address: 10.40.166.153 Capacity: 56.00 TB Available: 55.98 TB ? Used: 17.74 GB (0.03%) Data reduced by: 0.00%	Source: Show Location Type: Storage Slot  Force Unload (Virtual Tape Drives) Barcode Location Index WP Access Used (%) No Media Present in the Selected Elements of this Partition. Drive 0 (SN VD015V10248VE09371) Drive 1 (SN VD025V10248VE09371)
		Barcode Filter Apply Filter 2 Apply Reset
	To move a tape	e cartridge:

1 In the **Source** section:

**Caution:** Moving or unloading operations may impact backup jobs.

**Note:** The partition must be offline before moving a tape cartridge.

**Note:** You cannot move a cartridge from a deduplication enabled partition to a deduplication disabled partition.

- **a** Click the **Offline** button to turn the partition offline.
- **b** Select the source **Partition** from the drop down box.
- c Select the location type to display (Tape Drive, Storage Slot, or I/E Slot).

- **d** To force drives to unload prior to ejecting a tape cartridge out of a drive, select the **Force Unload** (**Drives**) checkbox.
- e Select the tape cartridge in the source partition to move.
- 2 In the **Destination** section:
  - a Select the location type to display (Drive, Storage Slot, I/E or Slot).

**Note:** Destination lists empty storage slots, I/E slots, and drives. Offline drives are NOT included in the list. Drives may be offline if they have not been mapped to a host.

**3** To reduce the number of tape cartridges displayed on the **Move** page, enter a barcode that the system can use to filter the tape cartridges. For example, entering **LTO**\* in the **Barcode Filter** edit box would only display tape cartridges with barcode beginning with LTO.

**Note:** Click the **Quick Tip** icon next to the **Barcode Filters** box for examples of acceptable barcode filters.

**Note:** The page will include tabs when over 100 barcodes are available.

4 Click Apply.

The tape cartridge is moved.

# Unload

The **Unload** page allows you to perform a bulk unload of media from I/E slots or drives.

To access the Unload page:

1 Click **Unload** located at the top of the **Partition Actions** page.

The **Unload** page displays (see <u>figure 36</u>).

#### Chapter 5: DXi6500 and DXi6700 Configuration VTL Configuration (DXi6700 Only)

#### Figure 36 Unload Page



To unload media:

**Caution:** Do NOT unload media while a backup to the drive is in process. This will cause the backup to fail.

1 Click the **Offline** button to turn the partition offline.

**Note:** The partition must be offline before unloading a tape cartridge.

- 2 Select the source Partition from the drop down box.
- 3 Select the location type to display (Drive or I/E Slot).
- **4** To force drives to unload prior to receiving a tape cartridge, select the **Force Unload (Drives)** checkbox.
- **5** Select the tape drive(s) or I/E/ slot(s) to unload. Media is moved to a previous storage slot if available. Otherwise, the media is moved to the first available storage slot.

6 To reduce the number of tape cartridges displayed on the Unload page, enter a barcode that the system can use to filter the tape cartridges. For example, entering LTO\* in the Barcode Filter edit box would only display tape cartridges with barcode beginning with LTO.

**Note:** Click the **Quick Tip** icon next to the **Barcode Filters** box for examples of acceptable barcode filters.

**Note:** The page will include tabs when over 500 tape cartridges are available.

#### 7 Click Apply.

A confirmation page displays. The time of the operation depends on the number of cartridges moved.

The tape cartridge(s) are unloaded.

## Configuring Host Access

The **Host Access** page is used to allow Fibre Channel hosts (initiators) to communicate with virtual medium changers and tape drives on the DXi6700 system. In addition, the **Host Access** page allows you to add, edit, and delete hosts as well as view the system's Fibre Channel target ports.

**Note:** If you do not create and associate a **Host Access Group** with a partition, the virtual devices will not be visible from the host and drives cannot be destinations for move operations.

To access the Host Access page:

1 Click Host Access located at the top of the VTL page.

The Host Access page displays (see figure 37).

#### Chapter 5: DXi6500 and DXi6700 Configuration VTL Configuration (DXi6700 Only)

#### Figure 37 Host Access



The Host Access page is divided into the following sections:

- Groups
- <u>Add</u>
- <u>Edit</u>
- Delete
- Hosts
- <u>Target</u>
- <u>Target Usage</u>

#### Groups

**Host Access Groups** are the mechanism by which you allow backup hosts to access virtual devices on your DXi6700 system. Host Access Groups are associated with a partition, host (Fibre Channel initiator on your SAN), and port (Fibre Channel Target on your DXi6700 system). From that association, you allow the host to access one or more devices in the partition via different Host LUNs on the port. If you wish to allow multiple hosts to access devices belonging to the same partition, you must create separate host access groups for each host.

To access the Groups page:

1 Click Groups located at the top of the Host Access page.

### The Groups page displays (see figure 38).

Figure 38 Groups Page	Quantum.		Admin Ticket	DX <i>i</i> 6700
		Friday, June 18, 2010 9:24:58 AM America/Los_Angeles (PDT)	Administrator Login	Logout ? Help
	Home	VTL PTT Network Date & Time Security Email SNMP Cont	acts	
	Configuration	Partitions Create Media Media Actions Partition Actions Host Access		
	Status	Host Access 2		
	Alerts	Groups Add Edit Delete Hosts Targets Target Usage		
	Data Services	Host Access Groups		
	Utilities	Partition : All Partitions		
	Status: Normal Info Hostname:	Partition Name Group Name Host Target Devices No host access groups have been added.		
	IP address: Capacity: 56.00 TB Available: 55.98 TB ? Used: 17.74 GB (0.03%)			
	Data reduced by: 0.00%			

**2** Select a partition from the drop down box to view the host access groups associated with that partition.

# Add

The Add page is used to add a host access group to the DXi6700 system.

**Note:** FC ports 1 and 3 are used for VTL host connections.

To access the Add page:

1 Click Add located at the top of the Host Access page.

The Add page displays (see figure 39).

#### Chapter 5: DXi6500 and DXi6700 Configuration VTL Configuration (DXi6700 Only)

#### Figure 39 Add Page

Quantum.		Admin Ticket	DX/6700
Quantum.         Home         Configuration         Status         Alerts         Data Services         Utilities         Status:         Normal         Info         Hostname:         IP address:         Capacity:       55.90 TB         Vuset:         17.74 GB (0.03%)	Filday, June 18, 2010 9:27:19 AM AmericaLos_Angeles (PDT)         VIL       PTT       Network       Date & Time       Security       Email       SNM         Partitions       Create Media       Media Actions       Partition Actions       Hot         Hotst Access       0       Groups       Add       Edit       Delete       Hotsts       Targets       Target Use         Add Host Access       Group       Partition:       MI01       ¥         Partition:       MI01       ¥       Group Name :       ¥         Host:       WWPN=2100001b328ae9e ¥       Target:       Node 1: FC0       ¥         Use CCL (not common) ?       ¥       ¥       Host Access       10         VIC       VL01SV1024BVE09371       0       1       1	Admini         Ticket           Administrator Login         I           IP         Contacts           set Access         I           Node 1 Target Ports (in bold)         I           ET+0         FC2         I           ET+1         FC3         I	DX; 6700
Data reduced by: 0.00%	VTD VD02SV1024BVE09371 💟 2 Apply Reset Cancel		

To add a Host Access Group:

- 1 Select a partition from the **Partition** drop down box.
- 2 Enter a Group Name for the host access group.
- **3** Select a host from the **Host** drop down box.

**Note:** You must configure a host before a host will be available from the **Host** drop down box (see <u>Hosts</u> on page 109).

- 4 Select a Fibre Channel port from the **Target** drop down box.
- 5 The CCL (Command and Control LUN) is:
  - Not used in most environments.
  - Recommended for Host Access Groups containing an HP-UX Host.
  - Sometimes used if Hosts that are not assigned to any Host Access Group exist in the SAN.
  - Only accessible to Hosts through LUN 0.

If you are not sure whether you should use the CCL, please contact Quantum Customer Service.

- Note: Checking this box under Add will cause a Command/ Control LUN to appear automatically as LUN 0 (it is always LUN 0, unconditionally). Unchecking it will cause the existing devices to shift back such that the first device (typically the first VMC) is LUN 0.
- 6 Select the check boxes for the media changer and tape drives that you would like added to the host access group.

The Host LUN assignment is displayed next to the device.

7 Click Apply to add the host access group to the DXi6700 system.

A confirmation page displays.

8 Click Yes to continue.

After confirming the host access group configuration, the process to add the host group begins. A progress indicator is displayed until the host access group creation action is complete.

The host access group is added.

# Edit

The Edit page is used to edit a host access group.

To access the Edit page:

1 Click Edit located at the top of the Host Access page.

The **Edit** page displays (see <u>figure 40</u>).

#### Figure 40 Edit Page

Quantum.		Admin Ticket	DX:6700
Home	VTL         PTT         Network         Date & Time         Security         Email         S	Administrator Login L	oqout ? <u>Heip</u>
Configuration Status Alerts	Partitions Create Media Media Actions Partition Actions Host Access @ Groups Add Edt Delete Hosts Targets Target	Host Access	
Data Services Utilities	Edit Host Access Group Partition :	Node 1 Target Ports (in bold)	FC0
Status: Normal Info Hostname: IP address:	Host: Target: Use CCL (not common) @	ETH1 FC3	FC1
Capacity: 56.00 TB Available: 55.98 TB ? Used: 17.74 GB (0.03%)	Device         Host Access           Type Serial Humber         Allow         LUH           No partitions exist         Apply         Reset         Cancel		
Data reduced by: 0.00%			

- 2 To edit a host access group:
  - a Select a partition from the Partition drop down box.
  - **b** Select a group name from the **Group Name** drop down box.
  - **c** Select/deselect the check boxes for the media changer and tape drives tat you would like added/removed to/from the host access group.

The LUN assignment is displayed next to the device.

- 3 The CCL (Command and Control LUN) is:
  - Not used in most environments.
  - Recommended for Host Access Groups containing an HP-UX Host.
  - Sometimes used if Hosts that are not assigned to any Host Access Group exist in the SAN.
  - Only accessible to Hosts through LUN 0.

If you are not sure whether you should use the CCL, please contact Quantum Customer Service.

- **Note:** If the CCL check box was previously unchecked, checking it it will have the same effect as checking it under the **Add** page, shifting the LUNs incrementally to make room for a new LUN 0. If the CCL check box was previously checked, unchecking it will shift the LUNs back decrementally only if this is a basic configuration.
- 4 Click **Apply** to save the changes to the host access group.

A confirmation page displays.

5 Click Yes to continue.

After confirming the host access group configuration, the process to edit the host group begins. A progress indicator is displayed until the host access group edit action is complete.

The host access group is saved.

# Delete

The **Delete** page is used to delete a host access group from the DXi6700 system.

To access the **Delete** page:

1 Click **Delete** located at the top of the **Host Access** page.

The **Delete** page displays (see <u>figure 41</u>).

#### Figure 41 Delete Page

Quantum.		Admin Ticket	DX;6700
Home	Friday, June 18, 2010 10:21:44 AM America/Los_Angeles (PDT)           VTL         PTT         Network         Date & Time         Security         Email         SNMP	Administrator Login	Logout ? Help
Configuration Status Alerts	Partitions Create Media Media Actions Partition Actions Host. Host Access @ Groups Add Edit Delete Hosts Targets Target Usage	Access	
Data Services Utilities	Delete Host Access Group         Node 1           Partition:         9           Group Name:         9	Target Ports (in bold)	
Status: Normal Info Hostname:	Host: Target:	FC3	FC1
Capacity: 56.00 TB Available: 55.98 TB ? Used: 17.74 GB (0.03%)	Type Serial Number / Alow LUN No partitions exist.		
Data reduced by: 0.00%			

- 2 To delete a host access group:
  - a Select a partition from the **Partition** drop down box.
  - **b** Select a group name from the **Group Name** drop down box.
  - c Click **Delete** to remove the host access group.

A confirmation page displays.

3 Click Yes to continue.

After confirming the host access group deletion, the process to delete the host access group begins. A progress indicator is displayed until the host access group deletion action is complete.

The host access group is removed from the DXi6700 system.

#### Hosts

The **Hosts** page is used to discover and add Fibre Channel hosts to the available host list for the DXi6700 system.

**Note:** You must add a host to the host list before you can associate a host group with a partition.

**Caution:** If you are connecting the DXi6700 directly to a host without using a Fibre Channel switch, you must know the WWPN connecting to each DXi6700 port. If you do not have this information, the system (medium changer and tape drives) will not display on the device manager.

To access the Hosts page:

1 Click Hosts located at the top of the Host Access page.

Quantum. Admin Friday, June 18, 2010 10:23-13 AM Americal Los Angeles (PDT) Administrat

The **Hosts** page displays (see <u>figure 42</u>).

Quantum.	Admin Ticket DX/6700	
Home	Friday June 18, 2010 10:23:13 AM Americal Los_Angeles (PDT) Administrator Login Logout ? Help	
Configuration Status	Partitions Create Media Media Actions Partition Actions Host Access	
Alerts Data Services Utilities	Hosts Page 1 August 1	
Status: Normal info Hostname: IP address: Capacity: 55.00 TB Available: 55.98 TB ? Used: 17.74 GB (0.03%) Data reduced by: 0.00%	WWPN     Alias     Connection Status       Add :	

2 To add a host:

**Note:** If you don't see the world wide name (WWN) of your host, ensure that the host is connected to the system FC port and click **Refresh Hosts**.

- a Click Refresh Host to display the available hosts.
- b Enter the World Wide Port Name (WWPN) in the WWPN box.
- c Enter an alias for the new host in the Alias box.
- d Click Apply to add the host.

# Figure 42 Hosts Page

A confirmation page displays.

e Click Yes to continue.

After confirming the host configuration, the process to add the host begins. A progress indicator is displayed until the host addition action is complete.

The new host is added.

# Target

The Target page is used to view the current target configuration.

To access the **Target** page:

1 Click **Target** located at the top of the **Host Access** page.

The **Target** page displays (see <u>figure 43</u>).

Figure 43 Target Page	Quantum.			Admin Ticket	DX; 6700
		Friday, June 18, 2010 10:24:49 AM America/Los_A	ngeles (PDT)	Administrator Login	Logout ? Help
	Home	VTL PTT Network Date & Time Se	curity Email SNMP Conta	icts	
	Configuration	Partitions Create Media Media Actions	Partition Actions Host Access		
	Status	HOST ACCESS 2			
	Alerts	Groups Add Edit Delete Hosts	Targets Target Usage		
	Data Services	Targets	Node 1 Target Ports (in bol	d)	
	Utilities	Node         Alias         WWPN           1         FC0         500e09e200130110           1         FC2         500e09c200130112	ETH0 FC2	FC0	
	Status: Normal Info	Reset Target(s) ?	ETH1 FC3	FC1	
	Hostname: IP address:				
	Capacity: 56.00 TB Available: 55.98 TB ? Used: 17.74 GB (0.03%)				
	Data reduced by: 0.00%				

The **Fibre Channel** targets display the **Node**, **Alias**, and **WWPN** for the currently configured targets.

# Target Usage

The **Target Usage** page is used to view current target and device mappings for the node.

To access the Target Usage page:

1 Click Target Usage located at the top of the Host Access page.

The Target Usage page displays (see figure 44).

Figure 44 Target Usage Page	Quantum.		Admin Ticket	DX <i>i</i> 6700
		Friday, June 18, 2010 10:26:04 AM America/Los_Angeles (PDT)	Administrator Login	Logout ? Help
	Home	VTL PTT Network Date & Time Security Email SNMP Con	tacts	
	Configuration	Partitions Create Media Media Actions Partition Actions Host Access		
	Status	Host Access 2		
	Alerts	Groups Add Edit Delete Hosts Targets Target Usage		
	Data Services	Target Usage Node 1 Target Ports (in bold)		
	Utilities			
	Status: Normal into Hostname: P address: Capacity: 56.00 TB Available: 55.98 TB ? Used: 17.74 GB (0.03%) Data reduced by: 0.00%	FC0     FC2       ETHI     FC3	FC0 FC1	

The Fibre Channel ports are listed with the virtual devices (VMC and VTDs) mapped to the ports.

# NAS & OST Configuration (DXi6500 Only)

The DXi6500 has the ability to serve as a NAS appliance or OST storage server for backup purposes. Use the **NAS & OST** page to configure NAS shares as well as OST storage servers.

The NAS & OST page contains the following tabs:

- <u>NAS Configuration</u>
- OST Configuration
- <u>Windows Domain Configuration</u>

•	Access	Control	Config	uration

<u>Advanced Setting</u>

To access the NAS & OST page, from the Configuration menu, click the NAS & OST tab.

**NAS Configuration** The DXi6500 has the ability to serve as a NAS appliance for backup purposes. Use the **NAS** page to add, edit, or delete NAS shares.

**Note:** If this is a Windows NAS share, you must configure the Windows domain (see <u>Windows Domain Configuration</u> on page 132) prior to creating your NAS share.

**Caution:** Filenames on NAS shares are limited to a length of 256 bytes. If a filename uses Japanese characters, the filename can be no longer than 85 characters. This is because each Japanese character is represented by 3 bytes.

To access the **NAS** page:

1 From the NAS & OST page, click the NAS tab.

**Note:** Ensure that the node is online before continuing with the NAS configuration.

The NAS page contains the following tabs:

- <u>Summary Page</u>
- Add NAS Share
- Edit NAS Share
- Delete NAS Share

#### **Summary Page**

To access the NAS share Summary page:

1 On the NAS page, click the Summary tab.

The NAS Shares Summary page displays (see Figure 45).

# Chapter 5: DXi6500 and DXi6700 Configuration NAS & OST Configuration (DXi6500 Only)

### Figure 45 NAS Shares Summary Page

Quantum.				Admi	n Ticket	DXi	6 <b>500</b>
	Monday, September 14, 20	009 7:31:48 Ar	merica/Los_Angeles (PDT)			Administrator L	.ogin
Home	NAS & OST PTT N	letwork E	ate & Time Security	Email SNMP	Contacts		
Configuration	NAS OST Window	rs Domain	Access Control Advance	ed Setting			
Statua	NAS Shares 2						
Status	Summary Add	Edit Delete	à				
Alerts							
Data Services	MAS Shares Sur     Maximum Si     Shares Creater	mmary hares: 128 ated: 14					
Ounties	<ul> <li>NFS Shares</li> <li>CIFS Shares</li> </ul>	Created: 8 5 Created: 6					
Status:	NFS Shares     CIFS Shares     Share Name	Created: 8 s Created: 6	Export Dath	Data Dodunlication	Rackup Window	Dormissions	Access
Status: Attention Info Hostname: vectra	NFS Shares     CIFS Shares     Share Name     Check	Created: 8 Created: 6 Protocol	Export Path	Data Deduplication	Backup Window	Permissions Read & Write	Access
Status: Attention Info Hostname: vectra IP address:	NFS Shares     CIFS Shares     Share Name     Check     check	Protocol NFS CIFS	Export Path /Q/shares/check /Q/shares/check-cifs	Data Deduplication Enabled Enabled	Backup Window Disabled Disabled	Permissions Read & Write Read & Write	Access all hosts all users
Status: Attention Info Hostname: vectra IP address:	NFS Shares     CIFS Shares     Share Name     Check     i check-cifs     tb_nbu_nfs2	Protocol NFS CIFS NFS	Export Path /Q/shares/check /Q/shares/check-cifs /Q/shares/b_nbu_nfs2	Data Deduplication Enabled Enabled Enabled	Backup Window Disabled Disabled Disabled	Permissions Read & Write Read & Write Read & Write	Access all hosts all users all hosts
Status: Attention Info Hostname: vectra IP address: Capacity: 24.00 TB Available: 4.05 TD 2	NFS Shares     CIFS Shares     Share Name     check     check     th_nbu_nfs2     vectradfs1	Protocol NFS CIFS NFS CIFS CIFS	Export Path /Q/shares/check /Q/shares/check-cifs /Q/shares/tb_nbu_nfs2 /Q/shares/tectracifs1	Data Deduplication Enabled Enabled Enabled Enabled	Backup Window Disabled Disabled Disabled Disabled	Permissions Read & Write Read & Write Read & Write Read & Write	Access all hosts all users all hosts all users
Status: Attention Info Hostname: vectra Paddress: Capacity: 24.00 TB Available: 4.05 TB ?? Vecto	NFS Shares     CIFS Shares     CIFS Shares     Share Name     check     check     check-cifs     tb_nbu_nfs2     ivectracifs1     ivectracifs1	Protocol NFS CIFS NFS CIFS CIFS CIFS CIFS CIFS	Export Path /Q/shares/check /Q/shares/beck-cifs /Q/shares/bectracifs1 /Q/shares/vectracifs1	Data Deduplication Enabled Enabled Enabled Enabled Enabled	Backup Window Disabled Disabled Disabled Disabled Disabled	Permissions Read & Write Read & Write Read & Write Read & Write Read & Write	Access all hosts all users all hosts all users all users
Status: Attention Info Hostname: vectra IP address: Capacity: 24.00 TB Available: 4.95 TB ?? Used: 10.05 TB (78.00%)	NFS Shares     CIFS Shares     CIFS Shares      Share Name     theck     theck     theck-cifs     th_nbu_nts2     vectracifs1     vectracifs2     vectracifs2	Protocol NFS CIFS NFS CIFS CIFS CIFS CIFS CIFS CIFS CIFS CI	Export Path /Q/shares/check /Q/shares/th_nbu_nfs2 /Q/shares/th_nbu_nfs2 /Q/shares/vectraclfs1 /Q/shares/vectraclfs2 /D/shares/vectraclfs2	Data Deduplication Enabled Enabled Enabled Enabled Enabled Enabled	Backup Window Disabled Disabled Disabled Disabled Disabled 21:00 to 05:00	Permissions Read & Write Read & Write Read & Write Read & Write Read & Write Read & Write	Access all hosts all users all hosts all users all users all users
Status: Attention Info Hostname: vecra IP address: Copacity: 24.00 TB Available: 4.95 TB (?) Used: 19.05 TB (?9.40%)	NFS Shares     CIFS Shares     CIFS Shares     Share Name     t check     t check-cifs     t b_nbu_nfs2     vectracifs1     vectracifs2     vectracifs3     vectracifs3	Protocol NFS CIFS NFS CIFS CIFS CIFS CIFS CIFS CIFS CIFS	Export Path I/Olshares/check I/Olshares/check-cfs I/Olshares/but_not_nfs2 I/Olshares/vectracifs1 I/Olshares/vectracifs3 I/Olshares/vectracifs3	Data Deduplication Enabled Enabled Enabled Enabled Enabled Enabled Enabled	Backup Window Disabled Disabled Disabled Disabled Disabled 21:00 to 05:00 Disabled	Permissions Read & Write Read & Write Read & Write Read & Write Read & Write Read & Write Read & Write	Access all hosts all users all hosts all users all users all users all users
Status: Attention Info Hostnama: vectra IP address: Capacity: 24.00 TB Available: 4.95 TB ? Used: 10.05 TB (79.40%)	NFS Shares     CIFS Shares     CIFS Shares      Share Name     check     check-ofs     tb_nbu_nfs2     vectradis1     vectradis3     vectradis3     vectradis4     vectradis5	Protocol NFS CIFS CIFS CIFS CIFS CIFS CIFS CIFS CI	Export Path /O/shares/check /O/shares/check-cfs /O/shares/check-cfs /O/shares/check-cfs /O/shares/checkafs /O/shares/checkafs /O/shares/checkafs /O/shares/checkafs	Data Deduplication Enabled Enabled Enabled Enabled Enabled Enabled Disabled	Backup Window Disabled Disabled Disabled Disabled Disabled 21:00 to 05:00 Disabled Disabled	Permissions Read & Write Read & Write	Access all hosts all users all hosts all users all users all users all users
Status: Attention inte Hostname: vectra IP address: Capacity: 24.00 TB Available: 4.95 TB (?) Used: 10.05 TB (79.40%) 	NFS Shares     NFS Shares     Share Name     Share Name     check     check-cris     t	Protocol NFS CIFS CIFS CIFS CIFS CIFS CIFS CIFS CI	Export Path /Olsharesicheck /Olsharesicheck-off /Olsharesicheck-off /Olsharesichectaffs /Olsharesichectaffs /Olsharesichectaffs /Olsharesichectaffs /Olsharesichectaffs /Olsharesichectaffs	Data Deduplication Enabled Enabled Enabled Enabled Enabled Enabled Disabled Enabled Enabled Enabled Enabled	Backup Window Disabled Disabled Disabled Disabled Disabled Disabled Disabled Disabled	Permissions Read & Write Read & Write	Access all hosts all users all users all users all users all users all users all users
Status: Attention Info Hostname: vectra IP address: Capacity: 24.00 TB Available: 4.95 TB ?? Used: 19.05 TB (79.40%) Extended by: 8.17%	NFS Shares     OFFS Shares     OFFS Shares     OffS Shares     OffS Shares     OffS OffS OffS OffS OffS OffS OffS	Created: 8 s Created: 6 NFS CIFS CIFS CIFS CIFS CIFS CIFS CIFS CI	Export Path /0/shares/check /0/shares/check-cfs /0/shares/check-cfs /0/shares/checkafs1 /0/shares/checkafs1 /0/shares/checkafs1 /0/shares/checkafs4 /0/shares/checkafs1 /0/shares/checkafs1 /0/shares/checkafs1	Data Deduplication Enabled Enabled Enabled Enabled Enabled Enabled Disabled Enabled Enabled Enabled	Backup Window Disabled Disabled Disabled Disabled 21:00 to 05:00 Disabled Disabled Disabled Disabled	Permissions Read & Write Read & Write	Access all hosts all users all users all users all users all users all users all users all hosts

The **Summary** page lists the information described in <u>Table 24</u>.

Note: You can click the Share Name, Protocol, Export Path, Data deduplication, Backup Window, Permissions, Access, and Description column headings to sort the rows in the media by the data in the respective column. Click the column heading again to invert the sorting sequence from ascending order to descending order.

Table 24 NAS Shares Summary Information	Column	Description		
	Share Name	This column lists the NAS share name.		
	Protocol	This column lists the NAS protocol ( <b>CIFS</b> or <b>NFS</b> ) in use on the NAS share.		
	Export Path	This column lists the location of the export path for this NAS share.		
	Data Deduplication	This column displays the data deduplication setting ( <b>Enabled</b> or <b>Disabled</b> ) for the NAS share.		

Column	Description
Backup Window	This column displays (if enabled) the time window where data deduplication will not be used.
Permissions	This column displays the permission ( <b>Read &amp; Write</b> or <b>Read Only</b> ) for the NAS share.
Access	This column lists the access type ( <b>All Users</b> or <b>specific users</b> ) for this NAS share.
Description	This column lists the description for the NAS share (if available).

# Add NAS Share

To add a NAS share:

1 On the **NAS** page, click the **Add** tab.

The Add NAS Share page displays (see Figure 46).

# Chapter 5: DXi6500 and DXi6700 Configuration NAS & OST Configuration (DXi6500 Only)

Figure 46 Add NAS Share Page

- 2 Edit the NAS share information as desired (see <u>Table 25</u> for a description of the fields).
- 3 Click Apply.

**Note:** When you create a CIFS share, the initial permissions are the same as the default permissions for a Windows 2003 share with the addition of an ACE (Access Control Entry) that permits full access to the share for all authenticated users. Administrators can choose to remove this full access ACE, set up custom permissions, or leave the ACL (Access Control List) as is if the server is set up in a fully trusted environment.

**Note:** When using NAS shares with network segmentation, I/O must be performed on the data segment, NOT the management or replication segment.
Table 25	Add	NAS	Share	Fields

Field	Description
Name	Enter a name for the NAS share.
Description (optional)	Enter a desciption for this NAS share (optional).
Enforce read- only access to this share	Select this option to make this NAS share read only. If selected, the share is locked and you will not be able to write to it. Clear the check box to unlock the share.
Hide this share from network browsing	Select this option to hide this network share from network browsing. (CIFS shares only.)
Export using CIFS	Select CIFS protocol for use on a Windows network.
Export using NFS	Select NFS protocol for use on a Linux network.
Enable Data Deduplication	Enable data deduplication to optimize disk usage. Data deduplication can only be enabled or disabled while a share is being created. <b>Note:</b> Data deduplication is enabled by default.
Enable Backup Window	<ul> <li>Select Enable Backup Window to enable data deduplication for a particular time period. By default, Enable Backup Window is not enabled.</li> <li>Using the drop down boxes, select the start time for the backup window.</li> <li>Using the drop down boxes, select the end time for the backup window.</li> </ul>

# **Edit NAS Share**

To edit a NAS share:

1 On the **NAS** page, click the **Edit** tab.

The Edit NAS Share page displays (see Figure 47).

# Chapter 5: DXi6500 and DXi6700 Configuration NAS & OST Configuration (DXi6500 Only)

Figure 47 Edit NAS Share Page

- 2 Select the NAS share to edit in the Name drop down box.
- **3** Edit the **NAS** share information as desired (see <u>Table 25</u> for a description of the fields).
  - Note: If you are editing a share, only the Description, Enforce read-only access to this share, Hide this share from network browsing (CIFS shares only), Enable Backup Window, and Allow all hosts to access this share options can be edited.
- 4 Click Apply.

Note: If you modify a NAS share that uses the CIFS protocol, a message displays stating that the CIFS service must be restarted for the changes to take effect. Click **Yes** to restart the CIFS service. Restarting the CIFS service will close all active connections to the NAS share. Most Windows workstations will automatically reconnect, but some applications may be affected.

Table 26 Edit NAS Share Fields	Field	Description
	Description (optional)	Enter a desciption for this NAS share (optional).
	Enforce read- only access to this share	Select this option to make this NAS share read only. If selected, the share is locked and you will not be able to write to it. Clear the check box to unlock the share.
	Hide this share from network browsing	Select this option to hide this network share from network browsing. (CIFS shares only.)
	Enable Backup Window	Select <b>Enable Backup Window</b> to enable data deduplication for a particular time period. By default, <b>Enable Backup Window</b> is not enabled.
	Allow all hosts to access this share	If this is selected, all users (hosts) can access this share. If not selected, you can click the <b>Add</b> button to specify a user to access the share. Once a user is added, permissions for that user cannot be changed. In order to change the permissions, you must delete the user from the list and add it as a new user with updated permissions.

## **Delete NAS Share**

To delete a NAS share:

1 On the NAS page, click the Delete tab.

The Delete NAS Shares page displays (see Figure 48).

# Chapter 5: DXi6500 and DXi6700 Configuration NAS & OST Configuration (DXi6500 Only)

Figure 48 Delete NAS Shares Page

Quantum.				Admin	Ticket	DX/6	500
	Monday, Septemb	er 14, 2009 7:31:48	America/Los_Angeles (PDT)		,	Administrator Lo	ogin
Home	NAS & OST	PTT Network	Date & Time Security	Email SNMP C	Contacts		
Configuration	NAS OST	Windows Domain	Access Control Advanced	Setting			
Status	NAS Shares	2					
Alerts	Summary	Add Edit Dele	te				
Alerts	Delete NA	S shares					
Data Services	Shar	e Name Protoco	el Export Path	Data Deduplication	Backup Window	Permissions	Access
Utilities	Check	NFS	/Q/shares/check	Enabled	Disabled	Read & Write	all hosts
	Check-	cifs CIFS	/Q/shares/check-cifs	Enabled	Disabled	Read & Write	all users
Statue	tb_nbu	_nfs2 NFS	/Q/shares/tb_nbu_nfs2	Enabled	Disabled	Read & Write	all hosts
Attention Info	vectrac	ifs1 CIFS	/Q/shares/vectracifs1	Enabled	Disabled	Read & Write	all users
Hostname: vectra	vectrac	ifs2 CIFS	/Q/shares/vectracifs2	Enabled	Disabled	Read & Write	all user
IP address:	vectrac	ifs3 CIFS	/Q/shares/vectracifs3	Enabled	21:00 to 05:00	Read & Write	all user
Capacity: 24.00 TB	vectrac	ifs4 CIFS	/Q/shares/vectracifs4	Enabled	Disabled	Read & Write	all user
Available: 4.95 TB 2	: 🗌 vectrac	ifs5 CIFS	/Q/shares/vectracifs5	Disabled	Disabled	Read & Write	all user
Used:	vectrar	ifs1 NFS	/Q/shares/vectranfs1	Enabled	Disabled	Read & Write	all hosts
19.05 IB (79.40%)	vectrar	ifs2 NFS	/Q/shares/vectranfs2	Enabled	Disabled	Read & Write	all hosts
	🗌 vectrar	ifs3 NFS	/Q/shares/vectranfs3	Enabled	21:00 to 05:00	Read & Write	all hosts
Data reduced by: 8.17%	vectrar	ifs4 NFS	/Q/shares/vectranfs4	Enabled	Disabled	Read & Write	all hosts
	vectrar	ifs5 NFS	/Q/shares/vectranfs5	Disabled	Disabled	Read & Write	all hosts
	vectrar	fsdatagen NFS	/Q/shares/vectranfsdatagen	Enabled	Disabled	Read & Write	all hosts
	Delete	Reset	Cancel				

- 2 Select the NAS share to delete.
- 3 Click **Delete** to delete the selected NAS share.

The NAS share is deleted.

## **OST Configuration**

Use the OST (Open Storage Technology) page to configure storage servers and also LSUs (Logical Storage Units).

To access the OST page:

1 From the NAS & OST page, click the OST tab.

**Note:** Ensure that the node is online before continuing with the OST configuration

The **OST** page contains the following tabs:

- <u>Storage Servers</u>
- <u>LSUs</u>
- OST Client Plug-In

## **Storage Servers**

Use the **Storage Servers** page to add, edit, or delete OST storage servers.

**Note:** The connections of a storage server that are used equals the data streams plus one for each LSU polling. A backup job may generate more than one data stream if the data can be read in parallel. For example, a policy that is backing up A, B, C, and D, drives of a Windows system can generate four data streams in parallel.

To access the **Storage Servers** page:

1 From the OST page, click the Storage Servers tab.

The Storage Servers Summary page displays (see Figure 49).



The **Storage Servers Summary** page lists the configured storage servers on the system as well as the maximum number of OST storage servers allowed (100), number of storage servers created, and number of logical storage units created (LSUs).

# Adding or Editing a Storage Server

To add or edit a storage server:

- **Note:** If this is a Windows storage server, you must configure the Windows domain (see <u>Windows Domain Configuration</u> on page 132) prior to creating your storage server.
- 1 From the Storage Servers page, click the Add tab.

The Add Storage Server page displays (see Figure 50).

**Note:** To edit a **Storage Server**, click the storage server name link on the **Summary** page, or click the **Edit** tab.

Quantum.	Admin Ticket DX/650
Home	Monday, September 14, 2009 7:31:48 America/Los_Angeles (PDT) Administrator Login Legoud 2.He NAS & OST PTT Network Date & Time Security Email SNMP Contacts
Configuration Status Alerts Data Services Utilities Status: Attention info Hostname: vectra IP address: Capacity: 24 00 TB Available: 4.95 TB ? Used: 19.05 TB (79.40%) 19.05 TB (79.40%)	NAS       OST       Windows Domain       Access Control       Advanced Setting         Storage Servers       USU       OST Client Plug.In         Storage Server Configuration       Image: Configuration       Image: Configuration         Add Storage Server       Image: Configuration       Image: Configuration         Add Storage Server       Edit       Delete         Add Storage Server       Image: Configuration       Image: Configuration         Storage Server       Settings       Image: Configuration         Name:       Image: Configuration       Image: Configuration         Description (optional):       Image: Configuration       Image: Configuration         Image: Configuration       Image: Configuration       Image: Configuration         Ostrage Server Settings       Name: Configuration       Image: Configuration         Image: Configuration (optional):       Image: Configuration       Image: Configuration

2 Edit the **Storage Server** information as desired (see <u>Table 27</u> for a description of the fields).

Figure 50 Add Storage Server Page Note: If you are editing a storage server, only the Description, Max Connections, Enforce read-only access to this Storage Server, and Allow all hosts to access this share options can be edited. The maximum connections cannot be edited if the storage server has non zero current connections (see the Summary page for the current connections).

## 3 Click Apply.

- **Note:** If you modify a storage server that uses the CIFS protocol, a message displays stating that the CIFS service must be restarted for the changes to take effect. Click **Yes** to restart the CIFS service. Restarting the CIFS service will close all active connections to the storage server. Most Windows workstations will automatically reconnect, but some applications may be affected.
- **Note:** When using OST with network segmentation, I/O must be performed on the data segment, NOT the management or replication segment.

Field	Description
Name	Enter a name for the storage server. <b>Note:</b> Storage server names must be unique and not used again on other DXi6500 systems.
Description (optional)	Enter a description for the storage server (optional).
Max Connections	Enter the maximum number of connections to the storage server. This is an integer field.
Enforce read- only access to this Storage Server	Select this option to make this storage server read only. If selected, the storage server is locked and you will not be able to write to it. Clear the check box to unlock the storage server.

#### Table 27 Storage Server Fields

Field	Description
Export using CIFS	Select CIFS protocol for use on a Windows network.
Export using NFS	Select NFS protocol for use on a Linux network.
Allow all hosts to access this share	If this is selected, all users (hosts) can access this share. If not selected, you can click the <b>Add</b> button to specify a user to access the storage server. Once a user is added, permissions for that user cannot be changed. In order to change the permissions, you must delete the user from the list and add it as a new user with updated permissions.

# **Deleting a Storage Server**

**Note:** If you have deleted the storage server from NetBackup or Backup Exec, you must wait several minutes before deleting the storage server from the DXi6500.

To delete a storage server:

1 From the **Storage Servers** page, click the **Delete** tab.

The **Delete Storage Servers** page displays (see Figure 51).

#### Figure 51 Delete Storage Servers Page

Quantum.				-	Admin Tick	et	DX/650
	Monday, September 14, 2009	7:31:48 America/I	Los_Angeles (PDT)		Administrator	Login	Logout ? He
Home	NAS & OST PTT Net	twork Date &	Time Security	Email SNM	P Contacts		
Configuration	NAS OST Windows D	omain Acces	s Control Advance	d Setting			
Status	Storage Servers LSU	OST Client Plug-	In				
Alerts	storage server comig	juration 2					
	Summary Add Edit	t Delete					
Data Services	Delete Storage Se	rvers					
Utilities	<ul> <li>Storage Servers</li> <li>Storage Servers</li> </ul>	containing LSUs with Active Conne	Cannot be deleted actions cannot be dele	ted			
Status: Attention Info	Name Pr	otocol LSUs	Max Connections	Connections	Permissions	Access	Description
Hostname: vectra	vectrated800 NF	S 8	65536	1	rw	all hosts	
IP address:	vectrated801 NF	S 1	65536	0	rw	all hosts	
Capacity: 24.00 TB	vectrated802 NF	S 1	65536	0	rw	all hosts	
Used: 4.95 TB C	vectrated803 NF	S 1	1024	0	rw	all hosts	
19.05 TB (79.40%)							
Data reduced by: 8.17%							
	Apply R	teset Ca	ancel				
						_	

**2** Select the storage server to delete.

**Note:** Storage servers containing active connections (non zero current connections) and storage servers containing LSUs cannot be deleted.

3 Click Apply to delete the selected storage server.

The storage server is deleted.

## LSUs

Use the LSU (Logical Storage Units) page to add, edit, or delete LSUs.

To access the LSU page:

1 From the **OST** page, click the **LSU** tab.

The LSU Summary page displays (see Figure 52).

# Chapter 5: DXi6500 and DXi6700 Configuration NAS & OST Configuration (DXi6500 Only)

# Figure 52 LSU Summary Page

Quantum.					Admin Ticket	DX/650
	Monday, September 14, 20	009 7:31:48 Ameri	ca/Los_Angeles (PDT	)	Administrator Login	Logout ? H
Home	NAS & OST PTT	Vetwork Date	e & Time Securi	ty Email S	SNMP Contacts	
Configuration	NAS OST Window	s Domain Acc	cess Control Adva	nced Setting		
<u> </u>	Storage Servers LSU	J OST Client P	lug-In			
Status	LSU ?					
Alerte						
Alerts	Summary Add	Edit Delete				
Data Services						
Data Octvices	LSU Summary					
Utilities	Name	Storage Server	Physical Capacity	Description	<u>~</u>	
	vectrated800-Isu1	vectrated800	3.00 GB			
	vectrated800-Isu2	vectrated800	3.00 GB			
Status:	vectrated800-Isu3	vectrated800	3.00 GB			
Attention Info	vectrated800-Isu4	vectrated800	3.00 GB			
Hostname: vectra	vectrated800-Isu5	vectrated800	3.00 GB			
P address:	vectrated800-Isu6	vectrated800	3.00 GB			
addi obol	vectrated800-Isu7	vectrated800	3.00 GB			
Capacity: 24.00 TB	vectrated800-Isu8	vectrated800	3.00 GB			
Available: 4.95 TB 2	vectrated801-Isu1	vectrated801	8.00 TB			
Jsed:	vectrated802-Isu1	vectrated802	1000.00 GB		×	
19.05 TB (79.40%)						
Data reduced by: 8.17%						

# Adding or Editing a LSU

To add or edit an LSU:

1 From the LSU page, click the Add tab.

The Create LSU page displays (see Figure 53).

**Note:** To edit an **LSU**, click the LSU name link on the **Summary** page, or click the **Edit** tab.

## Figure 53 Create LSU Page

Quantum.	Admin Ticket DX/6500
Home Configuration Status Alerts Data Services Utilities Status: Atention Info Hostname: vetra Padress: Capacity: 24.00 TB Available: 4.95 TB <sup>(2)</sup> Used: 19.05 TB (79.40%) Information Data reduced by: 8.17%	Monday, September 14, 2009 7:31:48 America/Los_Angeles (PDT)       Administrator Login       Logodt       2 Help         NAS & OST       PTT       Network       Date & Time       Security       Email       SNMP       Contacts         NAS & OST       Windows Domain       Access Control       Advanced Setting       Socrat       Socrat       Storage Servers       LSU       OST       Create LSU       Storage Servers       Vectrated8000       M       LSU Name:       Description(optional):       Physical Capacity:       (GB)       Apply       Reset       Cancel       Cancel       Socrat       Soc

2 Edit the LSU information as desired (see <u>Table 28</u> for a description of the fields).

Note: If you are editing an LSU, only the **Description** and **Physical Capacity** options can be edited. **Physical Capacity** cannot be edited when the storage server in which this LSU is created has active connections.

3 Click Apply.

**Note:** When using OST with network segmentation, I/O must be performed on the data segment, NOT the management or replication segment.

Field	Description
Storage Server	Select the <b>Storage Server</b> in which the LSU has to be created.
LSU Name	Enter a name for the LSU.
Description (optional)	Enter a description for this LSU.

Field	Description	
Physical Capacity	Enter a physical capacity for the LSU.	

## Deleting an LSU

**Note:** If you have deleted a logical storage unit from NetBackup or Backup Exec, you must wait several minutes before deleting the LSU from the DXi6500.

To delete an LSU:

1 From the LSU page, click the Delete tab.

The Delete LSU page displays (see Figure 54).



- 2 Select the Storage Server.
- **3** Select the LSUs in the selected storage server to delete.

Figure 54 Delete LSU Page

4 (Optional) Select the Force Delete LSU check box to delete LSUs that are not empty.

Normally, you cannot delete an LSU if it contains existing backup images. If for some reason you cannot remove files from the LSU, selecting the **Force Delete LSU** check box allows you to delete the LSU even though it is not empty.

5 Click Apply.

The LSU is deleted.

**Note:** LSUs in the storage server with active connections (nonzero current connections) cannot be deleted.

# **OST Client Plug-In**

The **OST Client Plug-In** (see Figure 55) allows the NetBackup or Backup Exec software running on your backup host to communicate with the DXi6500 OST service. You must download the OST Plug-in client to your backup host, then install and configure the client to allow your NetBackup or Backup Exec software to use the OST feature.



# OST Optimized Duplication

The Quantum DXi6500 has the capability to copy data from one appliance to another appliance. NetBackup and Backup Exec uses this capability to initiate optimized off host copy of backup images between these appliances. The duplicate operation of NetBackup and Backup Exec triggers the replication function in OST if both the source and destination volumes for the copy are OST disk volumes. OST optimized off host replication reduces the workload on the NetBackup or Backup Exec media server because the copy process does not require host resources. Replication can be done in the background very quickly as it uses Quantum's data deduplication capabilities to reduce the copy bandwidth. Replication is still initiated, managed, and controlled by the NetBackup or Backup Exec media server while the actual copy process is off-loaded to get the maximum benefits from the DXi6500 replication capabilities.

# Requirements

For NetBackup or Backup Exec to use OST off host optimized replication when image duplication is attempted, the following items are required:

- The source and destination storage units used for the copy are OST disk volumes created from OST shares on the DXi6500. Source and destination storage units could be created from the same DXi6500 or they could be located on different DXi systems.
- The DXi6500 is running in a normal state.
- The source image is deduplicated completely and tags are generated for this file before optimized duplication is attempted.
- The target system must be configured to enable replication using NetBackup or Backup Exec OST optimized copy (see <u>Chapter 8</u>, <u>DXi6500 and DXi6700 Data Services</u>).

# **Initiating Optimized Copy**

The source and target storage units could be on the same DXi-Series system or on a different DXi system. If the copy is to a different DXi, ensure that there is connectivity from the source DXi to the destination DXi.

The following steps assume that the storage units are located on different DXi systems, though the same steps can be applied even for storage units on the same DXi.

- 1 Ensure that the source and target DXi systems are running the latest DXi software and NetBackup 6.5.3 or later, or Backup Exec 2010 or later, is running on the media server.
- 2 At the NetBackup or Backup Exec media server (refer to the NetBackup or Backup Exec Documentation):
  - a Configure the NetBackup or Backup Exec media server for OST.
  - **b** Install OST plug-ins on the media server.
- 3 At the source and target DXi systems:
  - a Configure OST storage servers.

**Note:** If you are using Network Segmentation, you must use the Data IP address when registering a storage server.

- **b** Configure logical storage units.
- 4 Register source and target storage servers with NetBackup or Backup Exec.
- **5** Configure source and target disk pools respectively from the storage servers registered in **step 4** above.
- **6** Backup the required data set (refer to the NetBackup or Backup Exec documentation for more information).
- 7 Once the backup is successfully completed, wait for the backup image to be completely deduplicated at the source DXi system.
- 8 Select the backup image from the Catalog in the NetBackup or Backup Exec Administration console > NetBackup or Backup Exec Management. Right-click the image and start a "duplicate" operation. This will open a duplication window showing the default target storage units and other options. Change the target storage unit appropriately and continue with the copy. Repeat this for all the images to be replicated by searching for the required images using the search criteria in the Catalog.

To check the status of the duplicate operation, read job details in Activity Monitor from the NetBackup or Backup Exec Administration Console.

# Windows Domain Configuration

Use the **Windows Domain** page to join a Samba server to a Windows workgroup or a Windows domain.

**Note:** Ensure that your system has the date and time set correctly and is in sync with your domain controller.

To configure Windows domain information:

1 From the NAS & OST page, click the Windows Domain tab.

The Windows Domain page displays (see Figure 56).

Quantum.	Admin Ticket	DX/6500
	Monday, September 14, 2009 7:31:48 America/Los_Angeles (PDT) Administrator Login	Logout ? Help
Home	NAS & OST PTT Network Date & Time Security Email SNMP Contacts	
Configuration	NAS OST Windows Domain Access Control Advanced Setting	
Status	Windows Domain 2	
Alerts	This system has not joined a Windows Domain	
Data Services	Domain Type: Select a Type	
Utilities	Domain/Workgroup Name :	
Status: Attention Imfo Hostname: vectra IP address: Cepecity: 24 00 TB Available: 4.95 TB ? Used: 19.05 TB (?9.40%) Tota reduced by: 8.17% State of the state of the	Primary Domain Controller :  Use DNS Discovery  Specify Address Organization Unit (optional):  Administrator Name :  Administrator Password :  Apply	

2 Edit the **Windows Domain** information to join a workgroup or an Active Directory domain.

Note: You must disjoin a domain before you can delete a domain.

For detailed information, see the following sections:

- Joining a Windows Workgroup
- Joining a Windows Domain
- Joining a Domain Using a Domain User Credential
- Troubleshooting ADS Join Issues

Figure 56 Windows Domain Page

# Joining a Windows Workgroup

- 1 Edit the page information as follows:
  - Domain Type Select Workgroup.
  - **Domain/Workgroup Name** Enter the **Workgroup** name. This can be the name of an existing workgroup or a new workgroup (for example, **Workgroup** or **Sales**).
- 2 Click Apply.

Note: When a Samba server is joined to a workgroup, the share security is managed directly from the remote management pages. For a CIFS share, security is provided through the read only or read/write access to the share. By default, when a CIFS share is created the default security setting is to allow access for all users. Further access restrictions on individual users can be managed from the following page: NAS > Edit.

## Joining a Windows Domain

It is necessary to synchronize the server clock and the ADS (Active Directory Services) server so that the time difference is less than 300 seconds. This can be done by having both servers use the same NTP server. Once the clocks have been verified:

- 1 Edit the Windows Domain information as desired (see below):
  - Domain Type Select Active Directory.
  - Domain/Workgroup Name Enter the domain name.
  - **Primary Domain Controller** Enter the fully qualified name of the Primary Domain Controller (PDC). Choose one of these options:
    - Use DNS discovery Let the PDC be discovered automatically.
    - **Specify Address** Enter the fully qualified name, or the IP address, of the PDC.
  - **Organization Unit** (optional) Enter the name of the organizational unit in the domain. This is the organization of which the DXi6500 will become a member.

- Administrator Name Enter Administrator or any user who has the right to join a domain. By default any user belonging to the Administrators group or the Domain Admins group has the right to join the domain. In addition, any domain user can join the domain if he is specifically delegated this right by a member of the Administrators group. See Joining a Domain Using a Domain User Credential for an example.
- Administrator Password Enter the Administrator Password.
- 2 Click Apply.
  - Note: When the system is joined to the Active Directory domain all the share security is managed by the MMC (Microsoft Management Console) that is running on the domain controller. By default, when a CIFS share is created the default security setting is to allow access for all users. Any access restriction on individual users will have to be managed from the MMC.

## Joining a Domain Using a Domain User Credential

Many large companies do not want to use the Administrator account to join the ADS domain. They prefer to delegate a normal domain user account with special rights to join the domain. The purpose of this section is to provide an example of delegating a normal domain user account with special rights to join the domain.

To facilitate this example, the following information is assumed:

- The ADS is running on a Windows 2003 Server system.
- ADS domain name: abc.def.xyz.com
- **user1** is a normal domain user that has basically no administrative privileges.
- The server host name is DX1.
- DNS domain name: abc.def.xyz.com
- DNS IP address: 10.20.30.40
- 1 Steps to complete on the Windows 2003 MMC:
  - a Delegate the right to join the domain:
    - Select the domain name **abc.def.xyz.com**.

- Right-click and choose: Delegate Control | Next | Add
- Type the username: user1
- OK | Next
- **b** Delegate the following common tasks:
  - Join a computer to the domain.
  - Next | Finish
- **c** Delegate the right to read/write dNSHostname and servicePrincipalName:
  - Select the organizational unit **Computers** or the appropriate name. This is the folder that contains individual computers that belong to the domain.
  - Right-click and choose: Delegate control | Next | Add
  - Type the username: user1
  - OK | Next | Create a custom task to delegate
  - Next | Only the following objects in the folder:

Check the box: **Computer objects** 

Check the box: Create selected objects in this folder

- Next | Check box: Property-specific
- Scroll down the list and check the boxes for:
- Read dNSHostName
- Write dNSHostName
- Read servicePrincipalName
- Write servicePrincipalName
- Next | Finish
- 2 Steps to complete on the GUI:
  - a Network page:

Note on these fields:

- Hostname: DX1
- Domain name: Enter abc.def.xyz.com.

This is the DNS domain name. The DNS domain name is usually, but not necessarily, identical with the ADS domain name.

• Domain name server IP address: Enter 10.20.30.40.

This is the IP address of the domain name server that can resolve the domain name abc.def.xyz.com that you are trying to join to.

- **b** Windows Domain page:
  - Domain type: Active Directory
  - Domain name: abc.def.xyz.com

**Note:** You must use a fully qualified domain name; character case is not important.

#### • Primary Domain Controller:

Preferred option if DNS is working: Use DNS discovery

If DNS is not working well or if you cannot ping abc.def.xyz.com, then use the IP address of the PDC explicitly.

If you cannot ping the domain name abc.def.xyz.com, you may not join successfully unless you can resolve abc.def.xyz.com using the command:

#### # host abc.def.xyz.com ip\_address

where the **ip\_address** is the IP address of DNS as specified at the bottom of the network page.

• Organizational Unit:

This is optional. There is usually a default organizational unit such as **Computers**. If you want to join to an organizational unit that is different from the default, then enter the name of that organizational unit as seen in MMC.

- Administrator Name user1
- Password <enter password>

## Troubleshooting ADS Join Issues

For troubleshooting purposes we will assume the sample settings in <u>Joining a Domain Using a Domain User Credential</u> were used to join the domain **abc.def.xyz.com** through the remote management pages, but

the operation failed. This assumption is important in that all the necessary settings were already written in relevant files and you can log on the server to perform a number of tests to determine the root cause.

**1** Is the DNS server specified on the Network page capable of resolving the domain name?

#### # nslookup abc.def.xyz.com

or

#### # host abc.def.xyz.com 10.20.30.40

to see if the DNS server 10.20.30.40 can resolve abc.def.xyz.com. If it cannot, change to a different DNS server IP address on the **Network** page.

**2** Specify the fully qualified domain name on the **Windows Domain** page.

Do not specify the short name abc. Must specify abc.def.xyz.com.

3 Check the Primary Domain Controller.

To avoid any DNS issue, enter the IP address of the PDC on the **Windows Domain** page. Make sure you can ping the PDC successfully.

4 Check the clock time difference:

Time on the ADS server:

#### # net time -S abc.def.xyz.com

Time on the local server:

#### # date

Make sure the time difference is less than 300 seconds.

**5** Make sure the username exists in the ADS.

Test by logging in the Kerberos server:

# kinit user1@ABC.DEF.XYZ.COM

Note that the name after '@' must be all capitalized. If the command fails, it should tell what happened. Again, must make sure ABC.DEF.XYZ.COM can be resolved by the DNS. If the command succeeds, you should run the next two commands:

#### # klist

This command is to list all the Kerberos tickets just issued to user1.

### # kdestroy

This command is to destroy all the Kerberos tickets issued to user1.

6 If the username is not a member of the Administrator or Domain Admins group, then check to make sure he has the correct rights to join a domain:

#### # net ads status -U user1@ABC.DEF.XYZ.COM

Make sure you see the following lines in the output:

```
dNSHostName: dx1.abc.def.xyz.com
servicePrincipalName: HOST/ dx1.abc.def.xyz.com
servicePrincipalName: HOST/DX1
```

7 Finally, the errors from joining ADS domain are logged in:

### /tmp/nas/cifs.ads.join

The contents are overwritten each time you join the domain either from the GUI or by running an appropriate CLI command. The CLI command is not officially supported. You can run

#### # nastool

without options to show the syntax. Note that certain subcommands require a password. If you do not type the password option, you will be prompted interactively and the password entered will not be echoed on screen.

Access Control Configuration	Use the Access Control page to add, edit, or workgroup users. Note: For an ADS CIFS configuration there is no need to configure workgroup users.	
	1 From the NAS & OST page, click the Access Control tab.	
	The <b>Access Control</b> page displays (see <u>Figure 57</u> ).	

## Figure 57 Access Control Page

Quantum.	Admin Ticket DX/6500
Home Configuration Status Alerts Data Services Utilities Status: Atention Infor Hostname: vetra IP address: 4.95 TB <sup>(2)</sup> Used: 19.05 TB (79.40%) Information Used: 19.05 TB (79.40%)	Monday, September 14, 2009 7:31:48 America/Los_Angeles (PDT) Administrator Login Lodoul <sup>10</sup> , Help NAS & OST PTT Network Date & Time Security Email SNMP Contacts NAS OST Windows Domain Access Control Advanced Setting Access Control <sup>10</sup> Summary Add Edit Delete User Name Administrator Privileges Description Administrator No

2 Click Add to add a workgroup user.

**Note:** To edit a workgroup user, click the user name link on the **Summary** page, or click the **Edit** tab.

The Add Workgroup User page displays (see Figure 58).

Quantum.		Admin Ticket	DX:6500
	Monday, September 14, 2009 7:31:48 America/Los_Angeles (PDT)	Administrator Login	Logout 2 Help
Home	NAS & OST PTT Network Date & Time Security Email	SNMP Contacts	
Configuration	NAS OST Windows Domain Access Control Advanced Setting	l	
Status	Access Control 2		
Alerts	Summary Add Edit Delete		
Data Services	Add Workgroup User		
Utilities	Password		
	Confirm Password		
Status:	Description (optional)		
Hostname: vectra IP address: Capacity: 24.00 TB Available: 4.95 TB ? Used: 19.05 TB (79.40%)	Grant Administrator Privileges Apply Reset Cancel		
Data reduced by: 8.17%			

Figure 58 Add Workgroup User Page **3** Edit the **Workgroup Users** information as desired (see <u>Table 29</u> for a description of the fields).

Note: If you are editing a workgroup user, you cannot change the User Name.

#### 4 Click Apply.

**Note:** To delete a workgroup user, click the **Delete** tab. Select the user and click **Delete**.

Table 29 Workgroup User Fields

Field	Description	
User Name	Enter a user name for the workgroup user.	
Password	Enter a password for the workgroup user.	
Confirm Password	Enter the password again to confirm it.	
Description (optional)	Enter a description for the workgroup user (optional).	
Grant Administrator Privileges	Select this check box to add the workgroup user to the Windows Administrators group. This allows the workgroup user to override certain permissions settings and prevents the workgroup user from being locked out of shares or directories.	

## **ADS Share Permissions**

To set the ADS (Active Directory Service) share permissions:

- 1 Log into the primary domain controller as an administrator.
- 2 From the Administrative Tools, select the MMC Computer Management tool.
- **3** Access the DXi6500 system from the **Action** menu. Enter the system hostname and click **Enter**.

- 4 In the lower left field, expand **System Tools** and **Shared Folders** to access the **Shares**.
- 5 Right-click the share in the lower right field and select **Properties**.
- 6 Select the Share Permissions tab.
- 7 Select Add/Remove Share users/groups. Adding a user/group will display a dialog. You can enter a user/group to select and then click OK.
- 8 Set permissions for each user.
- 9 Click Apply/OK.

**Note:** In some cases, when you view file permissions on a Windows system, you will not see the user and group information. Instead you will see the SID (security ID) which appears as a series of numbers. This occurs when you move files (for example, using a backup utility or DOS xcopy) from one system to another system, and the user and group from the source system do not exist on the target system.

> Often users and groups are unique to a particular scope, such as a Windows system or an ADS domain. As a result, some assigned permissions might not be available on the target system because the associated user and group do not exist there. However, common groups (for example, Administrators, Users, and Everyone) are recognized on most Windows systems and domains.

## **Advanced Setting**

Use the Advanced Setting page to adjust the Samba settings.

Opportunistic locking lets clients lock files and locally cache information without the risk of another user changing the file. This increases performance for many file operations but may decrease performance in other operations because the server that grants the opportunistic lock must manage the breaking of that lock when another user requests access to the file.

To access the **Advanced Setting** page:

1 From the NAS & OST page, click the Advanced Setting tab.

The Advanced Setting page displays (see Figure 59).



- 2 To enable opportunistic locking, select the **Enable Opportunistic Locking** check box. To disable opportunistic locking, clear the check box.
- 3 Click Apply.

# **PTT Configuration**

Path to Tape (PTT) provides the ability to move data to physical tape cartridges in an attached tape library using a Fibre Channel connection.

The DXi6500 and DXi6700 supports the following type of PTT:

• Backup Application Specific - This option allows a physical tape library to be directly connected to a DXi6500 or DXi6700 through an NDMP (Network Data Management Protocol) connection. The DXi6500 supports OST path to tape using Symantec NetBackup. Note: For more information on backup application configuration for DXi6700, refer to the *NetBackup Backup Application Specific Configuration Instructions*, PN 6-66537, *NetWorker Backup Application Configuration Instructions*, PN 6-66530, *Oracle Secure Backup Application Specific Confutation Instructions*, PN 6-66720, and the *Atempo Time Navigator Backup Application Specific Configuration Guid*e, PN 6-66747 included on the *DXi6500 and DXi6700 Documentation CD* 

The PTT (Path to Tape) page provides the following discovery and configuration options:

- <u>Physical Device Discovery</u>
- <u>Backup Application Specific</u>

To access the **PTT** page, from the **Configuration** menu, click the **PTT** tab.

**Note:** The **PTT** page is available only on DXi6500 configurations that include a Fibre Channel card (Model 6540 and 6550) or the DXi6700.

**Note:** PTT options can only be configured when the Backup Application Specific license has been enabled (see <u>Licenses</u> on page 252).

## Physical Device Discovery

Use the **Physical Device Discovery** page to discover and configure attached physical libraries and tape drives. The attached libraries cannot be recognized and used for path to tape data movement until they have been discovered though physical device discovery.

To access the Physical Device Discovery page:

1 From the **PTT** page, click the **Physical Device Discovery** tab.

The Physical Device Discovery page displays (see Figure 60).

#### Chapter 5: DXi6500 and DXi6700 Configuration PTT Configuration

Figure 60 Physical Device Discovery Page



To configure an attached physical library:

**Note:** Clicking the **Information** button displays a window that provides additional physical library information such as SCSI ID and LUN assignment.

1 Click Scan for Devices to detect attached physical libraries.

Any attached physical libraries are shown in the **Medium Changers** (Physical Libraries) list.

- **2** Select the new attached library by selecting the check box to the left of the library serial number.
- **3** Select an intended use for this library:
  - Backup Application Specific Uses the library as a backup application specific server.
  - **Remove** Removes the attached library from the DXi6500 configuration.

**Caution:** The physical library MUST be physically disconnected from the DXi6500 before it can be removed from the configuration.

- Ignore Ignores the attached physical library.
- 4 Click Apply.

The library devices changes are applied.

**5** To view the library media changer and configured drives, click the **Serial Number** link for the library.

The tape drives are shown in the Tape Drives list.

- 6 Choose an intended use for the tape drives:
  - **Backup Application Specific** Configures the tape drive for use as a backup application specific enabled tape drive.
    - **Note:** Tape drives that will be utilized for backup application specific path to tape must be mapped to a host access group prior being configured as a backup application specific (NDMP) tape drive. Quantum recommends that you add a "fake" host using a WWPN that does not exist within your SAN. Then, create a new host access group using that host (and any target) to map all of your drives dedicated to application specific path to tape.
  - **Remove** Removes the tape drive from the DXi6500 configuration.

**Caution:** The tape drive MUST be physically disconnected or removed from the DXi6500 before it can be removed from the configuration.

- Ignore Ignores the tape drive.
- 7 Click Apply.

Once the tape library and tape drives are configured, they display in the **Medium Changer** list located at the bottom of the page.

# Backup Application Specific

Use the **Backup Application Specific** page to configure user settings for the backup application specific path to tape option. Symantec NetBackup is supported for OST path to tape:

To access the Backup Application Specific page:

1 On the **PTT** page, click the **Backup Application Specific** tab.

The Backup Application Specific page contains the following tabs:

- <u>Summary</u>
- <u>Add</u>
- Edit
- <u>Delete</u>

## Summary

To access the Summary page:

1 On the **Backup Application Specific** page, click the **Summary** tab.

The **Backup Application Specific Summary** page displays (see <u>Figure 61</u>).



The **Summary** page lists all backup application specific users that have been configured on the system.

## Add

To add a backup application specific user:

1 On the **Backup Application Specific** page, click the **Add** tab.

The **Backup Application Specific Add** page displays (see Figure 62).

Figure 62 Backup Application	Quantum,	Admin Ticket DX/6500
specific Add Page	Home Configuration Status Alerts Data Services Utilities Status: Attention info Hostname: vetra IP address: Capacity: 24.00 TB Available: 4.95 TB ?? Used: 10.05 TB (79.40%) International (79.40%) Internation	Monday, September 14, 2009 7:31:48 AmericaLos_Angeles (PDT) Administrator Login Lagood <sup>•</sup> Help NAS & OST PTT Network Date & Time Security Email SNMP Contacts Physical Device Discovery Backup Application Specific Initiators & Ports Backup Application Specific User Configuration 0 Summary Add Edit Delete Add Backup Application Specific User Username Password Confirm Password Description (optional) Apply Reset Cancel

- 2 Enter the following backup application specific user information:
  - a Enter a Username.
  - b Enter a Password.
  - c Confirm the password in the Confirm Password box.
  - d Add a **Description** (optional).
  - e Click Apply to add the backup application specific user.

## Edit

To edit a backup application specific user:

On the Backup Application Specific page, click the Edit tab.
 The Backup Application Specific Edit page displays (see Figure 63).

Figure 63 Backup Application Specific Edit Page

Quantum.	Admin Ticket DX/6500
Home	Monday, September 14, 2009 7.31.48 America/Los_Angeles (PDT)         Administrator Login         Logout         ?_Help           NAS & OST         PTT         Network         Date & Time         Security         Email         SNMP         Contacts
Configuration Status	Physical Device Discovery Backup Application Specific Initiators & Ports Gackup Application Specific User Configuration @ Summary Add Edit Delete
Data Services Utilities	Edit Backup Application Specific User Username vectrandmp v New Password (optional)
Status: Attention Info Hostname: vectra IP address:	Confirm New Password (optional) Description (optional) Quantum Apply Reset Cancel
Capacity: 24.00 TB Available: 4.95 TB (2) Used: 19.05 TB (79.40%) Data reduced by: 8.17%	

- 2 Edit the following backup application specific user information:
  - **a** From the **Username** drop down box, select the backup application specific username to edit.
  - b Edit the Password.
  - c Confirm the password in the Confirm Password box.
  - d Add a Description (optional).
  - e Click Apply to edit the backup application specific user.

## Delete

To delete a backup application specific user:

1 On the **Backup Application Specific** page, click the **Delete** tab.

The **Backup Application Specific Delete** page displays (see Figure 63).



- 2 Select the check box for backup application specific user to delete.
- **3** Click **Delete** to delete the selected backup application specific user. The backup application specific user is deleted.

#### **Initiators and Ports**

Use the **Initiators & Ports** page (see <u>Figure 65</u>) to see a list of all pathto-tape initiator ports and their associated World Wide Port Numbers (WWPNs). The **Initiators & Ports** page also displays a map of all Fibre Channel and Ethernet ports on the node. Initiator ports are shown in bold on the map.

To access the Initiators & Ports page, on the PTT page, click the Initiators & Ports tab.

**Note:** The **Initiators & Ports** page is available only on DXi6500 configurations that include a Fibre Channel card (Model 6540 and 6550) or the DXi6700.

Chapter 5: DXi6500 and DXi6700 Configuration Network Configuration



# **Network Configuration**

The network configuration information was entered during the initial setup of the DXi6500 and DXi6700. Consult your network administrator prior to changing any of the information.

**Note:** The DXi6500 and DXi6700 **Network** page differs depending on the number of Ethernet ports available on your system. There are three possible Ethernet port configurations: 2 x 1GbE ports, 6 x 1GbE ports, and 2 x 1GbE ports plus 2 x 10GbE ports.

Use the **Network** page to view and edit the network configuration information.

To access the **Network** page:

1 From the **Configuration** menu, click the **Network** tab.

The Network page contains the following tabs:

- <u>General</u>
- <u>IP</u>

#### <u>Segmentation and Bonding</u>

**Caution:** Changing the network configuration requires a system reboot in order for all system services to function correctly. The system automatically reboots immediately after changes are applied.

Note: Rebooting the system can take several minutes. After the network configuration is saved, close your Web browser and wait 15 minutes before logging in again. If the IP address that you use to log in to the system is changed, you will temporarily lose your connection to the remote management pages. Because of this, you might not see a confirmation page informing you that settings have been saved.

General

Use the **General** tab to specify the hostname and domain name server (DNS) search path.

To specify the hostname and domain search path:

1 From the **Network** page, click the **General** tab.

The Network General page displays (see Figure 66).

Figure 66 Network General	Quantum.	Admin Ticket DX:6500
Page	1	Monday, September 14, 2009 7:31:48 America/Los_Angeles (PDT) Administrator Login Logaut ? Help
	Home	NAS & OST   PTT   Network   Date & Time   Security   Email   SNMP   Contacts
	Configuration	Network Configuration 2
	Status	General IP Segmentation and Bonding
	Alerts	System
	Data Services	* Hostname: vectra
	Utilities	DNS
	Status:	Domain Search Path: sjcenglab.com
	Attention Info	* Required Field
	Hostname: vectra IP address:	Apply Reset
	Capacity: 24.00 TB	
	Used: 19.05 TB (79.40%)	
	Data reduced by: 8.17%	

- 2 Under System, enter the Hostname for the DXi6500 or DXi6700.
- **3** (Optional) Under **DNS**, enter a **Domain Search Path**. This is either a single domain name or a comma separated list (no spaces) of up to 6 domain names

The first domain name listed is used as the local domain. Domain names must contain only letters (A-Z or a-z), numbers (0-9), dots (.), and hyphens (-).

4 Click Apply.

Use the **IP** tab to set the network IP addresses for the DXi6500 or DXi6700.

**Note:** When entering IP addresses, never use an address that is in a reserved IP address range. To see a list of reserved IP address ranges, click the quick tip icon (?) located near the IP address field.

To configure the network on a DXi6500 or DXi6700:

1 From the **Network** page, click the **IP** tab.

The Network IP page displays (see Figure 66).

IP
Monday, September 14, 2009 7.31.48 Americal.os_Angeles (PDT)     Administrator Login     Logout       Home     NAS & OST     PTT     Network     Date & Time     Security     Email     SNMP     Contacts       Configuration     Status     Alerts     O     Elements displayed below correspond to the selected segmentation option: BOND ALL     Elements displayed below correspond to the selected segmentation option: BOND ALL     FC1     ETH4       Status     Fc0     ETH4       Utilities     State and the three thre
IP address:       * BOND ALL       * BOND ALL </td

**2** Under **System**, enter the IP address and netmask information for the DXi6500 or DXi6700.

The information you must enter varies depending on the segmentation option selected on the **Segmentation and Bonding** page.

- **3** (Optional) Under **System**, enter the **Default Gateway IP Address** for the DXi6500 or DXi6700.
- 4 (Optional) Under **DNS**, enter the IP address of up to three servers where the domain name is resolved or translated into an IP address.

**Note:** If you are using network segmentation, you must specify a DNS server for the **Data** IP address to enable NAS access.

5 Click Apply.

# Segmentation and Bonding

Network segmentation is the process of splitting a single network into several **subnetworks** or **segments**. The advantages of a segmented network are improved performance and security. Performance is

improved because there are fewer hosts on the segmented network, which in turn minimizes local traffic. Security is improved because the data traffic is contained on this segment and not visible to the outside network.

Note: If your system is configured using network segmentation, you must use the data segment IP address, NOT the management segment IP address OR hostname, to map CIFS shares or manage the system. If the system is joined to an Active Directory domain, you can use the Microsoft Management Console (MMC) tool to manage shares and user or group access. To do this, right-click the server name in MMC and click Manage. The Computer Management console displays and your system is connected for management. If your system uses network segmentation, the connection will fail because the system name is not resolved into the data segment IP address. In this case you must specify the system using its data segment IP address, not the hostname, by selecting the following option in the Computer Management console: Action > Connect to another computer > Another computer.

The DXi6500 and DXi6700 allows you to configure your network for separate segment types. The three primary segments are defined by the type of network traffic that can be used on that segment. The three types of network traffic are:

- **Replication traffic** This segment is be used exclusively for replication data movement
- Management traffic This segment is be used exclusively for DXi6500 or DXi6700 remote management (Web page access)
- Data traffic This segment is used exclusively for NAS data movement

Each network segment has its own network interface (IP address, network mask, and default gateway). In this way, the segment is separated from other network segment traffic.

Note: Print out <u>Table 30</u> on page 160, <u>Table 31</u> on page 161, or <u>Table 32</u> on page 162 to gather the network configuration information for your configuration.

# Using Round Robin (Mode 0) With a Dell or CISCO Switch

If you are using the **Round Robin (Mode 0)** option and you have a Dell or CISCO switch, then the ports that connect to the DXi6500 or DXi6700 must be bonded.

For example, specify the following settings from the switch CLI:

- Interface Ethernet If both ports connect to the same switch, set to 1/gX where X is the port number. If there two or more switches, replace "1" with the correct ID number (2 or 3).
- Switchport mode Set to trunk.
- Channel-group 1 mode Set to on.

# Configuring the Network on a DXi6500 or DXi6700

To configure the network on the DXi6500 or DXi6700:

1 From the Network page, click the Segmentation and Bonding tab.

The **Network Segmentation and Bonding** page displays (see <u>Figure 66</u>).



This page lists the network segmentation options that are available for your configuration. The grid shows a graphical representation of the Ethernet ports as they appear on the rear of the system. The grid also indicates how the ports are currently bonded.

Physical Ethernet ports that are bonded together act as a single logical port. That is, multiple ports that are bonded together behave like a single port and require one set of network settings. Ports that are bonded together in the currently selected segmentation option are shaded the same color in the grid. For example:

- If you select **BOND ALL (not segmented)**, all Ethernet ports are bonded together into a single logical port and are shaded blue in the grid.
- If you select BOND ALL 1GB (Replication), BOND ALL 10GB (Management/Data), Ethernet ports 0 and 1 are bonded together into a single logical port and are shaded blue in the grid, while Ethernet ports 2 and 3 are bonded together into a single logical port and are shaded purple in the grid.

For diagrams that show how the port numbering used in the grid corresponds to the physical ports on the rear of the DXi6500 or DXi6700, see <u>Node Rear Panel Connectors</u> on page 20.

**Note:** The grid also shows the Fibre Channel ports as they appear on the rear of the system.

**2** Under **Segmentation**, select the type of network segmentation for your system:

DXi6500 - 6510 and DXi6700 (2 x 1GbE ports)

- **Note:** On a DXi6700, you must enter a "dummy or fake" IP address for the Data segment since data or NAS traffic is not supported on the DXi6700. If a Data segment is not entered, network segmentation will not operate properly.
- BOND ALL (Not segmented) Both ports (ETH0 and ETH1) are bonded together and require a single set of network settings on the IP page.
- BOND ALL (Replication/Management/Data) Both ports (ETH0 and ETH1) are bonded together for all traffic types. Each traffic type (Data, Management, and Replication) requires a set of network settings on the IP page.

- ETH0 (Replication), ETH1 (Management/Data) All Replication traffic takes place on port ETH0. Data and Management traffic take place on port ETH1. Each traffic type (Data, Management, and Replication) requires a set of network settings on the IP page.
- ETH0 (Management), ETH1 (Replication/Data) All Management traffic takes place on port ETH0. Data and Replication traffic take place on port ETH1. Each traffic type (Data, Management, and Replication) requires a set of network settings on the IP page.
- ETH1 (Data), ETH0 (Replication/Management) All Data traffic takes place on port ETH1. Management and Replication traffic take place on port ETH0. Each traffic type (Data, Management, and Replication) requires a set of network settings on the IP page.

#### DXi6500 - 6520, 6530, 6540 (6 x 1GbE ports)

- **BOND ALL (Not segmented)** All ports (ETH0, ETH1, ETH2, ETH3, ETH4, and ETH5) are bonded together and require a single set of network settings on the **IP** page.
- BOND ALL (Replication/Management/Data) All ports (ETH0, ETH1, ETH2, ETH3, ETH4, and ETH5) are bonded together for all traffic types. Each segment (Data, Management, and Replication) requires a set of network settings on the IP page.
- ETH0 (Replication), BOND ALL-1 (Management/Data) All Replication traffic takes place on port ETH0. Data and Management traffic take place on ports ETH1, ETH2, ETH3, ETH4 and ETH5. Each segment (Data, Management, and Replication) requires a set of network settings on the IP page.
- ETH0 (Management), BOND ALL-1 (Replication/Data) All Management traffic takes place on port ETH0. Data and Replication traffic take place on ports ETH1, ETH2, ETH3, ETH4 and ETH5. Each segment (Data, Management, and Replication) requires a set of network settings on the IP page.
- BOND ALL-1 (Data), ETH0 (Replication/Management) All Data traffic takes place on ports ETH1, ETH2, ETH3, ETH4 and ETH5. Management and Replication traffic take place on port ETH0. Each segment (Data, Management, and Replication) requires a set of network settings on the IP page.

#### DXi6500 - 6550 (2 x 1GbE ports and 2 x 10GbE ports)

- BOND ALL 1GB (Not segmented) Both 1GbE ports (ETH0 and ETH1) are bonded together and require a single set of network settings on the IP page. (The 10GbE ports are not used in this configuration.)
- BOND ALL 10GB (Not segmented) Both 10GbE ports (ETH4 and ETH5) are bonded together and require a single set of network settings on the IP page. (The 1GbE ports are not used in this configuration.)
- BOND ALL 1GB (Replication/Management/Data) Both 1GbE ports (ETH0 and ETH1) are bonded together for all traffic types. Each traffic type (Data, Management, and Replication) requires a set of network settings on the IP page. (The 10GbE ports are not used in this configuration.)
- BOND ALL 10GB (Replication/Management/Data) Both 10GbE ports (ETH4 and ETH5) are bonded together for all traffic types. Each traffic type (Data, Management, and Replication) requires a set of network settings on the IP page. (The 1GbE ports are not used in this configuration.)
- BOND ALL 1GB (Replication), BOND ALL 10GB (Management/ Data) - All Replication traffic takes place on ports ETH0 and ETH1. Data and Management traffic take place on ports ETH4 and ETH5. Each traffic type (Data, Management, and Replication) requires a set of network settings on the IP page.
- BOND ALL 1GB (Management), BOND ALL 10GB (Replication/ Data) - All Management traffic takes place on ports ETH0 and ETH1. Data and Replication traffic take place on ports ETH4 and ETH5. Each traffic type (Data, Management, and Replication) requires a set of network settings on the IP page.
- BOND ALL 10GB (Data), BOND ALL 1GB (Replication/ Management) - All Data traffic takes place on ports ETH4 and ETH5. Management and Replication traffic take place on ports ETH0 and ETH1. Each traffic type (Data, Management, and Replication) requires a set of network settings on the IP page.
- 3 Under Bonding, select a bonding option:
  - Round Robin (Mode 0) This option sends Ethernet frames using the bonded Ethernet ports with a valid MII link. Frames are sent in a round-robin fashion, starting with the first slave device and then the rest of the devices. This only applies to the traffic sent from the DXi6500. Your Ethernet switch needs to

aggregate the ports, so the connected ports are treated as a logical port. The frame reception is completely dependent on the transmission algorithm of your Ethernet switch. The bonding mechanism does not balance the frame reception.

- LACP (Mode 4) This option (Link Aggregation Control Protocol) is based on the 802.3ad IEEE standard for aggregating Ethernet ports. If the bonding algorithm is set to LACP, your Ethernet switch ports need to be configured in a 802.3ad based Link Aggregation group (LAG) in LACP mode. The frame reception and transmission is controlled by the LACP between the bonded ports and your Ethernet switch ports.
- Note: Note: In order to maintain network connectivity to your system, you must reconfigure the switch that is connected to your system to use the same bonding mode. The best time for you to change the bonding mode on your switch will be during the next reboot of your system, after you have saved the new network settings. Changing the bonding mode on your switch before saving these settings and rebooting may result in the loss of network connectivity to your system.
- 4 Click Apply.

#### Table 30 Network Configuration Information

(2 x 1GbE Configuration)

Segmentation Option	Network Information		
BOND ALL (Not	Bond All IP Address:		
Segmented)	Bond All Netmask:		
	Replication Network Information	Management Network Information	Data Network Information
BOND ALL	IP Address:	IP Address:	IP Address:
(Replication/	Netmask:	Netmask:	Netmask:
Management/ Data)	Gateway:	Gateway:	Gateway:
ETH0 (Replication), ETH1 (Management/ Data)	ETH 0	ETH 1	ETH 1
	IP Address:	IP Address:	IP Address:
	Netmask:	Netmask:	Netmask:
	Gateway:	Gateway:	Gateway:
ETH0 (Management), ETH1 (Replication/ Data)	ETH 1	ETH0	ETH 1
	IP Address:	IP Address:	IP Address:
	Netmask:	Netmask:	Netmask:
	Gateway:	Gateway:	Gateway:
ETH1 (Data), ETH0 (Replication/	ETH 0	ETH 0	ETH 1
	IP Address:	IP Address:	IP Address:
ivianagement)	Netmask:	Netmask:	Netmask:
	Gateway:	Gateway:	Gateway:

#### Table 31 Network Configuration Information (6 x 1GbE Configuration)

Segmentation Option	Network Information			
BOND ALL (Not	Bond All IP Address:	Bond All IP Address:		
Segmented)	Bond All Netmask:	Bond All Netmask:		
	Replication Network Information	Management Network Information	Data Network Information	
BOND ALL	IP Address:	IP Address:	IP Address:	
(Replication/	Netmask:	Netmask:	Netmask:	
Management/ Data)	Gateway:	Gateway:	Gateway:	
ETH0 (Replication),	ETH0	BOND ALL-1	BOND ALL-1	
	IP Address:	IP Address:	IP Address:	
BOND ALL-1 (Management/	Netmask:	Netmask:	Netmask:	
Data)	Gateway:	Gateway:	Gateway:	
ETH0	BOND ALL-1	ETH0	BOND ALL-1	
(Management), BOND ALL-1 (Replication/Data)	IP Address:	IP Address:	IP Address:	
	Netmask:	Netmask:	Netmask:	
	Gateway:	Gateway:	Gateway:	
BOND ALL-1	ETH0	ETH 0	BOND ALL-1	
(Data),	IP Address:	IP Address:	IP Address:	
ETHU (Replication/ Management)	Netmask:	Netmask:	Netmask:	
wanayement)	Gateway:	Gateway:	Gateway:	

Table 32NetworkConfiguration Information(2 x 1GbE and 2 x 10GbEConfiguration)

Segmentation Option	Network Information		
BOND ALL 1GB	Bond All IP Address:		
(Not Segmented)	Bond All Netmask:		
BOND ALL 10GB	Bond All IP Address:		
(Not Segmented)	Bond All Netmask:		
	Replication Network Information	Management Network Information	Data Network Information
BOND ALL 1GB	IP Address:	IP Address:	IP Address:
(Replication/	Netmask:	Netmask:	Netmask:
Management/ Data)	Gateway:	Gateway:	Gateway:
BOND ALL 10GB (Replication/ Management/ Data)	IP Address:	IP Address:	IP Address:
	Netmask:	Netmask:	Netmask:
	Gateway:	Gateway:	Gateway:
BOND ALL 1GB	BOND ALL 1GB	BOND ALL 10GB	BOND ALL 10GB
(Replication),	IP Address:	IP Address:	IP Address:
(Management/	Netmask:	Netmask:	Netmask:
Data)	Gateway:	Gateway:	Gateway:
BOND ALL 1GB	BOND ALL 10GB	BOND ALL 1GB	BOND ALL 10GB
(Management),	IP Address:	IP Address:	IP Address:
(Replication/Data)	Netmask:	Netmask:	Netmask:
(hepheation/Data)	Gateway:	Gateway:	Gateway:
BOND ALL 10GB	BOND ALL 1GB	BOND ALL 1GB	BOND ALL 10GB
(Data),	IP Address:	IP Address:	IP Address:
(Replication/	Netmask:	Netmask:	Netmask:
Management)	Gateway:	Gateway:	Gateway:

# **Date and Time Configuration**

The date and time can be set from the remote management pages. Setting the correct date and time allows the system to provide accurate reports when events occur on the system.

Use the **Date & Time** page to set the system date and time.

To access the **Date & Time** page:

1 From the **Configuration** menu, click the **Date & Time** tab.

The System Date and Time Settings page displays (see Figure 69).

Figure 69 System Date and	Quantum.	Admin Ticket DX/r6	500
nine settings rage	Home	Monday, September 14, 2009 7:31:48 AmericaLos_Angeles (PDT)         Administrator Login         Logaut           NAS & OST         PTT         Network         Date & Time         Security         Email         SNMP         Contacts	2 <u>Help</u>
	Configuration	System Date and Time Settings 2	
	Status Alerts Data Services	Current Node 1 Date: Monday, September 14, 2009 New System Date: Monday, September 14, 2009 Edit	
	Utilities	Current Node 1 Time:         7:30:27 America Los_Angeles (PDT)           New System Time:         07          1 30          1 28	
	Status: Attention Info Hostname: vectra IP address: Capacity: 24 00 TB	Use NTP     Select a Timeserver Pool     -or-     O     Specify a Timeserver or Pool     192 43 244.18	
	Available: 3.88 TB ? Used: 20.12 TB (83.83%)	Timezone:         America/Los_Angeles           Time Format         O 12 Hours	
	Data reduced by: 16.02%	Apply Reset	

- 2 There are two options for setting the system date and time (select one):
  - (Recommended) Select Use NTP (Network Time Protocol) to synchronize the DXi6500 or DXi6700 to an NTP timeserver or timeserver pool.

The **Select a Timeserver Pool** drop down box provides a list of well-known, geographically-based, NTP timeserver pools. This option is recommended if you configured at least one DNS IP address during network configuration.



The **Specify a Timeserver or Pool** box lets you type the name or IP address of any desired NTP server/pool. (See <u>http://</u><u>support.ntp.org</u> for information on publicly available NTP servers)

- Select **Manual** to manually set the system date and time. Click **Edit** to specify the system date. Use the drop down boxes to specify the system time.
- 3 Select the Timezone.
- 4 Select the desired time format (24 hours or 12 hours).
- 5 Click Apply.

# **Security Configuration**

To access the **Security** page, from the **Configuration** menu, click the **Security** tab.

The **Security** page contains the following tabs:

- <u>Passwords</u>
- <u>SSL</u>
- Login Session

#### Passwords

The DXi6500 and DXi6700 has two levels of security built into the system:

- The **Monitor** user is allowed to view the DXi6500 and DXi6700 management pages, but not change them.
- The Administrator user can view and edit the management pages.

To set the monitor and administrator passwords:

1 From the **Security** page, click the **Passwords** tab.

The **Passwords** page displays (see Figure 70).

#### Figure 70 Passwords Page

Quantum.	Admin Ticket	DX/6500
Home	Monday, September 14, 2009 7:31:48 Americal Los_Angeles (PDT) Administrator Login NAS & OST PTT Network Date & Time Security Email SNMP Contacts Passwords SSL Login Session	Loqout <sup>2</sup> Help
Status Alerts Data Services Utilities	Monitor Password 2 New Password Confirm New Password Apply	
Status: Attention Info Hostname: vectra IP address: Copacity: 24.00 TB Available: 4.95 TB (2) Used: 19.05 TB (79.40%) Information Data reduced by: 8.17% Information Information	Administrator Password O New Password Confirm New Password  Enable CLI Monitor Account C Enable CLI Monitor Account C Reset Password to Factory Default C Change Password - Leave blank to keep existing password. New Password Confirm New Password Apply	
	CLI Administrator Account Q ✓ Enable CLI Administrator Account ○ Reset Password to Factory Default ③ Change Password - Leave blank to keep existing password. New Password Confirm New Password Apply	

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

Note: The passwords are limited to 15 characters.

- 3 Click Apply.
- 4 Under Administrator Password, enter the desired password in the New Password field and again in the Confirm New Password field.

**Note:** The passwords are limited to 15 characters.

5 Click Apply.

6 To reset the CLI (command line interface) monitor or administrator password to factory default, select **Reset Password to Factory Default** and click **Apply**.

The password is returned to the factory default.

- 7 To set the CLI monitor or administrator passwords, select **Change Password**, enter the new password, confirm the new password, and click **Apply**.
- 8 To enable or disable the CLI monitor or administrator account, select or clear the Enable CLI Monitor Account check box or the Enable CLI Administrator Account check box, and click Apply.

Use the **SSL** page to enable or disable SSL (Secure Sockets Layer) on the DXi6500 and DXi6700, or to add an SSL certificate.

To access the SSL page:

1 From the **Security** page, click the **SSL** tab.

The **SSL** page displays (see Figure 71).

Quantum.	Admin Ticket	DX:6500
Home Configuration Status Alerts Data Services Utilities	Monday, September 14, 2009 7:31:48 AmericaLos_Angeles (PDT) Administrator Login NAS & OST PTT Network Date & Time Security Email SNMP Contacts Passwords SSL Login Session Properties 0 SSL: O Enabled O Disabled Apply	Looout <sup>©</sup> Help
Status: Attention Info Hostname: vectra IP address: Capacity: 24 00 TB Available: 4.95 TB '? Used: 19.05 TB (79.40%) Data reduced by: 8.17% [Info	Cortificate 0 The Quantum default SSL certificate is currently installed. New	



SSL

# **SSL Properties**

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

To establish a secure SSL connection, your DXi6500 or DXi6700 must have an encryption key assigned to it by a Certification Authority in the form of a certificate file, private key file, and pass phrase. Once you install these components, you can establish a secure connection using the SSL protocol. The DXi6500 and DXi6700 comes with a SSL certificate.

To enable or disable SSL:

- 1 Do one of the following actions:
  - To enable SSL, select **Enabled**.
  - To disable SSL, select **Disabled**.

Note: The default setting for SSL is Disabled.

2 Click Apply.

#### **Server Authentication Warnings**

Enabling SSL with the default Quantum certificate allows you to securely communicate with the DXi6500 or DXi6700 Web-based interface using SSL encryption. However, you may receive a warning from your Web browser stating that the server you are attempting to connect to does not match the server embedded within the certificate. This is expected behavior since the default certificate can only be used for encryption and not server authentication. You may install your own custom certificate in order to take advantage of server authentication in addition to encrypted communication.

To suppress server authentication warnings for the default certificate:

Internet Explorer - If a dialog box displays warning you of a
possible certificate error, add the IP address for your DXi6500 or
DXi6700 to the Trusted Sites list (Tools > Internet Options >
Security > Trusted Sites). If you receive subsequent warning pages
and the option to close the browser or continue to the Web site,
click Continue. This suppresses the warnings until you restart the
browser.

• **Firefox** - If the **Secure Connection Failed** dialog box displays, click the link at the bottom of the dialog box and follow the instructions to add an exception for your DXi6500 or DXi6700.

# **SSL Certificate**

You can purchase other certificates and add them to the DXi6500 or DXi6700 SSL configuration.

To add an SSL certificate:

1 Click New.

The Install New Certificate page displays (see Figure 72).

	Quantum.	Admin Ticket DX/6500
2		Monday, September 14, 2009 7:31:48 America/Los_Angeles (PDT) Administrator Login Logout 2 He
	Home	NAS & OST PTT Network Date & Time Security Email SNMP Contacts
	Configuration	Passwords SSL Login Session
	Status	Install New Certificate 2
	Alerts	Step 1: Upload your SSL certificate file.
	Data Services	Certificate File: Browse
	Utilities	Note: The SSL certificate file to be uploaded must be named server.crt.
	Status: Attention Info	Upload Cancel
	Hostname: vectra	Step 2: Upload your SSL private key file.
	Capacity: 24.00 TB Available: 4.95 TB ? Used:	Step 3: Enter your SSL passphrase and activate.
	19.05 TB (79.40%)	
	Data reduced by: 8.17%	

2 In the **Certificate File** box, type the location and filename of the new SSL certificate.

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

- 3 Click Upload to install the SSL certificate file.
- 4 Type your private key and press Enter.
- 5 Type your pass phrase and press Enter.



A **Successful Upload** page displays indicating that the SSL certificate file has been installed on the system.

6 Click OK.

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

# **Login Session**

Use the **Login Session** page to specify an inactivity time-out value from 1 to 60 minutes. The default setting is 30 minutes. When the remote management pages are inactive for this period of time, the user is automatically logged out of the session and must log back in to continue.

To access the Login Session page:

1 From the **Security** page, click the **Login Session** tab.

The Session Configuration page displays (see Figure 73).

Quantum.		Admin Ticket	DX:6500
	Monday, September 14, 2009 7:31:48 America/Los_Angeles (PDT)	Administrator Login	Logout ? Help
Home	NAS & OST PTT Network Date & Time Security Email	I SNMP Contacts	
Configuration	Passwords SSL Login Session		
Status	Session Configuration 2		
Alerts	Inactivity Timeout (1-60 minutes) 30		
Data Services	Apply		
Utilities			
Status:			
Attention			
Hostname: vectra IP address:			
Capacity: 24.00 TB Available: 4.95 TB (?) Used: 19.05 TB (79.40%)			
Data reduced by: 8.17%			

2 Enter an Inactivity Timeout (1 to 60 minutes) and click Apply.

The inactivity timeout value is set.



# **Email Configuration**

Use the **Email** page to specify e-mail server settings as well as recipients who should be contacted when service tickets or administrator alerts occur. You can specify e-mail recipients, notification levels, and information about your e-mail configuration.

To access the **Email** page, from the **Configuration** menu, click the **Email** tab.

The Email page contains the following tabs:

- <u>Recipients</u>
- <u>Server</u>
- <u>Test</u>
- Email Home

Recipients

Use the **Recipients** page to add, edit, and delete e-mail recipients.

**Note:** To enable the DXi6500 or DXi6700 to send notifications to recipients, you must configure the e-mail server settings (see <u>Server</u> on page 173).

To access the **Recipients** page:

1 From the **Email** page, click the **Recipients** tab.

The Email Recipient Configuration page displays (see Figure 74).

#### Figure 74 Email Recipient Configuration Page

Quantum.	Admin Ticket	DX:6500
	Monday, September 14, 2009 7:31:48 America/Los_Angeles (PDT) Administrator Login	Logout ? Help
Home	NAS & OST PTT Network Date & Time Security Email SNMP Contacts	
Configuration	Recipients Server Test Email Home	
Status	Email Recipient Configuration 2	
Alerts	Summary Add Edit Delete	
Data Services	Email Recipient Summary	
Utilities	Name         Email Address         Notification Type         Notification Status           DXi6500         techsup@quantum.com         All         Disabled	
	adm1 @quantum.com All Enabled	
Status: Attention Info		
Hostname: vectra		
Capacity: 24.00 TB Available: 4.95 TB ?		
Used: 19.05 TB (79.40%)		
Data reduced by: 8.17%		

The **Recipients** page contains the following tabs:

- <u>Summary</u>
- <u>Add</u>
- Edit
- <u>Delete</u>

### Summary

The **Summary** page lists all configured e-mail recipients. To edit information for an e-mail recipient, click the **Name** link.

# Add

Use the Add page to configure an e-mail recipient.

To add an e-mail recipient:

- 1 From the **Recipients** page, click the **Add** tab.
- 2 Enter the Name of the recipient.
- 3 Enter the e-mail address of the recipient.
- 4 Select a notification type:

• **High** - Send e-mail notifications for High service tickets (see <u>Service Tickets</u> on page 203 for more information).

High service tickets indicate that a critical event has occurred which needs to be resolved immediately. The operation and performance of the DXi6500 or DXi6700 is degraded and there is a risk of impending system failure or data loss

• **High and Medium** - Send e-mail notifications for High and Medium service tickets.

Medium service tickets indicate that a more serious event has occurred which needs to be resolved, but it does not necessarily need to be fixed immediately. The operation and performance of the DXi6500 or DXi6700 may be degraded.

• All - Send e-mail notifications for High, Middle, and Low service tickets as well as any administrator alerts (see <u>Admin Alerts</u> on page 201 for more information).

Low service tickets indicate that an event has occurred which needs to be resolved, but it generally does not affect the operation or performance of the DXi6500 or DXi6700.

- **5** Select the **Notification Enabled** check box. When notifications are enabled, the recipient receives notifications.
- 6 Click Apply.

The e-mail recipient is added.

# Edit

Use the **Edit** page to edit the e-mail recipient information for a specific recipient.

To access the Edit page, from the Recipients page, click the Edit tab.

# Delete

Use the **Delete** page to delete a previously configured e-mail recipient.

To delete an e-mail recipient:

- 1 From the **Recipients** page, click the **Delete** tab.
- 2 Select the e-mail recipient.
- 3 Click Delete.

The e-mail recipient is deleted.

Server	Use the Server page to edit the outgoing e-mail server information.		
	1 From the <b>Email</b> page, click the <b>Server</b> tab.		
	2 Enter the Host Name or IP Address for the outgoing e-mail server (for example, the DNS name).		
	<b>Note:</b> When entering IP addresses, never use an address that is in a reserved IP address range. To see a list of reserved IP address ranges, click the quick tip icon (?) located near the IP address field.		
	3 Enter the return e-mail address in the From Email Address box.		
	Specify a return address that lets you easily identify the system that generated the e-mail (for example, DXi-systemname@any-domain.com). The return address must contain an @ symbol and a valid domain name including a period.		
	4 Click Apply.		
Test	Use the <b>Test</b> page to send a test e-mail to verify the e-mail configuration.		
	To access the <b>Test</b> page, from the <b>Email</b> page, click the <b>Test</b> tab. To send a test e-mail, select a recipient from the list and click <b>Send</b> .		
Email Home	Use the <b>Email Home</b> page to configure the DXi6500 or DXi6700 to automatically send XML-based reports to e-mail recipients.		
	The report represents a snapshot of the system information at the time the report is generated. Quantum recommends generating and saving a report before performing a software upgrade or reconfiguring the system.		
	The system can generate two types of reports:		
	Status Data - System status information		
	Configuration Data - System configuration data		

The report is contained in an e-mail that also includes the following information:

- System serial number
- Date and time
- A message with the e-mail origin that informs the user it is an automated e-mail and that they should not respond to it.

To access the **Email Home** page, from the **Email** page, click the **Email Home** tab.

The **Email Home** page contains the following tabs:

- <u>Schedule</u>
- On Demand

# Schedule

Use the **Schedule** page to enable the Email Home Scheduler, set the day and time when the Status Data or Configuration Data reports are sent, and configure up to three e-mail recipients.

The Email Home Scheduler feature automatically sends an e-mail to the configured recipients once a week.

To configure the Email Home Scheduler:

- 1 From the **Email Home** page, click the **Schedule** tab.
- 2 To enable the Email Home Scheduler, select the **Enable Email Home** Scheduler check box.
  - The Email Home Scheduler is enabled by default.
  - To disable the Email Home Scheduler, clear the Enable Email Home Scheduler check box.
- 3 Specify the day and hour of the week when reports are sent.
- 4 Specify up to three e-mail recipients.

Note: You cannot edit the first recipient.

5 Click Apply.

### **On Demand**

Use the **On Demand** page to immediately send a Status Data or Configuration Data report to a recipient.

- 1 From the **Email Home** page, click the **On Demand** tab.
- 2 Select the type of report to send (Status Data or Configuration Data).
- **3** In the **Send To** box, specify the e-mail address where you want to send the report.
- 4 Click Send.

# **SNMP Configuration**

SNMP is short for Simple Network Management Protocol, a set of protocols for managing complex networks. SNMP works by sending messages, called protocol data units (PDUs), to different parts of a network. SNMP-compliant devices, called agents, store data about themselves in Management Information Bases (MIBs) and return this data to the SNMP requesters.

To access the **SNMP** page, from the **Configuration** menu, click the **SNMP** tab.

The **SNMP** page contains the following tabs:

- Destinations
- <u>Community</u>
- <u>Test</u>

#### Destinations

Use the **Destinations** page to add, edit, or delete SNMP destinations.

To access the **Destinations** page:

1 From the **SNMP** page, click the **Destinations** tab.

The Trap Destination Configuration page displays (see Figure 75).

#### Chapter 5: DXi6500 and DXi6700 Configuration SNMP Configuration

Figure 75 Trap Destination Configuration Page



### Add or Edit Destinations

To add or edit an SNMP destination:

1 From the **Destinations** page, click the **Add** tab.

**Note:** To edit a destination, click the destination IP address link on the **Summary** page, or click the **Edit** tab.

2 Enter the IP Address that will receive the traps generated by the DXi6500 or DXi6700 (for example, 12.34.56.78).

**Note:** If you are editing a destination, select the destination you want to edit in the **IP Address** list. You cannot edit the IP address.

**Note:** When entering IP addresses, never use an address that is in a reserved IP address range. To see a list of reserved IP address ranges, click the quick tip icon (?) located near the IP address field.

- **3** Enter a **Name** for the SNMP destination.
- 4 Select the traps to be reported (see <u>Table 33</u>):

#### Table 33SNMP Trap Selections

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

### 5 Click Apply.

# **Delete Destinations**

To delete an SNMP destination:

- 1 From the **Destinations** page, click the **Delete** tab.
- **2** Select the destinations to delete.
- 3 Click Delete.

# Community

Use the **Community** page to add, edit, and delete the SNMP community information.

To access the **Community** page:

1 From the **SNMP** page, click the **Community** tab.

The **SNMP Community Configuration** page displays (see Figure 76).

# Chapter 5: DXi6500 and DXi6700 Configuration SNMP Configuration

Figure 76 SNMP Community Configuration Page

		Admin	DX/6500
Home     Monday, September       Configuration     NAS & OST       Status     Alerts       Data Services     SIMM Communication       Utilities     Sinther       Status:     Atention       Hostname:     vectra       IP address:     24 90 TB       Available:     4 95 TB	I4, 2009 7:31:48 AmericaL.os_Angeles (PDT) T Network Date & Time Security Email  mmunity Test ty Contiguration 0 a. Edit. Delete mmunity Summary dress Network Mask Access Type Community Status mmunities have been configured.	Administrator Login	

# Add or Edit Communities

To add or edit a community:

1 From the **Community** page, click the **Add** tab.

**Note:** To edit a community, click the community name link on the **Summary** page, or click the **Edit** tab.

2 Enter a unique Name (up to 20 characters). Valid characters are letters, numbers, hyphens, and underscores.

**Note:** If you are editing a community, select the community you want to edit in the **Name** list. You cannot edit the name.

**Caution:** If no communities are defined, the SNMP agent is not accessible.

3 Enter a valid IP Address and Network Mask pair.

A pair is valid if performing a logical bitwise **AND** operation on the IP address and the network mask results in the IP address. See the following table for examples:

IP Address / Network Mask	Result
10.40.166.87 255.255.255.255	Allows access only from 10.40.166.87
10.40.166.87 10.40.166.87	Allows access only from 10.40.166.87
10.40.166.87 10.40.166.0	Invalid because the logical bitwise operation (address <b>AND</b> mask) is not equal to the address
10.40.166.87 255.255.0.0	Invalid because the logical bitwise operation (address <b>AND</b> mask) is not equal to the address
10.40.0.0 255.255.0.0	Allows access from any client with address 10.40. <i>xx.xx</i>

**Note:** If you define a single community and set both the IP address and network mask to 0.0.0.0 (or leave both blank), then IP address-based access control is disabled. In this case, the SNMP agent is accessible from any IP address.

**Note:** When entering IP addresses, never use an address that is in a reserved IP address range. To see a list of reserved IP address ranges, click the quick tip icon (?) located near the IP address field.

- 4 Select the Access Type for the new community:
  - Get allows SNMP get operations.
  - Get/Set allows both SNMP get and put operations.
- **5** Select the **Community Status** check box to enable this SNMP community.
- 6 Click Apply.

An **Information** page displays indicating the community has been added.

# **Delete Communities**

To delete an SNMP community:

- 1 From the **Community** page, click the **Delete** tab.
- 2 Select the communities to delete.
- 3 Click Delete.

Use the **Test** page to send a test SNMP trap.

To send a test SNMP trap:

- 1 From the **SNMP** page, click the **Test** tab.
- 2 Select an SNMP destination.
- 3 Click Send to send a test SNMP trap.

The test trap is sent. Verify the destination to ensure the SNMP trap was sent.

# **Contacts Configuration**

Use the **Contacts** page to enter company contact information.

To access the **Contacts** page:

1 From the **Configuration** menu, click the **Contacts** tab.

The **Company Information** page displays (see Figure 77).

Test

#### Figure 77 Company Information Page

Quantum.	Admin Ticket DX;6500
	Monday, September 14, 2009 7:31:48 America/Los_Angeles (PDT) Administrator Login Logout ? Help
Home	NAS & OST PTT Network Date & Time Security Email SNMP Contacts
Configuration	Company Primary Secondary
Status	Company Information
Alerts	Company Name:
Data Services	Street
Utilities	City:
	State:
Status: Attention Info	Postal Code:
Hostname: vectra	Country:
IP address:	DXi6500 Location:
Available: 4.95 TB ? Used:	Support Contract:
19.05 TB (79.40%)	Apply
Data reduced by: 8.17%	

The **Contacts** page contains the following tabs:

- <u>Company</u>
- <u>Primary and Secondary</u>

# Company

Use the **Company** page to enter company specific information.

- 1 From the **Contacts** page, click the **Company** tab.
- 2 Edit the company information as desired (see <u>Table 34</u> for a description of the fields).
- 3 Click Apply.

Table 34 Company Information	Field	Description
	Company Name	View or edit the company name where the DXi6500 or DXi6700 system resides.
	Street	View or edit the street name where the company is located.
	City	View or edit the city where the company is located.

Field	Description
State	View or edit the state where the company is located.
Postal Code	View or edit the postal code.
Country	View or edit the country where the company is located.
DXi6500 or DXi6700 Location	View or edit the physical location of the DXi6500 or DXi6700 system (for example, data center).
Support Contract	View or edit the support contract number.

# **Primary and Secondary**

Use the **Primary** and **Secondary** pages to enter primary and secondary contact information.

- 1 From the **Contacts** page, click the **Primary** or **Secondary** tab.
- 2 Edit the primary or secondary contact information as desired (see <u>Table 35</u> for a description of the fields).
- 3 Click Apply.

Field	Description
Name	View or edit the primary/secondary contact name.
Email Address	View or edit the primary/secondary contact e- mail address.
Phone	View or edit the primary/secondary contact phone number.
Fax	View or edit the primary/secondary contact fax number.

Table 35 Primary and Secondary Contact Information

Field	Description
Pager	View or edit the primary/secondary contact pager number, if available.
Street	View or edit the primary/secondary contact street address.
City	View or edit the primary/secondary contact city location.
State	View or edit the primary/secondary contact state location.
Postal Code	View or edit the primary/secondary contact postal code.
Country	View or edit the primary/secondary contact country location.

Chapter 5: DXi6500 and DXi6700 Configuration Contacts Configuration

# Chapter 6 DXi6500 and DXi6700 Status

The **Status** pages allow you to view information on the DXi6500 and DXi6700 hardware as well as performance information. The status information is polled by the system every two minutes.

To access the **Status** pages, from the contents frame, click the **Status** menu.

Use the Status pages to view the following status information:

- <u>Hardware</u>
  - <u>Summary</u>
  - Details
- <u>System</u>
  - <u>CPU</u>
  - RAID
  - <u>Ethernet</u>
  - Data Deduplication
  - Ingest
  - Disk Usage
- <u>VTL (DXi6700 Only)</u>
  - <u>Physical View</u>
  - Logical View

#### Performance View

# Hardware

The DXi6500 and DXi6700 provides a variety of hardware information from the **Hardware** page. The **Hardware** page gives the current status of the node and command components such as the hard drives, power supplies, fan modules, and temperature of the node.

To access the **Hardware** page, from the **Status** menu, click the **Hardware** tab.

The Hardware Status page contains the following tabs:

- <u>Summary</u>
- <u>Details</u>

#### Summary

The **Summary** page displays the status of the node and also all shared components. The overall status information for each component is reported as **Normal**, **Attention**, or **Failed**.

To access the Summary page:

1 From the Hardware page, click the Summary tab.

The Summary page displays (see Figure 78):



**2** Click a component link to display detailed information for that component.

#### Details

Use the **Details** page to view detailed information for each component. To access the **Details** page, from the **Hardware** page, click the **Details** tab.

The **Details** page contains the following tabs:

- Node 1 View hardware details for the following components:
  - <u>System Board</u>
  - <u>FC Adapters</u>
  - <u>Network Ports</u>
- Common View hardware details for the following components:
  - Storage Arrays

To view hardware details for a component, click the appropriate tab on the **Node 1** or **Common** page.

# System Board

The node contains a system board that provides the following types of information:

- System temperature
- CPU temperature
- System voltages
- Fan status
- Power supply status

Each component is shown in the **Name** column. The component type is shown in the **Type** column. If available, the value of the component is shown in the **Value** column. The status for each component is shown in the **Status** column:

- Normal The component is operating within normal operating parameters.
- Attention The component passed the attention threshold. Action may be required on the system.
- Warning The component has passed the warning threshold and requires attention.
- Failure The component has failed.
- NA The component status is unknown.
- Down The component is not connected.

#### **FC Adapters**

Each node can contain an optional Fibre Channel adapter with two Fibre Channel ports.

**Note:** The **FC Adapters** page is available only on DXi6500 configurations that include a Fibre Channel card (Model 6540 6550, and DXi6700).

Each Fibre Channel adapter is shown in the **Name** column. The status for each adapter is shown in the **Status** column.

- Normal The Fibre Channel adapter is operating within normal operating parameters.
- Failure The Fibre Channel adapter has failed and must be replaced.

The port status is shown for each Fibre Channel adapter. The port **Name** is shown as well as the **Value**. The **Value** shows the current throughput capacity in MB/sec.
The port can have one of the following statuses:

- Up The port is connected.
- **Down** The port is not connected.

#### **Network Ports**

Each node contains two or more Ethernet ports (depending on the configuration). Each Ethernet port is shown in the **Name** column. The speed of the port is shown in the **Value** column. The status for each port is shown in the **Status** column.

- Up The port is connected.
- Down The port is not connected.

#### **Storage Arrays**

All storage arrays, components, and controllers in the system appear in the **Name** column. The status for each array is shown in the **Status** column.

- **Normal** The array is operating within normal operating parameters.
- Failure The array has failed and requires attention.
- Missing The array has been removed.
- Attention The array is operable but performance is degraded.

Click an array link to display the components for that array. Click a component link to display the status for that component.

## System

To access the **System** page, from the **Status** menu, click the **System** tab.

The **System** page provides performance information for the following components:

• <u>CPU</u>

- RAID
- <u>Ethernet</u>
- Data Deduplication
- Ingest
- Disk Usage

To access the CPU performance page:

1 From the **System** page, click the **CPU** tab.

The CPU page displays (see Figure 79):

#### Figure 79 CPU Page

CPU

Quantum.		Admin Ticket	DX/6500
Home	Monday, September 14, 2009 8:10:40 America/Los_Angeles (PDT) Hardware System	Administrator Login	Logout ? Help
Configuration	CPU RAID Ethernet Data Deduplication Ingest Disk Usage		
Status Alerts Data Services	CPU Usage • Horizontal axis (Seconds): 100 - 0 seconds • Vertical axis (Data in Percentage): 0 - 100 % • Vertical bars represent approximately 1 second intervals. • Moving your mouse over a bar will display its value.		
Status: Normal Info Hostname: volante IP address: Capacity: 32.00 TB Available: 29.61 TB 9 Used: 2.39 TB (7.47%)	Node 1 CPU: Avg. x Usage		
Data reduced by: 95.12%	Time (in seconds)		

The CPU page displays the system CPU performance in a dynamic graph.

- Horizontal axis (Seconds): 100 0 seconds
- Vertical axis (Data in Percentage): 0 100%.
- Vertical bars represent approximately 1 second intervals.
- Moving your mouse over a bar will display its value.

You can monitor a specific CPU or an average of CPUs by selecting an option in the **CPU** drop down box.

RAID

To access the **RAID** performance page:

1 From the **System** page, click the **RAID** tab.

The **RAID** page displays (see Figure 80):



The **RAID** page displays the system RAID performance in a dynamic graph.

- · Horizontal axis (Seconds): 100 0 seconds
- Vertical axis (Amount of Read/Write): 0 100 OPS/sec.
- Values exceeding the vertical axis max are shown in brighter green.
- Vertical bars represent approximately 1 second intervals.
- Moving your mouse over a bar will display its value.

#### Ethernet

To access the Ethernet performance page:

1 From the **System** page, click the **Ethernet** tab.

The Ethernet page displays (see Figure 81):

Chapter 6: DXi6500 and DXi6700 Status System

Figure 81 Ethernet Page

Quantum.		Admin Ticket	DX:6500
Home Configuration Status Alerts Data Services	Monday, September 14, 2009 8:13:35 Americal.cos_Angeles (PDT) Hardware System CPU RAID Ethernet Data Deduptication Ingest Disk Usage Ethernet 2 Network Throughput - Horizontal axis (Seconds): 100 - 0 seconds - Vertical axis (Sata in MB): 0 - 125 MB/sec Values exceeding the vertical axis max are shown in brighter green Vertical bars representable prescond intervals.	Administrator Login	Locout <sup>9</sup> Help
Utilities	• Moving your mouse over a bar will display its value.		

The **Ethernet** page displays the system Ethernet performance in a dynamic graph.

- Horizontal axis (Seconds): 100 0 seconds
- Vertical axis (Data in MB): 0 125 MB/sec.
- Values exceeding the vertical axis max are shown in brighter green.
- Vertical bars represent approximately 1 second intervals.
- Moving your mouse over a bar will display its value.

You can monitor a specific port or an average of all ports by selecting an option in the **Ethernet** drop down box.

#### **Data Deduplication**

The **Data Deduplication** page displays the data deduplication performance for the system

To access the Data Deduplication performance page:

1 From the **System** page, click the **Data Deduplication** tab.

Figure 82 Data Deduplication	Quantum.		Admin	DX/6500
Figure 82 Data Deduplication Page	Quantum. Home Configuration Status Alerts Data Services Utilities Status: Normal Hostname: volante Pladres: Capacity: 3260 TB Austikhee 200 TB Austikhee Austikhee Austikhee Austikhee Austikhee Austikhee Austikhee Austikhee Configuration Austikhee Configuration Configuration Configuration Austikhee Austikhe	Monday, September 14, 2009 8:14:18 Americal_os_Angeles (PDT) Hardware System CRU RAID Ethernet Data Deduplication Ingest Disk Usage Data Deduplication 2 Data Deduplication	Admin Ticket Administrator Login	DX:6500
	Used: 2.40 TB (7.50%) B Data reduced by: 95 12% [10003203303032032032	Time (in minutes)		

The Data Deduplication page displays (see Figure 82):

The **Data Deduplication** page displays the system data deduplication performance in a dynamic graph.

- Horizontal axis (Minutes): 60 0 minutes.
- Vertical axis (Data in MB)
- Vertical bars represent 1 minute intervals.
- Moving your mouse over a bar will display its value.

You can select the time period to view from the Last drop down box.

#### Ingest

The **Ingest** page displays the throughput performance for the system. To access the **Ingest** performance page:

1 From the **System** page, click the **Ingest** tab.

The Ingest page displays (see Figure 83):

Chapter 6: DXi6500 and DXi6700 Status System

#### Figure 83 Ingest Page

Quantum.		Admin Ticket	DX:6500
Quantum. Home Configuration Status Alerts Data Services Utilities Status: Normal Info Hostname: volante IP address: Capacity: 32.00 TB Available: 29.60 TB ? Used: 2.40 TB (7.49%)	Monday, September 14, 2009 8:14:51 AmericaLos_Angeles (PDT) Hardware System CRVI RAD Ethernet Data Deduptication Ingest Disk Usage Ingest © Ingest Throughput • Horizontal axis (Seconds): 100 - 0 seconds • Values exceeding the vertical axis max are shown in brighter green. • Values exceeding the vertical axis max are shown in brighter green. • Values exceeding the vertical axis max are shown in brighter green. • Values exceeding the vertical axis max are shown in brighter green. • Mode 1 Throughput	Administrator Login	DX:6500
Data reduced by: 95.12%	Time (in seconds)		

The **Ingest** performance page provides the following information for the system:

- Horizontal axis (Seconds): 100 0 seconds
- Vertical axis (Data in MB): 0 1000 MB/sec.
- Values exceeding the vertical axis max are shown in brighter green.
- Vertical bars represent approximately 1 second intervals.
- Moving your mouse over a bar will display its value.

#### **Disk Usage**

To access the **Disk Usage** performance page:

1 From the **System** page, click the **Disk Usage** tab. The **Disk Usage** page displays (see Figure 84): Figure 84 Disk Usage Page

Quantum.		Admin Ticket	DX:6500
Home Configuration Status Alerts	Monday, September 14, 2009 8:16:34 AmericalLos_Angeles (PDT) Hardware System CPU RAD Ethernet Data Deduplication Ingest Disk Usage Disk Usage O Available 29:61 TB (92:54 % of Capacity)	Admin Tröket Administrator Login	DX76500
Data Services Utilities Status: Normal infe Hostname: volante IP address: Capacity: 32.00 TB Available: 29.60 TB ? Used: 2.40 TB (7.50%) III Data reduced by: 95.12%	Detail         Value         % of Capacity           Free space         3.87 TB         11.17 %           Cached data eligible for truncation         26.03 TB         11.17 %           Cached data eligible for truncation         26.03 TB         11.17 %           Used         2.39 TB (7.45 % of Capacity)         11.07 %           Detail         Value         % of Capacity           Deduplicated data         2.25 TB         7.02 %           Data waining to be deduplicated         27.56 GB         0.09 %           Data not intended for data deduplication         0.00 MB         0.00 %           System metadata         125.52 GB         0.39 %           Data Reduction 19         11.17 28         17.28           Compression Ratio         17.28         17.28           Compression Ratio         1.19         15.9		
	Reduced Size 2.25 TB		

The **Disk Usage** page provides the following information for the system:

- <u>Available (System Capacity)</u>
- Used (System Capacity)
- Data Reduction

#### Available (System Capacity)

Available space is the area that is available for data storage. The **Available** value is displayed as an amount and as a percentage of the total capacity in the system.

Available space is divided into the following categories:

**Note:** The value for each category is displayed as an amount and as a percentage of the total capacity in the system.

- Free Space This area is available for data storage.
- Cached data eligible for truncation After data is deduplicated, the native format is cached to allow for higher performance should you need to read the data back. When necessary, the system will automatically begin to delete some of this cached data in order to increase free space. The process of

deleting this cached data is called truncation (see <u>Space</u> <u>Management</u> on page 209).

#### **Used (System Capacity)**

Used space is the area that already holds data. The **Used** value is displayed as an amount and as a percentage of the total capacity in the system.

Used space is divided into the following categories:

**Note:** The value for each category is displayed as an amount and as a percentage of the total capacity in the system.

- **Deduplicated data** The amount of data that has already been deduplicated.
- Data waiting to be deduplicated The amount of data that is waiting to be deduplicated.
- Data not intended for data deduplication The amount of data that will NOT be deduplicated.
- **System metadata** The area on the system that is occupied by the system metadata.

#### **Data Reduction**

The data reduction area displays the data reduction performance for the system. Data reduction is divided into the following categories:

- **Note:** Since these values are calculated as data is deduplicated and compressed, they will not be completely up-to-date until all data that is eligible for deduplication is processed by the data deduplication and compression engines.
- Total Data Reduced The original, native size of all existing data that has been processed by the data deduplication and compression engines.
- Data Deduplication Ratio The deduplication ratio of all existing data that has been processed by the data deduplication engine.

- Compression Ratio The compression ratio of all existing data that has been processed by the data deduplication and compression engines.
- Total Reduction Ratio The total reduction ratio of all existing data that has been processed by the data deduplication and compression engines (calculated by dividing Total Data Reduced by Reduced Size).
- **Reduced Size** The final, reduced size of all existing data that has been processed by the data deduplication and compression engines.

# VTL (DXi6700 Only)

To view the VTL page:

1 From the **Status** page, click **VTL**.

The VTL page displays (see <u>figure 85</u>):

# Chapter 6: DXi6500 and DXi6700 Status VTL (DXi6700 Only)





The VTL page provides three views for the system hardware:

- Physical View
- Logical View
- Performance View

#### **Physical View**

The physical view displays the physical representation of the virtual components (tape drives, tape cartridges, and robots) of the VTL. Each drive and tape cartridge is displayed in the tape drive and storage bin sections. Clicking on a tape drive or cartridge displays the specific details for that device on the right hand side of the page.

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



• **Degraded Tape Cartridges** - when the RAID is degraded, all tape cartridges are shown in a degraded state.



• Unavailable Tape Cartridges - when the RAID has failed or is inaccessible due to failure, all tape cartridges are shown as unavailable.

**Logical View** 

A logical view displays the partitions within the DXi6700 system. Clicking on a partition displays the specific details for that partition such as:

- Partition name
- Number of drives
- Capacity
- Used
- Raw Data Size
- Compression Ratio
- Used Percent

Clicking on the i in the left-hand column displays additional information about the partition (serial number, number of cartridges, number of storage slots, number of import/export (i/e) slots, and the number of empty slots.

#### Tape Cartridge Capacity

The tape cartridge capacity is the specified capacity of a tape cartridge. This capacity value is the amount of data that would fit on a tape cartridge with compression turned off. To ensure that the data stored on a virtual tape cartridge can fit on a physical tape cartridge, the system uses a feature called **Tape Capacity Prediction**. This feature provides an estimate of the amount data required on a physical tape cartridge. This can cause some of the physical tape cartridge capacity to be unused.

#### Used

The **Used** value shows the amount of space on all media belonging to the partition, currently being utilized to store data. The **Used** value may be less than the original, native (raw) data size due to the data being compressed before being written to the media.

#### **Raw Data Size**

Raw Data Size represents the original, native amount of data (prior to compression) that has been written to all media belonging to the partition.

#### **Compression Ratio**

Compression Ratio represents the original, native amount of all data belonging to the partition (prior to compression) divided by the amount of space on all media belonging to the partition, currently being utilized to store data. In other words, Raw Data Size / Used.

#### Performance View

A performance view shows the average write speed for every partition and individual tape drive. You can click on specific partitions or tape drives to view the individual performance information.

# Chapter 7 DXi6500 and DXi6700 Alerts

Use the **Alerts** page to view administrator alerts (admin alerts) and service tickets. These alerts are generated by the system when hardware or software events have occurred.

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

The **Alerts** page contains the following tabs:

- <u>Admin Alerts</u>
- <u>Service Tickets</u>

# **Admin Alerts**

Admin alerts are generated by the system when the condition of the system has changed, such as going from the offline state to the online state.

**Note:** You must complete e-mail configuration (see <u>Email</u> <u>Configuration</u> on page 170) before administrator alerts can be sent.

To access the Admin Alerts page:

1 From the Alerts page, click the Admin Alerts tab.

The Administration Alerts page displays (see Figure 86):

Figure 86 Administration	Quantum.	Admin Ticket DX/6500
Figure 86 Administration Alerts Page	Quantum. Home Configuration Status Alerts Data Services Utilities Status: Attention Info Hostname: Ford IP address:	Admin     Ticket     DX:6500       Monday, September 14, 2009 8:20:20 AM AmericaLos_Angeles (PDT)     Administrator Login     Logout <sup>2</sup> Lete       Admin Aterts     Service Tickets       Administration Alerts     9       Click on an Alert from the table below to display its details.       Image: Alert Complete C
	Capacity: 24.00 TB Available: 23.94 TB 2 Used: 59.39 GB (0.25%) Data reduced by: 60.69%	No Administrative Alert selected for display.

The **Administration Alerts** page displays administration alerts for the DXi6500 and DXi6700 (see <u>Table 36</u>).

Note: You can click the Alert, Last Update, and Summary column headings to sort the rows in the report by the data in the respective column. Click the column heading again to invert the sorting sequence from ascending order to descending order.

Columns	Column	Description
	Alert	Name of the admin alert. Click the link to see the activity status history for the admin alert.
	Last Updated	Date when the admin alert was last opened or closed.
	Summary	Summary description of the admin alert.
	Delete	Click to delete the selected admin alert.

### **Service Tickets**

When an event in the DXi6500 or DXi6700 is detected, and localized isolation and recovery is attempted, the event is reported to one of the monitoring daemons. The monitoring daemon reports the event to the service daemon. The service daemon then logs the event and applies additional logic to determine whether the event warrants a service ticket.

If the event is not critical, the process for the event is completed. If the event is critical, the service daemon creates and logs a service ticket and notifies the user interface that a new service event needs attention. If the DXi6500 or DXi6700 detects that the problem is resolved, the ticket is closed. If the user indicates that the problem has been resolved, the ticket can be closed manually. At this point, the service daemon updates the ticket database and notifies the DXi6500 and DXi6700 Web pages.

**Note:** Tickets that are not resolved are generated again after 24 hours.

Note: You must complete e-mail configuration (see <u>Email</u> <u>Configuration</u> on page 170) before service tickets can be sent.

To help users determine the criticality of events occurring in the DXi6500 and DXi6700, service tickets grade events as **Low**, **Middle**, or **High** severity.

- Low (green) An event has occurred which needs to be resolved, but it generally does not affect the operation or performance of the DXi6500 and DXi6700.
- Middle (yellow) A more serious event has occurred which needs to be resolved, but it does not necessarily need to be fixed immediately. The operation and performance of the DXi6500 and DXi6700 may be degraded.
- **High (red)** A critical event has occurred which needs to be resolved immediately. The operation and performance of the DXi6500 and DXi6700 is degraded and there is a risk of impending system failure or data loss.

Service tickets or recommended action tickets (RAS) provide guidance to users on how to resolve certain events in the DXi6500 and DXi6700.

Some service tickets (and associated recommended actions files) guide users through a series of steps that may resolve the problem prior to contacting Quantum customer support.

The procedures described in system status tickets are intended to be performed by users who are familiar with the DXi6500 and DXi6700. At any time, a user may contact Quantum customer support for assistance or if the user is concerned about what specific actions to take.

#### **Viewing Service Tickets**

Viewing service tickets can be performed by users with the following access privilege:

- Monitor
- Administrator

To view service tickets:

1 From the Alerts page, click the Service Tickets tab.

The Service Tickets page displays (see Figure 87):



The Service Tickets page lists the information described in Table 37.

Note: You can click the Ticket, Request ID, State, Priority, Last Update, and Details column headings to sort the rows in the report by the data in the respective column. Click the column heading again to invert the sorting sequence from ascending order to descending order.

Table 37 Service Tickets	Column	Description
	Ticket	Service ticket numbers.
	Request ID	Request ID for the ticket.
	State	Current status of the service ticket ( <b>Open</b> or <b>Closed</b> ).
	Priority	Severity level of the problem described in the service ticket ( <b>Low</b> , <b>Middle</b> , or <b>High</b> ).
	Last Updated	Date when the service ticket was last opened or closed.
	Details	Summary description of the problem reported by the DXi6500 and DXi6700.

2 To view details for a ticket, click the ticket number.

The **Ticket Details** display at the bottom of the screen (see Figure 88).

#### Figure 88 Ticket Details

	Quantum.					Admin Ticket	DX:6500
		Monday, September 14, 20	09 8:28:	08 AM Am	erica/Los_Angeles (PDT)		Admini
	Home Alerts						
	Configuration	Admin Alerts Service	Tickets				
	Status	Click on a Service T	icket fro	m the ta	ble below to show its details	s, send email or change its	status.
	Alerts	Ticket Request ID	State	Priority	Last Update		Details
	Data Services	1 7	open	high	2009-09-02T08:12:25+00:00	I/O Server fan : Nonrecoverable	speed
	Data Services	2 74	open	high	2009-09-02T08:16:35+00:00	storage subsystem chassis C	0E0 : storage subsystem batte
	Utilities	3 70	open	high	2009-09-02T08:16:35+00:00	storage subsystem chassis C	0E0 : storage subsystem volu
	o tintioo	4 77	open	high	2009-09-02T08:26:44+00:00	storage subsystem chassis C	ONTROLLER_C1 : storage su
		5 66	open	high	2009-09-02T17:01:01+00:00	DXI6500: General DXI6500 So	tware : Operation failure
	Status:	0 /	open	nign	2009-09-04108:14:13+00:00	1/O Server fan : Nonrecoverable	speed
	Attention Info	1 1004754070	open	high	2009-09-04108.18.13+00.00	Storage subsystem chassis C	beo : storage subsystem balle
	Hartmann Frid	0 7	open	high	2009-09-05112.01.02+00.00	I/O Server for : Manageverable	spood
	Hostname: Ford	10 74	open	high	2009-09-05108:14:13+00:00	storane subsystem chassis C	r speeu NEN : storane subsystem batti
	Available: 23.94 TB ? Used: 59.39 GB (0.25%)	Ticket Details Tic	cket: '	Req	Jest ID: 7		
	Data reduced by: 60.69%	Closed At: O Closed By: O Priority: hi Summary: I/0	pen pen gh O Serve	r fan : N	onrecoverable speed		
ïcket details	t details						
		Analysis	Email				

The **Ticket Details** area lists the service ticket number, date and time when the ticket was last accessed (either opened or closed), ticket status (open or closed), a summary of the problem, and detailed information about the problem.

**Note:** The time indicated in the service ticket may not match the DXi6500 and DXi6700 system time.

Most service tickets also include a **View Recommended Actions** link. Click the link opens a separate window with recommended steps to resolve the problem. To close the window, click **x** in the upper right corner.

**Note:** For information on analyzing service tickets and obtaining additional information about a reported problem, see <u>Modifying Service Tickets</u>.

Figure 89 shows a sample Recommended Actions window.

#### Figure 89 Recommended Actions Window

IF	THEN			
A file system failed over unexpectedly:	Inspect the system log and the FSM cvid	Inspect the system log and the FSM cvlog to determine the root cause.		
The problem IS resolved:	Close the service ticket. Refer to Closing	Service Tickets.		
ine problem nas <u>"UUI</u> been resolved:	Modify the ticket according to the troubleshooting steps taken. Refer to <u>Analyzing Service Tickets</u> .     Contact the Quantum Technical Assistance Center.     In the USA: 1+800-284-5101     UK, France and Germany: 00000 4 QUANTUM     EMEA: 49 5131 3241 1164 / Asia Pacific: +603 7953 3010     On the Web: http://www.quantum.com/support			
	Print Document   Clos	ie Window		

#### **Modifying Service Tickets**

Modifying service tickets can be performed by users with this access privilege:

• Administrator

Use this procedure to add information to a service ticket related to system troubleshooting and to view the current status of a problem reported by the DXi6500 and DXi6700. All modified entries are kept with the ticket number and ticket summary when the service ticket is closed.

1 View a service ticket and show the ticket details.

See <u>Viewing Service Tickets</u> on page 204.

2 Click Analysis.

The Ticket Analysis page displays.

**3** Enter all relevant information regarding actions taken to resolve the issue and click **Apply**.

#### Sending Service Tickets by E-mail

Sending service tickets by e-mail can be performed by users with this access privilege:

• Administrator

DXi6500 and DXi6700 service tickets can be sent to a designated recipient via e-mail. Optionally, the sender can include a comment about the service ticket with the e-mail message.

1 View a service ticket and show the ticket details.

See Viewing Service Tickets on page 204.

- 2 Select a service ticket to send by e-mail and click Email.
  - **a** In the **Email Recipient** box, enter an e-mail address where the service ticket should be sent.
  - **b** (Optional) In the **Comment** box, enter a comment to send with the service ticket.
  - c Click Send.

#### **Closing Service Tickets**

Closing service tickets can be performed by users with this access privilege:

• Administrator

Use this procedure to close a service ticket.

Note: You can analyze a service ticket after it has been closed (see <u>Modifying Service Tickets</u> on page 207).

1 View a service ticket and show the ticket details.

See Viewing Service Tickets on page 204.

2 Click Analysis.

The Ticket Analysis page appears.

- 3 Select the Close Ticket check box.
- 4 Click **Apply** to close the service ticket.

# Chapter 8 DXi6500 and DXi6700 Data Services

Use the **Data Services** pages to configure space management and configure the system replication capability.

To access the **Data Services** pages, from the contents frame, click the **Data Services** menu.

The **Data Services** pages contain the following tabs:

- <u>Space Management</u>
- Data Replication

# **Space Management**

When data deduplication is enabled on the DXi6500 and DXi6700, it is not possible to accurately predict the amount of storage space required because the data deduplication process depends on the type of data being stored. This makes it necessary to define storage space thresholds so the user can be notified when storage space begins to run low. Space management provides the ability to monitor the storage space available on the system and notify the user if storage space begins to run low.

Note:	When a "low-disk-space" condition occurs on a system, the
	current system will pause its replication activity and any source
	systems that are currently replicating to this system are paused.
	When the "low-disk-space" condition ends, the current system
	will resume its replication activity and the source systems that
	were replicating to this system resume.

To access the Space Management page, from the Data Services menu, click the **Space Management** tab.

The **Space Management** page contains the following tabs:

- General
- Schedule

#### General

Use the General page to start or stop space reclamation and to monitor the progress of space reclamation.

To run space reclamation:

1 From the Space Management page, click the General tab.

The General page displays (see Figure 90).

Figure 90 General Page					
lighte 50 General Lage	Quantum.	Admin Ticket DX;6500			
		Monday, September 14, 2009 8:32:35 AM America/Los_Angeles (PDT) Administrator Login Logout 2 Help			
	Home	Space Management Replication			
	Configuration	General Schedule			
	Status	General Ø			
	Alerts	General Space Reclamation			
	Data Services	Status Reclamation Completed - No Candidates To Delete			
	Utilities				
	Status: Attention Info Hostname: Ford IP address:	Start Time         Sun Sep 13 13:00:12 2009           End Time         Sun Sep 13 13:00:18 2009			
	Capacity: 24.00 TB Available: 23.94 TB 2 Used: 59.39 GB (0.25%)	Space Reclaimed 0.00 MB Start Stop Refresh			
	Data reduced by: 60.69%				

2 To run space reclamation immediately, click Start.

The space reclamation process begins immediately. The **Status** section displays the space reclamation status.

The **Space Reclaimed** value indicates the amount of space that has been reclaimed so far during the active space reclamation process. If space reclamation is not running, the **Space Reclaimed** value indicates the amount of space reclaimed by the previous space reclamation.

**Note:** The space reclamation process will effect system performance. If possible, ensure that space reclamation occurs when the system is idle.

**3** To stop a reclamation in process, click **Stop**.

The status of space reclamation can be:

- **Reclamation Completed** Space reclamation has completed without errors.
- **Reclamation Started by User** Space reclamation has been started manually by a user.
- **Reclamation Interrupted** Space reclamation has been interrupted. Space reclamation must be restarted.
- **Reclamation Interrupted by User** Space reclamation has been interrupted by a user. Space reclamation must be restarted.
- **Reclamation Interrupted Error Encountered** Space reclamation has been interrupted because an error was encountered. Space reclamation must be restarted.
- Reclamation Completed No Candidates To Delete = Space reclamation completed, but there were no candidates for reclamation.
- **Reclaim Existing block Pool Freed space** The existing block pool space has been reclaimed for use.
- Stage 1 of 4 Delete Existing Candidates
- Stage 2 of 4 Calculating Deletion Candidates
- Stage 3 of 4 Delete New Candidates
- Stage 4 of 4 Reclaim disk space

#### Schedule

The block pool data area of the DXi6500 and DXi6700 is used to store tags that reference deduplicated and replicated data. Tags are used to rebuild a deduplicated file if it needs to be recovered. If this deduplicated or replicated data has been deleted from the system, the tags need to be removed from the block pool so the space can be used for additional reference tags.

To schedule space reclamation:

1 From the **Space Management** page, click the **Schedule** tab.

Figure 91 Schedule	Quantum.		Admin Ticket	DX/6500
	Home Configuration Status Alerts Data Services Utilities Status: Attention Hostname: Ford IP address: Capacity: 24 00 TB Available: 23 94 TB ?? Used: 59 39 GB (0 25%) Data reduced by: 60.69%	Monday, September 14, 2009 8:33:32 AM Americat.os_Angeles (PDT)         Space Management       Replication         General       Schedule         Periodic Space Reclamation       No Schedule         Daily at       01 ¥ : 00 ¥ : PM ¥         Weekty on       SUN ¥ at       01 ¥ : 00 ¥ : PM ¥         Apply	Administrator Login	

The Schedule page displays (see Figure 91).

Use the **Schedule** page to schedule periodic space reclamation either daily or weekly.

- 2 To schedule periodic space reclamation:
  - a Select Daily or Weekly and set the day and time information.

Or to disable periodic space reclamation, select No Schedule.

b Click Apply.

The schedule information is set.

# **Data Replication**

	<b>Note:</b> The information in this section applies to native DXi6500 and DXi6700 replication. OST optimized duplication using NetBackup or Backup Exec is described separately (see <u>OST</u> <u>Optimized Duplication</u> on page 130).
	The DXi6500 can be configured to automatically replicate data on another DXi system as part of a disaster recovery plan. Replication is the process of sending replicated data from a source VTL partition or NAS share to a target VTL partition or NAS share. This process is configurable on a per VTL partition or NAS share basis. The source system must have replication enabled. The target system can store replicated VTL partition or NAS share data for one or more source systems. A system can be both a source (VTL partition or NAS share sending replicated data) and target (receiving replicated data).
Configuring Replication for the First Time	For a new DXi6500 and DXi6700 installation, or immediately after a new share/partition has been created, be sure to replicate the namespace (via the <i>on demand</i> <b>Replicate Now</b> function) for each share /partition as soon as it is created and before any data is written to it.
	This action establishes the <b>namespace</b> file on the target. Establishing the namespace file <i>before</i> any data is written will expedite the first replication that occurs after the first backup.
	Failure to replicate the empty namespace is not fatal, but the speed of the first replication after the first backup will be up to twice as fast if you did replicate the empty namespace. This could be especially important when backing up a significant amount of data.
	Always replicate a share/partition namespace immediately after creation, no matter which option you chose for the very first replication
Replication Configuration Steps	<ul> <li>Configuring Replication consists of the following steps:</li> <li>1 Before data can be replicated from a source system to a target system, the target must be authorized to receive data from a</li> </ul>

specific source. To authorize a target system to receive data from a source, you must add the source host name or IP address to the Source Host List on the target system (see <u>Target Role Configuration</u> on page 229).

- 2 Once you have added the source system hostname or IP address to the target system, you must add the target system hostname or IP address to the source system. The source system can only replicate data to one target (see <u>Source Role Configuration</u> on page 216).
- 3 Now that both the target and source systems are setup for replication, you can enable replication and either schedule the replication process or manually replicate a partition or share (see either <u>Source Role VTL Configuration (DXi6700 Only)</u> on page 218 or <u>Source Role NAS Configuration (DXi6500 Only)</u> on page 222).

Cartridge Based Replication VTL Configuration Steps (DXi6700 Only) Configuring Cartridge Based Replication consists of the following steps:

- 1 On the **Target** system, create a new VTL partition that uses the same EXACT name, tape cartridge type, and tape drive type as the **Source** system VTL partition.
- 2 On the Target system, access the Cartridge Based Targets tab and set the partition Sync ID. The Sync ID is used to synchronize the Source Role VTL partition with the Target Role VTL partition (see Source Role VTL Cartridge Based Replication Configuration on page 221).
- **3** On the **Source** system, edit the partition that is enabled for replication and enter the **Sync ID** previously configured on the **Target** system (see <u>Source Role VTL Configuration (DXi6700 Only)</u> on page 218).
- 4 Your system is configured for VTL Cartridge Based Replication.

#### Directory/File Based Replication (DXi6500 Only)

Directory/File Based Replication, when configured, automatically replicates file data without user intervention or a schedule. The replication is triggered by a CLI command for file data (NAS share). This greatly enhances replication performance since only the file data in a NAS share that has changed will be replicated instead of the entire NAS share.

After Directory/File Based Replication, NAS share files are automatically recovered on the **Target** system. You may also initiate a synchronization

from the **Source** system to the **Target** system on NAS shares that have been configured for Directory/File Based Replication. This will replace all files on the **Target** NAS share with the most up to date files on the **Source** system.

Directory/File Based Replication NAS Configuration Steps (DXi6500 Only) Configuring Directory/File Based Replication consists of the following steps:

- On the **Target** system, create a new NAS share with the EXACT name as the NAS share on the Source system.
- On the Target system, access the Directory/File Based Targets page and set the share Sync ID. The Sync ID is used to synchronize the Source Role NAS share with the Target Role NAS share (see <u>Target</u> <u>Role NAS Directory/File Target Configuration</u> on page 236).
- On the Source system, edit the NAS share that is enabled for replication and enter the Sync ID previously configured on the Target system (see <u>Source Role NAS Configuration (DXi6500 Only)</u> on page 222).
- Your system is configured for NAS Directory/File Based Replication.

Replication Requirements The following list provides requirements for replication:

- Only VTL partitions or NAS shares with de-duplication enabled can be replicated.
- Only VTL partitions or NAS shares with replication enabled can be replicated.
- The target system must specify which source systems (up to ten) it will accept replicated data from.

**Note:** For optimization purposes, the underlying data is continuously updated and will become available when the replication is either run manually or using a scheduled replication.

#### Data Transmission

Once a data set has been deduplicated, it may be replicated (nonredundant data is transmitted from a source system to a target). Data deduplication tags representing files with a high probability of being replicated (for example, NAS shares marked for replication) are queued for replication after data deduplication is complete without regard to the replication schedule. This continuous transmission of data is an optimization allowing replication to be used with low bandwidth networks.

#### **Replication Set Transmission and Accounting**

When a replication set is scheduled for transmission, the system scans the files comprising the replication set and a **namespace** file is created. A **namespace** file contains the complete set of data deduplication tags for the replication set. Data that is active (a NAS file that is open) or data that is not yet deduplicated is not included in the **namespace** file. The **namespace** file is then deduplicated and transmitted to the target system after the data transmission of the replication set is complete. Once both the replication set and **namespace** file have been transmitted to the target system, the replication can be recovered.

#### Accessing Replication

To access the **Replication** page, from the **Data Services** menu, click the **Replication** tab.

The **Replication** page contains the following tabs:

- <u>Source Role Configuration</u>
  - Source Role VTL Configuration (DXi6700 Only)
  - <u>Source Role NAS Configuration (DXi6500 Only)</u>
- <u>Target Role Configuration</u>
  - Target Role VTL Configuration (DXi6700 Only)
  - Target Role NAS Configuration (DXi6500 Only)
- <u>Reports</u>

# **Source Role Configuration**

Use the **Source Role** page to define the NAS shares that will be replicated and the target that will receive the replicated data.

- Note: You must configure the target system prior to configuring the source. If the target system is not configured first, you will not be able to designate the replication target.
- Note: You MUST have at least one VTL partition or NAS share created on the source before you can configure it for replication.

To configure the source system for replication:

- **Note:** If you need to add, delete, or change a replication target, you must first pause replication from the Source Role Actions page. After the replication target has been changed, you must resume replication from the Source Role Actions page.
- 1 From the **Replication** page, click the **Source Role** tab.

The **Source Role General** page displays (see Figure 92).

Figure 92 Source Role General Page	Quantum.		Admin Ticket	DX:6500
		Monday, September 14, 2009 9:48:49 AM America/Los_Angeles (PDT)	Administrator Login	Logout ? Help
	Home	Space Management Replication		
	Configuration	Source Role Target Role Reports General NAS Actions Centeral Q		
	Status			
	Alerts			
	Data Services	Replication Target		
	Utilities	At least one Share must exist before Replication Target can be defined.     If the Replication Target has already been configured.		
	Status:	then the <u>Replication Service</u> must be paused in order to change the target.     All replications initiated from this system will be alread as the target categories.		
	Hostname: Ford IP address:	stored on the target specified, below.		
	Capacity: 24.00 TB Available: 23.94 TB ?	Host Name or IP Address:		
	59.39 GB (0.25%)	Use Encryption		
	Data reduced by: 60.69%			
		Source Role Performance 💿		
		Total Data Sent: 17.30 MB Total Bytes Sent: 11.65 MB		
		Average Send Rate : 0.30 I/IB/sec		
		L		

2 Enter the Host Name or IP Address for the replication target and click Apply.

- -\_

	Note: When entering IP addresses, never use an address that is in a reserved IP address range. To see a list of reserved IP address ranges, click the quick tip icon (?) located near the IP address field.
	<b>Use Encryption</b> is selected by default. When <b>Use Encryption</b> is enabled, data that is replicated is encrypted before it is replicated to another system. If your data network is already secured, disable <b>Use</b> <b>Encryption</b> for increased replication performance.
Source Role Performance	The <b>Source Role Performance</b> information displays the following statistics:
	• <b>Total Data Sent</b> - This field indicates the original, native size of the data transferred during replication or failback. This does not indicate the actual number of bytes sent over the network during replication or failback.
	• <b>Total Bytes Sent</b> - This field indicates the actual number of bytes transferred over the network during replication or failback, and is usually much less than the native size due to the benefits of data deduplication.
	• Average Send Rate - This field is based on the actual number of bytes transferred over the network during replication or failback. They are a measure of the total, number of bytes sent (in MB/sec) divided by the amount of time required to complete the replication or failback job(s).
Source Role VTL Configuration (DXi6700	The <b>Source Role VTL</b> section is used to select and configure VTL partitions for replication.
Only)	1 Click VTL from the Source Role page to replicate VTL partitions.
	The <b>Source Role VTL</b> page displays (see <u>figure 93</u> ).

Figure 93 Source Role VTL Page



The **Source Role VTL** page displays the available VTL partitions that are available for replication. The page also displays the current replication status for the partition and information on the most recent replication that was run.

The replication status can display the following states:

- In Progress the replication job is in progress.
- **Partial** the replication job was partially completed. Refer to the log file to view the files that were not replicated.
- Queued The replication job is queued and has not yet begun.
- Waiting The replication job is waiting for another job to complete before beginning.
- Success the replication job was completed successfully.
- Failure The replication job was not completed.

The **Information** button displays during a replication in progress or a replication successfully completed. The **Information** page displays the

amount of data transferred as well as the average MB/sec for a replication job.

- **2** To enable replication on the VTL partition and/or schedule a replication time, select the VTL partition and click **Edit**.
  - a Select **Enable Replication** to enable replication. To schedule a replication time, select **Replicate daily at** and enter the date and time to run the replication process.

**Note:** Replication should be scheduled to run after backups are complete.

b Click Apply.

**Note:** To disable replication or replication schedule for this VTL partition, deselect **Enable Replication** or **Replicate daily at**.

**3** To check the status of the VTL partition prior to replicating, click **Check Readiness**.

A window displays showing the status of the VTL partition. If any tape cartridges are in use or being deduplicated, they will display in the window. These files will be skipped if this VTL partition is replicated.

**4** To manually run the replication process, select the VTL partition and click **Replicate Now**.

**Caution:** If a node fails during a replication job, the replication job must be restarted.

The VTL partition replication process begins. The status of the current replication displays in the **Status** area.

- **5** To abort the replication, click the **Synchronize/Abort** button.
- 6 To Synchronize the partitions configured for **Cartridge Based Replication**, click **Synchronize/Abort**. The system will update all tape cartridges in the partition.

**Note:** Only partitions enabled for Cartridge Based Replication may be synchronized.

**Caution:** If a **Cartridge Based** replication is in process, a Synchronization will NOT complete and a namespace replication will NOT start. You must manually run a namespace replication.

7 To abort the synchronization, click Synchronize/Abort.

#### Source Role VTL Cartridge Based Queue

The **Cartridge Based Queue** provides Cartridge Based Replication statistics for data sent to the target system.

To view the Cartridge Based Queue:

1 Select a partition and click **Cartridge Based Queue** located at the bottom of the page.

The **Cartridge Based Queue** screen displays the following information:

- A list of barcodes that are loosely sorted by replication order.
- Amount of data to be transferred.
- Average transfer rate
- Estimated completion time for the entire replication queue.

**Note:** The contents of the replication queue are dynamic, so the estimated time to completion and the list of barcodes are subject to change if items are added.

#### Source Role VTL Cartridge Based Replication Configuration

Before you can execute a Cartridge Based Replication, you must assign the partition on the **Source** system a Synch ID so it can be replicated automatically to the **Target** system. The Sync ID is used to identify the corresponding target partition that will receive the data replicated from this source partition.

To assign the partition a Sync ID:

1 Select the partition from the Source Role VTL page and click Edit.

The Source Role VTL Partition Edit settings displays (see figure 94).

Figure 94 Editing the Source Role Partition Settings

	Quantum.		Admin Ticket	DX <i>i</i> 6700			
		Friday, June 18, 2010 10:48:27 AM America/Los_Angeles (PDT)	Administrator Login	Logout ? Help			
	Home	Space Management Replication					
	Configuration Source Role Target Role Repo	Source Role Target Role Reports					
	Status	General         VII.         Actions           vii01 Settings         .         The Sine ID is used to identify the corresponding target partition					
	Alerts						
	Data Services	that will receive the data replicated from this source partition.					
	Utilities	Caution: Do NOT replicate a partition containing media in an Exported state.					
		Enable Replication					
	Status:	Enable scheduled replication					
	Hostname:	◯ Daily at 12 🐨 : 00 🐨 PM 💌					
Cartridge Based	IP address:	Every Hour 💟 starting today at 12 💟 PM 💟					
Settings	Capacity: 56.00 TB Available: 55.98 TB ?	Enable Cartridge Based Replication to target Sync ID vt101					
	Used: 17.74 GB (0.03%) Data reduced by: 0.00%	Apply Cancel					

2 Select Enable Cartridge Based Replication and enter a Sync ID in the edit box. The Sync ID for this partition MUST match the Sync ID configured for this partition on the Target system.

**Note:** The **Target** system must have the corresponding partition configured with a **Sync ID** prior to configuring the **Source** system partition (see <u>Target Role VTL Cartridge Based Target</u> <u>Configuration</u> on page 233).

The partition is now configured for Cartridge Based Replication.

Source Role NAS Configuration (DXi6500 Only) Use the **Source Role NAS** page to select and configure NAS shares for replication.

To replicate NAS shares:

1 From the **Source Role** page, click the **NAS** tab.

The Source Role NAS page displays (see Figure 95).

Figure 95 Source Role NAS Page

Quantum.	Admin Ticket	DXi6500
Home	Monday, September 14, 2009 9:49:43 AM America/Los_Angeles (PDT) Administrator Login Space Management Replication	Logout <sup>2</sup> Help
Configuration Status Alerts Data Services Utilities	Source Role Target Role Reports General INAS Actions NAS 0 Deduplicated Shares Only shares with data deduplication enabled may be replicated Only shares enabled for Directory/File Based Replication may be synchronized. Devices Target Action 2000	
Status: Attention Info Hostname: Ford IP address: Capacity: 24.00 TB Available: 23.94 TB ? Used: 59.39 GB (0.25%) Data reduced by: 60.69%	Replication     Last Replication       Name     State     Schedule     Synchronization       V tg_Share     Schedule     Synchronization     Stated / Finished / States       V ug_Share     Shaled     mmhtest     Thu Sep 10 1450:16 2009       Thu Sep 10 1450:16 2009     Thu Sep 10 1451:11 2009     Success       Edit     Replicate/Abort     Synchronize/Abort     File Based Queue     2	

The **Source Role NAS** page displays the available NAS shares that have been deduplicated. The page also displays the current replication status for the share and information on the most recent replication that was run.

Note: The Last Replication and Last Synchronization columns display status information only for the most recent manual replication or synchronization. To view status information for Directory/File Based Replication, use the File Based Queue page (see <u>Source Role NAS File Based Queue</u> on page 225). To view complete replication history, generate a replication report (see <u>Reports</u> on page 239).

The replication status can display the following states:

- In Progress The replication job is in progress.
- **Partial** The replication job was partially completed. Refer to the log file to view the files that were not replicated.
- **Queued and Waiting** The replication job is queued and waiting for another job to complete before beginning.
- Success The replication job was completed successfully.

- Failure The replication job was not completed.
- **Disabled** Replication is disabled for the share.

The synchronization status can display the following states:

- **Queued** Synchronization has been queued and will continue when ready.
- Success Synchronization has completed successfully.
- **Recovering** The recover operation is in process.
- Replicating The replication operation is in process.
- Failed Synchronization has failed.

The **Information** page displays during a replication in progress or a replication successfully completed. The **Information** page displays the amount of data transferred as well as the average MB/sec for a replication job.

- 2 To enable or disable replication on the share, or to schedule a replication time, select the share and click **Edit**.
  - **a** Select the **Enable Replication** check box to enable replication.

Or clear the **Enable Replication** check box to disable replication.

**b** To schedule a replication time, select **Enable scheduled replication** and enter the date and time to run the replication process.

**Note:** Replication should be scheduled to run after backups are complete. If you do not enable scheduled replication, replication will only occur if you manually run it or if you configure Directory/File Based Replication (see <u>Source Role NAS Directory/File Based</u> <u>Replication Configuration</u> on page 226).

- c Click Apply.
- **3** To manually run the replication process, select the share and click **Replicate Now**.

**Caution:** If a node fails during a replication job, the replication job must be restarted.
The NAS share replication process begins. The status of the current replication displays in the **Status** area.

- 4 To abort the replication, click **Abort**.
- **5** To synchronize the NAS share configured for Directory/File Based Replication, click **Synchronize Now**.

Performing a synchronization ensures that the contents of the source share are the same as the target share. The synchronization verifies that the same files exist in both locations, and that no additional files exist in either location. This is important because, during replication, files that are deleted on the source share are not deleted on the target share. These files are only deleted during synchronization.

Quantum recommends that you periodically perform a synchronization, and also that you also perform a synchronization before scheduled space reclamation.

**Note:** Only NAS shares enabled for Directory/File Based Replication may be synchronized.

**Caution:** If a File Based replication is in process, a Synchronization will NOT complete and a namespace replication will NOT start. You must manually run a namespace replication.

6 To abort the synchronization, click Abort.

#### Source Role NAS File Based Queue

To access the File Based Queue page:

1 Select a share and click **File Based Queue** at the bottom of the **Source Role NAS** page.

The system displays Directory/File Based Replication statistics for data sent to the target system.

**Note:** The contents of the File Based Queue are dynamic, so the estimated time for completion and the list of files are subject to change if items are added.

#### Source Role NAS Directory/File Based Replication Configuration

Before you can execute a Directory/File Based Replication, you must assign the NAS share on the **Source** system a Sync ID so it can be replicated automatically to the Target system.

To assign the NAS share a Sync ID:

1 Select the NAS share from the **Source Role NAS** page and click **Edit**.

The Source Role NAS Settings page displays (see Figure 96).

Figure 96 Source Role NAS Settings	Quantum.		Admin Ticket	DX/6500
		Monday, September 14, 2009 9:51:00 AM America/Los_Angeles (PDT)	Administrator Login	Logout 2 Help
	Home	Space Management Replication		
	Configuration	Source Role Target Role Reports		
	Status	General NAS Actions		
	Alerts	trg_Share Settings <ul> <li>The Sync ID is used to identify the corresponding target share</li> </ul>		
	Data Services	that will receive the data replicated from this source share.		
	Utilities	Enable Replication		
		Enable scheduled replication		
	Status: Attention Info	Daily at 12 . 00 PM PM		
	Hostname: Ford	Every Hour Starting today at 12 PM S		
	IP address:	Enable Directory/File Based Replication to target Sync ID mmhtes	st .	
	Available: 23.94 TB ?	A customized, post-backup script is required to automate this fe the Directory/File Based Replication section of the Admin/User's	ature. Please consult Guide for details.	
	Used: 59.39 GB (0.25%)	Apply Cancel		
	Data reduced by: 60.69%			

2 Select Enable Directory/File Based Replication and enter a Sync ID in the box. The Sync ID for this NAS share MUST match the Sync ID configured for this NAS share on the Target system.

Note: The Target system must have the corresponding NAS share configured with a Sync ID prior to configuring the Source system share (see Target Role NAS Directory/File Target Configuration on page 236).

#### 3 Click Apply.

The NAS share is now configured for Directory/File Based Replication.

**Note:** The replication can ONLY be executed by a post backup script run on an external host (see <u>Directory/File Based</u> <u>Replication Post Backup Scripts</u> on page 237).

Source Role Actions	Use the <b>Source Role Actions</b> page to pause or resume the replication service and enable or disable the replication state.		
	If you need to add, delete, or change a replication <b>Target</b> , you must first pause replication service from the <b>Source Role Actions</b> page.		
	<b>Note:</b> After the replication <b>Target</b> has been changed, you must resume the replication service from the <b>Source Role Actions</b> page.		
	To access the <b>Source Role Actions</b> page:		
	1 From the Source Role page, click the Actions tab.		

The Source Role Actions page displays (see Figure 97).

Chapter 8: DXi6500 and DXi6700 Data Services Source Role Configuration

Figure 97 Source Role Actions Page



#### **Replication Service**

The replication service controls both replication and failback traffic.

 Click Pause to pause both replication and failback traffic for a replication in process. When you click Pause, the system will continue to replicate the current block of information in process. Since the block can be as large as 250 MB, the process of completing the current block replication can take up to 15 minutes to complete. Once that block has completed replication the system will pause and wait to resume.

**Note:** If you pause a replication in process, a **Failure** event will be generated on the **Replication Events** page. When the replication is resumed, the replication process will continue.

• Click Resume to resume replication and failback traffic.

#### **Replication State**

You may enable or disable replication for all deduplicated NAS shares by clicking the appropriate button.

- Click Enable to enable replication for all deduplicated NAS shares.
- Click Disable to disable replication for all deduplicated NAS shares.

**Note:** If you click **Disable** during a replication in process, the system will complete the entire replication and then disable replication on the system. The system will be unable to replicate until you click **Enable**.

Note: To disable replication for a single share, select the share on the Source Role NAS page and click Edit. Clear the Enable Replication and the Enable scheduled replication check boxes, then click Apply. For more information, see <u>Source</u> <u>Role NAS Configuration (DXi6500 Only)</u> on page 222.

#### **Replication Performance**

Source role performance data includes statistics gathered while replicating or failing back shares to target systems.

• To clear these statistics, click Clear.

### **Target Role Configuration**

Use the **Target Role** page to define up to 10 source systems that the target can accept replicated data from. The **Target Role** page is also used to perform actions upon replicated NAS shares that have been received. The source systems must be defined in the **Target Role** page prior to defining the target systems in the **Source Role** page.

To configure the target system for replication:

1 From the **Replication** page, click the **Target Role** tab.

The Target Role General page displays (see Figure 98).

Chapter 8: DXi6500 and DXi6700 Data Services Target Role Configuration

Figure 98 Target Role General Page

Quantum.	Admin Ticket DX/6500
	Monday, September 14, 2009 9:54:34 AM America/Los_Angeles (PDT) Administrator Login Logout 2 Help
Home	Space Management Replication
Configuration	Source Role Target Role Reports
Status	General NAS Actions
Alorta	
Data Services	Allowed Replication Sources
Data Services	Only the sources specified below are allowed to replicate to this system.
Utilities	
Statue	
Attention Info	Host Name or IP Address : Add
Hostname: Ford	Host Name or IP Address Total Bytes Received 2 Average Receive Rate 2
IP address:	0.00 MB 0.00 MB/sec
Available: 23.94 TB ?	
Used:	Dalata
59.39 GB (0.25%)	Delete
Data reduced by: 60.69%	
	Replicated Snapshots
	Maximum Snapshots Per Share : 10 M
	Apply

The **Target Role General** page displays the following information for each replication source.

- Host Name or IP Address The source system replicating to the target system
- Total Bytes Received The actual number of bytes received over the network from the corresponding Allowed Replication Source.
- Average Receive Rate The average rate at which actual bytes are being received over the network from the corresponding Allowed Replication Source.
- 2 Enter the Host Names or IP Address for the replication source and click Add. Up to 10 sources can be defined.
- **3** To delete a host name or IP address, select the appropriate check box and click **Delete**.

**Replicated Snapshots** 

The replicated snapshots section allows you to configure the number of saved replicated snapshots on the target. A snapshot is a NAS share or VTL partition that has been replicated to the Target system. Up to 24

	snapshots for each NAS share or VTL partition can be saved on the target. Having snapshots configured allows you to return to a previously replicated VTL partition or NAS share if necessary.
	To configure the number of replicated snapshots:
	1 From the <b>Replication</b> page, click the <b>Target Role</b> link.
	<b>2</b> Select the maximum snapshots per NAS share or VTL partition from the drop down box.
	3 Click Apply.
Target Role VTL Configuration (DXi6700 Only)	The <b>Target Role VTL</b> section is used to select and perform actions on replicated VTL partitions such as <b>Recover, Failback</b> , or <b>Delete</b> replicated VTL partitions.
	<b>Note:</b> The target system will retain up to 24 replication snapshots. Once 24 replication snapshots have been saved, the oldest snapshot will be deleted as necessary in order to make room for a new snapshot.
	1 Click VTL from the Target Role page to replicate VTL partitions.

The Target Role VTL page displays (see figure 99).

#### Figure 99 Target Role VTL Page



The **Target Role VTL** page displays the available VTL partitions that have been replicated. The page displays information on failback jobs and also the average MB/sec for a replication job that was completed or in progress.

2 To recover a VTL partition, select the VTL partition and click Recover.

The VTL partition and its cartridges are recreated on the target system. You must add tape drives and a robot as well as map the devices before the VTL partition is accessible. If the partition contains media, you will only be able to select the highest capacity tape drive for that media type. For example, if the partition contains SDLT600 tape cartridges, you will only be able to select DLT-S4 tape drives when mapping devices to the recovered partition.

**Note:** When a VTL is recovered from a target system, a new serial number is created for that VTL.

- **Note:** In some uncommon cases, the Used value may be larger than cartridge Capacity. This is due to differences in compression technology, and can only occur for cartridges received from certain other systems via replication. All existing data will be maintained. However, if the cartridge is subsequently overwritten, the Used size will not be allowed to exceed Capacity.
- **3** To failback a VTL partition:

**Note:** You must configure the **Target Role** IP address on the **Source** system before you failback a VTL partition.

a Select the VTL partition and click Failback.

The system prompts you for a hostname or IP address of the source system.

**b** Enter the hostname or IP address for the source system where you want the replicated partition to failback.

The VTL partition is failed back to the source system. On the source system, select the recovered VTL partition from the replicated VTL partition list and click **Recover**. The VTL partition and its cartridges are recreated on the source system. You must add tape drives and a robot as well as map the devices before the VTL partition is accessible.

**Caution:** If a node fails during a recover job, the recover job must be restarted.

#### Target Role VTL Cartridge Based Target Configuration

To configure the **Cartridge Based Target**, you must first create a partition on the Target system that matches the VTL partition on the source system (name, tape cartridge type, and tape drive type). See <u>Creating</u> <u>Partitions</u> on page 91 for more information on creating a partition. Once the partition has been created on the target system, it will display in the Cartridge Based Target page.

To configure the Cartridge Based Target:

1 From the Target Role VTL page, click Cartridge Based Target.

#### The Cartridge Based Target page displays (see figure 100).



- 2 Select a Partition Name and then click Edit.
- **3** Select **Enable as a Cartridge Based Replication Target** and enter a **Sync ID** in the edit box. The **Sync ID** is used to identify the corresponding source partition
- 4 Select **Unlocked** to allow this partition to be used as a Cartridge Based Replication target. Select **Locked** to deny use of this partition as a Cartridge Based Replication target.
- 5 Click Apply.

The VTL Cartridge Based Replication configuration is complete.

6 Click **Unpack Queue** to view **Cartridge Based Replication** statistics for data received from the source system.

#### Target Role NAS Configuration (DXi6500 Only)

Use the **Target Role NAS** page to select and perform actions on replicated NAS shares such as **Recover**, **Failback**, or **Delete** replicated NAS shares.

To display replicated NAS shares:

1 From the Target Role page, click the NAS tab.

The Target Role NAS page displays (see Figure 101).

Figure 101 Target Role NAS Page	Quantum.	Admin Ticket DX/650	0
		Monday, September 14, 2009 9:55:26 AM America/Los_Angeles (PDT) Administrator Login Logout 2.H	elp
	Home	Space Management Replication	
	Configuration	Source Role Target Role Reports General NAS Actions	
	Status	NAS O	
	Alerts	Replicated Shares Recovery Jobs Failback Jobs Directory/File Based Targets	1
	Data Services	Replicated Shares	
	Utilities	NAS shares that have been received from allowed replication sources.	
		Share Source Host Name Last Replication	
	Attention Info Hostname: Ford	Name         or IP Address         Started         Finished         Status           +         >         abc         Fri Sep 11 16:43:14 2009         Fri Sep 11 16:43:17 2009         Success           Image: Success         Success         Success         Success         Success	
	IP address: Capacity: 24.00 TB Available: 23.94 TB ?	+ O src_Share5 Thu Sep 3 13:52:06 2000 Thu Sep 3 13:52:14 2000 o src_Share Thu Sep 3 11:49:13 2000 Thu Sep 3 11:49:23 2000 Success inter	
	Used: 59.39 GB (0.25%)	Recover Failback Delete	
	Data reduced by: 60.69%		1

The **Target Role NAS** page displays the available NAS shares that have been replicated. The page also displays information on failback jobs.

2 To recover a NAS share, select the share and click Recover.

The NAS share is recreated on the target system and is ready for use.

You can view details about previously completed recovery jobs on the **Recovery Jobs** tab.

**Note:** If the source share is an NFS share, then the target NFS share is restored as an NFS share. If the source share is a CIFS share, then the target CIFS share is restored as a CIFS share.

- **3** To failback a NAS share:
  - a Select the share and click Failback.
  - **b** Enter the **Host Name or IP Address** for the source system where you want the replicated share to failback and click **Apply**.

The NAS share is failed back to the source system. On the source system, select the recovered NAS share from the replicated share list and click Recover. The NAS share is recreated on the source system.

You can view details about previously completed failback jobs, or abort a failback job that is in progress, on the **Failback Jobs** tab.

**Caution:** If a node fails during a recover job, the recover job must be restarted.

4 To delete a replicated share, select the share and click **Delete**.

Before you can delete a replicated share, you must take one of the following actions:

- Change the replication state of the share on the source system to **Disabled** (see <u>Source Role NAS Configuration (DXi6500 Only)</u> on page 222).
- Delete the source system from the list of allowed replication sources on the Target Role > General page (see <u>Target Role</u> <u>Configuration</u> on page 229).

Also, you cannot delete a share if a failback is in progress for the share. Wait for the failback to complete, or abort the failback job on the **Failback Jobs** tab.

Details about previously completed recovery or failback jobs are stored in the **Recovery Jobs** and **Failback Jobs** tabs.

#### Target Role NAS Directory/File Target Configuration

To configure the Directory/File Based **Target**, you must first create a NAS share on the **Target** system that matches the NAS share on the **Source** system (name of NAS share). See <u>NAS Configuration</u> on page 113 for more information on creating a NAS share. Once the NAS share has been created on the **Target** system, it will display in the **Directory/File Based Targets** page.

To configure the Directory/File Based Target:

1 From the Target Role NAS page, click the Directory/File Based Targets tab.

The Directory/File Based Targets page displays (see Figure 102).

Figure 102 Directory/File Based Targets Page

Quantum.	Admi	n Ticket	DXi	6500
Quantum. Home Configuration Status Alerts Data Services	Admi Monday, September 14, 2009 9:57:21 AM Americal.os_Angeles (PDT) Space Management Replication Source Role Target Role Reports General NAS Actions NAS © Replicated Shares Recovery Jobs Faitback Jobs DirectoryFile Based Targets	n Ticket Administrator Login	DX/(	6500 <u>P Help</u>
Utilities Status: Attention me Hostname: Ford IP address: Capacity: 24.00 TB Available: 23.94 TB ? Used: 59.39 GB (0.25%) Data reduced by: 60.09%	Only shares with data deduplication enabled may be configured as Directory/File Share Directory/File Based Target Name State Sync ID Access O trg_Share Disabled Edit Unpack Queue ?	Based Targets.		

- 2 Select the Share Name and click Edit.
- **3** Select **Enable as a Directory/File Based Replication** target and enter a **Sync ID** in the box.
- 4 Select Unlocked to allow this NAS share to be used as a Directory/ File Based Replication target. Select Locked to deny use of this NAS share as a Directory/File Based Replication target.
- 5 Click Apply.

The NAS Share Directory/File Based Replication configuration is complete.

#### **Unpack Queue**

Click **Unpack Queue** to view Directory/File Based Replication statistics for data received from the source system.

#### **Directory/File Based Replication Post Backup Scripts**

After the NAS shares are configured for Directory/File Based Replication (with Sync IDs), the replication can ONLY be executed by a post backup script run on an external host. The following post backup scripts are provided as examples only. Your specific post backup script may differ from the examples below.

	<b>Note:</b> You will be prompted for a password on the remote host. Alternately you can copy the <b>authorized_keys</b> generated from the remote host to the cliadmin user home directory to remove the password login requirement.
	Directory Replication Script:
	ssh cliadmin@10.40.164.70 sysclireplicate nasname /nas/ path/
	File Replication Script:
	ssh cliadmin@10.40.164.70 sysclireplicate nasname /nas/ path/file
Target Role Actions Page	Use the <b>Target Role Actions</b> page to display the replication performance.
	To view replication performance:
	1 From the Target Role page, click the Actions tab.

The Target Role Actions page displays (see Figure 103).



Target role performance data includes statistics gathered while receiving replicated or failed back shares from source systems.

• To clear these statistics, click **Clear**.

#### Reports

Use the **Reports** page to generate and download a zip file containing .csv (comma separated value) files suitable for importing into a spreadsheet. The replication report contains a namespace replication summary and details as well as a Directory/File based replication summary and details.

To create and download a new replication report:

- 1 From the **Replication** page, click the **Reports** tab.
- 2 Click Generate New to generate a new replication report.
- **3** Click **Download Current** to download the current replication report.

Chapter 8: DXi6500 and DXi6700 Data Services Target Role Configuration

# Chapter 9 DXi6500 and DXi6700 Utilities

Use the **Utilities** pages to perform maintenance functions on the DXi6500 and DXi6700, including uploading and activating software images as well as generating and downloading diagnostic files. The **Utilities** pages also allow you to reboot or shut down the DXi6500 and DXi6700.

To access the **Utilities** pages, in the contents frame, click the **Utilities** menu.

The **Utilities** pages contain the following tabs:

- <u>Software</u>
- Diagnostics
- <u>Analyzer</u>
- <u>Node Management</u>
- License Keys

## Software

Use the **Software** page to upload a new software image to the DXi6500 and DXi6700.

Uploading Software	<b>Note:</b> The system should be scheduled for downtime during a software upgrade. Before you start the upgrade, ensure that all replication and backup jobs are completed, all space management tasks are completed, and all hardware statuses on the system are Normal (see <u>Hardware</u> on page 186).
	To upload a new software image: <b>1</b> From the <b>Utilities</b> menu, click the <b>Software</b> tab.

The Software page displays (see Figure 104).

#### Quantum. DX:6500 Monday September 14, 2009 10:03:26 AM America/Los, Angeles (PDT) Administrator Login Home Software Diagnostics Analyzer Node Management License Keys Configuration w System Software Image 📀 Status Upload Software Image Alerts Software Image File: Browse... Data Services Note: The software image to be uploaded must contain the extension .fw. Utilities Warning: The upload process may take a few minutes and MUST NOT BE INTERRUPTED. Once you click on the Uploa any hyperlinks, toolbar buttons, or menu items until you see a message indicating that the upload has finis Upload Status: Attention Info Hostname: Ford IP address: 24.00 TB Capacity: Available: 23.94 TB ? Used: 59.39 GB (0.25%) Data reduced by: 60.69%

- 2 Type the location and filename of the new software image, or click the **Browse** button and locate the new software image.
- **3** Click **Upload** to place the new software image in a temporary area of the system.

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

4 Click **Activate** to activate the new software image or **Remove** to remove the software image from the system.

An **Information** page indicates the software has been either activated or removed. If activated, the system enters limited mode and displays activation progress until the system reboots.

#### Figure 104 Software Page

**Caution:** The system reboots automatically following the software activation. After the reboot process begins, wait at least 15 minutes before attempting to log in to the system.

### **Diagnostics**

The DXi6500 and DXi6700 allows you to download diagnostic files to your local host. These diagnostic files are helpful when troubleshooting problems on the system. Have the diagnostic files available prior to contacting Quantum customer support.

To access the **Diagnostics** page:

1 From the Utilities menu, click the Diagnostics tab.

The **Diagnostics** page contains the following tabs:

- <u>System Diagnostics File</u>
- Storage Array
- Healthchecks

#### System Diagnostics File

The **System Diagnostics** file contains the diagnostic logs for all of the system components.

To generate and download a system diagnostics file:

1 On the **Diagnostics** page, click the **System** tab.

The System Diagnostics page displays (see Figure 105).

Figure 105 System Diagnostics Page



2 Click Generate New to generate a new system diagnostics file.

The system generates a new diagnostics file. This can take several minutes.

- **3** After the report finishes generating, refresh the Web browser to enable the **Download Current** button.
- 4 To download the newly generated diagnostics file, click **Download Current**.

A dialog box displays asking if you want to open or save the file.

5 Click Save or OK to download the file.

#### **Storage Array**

The **Storage Array Diagnostics** file contains the diagnostics logs pertaining to the storage arrays.

To generate and download a storage array diagnostics file:

1 On the **Diagnostics** page, click the **Storage Array** tab.

The **Storage Array** page displays (see Figure 106).

Figure 106 Storage Array Page



2 Click **Generate New** to generate a new storage array diagnostics file.

The system generates a new diagnostics file. This can take several minutes.

- **3** After the report finishes generating, refresh the Web browser to enable the **Download Current** button.
- 4 To download the newly generated diagnostics file, click **Download Current**.
  - A dialog box displays asking if you want to open or save the file.
- 5 Click Save or OK to download the file.

#### Healthchecks

Use the **Healthchecks** page to configure the automatic healthcheck function on the DXi6500 and DXi6700. When configured, the system periodically runs tests to verify the health and integrity of the data deduplication block pool.

To access the Healthchecks page:

1 On the **Diagnostics** page, click the **Healthchecks** tab.

The Healthchecks page displays (see Figure 107).

Figure 107 Healthchecks Page

The Healthchecks page contains the following tabs:

- <u>General</u>
- Healthchecks Status
- Healthchecks Schedule

#### General

The **General** page displays the overall status of the healthchecks as they are being run. Use this page to run healthchecks on demand or to stop them if they are already running. When healthchecks are started, only those healthchecks that are enabled are run. The progress of the healthchecks is displayed as well as the start and completion time.

- To start all enabled healthchecks, click Start.
- To stop all healthchecks in progress, click **Stop**.

#### **Healthchecks Status**

The **Healthchecks Status** page displays the available healthcheck tests. The state of each healthcheck (enabled or disabled) is displayed, as well as when the healthcheck was last run and the status (success or failure).

To change the state of a healthcheck, select it and then click **Edit**. Select the **Enable** check box to enable the healthcheck, or clear the check box

to disable the healthcheck, and then click **Apply**. When healthchecks are run (either manually or scheduled), only healthchecks that are enabled are run.

The following healthchecks are available:

- **De-Duplication** Checks the overall health of the block pool. This healthcheck verifies that the metadata in the namespace file and the data tags in the block pool are correctly in sync.
- Integrity Checks the integrity of data in the block pool. This healthcheck examines a sample of data tags in the block pool and verifies that the data has been properly stored without errors or corruption.

If a healthcheck fails when it is run, there may be a problem in the block pool which could cause replication or restore operations to fail. Contact Quantum customer support if a healthcheck fails.

#### **Healthchecks Schedule**

Use the **Healthchecks Schedule** page to configure the DXi6500 and DXi6700 to automatically run healthchecks. The schedule applies to all enabled healthchecks. Healthchecks can be scheduled to run daily, weekly, or not at all.

- To configure a healthchecks schedule, select **Daily** or **Weekly**. Use the drop down boxes to select a start time, and click **Apply**.
- To disable running healthchecks on an automatic schedule, select **Never**, and click **Apply**.

## Analyzer

Use the **Analyzer** page to analyze network information and disk information.

To access the Analyzer page:

1 From the **Utilities** menu, click the **Analyzer** tab.

The Analyzer page displays (see Figure 109).

Chapter 9: DXi6500 and DXi6700 Utilities Analyzer

Figure 108 Analyzer Page



The Analyzer page contains the following tabs:

- <u>Network Analysis</u>
- Disk Analysis

**Network Analysis** 

Use the **Network** page to measure network performance with another system.

To access the **Network** page, from the **Analyzer** page, click the **Network** tab.

The **Network** page contains the following tabs:

- Performance
- <u>Settings</u>

#### Performance

Use the **Performance** page to perform network analysis with another system.

To perform network analysis:

- 1 From the **Network** page, click the **Performance** tab.
- 2 Enter the IP Address of another system.

The system you specify in the **IP Address** box should have NetServer enabled (see <u>Settings</u> on page 249).

3 Click Start to begin the analysis.

Note: It takes approximately 5 seconds to refresh the results.

The throughput result is displayed below in MB/sec.

#### **Settings**

The network performance monitor tests the network performance between the DXi6500 and DXi6700 and your network. You must have a network performance client installed on a local host to use this feature.

**Note:** Network performance clients such as *NetPerf* for Windows and Linux are available from the Internet.

To enable or disable NetServer:

- 1 From the **Network** page, click the **Settings** tab.
- 2 Select Enabled or Disabled and click Apply.
- **3** When you are done testing the network performance, disable the network performance monitor.

**Disk Analysis** 

Disk analysis measures the hard disk performance (disk read and write performance) on the system.

To perform hard disk analysis:

- 1 From the **Analyzer** page, click the **Disk** tab.
- 2 Click Start to begin the analysis.

Note: It takes approximately 5 seconds to refresh the results.

The throughput result is displayed below in KB/sec.

### Node Management

Use the Node Management page to reboot or shut down the DXi6500 and DXi6700.

To reboot or shutdown the DXi6500 and DXi6700:

1 From the Utilities menu, click the Node Management tab.

The Node Management page displays (see Figure 109).



- 2 Under Select Node Action, select an action:
  - Reboot This action restarts the DXi6500 and DXi6700. Rebooting the system closes the Web browser connection. You must log on again after the system has rebooted.
  - Shutdown This action shuts down the DXi6500 and DXi6700.

**Note:** Shutting down the system can take up to 15 minutes.

- Reset Diagnostic State If the node is degraded, this action restarts the services on the node without rebooting the system.
- 3 Click Apply.

Page

Note: Shutting down the system can take up to 15 minutes. Only the node will completely shut down. To completely shut down all components, see <u>Turning On and Shutting Down</u> the System on page 37.

### **License Keys**

Use the **License Keys** page to add license keys that enable new system functionality.

To add a license key:

1 From the Utilities menu, click the License Keys tab.

The License Keys page displays (see Figure 110).

Figure 110 License Keys Page	Quantum.	Admin Ticket DX;6500
		Monday, September 14, 2009 10:10:11 AM America/Los_Angeles (PDT) Administrator Login Logout 2. Help
	Home	Software Diagnostics Analyzer Node Management License Keys
	Configuration	License Keys 🛛
	Status	Click on License Name for additional license information.
	Alerts	Name Installed Date Installed License Description
	Data Services	NAS         Yes         2009-09-03 11:30:47         Expose NAS interface to host           Data Deduplication         Yes         2009-09-03 11:31:21         Enables Data Deduplication
	Utilities	Replication         Yes         2009-09-10 11:02:11         Enables Replication           Storage Capacity         Yes         2009-09-04 14:51:05         Limit Storage Capacity
		OST No Not Installed Limit Open Storage Server Connections Vision Advanced Reporting No Not Installed Enables Vision Advanced Reporting
	Status: Attention Info	
	Hostname: Ford IP address:	
	Capacity: 24.00 TB Available: 23.94 TB ? Used: 59.39 GB (0.25%)	New Key. Add
		No License Name selected for display.
	Data reduced by: 60.69%	

2 Enter the license key in the New Key field.

To obtain a license key, see Enabling Licensed Features on page 253.

3 Click Add.

The new key displays in the **Installed Keys** section. The new functionality is now available through the remote management pages.

Licenses	The following licenses are included with the DXi6500 and DXi6700. Some licenses are pre-installed and some are included on license certificates, as noted below.
	<ul> <li>NAS - Exposes NAS interface to host. (License key is pre-installed on all DXi6500 models.)</li> </ul>
	<ul> <li>VTL - Exposes a VTL interface to host. (License key is pre-installed on the DXi6700 only)</li> </ul>
	<ul> <li>Backup Application Specific - Enables the backup application specific path-to-tape capability. (License Certificate is included with DXi6500 Model 6540, Model 6550, and the license key is pre- installed on the DXi6700.)</li> </ul>
	<b>Note:</b> A Fibre Channel card must be installed in the system to enable PTT.
	<ul> <li>Data Deduplication - Enables data deduplication capability. (License key is pre-installed on all DXi6500 and DXi6700 models.)</li> </ul>
	<ul> <li>Replication - Enables replication capability. (License key is pre- installed on all DXi6500 and DXi6700 models.)</li> </ul>
	<ul> <li>Storage Capacity - Enables the installed storage capacity for the system. (License key is pre-installed on all DXi6500 and DXi6700 models.)</li> </ul>
	<b>Note:</b> A storage capacity license key is pre-installed for all capacity shipped from the factory. License keys for additional capacity purchased after the initial point of sale are installed by the customer.
	<b>Note:</b> If you purchase a storage capacity upgrade, a license certificate to enable the additional capacity is included with the upgrade.

• **OST** - Enables the Open Storage Technology (OST) connection. (License Certificate is included with all DXi6500 models.)

- DXi Advanced Reporting Enables the DXi Advanced Reporting capability. (License key is pre-installed on all DXi6500 and DXi6700 models.)
- **esXpress** Enables Quantum esXpress<sup>™</sup> virtual backup server software. (License key is pre-installed on all DXi6500 models.)

Note: To learn more about Quantum esXpress, go to: <u>http://</u> <u>www.quantum.com/Products/Software/esXpress/</u> <u>Index.aspx</u>

### Enabling Licensed To enable any of the licensed features of the DXi6500 and DXi6700, contact your Ouantum Sales representative for more information on Features purchasing these options. Once you have received a License Certificate containing the authorization code for the feature, use the following instructions to enable a licensed feature. To enable a licensed feature: Open a Web browser on a computer with Internet access. 2 Enter http://www.guantum.com/licensekeys in the browser address box. The License Key Management page displays. **3** Enter the DXi6500 and DXi6700 system (node) serial number in the Serial Number box and click Submit. Note: The serial number appears under System Details on the Home page in the remote management pages. The Licensed Feature page displays. 4 Enter the authorization code (printed on the License Certificate) and click Get License Key. The **Licensed Feature** page returns a license key. Print out or write down the license key, or save it to a text file. 5 Enter this license key into the DXi6500 and DXi6700 License Keys page.

The new option is enabled.

Chapter 9: DXi6500 and DXi6700 Utilities License Keys



# Chapter 10 Troubleshooting

This chapter describes problems you may encounter during the setup and operation of the DXi6500 and DXi6700 system. Corrective information is provided to help you resolve the problems.

This chapter consists of the following sections:

- <u>DXi6500 and DXi6700 Problem Reporting</u>
- <u>Using DXi6500 Status Page for Troubleshooting</u>
- <u>Common Problems and Solutions</u>
- <u>Service Tickets</u>

### DXi6500 and DXi6700 Problem Reporting

The DXi6500 and DXi6700 reports status information through the remote management pages (see <u>DXi6500 and DXi6700 Remote</u> <u>Management</u> on page 57). The following actions are performed by the DXi6500 remote management pages:

- Monitors both the system software and hardware components.
- Detects system problems.

- Attempts to isolate each problem to a specific field replaceable component.
- Attempts to recover from the problem.
- Logs the problem.
- If the problem requires service, the system reports the problem in a service ticket associated with the field replaceable component.

Service tickets include time and date information, status (open or closed), information about each error, and links to recommended troubleshooting procedures. The DXi6500 and DXi6700 generates service tickets according to the following scenarios:

- If the component associated with the problem does not have an open service ticket, the DXi6500 and DXi6700 opens a service ticket for the component and reports the problem in a service ticket.
- If the problem reoccurs, the DXi6500 and DXi6700 logs the number of times that it detects the problem in the existing report.
- If a different problem occurs with the same component, the DXi6500 and DXi6700 adds a new report to the same service ticket.
- If a problem occurs with a different component, the DXi6500 and DXi6700 uses the above scenario to open a new service ticket for the component or report the problem in an existing service ticket associated with the component.

### Using DXi6500 Status Page for Troubleshooting

The DXi6500 and DXi6700 **Status** page can be used to verify the overall status of the DXi6500 and DXi6700 system. A failed status indicator can help troubleshoot a problem in the DXi6500 and DXi6700.

To view the hardware status:

1 From the **Status** menu, click the **Hardware** tab.

The Hardware Summary page displays (see Figure 111):



The **Hardware Summary** page displays the overall health status of the DXi6500 or DXi6700 system. All components are listed as links on this page. Click a link to see detailed information on specific component status.

#### Downloading the System Diagnostics File

The DXi6500 and DXi6700 systems allow you to download a system diagnostics file to your local host. This file is helpful when troubleshooting problems on the system. Have this file available prior to contacting Quantum customer support.

To generate and download a system diagnostics file:

1 On the **Diagnostics** page, click the **System** tab.

The System Diagnostics page displays (see Figure 112).

Figure 112 System Diagnostics Page



2 Click Generate New to generate a new system diagnostics file.

The system generates a new diagnostics file. This can take several minutes.

**3** To download the newly generated diagnostics file, click **Download Current**.

A dialog box displays asking if you want to open or save the file.

4 Click Save or OK to download the file.

### **Common Problems and Solutions**

The troubleshooting information in this section covers the following topics:

- <u>Start-up Problems</u>
- Hardware Problems
- <u>Ethernet Network Problems</u>
- <u>Replication Problems</u>
- <u>Temperature Problems</u>

#### Start-up Problems

Table 38 describes problems that can occur during system start-up.

#### Table 38 Start-up Problems

Problem	Corrective Action
FATAL ERROR Unable	Contact your Quantum Customer Support
to start SNFS!	representative (see <u>Getting More</u>
Message displays.	<u>Information or Help</u> on page xxvi).
FATAL ERROR Unable	Contact your Quantum Customer Support
to start block pool!	representative (see <u>Getting More</u>
Message displays.	<u>Information or Help</u> on page xxvi).

#### Hardware Problems

<u>Table 39</u> describes corrective actions for problems occurring with the system hardware.

Table 39 Hardware Problems

Problem	Corrective Action
The system does not power on.	Make sure the power cords are connected to a grounded electrical outlet and the power switches located on the back of the power supplies are on. If the problem persists, contact your Quantum Customer Support representative to arrange for service (see <u>Getting More Information or</u> <u>Help</u> on page xxvi).
One power supply is not functioning.	Determine which power supply has failed by observing the red fault LED on the power supply. Contact your Quantum Customer Support representative to arrange for service (see <u>Getting More Information or</u> <u>Help</u> on page xxvi).

Problem	Corrective Action
Both power supplies are not functioning.	Determine which power supply has failed by observing the red fault LED on the power supply. Contact your Quantum Customer Support representative to arrange for service (see <u>Getting More Information or</u> <u>Help</u> on page xxvi).
One fan is not operating.	Determine which fan has failed by reading the service ticket generated by the system. Contact your Quantum Customer Support representative to arrange for service (see <u>Getting More Information or Help</u> on page xxvi).
Multiple fans are not operating.	Caution: Turn the system off immediately! The system will overheat with multiple fans not operating. Contact your Quantum Customer Support representative to arrange for service (see <u>Getting More Information or Help</u> on page xxvi).
A hard drive is not responding	Determine which drive has failed by observing the red fault LED on the drive carrier. Contact your Quantum Customer Support representative for a drive carrier replacement (see <u>Getting More Information</u> <u>or Help</u> on page xxvi).
A SAS cable is removed during normal operation.	The system will shut down as soon as it recognizes the problem. There is a potential for data loss. Power off the system, re-insert the SAS cable and restart system. Depending on the state of the system when the SAS cable was removed, a long-running, mandatory data verification may occur.
#### Ethernet Network Problems

<u>Table 40</u> describes corrective actions for problems occurring with the Ethernet network.

Table 40 Ethernet Network Problems	Problem	Corrective Action
	The Ethernet link light on the DXi6500 or DXi6700 is not lit	Check to make sure the Ethernet cable is not a cross-over cable. Use only "straight" CAT-6 Ethernet cables.
	when a cable is connected to a hub or	Port on the hub or switch is not active or damaged.
	switch.	Port on the DXi6500 is damaged. Contact the Quantum Customer Support department (see <u>Getting More Information</u> <u>or Help</u> on page xxvi).
	The Ethernet link light on the switch or hub is not lit when a cable	Check to make sure the Ethernet cable is not a cross-over cable. Use only "straight" CAT-6 Ethernet cables.
	is connected to DXi6500 or DXi6700 system.	Port on the hub or switch is not active or damaged.
		Port on the DXi6500 or DXi6700 is damaged. Contact the Quantum Customer Support department (see <u>Getting More</u> <u>Information or Help</u> on page xxvi).
	DXi6500 or DXi6700 system is not visible on the Ethernet network.	Try to ping the DXi6500 or DXi6700 system IP address from a host on the same network. If the ping reports round trip times, the DXi6500 or DXi6700 system is active. If not, check the cables, switches, or hubs for damaged components. If everything checks out, contact the Quantum Customer Support department (see <u>Getting More Information or Help</u> on page xxvi).

Problem	Corrective Action
DXi6500 or DXi6700 remote management pages are not visible.	IF you cannot connect to the DXi6500 or DXi6700 remote management pages, verify that the following network settings for the DXi6500 or DXi6700 are correct:
	Hostname
	IP addresses
	Default gateway
	<ul> <li>Subnet mask</li> </ul>
	Domain name (optional)
An Ethernet cable is removed during normal operation.	The system will discontinue use of the associated Ethernet port. A Service ticket will be issued. The possibility of errors exist; data corruption will not occur.
	Reconnect the cable as soon as possible. It is not necessary to power the system off. Depending on the state of the system when the Ethernet cable was removed, replication, system management, or ingest may need to be restarted.

### **Replication Problems**

<u>Table 41</u> describes corrective actions for problems occurring with the replication.

Table 41Replication Problems

Problem	Explanation/Corrective Action
The replication was paused, but the replication is still in process.	When you click <b>Pause</b> , the system will continue to replicate the current tag or block of information in process. The process of completing the current tag replication can take up to 15 minutes to complete. Once that tag has completed replication the system will pause and wait to resume.

Problem	Explanation/Corrective Action
The replication was paused and a <b>Failure</b> event was generated in the <b>Replication</b> <b>Events</b> page.	This is normal. When a replication is paused, a failure event is generated on the <b>Replication Events</b> page. They system will continue the replication when you click <b>Resume</b> .
Replication was disabled while a replication was in process and the replication completed.	If you click <b>Disable</b> during a replication in process, the system will complete the entire replication and then disable replication on the system. The system will be unable to replicate until you click <b>Enable</b> .
Enabled replication on a NAS share and received the following Event: No destination host is specified for replication.	You must configure the target system prior to configuring the source. If the target system is not configured first, you will not be able to designate the replication target.
Able to enable and schedule replication for NAS even though no target IP configured.	It is possible to enable and schedule a replication when a target system has not been configured. The replication will not start until a target system is configured.

#### **Temperature Problems**

Temperature problems are generally caused by incorrect room temperature, poor air circulation inside the DXi6500 or DXi6700 rack or components, or a malfunctioning cooling fan (see <u>Environmental</u> <u>Specifications</u> on page 289).

Use the following procedure if a temperature problem is reported:

- 1 Check the ambient temperature of the room containing the DXi6500 system to verify that the temperature falls within the specified range.
- **2** Inspect for adequate air circulation inside the rack. Some racks may provide additional fans to improve air circulations. Check the fan for proper operation. Clean or replace any air filter as necessary.

**3** If a component reports a temperature problem, verify that the associated fan is operating correctly. If necessary, contact Quantum customer support to replace the fan (see <u>Getting More Information</u> <u>or Help</u> on page xxvi).

## **Service Tickets**

The DXi6500 and DXi6700 systems can generate service tickets which can be used to resolve a problem.

To access the Service Tickets page:

- 1 Access the DXi6500 or DXi6700 remote management pages (see <u>Accessing DXi6500 and DXi6700 Web Pages</u> on page 67), and log onto the system as an administrator.
- 2 From the **Home** page, click the **Ticket** button located at the top of the page.

The **Service Tickets** page displays (see Figure 113).

Figure 113 Service Tickets	Quantum.	Admin Ticket DX;6500
Page	Cuantum.	Admin         Ticket         DX:6500           Monday, September 14, 2009 8:24:04 AM AmericaLos_Angeles (PDT)         Admin           Alertis         Admin         Admin           Alertis         Service Tickets         Service Tickets           Service Tickets         Click on a Service Ticket from the table below to show its details, send email or change its status.         Ticket         Request 10           Ticket         Request 10         State         Priority         Last Update           1         7         open high         2000-09-02708:16:35-0000         UO Sener fan: Nonrecoverable speed           2         74         open high         2009-09-02708:16:35-0000         storage subsystem chasis CDEI storage subsystem to storage subsystem chasis CDEI storage subsystem to storage subsystem of tables         Details           3         70         open high         2009-09-02708:16:35-0000         storage subsystem chasis CDEI storage subsystem to storage subsystem of tables           4         77         open high         2009-09-02718:16:37-0000         Divert fan: Nonrecoverable speed           5         68         open high         2009-09-02718:16:37-0000         Divert fan: Nonrecoverable speed           6         7         open high         2009-09-02718:16:37-0000         Divert fan: Nonrecoverable speed           7
	Data reduced by: 60.69%	

3 To view details for a ticket, click the ticket number.

The **Ticket Details** display at the bottom of the screen (see Figure 114).

#### Figure 114 Ticket Details

	Quantum.	Admin Ticket DX/6500
		Monday, September 14, 2009 8:28:08 AM America/Los_Angeles (PDT) Admin
	Home	Alerts
	Configuration	Admin Alerts Service Tickets
		Service Tickets 2
	Status	Click on a Service Ticket from the table below to show its details, send email or change its status.
	Alerts	Ticket Request ID State Priority Last Update Details
	Data Services	1 7 open high 2009-09-02T08:12:25+00:00 VO Server fan : Nonrecoverable speed
	Data Services	2 74 open high 2009-09-02T08:16:35+00:00 storage subsystem chassis C0E0 : storage subsystem batt
	Litilities	3 70 open high 2009-09-02T08:16:35+00:00 storage subsystem chassis C0E0 : storage subsystem volu
	Oundes	4 77 open high 2009-09-02T08:26:44+00:00 storage subsystem chassis CONTROLLER_C1: storage su
		5 66 open high 2009-09-02T17:01:01+00:00 DXi6500: General DXi6500 Software : Operation failure
	Statuci	6 7 open high 2009-09-04T08:14:13+00:00 I/O Server fan : Nonrecoverable speed
	Attention Infe	7 74 open high 2009-09-04T08:18:13+00:00 storage subsystem chassis C0E0 : storage subsystem batt
	Attendon	8 1924754970 open high 2009-09-05T12:01:02+00:00 DXi6500: General DXi6500 Software : Operation failure
	Hostname: Ford	9 7 open high 2009-09-05T08:14:13+00:00 //O Server fan : Nonrecoverable speed
	IP address:	10 74 open high 2009-09-05T08:18:13+00:00 storage subsystem chassis C0E0 : storage subsystem batt
	Capacity: 24.00 TB Available: 23.94 TB ? Used:	Close All Show Tickets: Open 🖌 Get individual ticket Apply
	59.39 GB (0.25%)	Ticket Details Ticket: 1 Request ID: 7
	Data reduced by: 60.69%	Opened At:         2009-09-02T06:12:25+00.00           Closed At:         Open           Closed By:         Open           Priority:         high           Summary:         I/O Server fan : Nonrecoverable speed
Ticket details ——		2009-02T08:12:25+00:00 Summary: UO Server fan : Nonrecoverable speed Details: The Fan 4 has exceeded a threshold. <u>View Recommended Actions</u>
		Analysis Email

**4** To see information about the actions you can to take to resolve the ticket, click the **View Recommended Actions** link.

The Recommended Actions window displays (Figure 115).

Figure 115 Recommended Actions Window

IF	THEN	
A file system failed over unexpectedly:	Inspect the system log and the FSM cvid	og to determine the root cause.
The problem IS resolved:	Close the service ticket. Refer to Closing	Service Tickets.
The problem has <u>NOT</u> been resolved:	Modify the ticket according to the Refer to <u>Analyzing Service Ticket</u> :     Contact the Quantum Technical A In the USA: UK, France and Germany: EMEA: On the Web:	troubleshooting steps taken. & kssistance Center. 1+800-284-5101 00800 4 QUANTUM +49 6131 3241 1164 / Asia Pacific: +603 7953 3010 http://www.quantum.com/support
	Print Document   Clos	ie Window

**5** Follow the instructions on the **Recommended Actions** window to resolve the problem.

# Chapter 11 Implementing a Data Replication Plan

The DXi6500 and DXi6700 can be used as part of your disaster recovery plan through its built-in data replication capability. Data replication is used to create another copy of your data on a remote DXi6500 or DXi6700 system. In the event of a disaster where the original data was lost, the replicated data can be quickly recovered from the remote system allowing your business to resume normal operations.

The following sections provide information on setting up data replication and also recovering replicated data:

- <u>Setting Up Data Replication</u>
- <u>Recovering Replicated Data</u>

### **Setting Up Data Replication**

Note: The information in this section applies to native DXi6500 and DXi6700 replication. OST optimized duplication using NetBackup or Backup Exec is described separately (see OST Optimized Duplication on page 130).

Setting up data replication on the DXi6500 and DXi6700 consists of the following steps (see Figure 116):

- Setting Up the Target DXi System
- <u>Setting Up the Source DXi System</u>
- Enabling and Running Replication



#### Setting Up the Target DXi System

Before data can be replicated from a source system to a target system, the target must be authorized to receive data from a specific source. To authorize a target system to receive data from a source, you must add the source hostname or IP address to the **Source Host List** on the target system.

To add a source hostname or IP Address on the target system:

1 Access the remote management pages on the target system.

Note: For more information on accessing the remote management pages, see <u>Chapter 3</u>, DXi6500 and DXi6700 <u>Concepts</u>. 2 From the **Replication** page, click the **Target Role** tab.

The Target Role General page displays (see Figure 117).

Figure 117 Target Role General	Quantum.		Admin	Ticket	DXi	6500
Page	Home Configuration Status Alerts Data Services Utilities Status: Attention Hostname: Ford IP address: Capacity: 24.00 TB Available: 23.94 TB ?) Used: 59.39 GB (0.25%) Data reduced by: 80.69% Content of the second	Monday: September 14, 2009 9:54:34 AM AmericaLus_Angeles (PDT)         Space Management       Replication         Source: Role       Target Role         General       MAS         Address       - Address         • Only the sources specified below are allowed to replicate to this         Host Name or IP Address:       - Address         • Only the sources specified below are allowed to replicate to this         • Itost Name or IP Address:       - Address         • Replicated Snapshots       000 MB         • Do to 10 sources can be defined         the host names or IP addresses of an the target system allows the tare at these sources.	Admi	lication eplicatio	sour sour	° Help
Setting Up the Source DXi System	Once you have target system, to the source target.	e added the source system hostn , you must add the target system system. The source system can o	ame o hostr nly rep	or IP add name or olicate d	dress r IP ac data t	to th ddres to on
	Note: You m source be ab	nust configure the target system   e. If the target system is not conf le to designate the replication tar	orior t igurec rget.	o confi l first, y	gurin ′ou w	g the vill no

1 Access the remote management pages on the source system.

Note: For more information on accessing the remote management pages, see Chapter 3, DXi6500 and DXi6700 Concepts.

2 From the **Replication** page, click the **Source Role** tab.

The **Source Role General** page displays (see Figure 118).

Figure 118 Source Role	Quantum.		Admin Ticket	DX;6500
General Page	Cuantum.	Monday, September 14, 2009 9:48:49 AM AmericaLos_Angeles (PDT) Space Management Replication Source Role Target Role Reports General NAS Actions Centers Center	Administrator Login	DX/6500

3 Enter the Host Name or IP Address for the replication target and click Apply.

The source system can now replicate data to a target system.

Enabling and Running Replication

Now that both the target and source systems are setup for replication, you can enable replication and either schedule the replication process or manually replicate a share.

**Note:** For optimization purposes, the underlying data is continuously updated. The data will become available when the replication is either run manually or using a scheduled replication.

The **Source Replication** pages differ depending on the type of data being replicated (partition or share). Refer to the following sections for your specific data type:

- Replicating a VTL Partition (DXi6700 Only)
- Replicating a NAS Share (DXi6500 Only)

#### Replicating a VTL Partition (DXi6700 Only)

To enable replication and to replicate a VTL partition:

1 Click VTL from the Source Role page to replicate VTL partitions.

The **Source Role VTL** page displays (see <u>figure 119</u>).

Quantum.       Admin       Tester       DX;670         Home       Space Management       Replication       L0201       9.84         VTL       Configuration       Searce Role       Target Role       Replication         Searce Role       Target Role       Replication       Searce Role       Target Role         Data Services       Utilities       - Only particins with data deduplication enabled may be replicated.       - Only particins with data deduplication enabled may be replicated.         VTL partitions       Participes Searce Role       Status       - Only participes Replication       Last Synchronizad.         VTL partitions       Participes Searce Role       Status       - Only participes Replication Target Role       Last Synchronizad.         VTL partitions       Participes Searce Role       Status       - Only participes Replication Target Role       - Only participes Replication Replication         VTL partitions       Replication Target Role       - Only participes Role       Started / Fireshed / Status       Started / Fireshed / Status         Montanet:       - Only continue       - Only participes Role       - Only participes Role       Started / Fireshed / Status         Montanet:       - Only continue       - Only participes Role       - Only participes Role       - Only participes Role         Montanet:	Figure 119 Source Role VTL Page			
VTL       Fiday, June 18, 2010 10-48:20 AM AmeticaLos_Angeles (PDT)       Administrator Login       Logal       * Lidad         VTL       Configuration       Status       Status       Status       Image: Configuration       Status         Alerts       Data Services       Utilities       O       O       Deduplicated Partitions         VTL partitions       Status       Image: Configuration       Status       Image: Configuration         VTL partitions       Data Services       0 Mig partions enabled for Carindge Based Replication may be synchronized.       East Synchronized.         VTL partitions       Status:       Image: Configuration       Stated / Finished / Status       Stated / Finished / Status         VTL partitions       Capacity: 56.00 TB Available::       0 Mig 2 Disabled       Stated / Finished / Status       Stated / Finished / Status         VTL partitions       Data reduced by: 0.00%       Image: Data Reduced by: 0.00%       Stated / Finished / Status       Stated / Finished / Status         Vota reduced by: 0.00%       Image: Data Reduced by: 0.00%		Quantum.		Admin Ticket DX: 6700
Data Services       Utilities         Utilities       • Only partitions enabled for Cartridge Based Replication may be synchronized.         Status:       • Only partitions maked for Cartridge Based Replication may be synchronized.         VTL partitions       • Market Schedule Sync. ID         Hostname:       • Woll Disabled         • Will Disabled       • Status         • Utilities       • Woll Disabled         • Woll Disabled       • Woll Disabled	VTL —	Home Configuration Status Alerts	Friday, June 18, 2010 10:46:20 MI AmericaLos_Angeles (PDT) Space Management Replication Source Role Target Role Reports TIL Actions VII. 0	Administrator Login <u>Logout <sup>®</sup>.Help</u>
Edit Replicate/Abort Synchronize/Abort Cartndge Based Queue	VTL partitions—	Data Services Utilities Status: Normal info Hostname: IP actress: Capacity: 56.00 TB Available: 55.98 TB ? Used: 17.74 GB (0.03%) Data reduced by: 0.00%	Deduplicated Partitions         • Only partitions with data decupication enabled may be replicated.         • Only partitions enabled for Catridge Based Replication may be synchronized.         Replication Target : None configured         Partition       Replication         Value       Schedule         V101       Disabled         V101       Disabled         V102       Disabled         V103       Disabled	ast Synchronization red / Finished / Status

The **Source Role VTL** page displays the available VTL partitions that have been deduplicated. The page also displays the current replication status for the partition and information on the most recent replication that was run.

2 Select the partition to replicate and click Edit.

#### Chapter 11: Implementing a Data Replication Plan Setting Up Data Replication

The Edit Replication page displays (see figure 120).

Figure 120 Editing the VTL	Quantum.		Admin Ticket	DX:6700
Replication rage		Friday, June 18, 2010 10:48:27 AM America/Los_Angeles (PDT)	Administrator Login	Logout ? Help
	Home	Space Management Replication		
	Configuration	Source Role Target Role Reports		
	Status			
	Alerts	Vt01 Settings     The Sync ID is used to identify the corresponding target partition		
	Data Services	that will receive the data replicated from this source partition.		
	Utilities	Caution: Do NOT replicate a partition containing media in an Exported state.		
		Enable Replication		
	Status:	Enable scheduled replication		
	Hostname:	O Daily at 12 💽 : 00 💟 PM 🕑		
	IP address:	Every Hour Starting today at 12 PM		
	Capacity: 56.00 TB Available: 55.98 TB ?	Enable Cartridge Based Replication to target Sync ID vtl01		
	Used: 17.74 GB (0.03%)	Apply Cancel		
	Data reduced by: 0.00%			

3 Select Enable Replication to enable replication. To schedule a replication time, select **Replicate daily at** and enter the date and time to run the replication process.

Note: Replication should be scheduled to run after backups are complete.

4 Click Apply.

The **Source Role VTL** page displays (see <u>figure 119</u>).

5 To manually run the replication process, select the partition and click Replicate Now.

> **Note:** The **Replicate Now** button automatically runs a namespace replication (see Continuous Replication and Namespace Replication on page 65 for more information).

The partition is replicated from the source system to the target system. To pause or resume the replication process, see <u>Source Role</u> Configuration on page 248.

#### Replicating a NAS Share (DXi6500 Only)

- 1 Access the remote management pages on the source system.
  - **Note:** For more information on accessing the remote management pages, see Chapter 3, DXi6500 and DXi6700 Concepts.
- 2 From the **Source Role** page, click the **NAS** tab.

The **Source Role NAS** page displays (see Figure 121).

Monday, September 14, 2009 9:49:43 AM Americal.os_Angeles (PDT)         Administrator Login         Logout           Home         Space Management         Replication         Space Management         Replication	(i6 <b>500</b>
Status       NAS       Q         Alerts       Data Services         Utilities       • Only shares with data deduplication enabled may be replicated.         Status:       • Only shares enabled for Directory/File Based Replication may be synchronized.         Status:       • Only shares enabled for Directory/File Based Replication         Status:       • State Based Copy States         Attention       • Info         Hostname:       Ford         IP address:       • State Schedule         Capacity:       • 24 00 TB         Vused:       59.39 GB (0.25%)         Data reduced by: 60.69%         Immediate:       23.93 GB (0.25%)         Data reduced by: 60.69%         Edit       Replicate/Abort         Edit       Replicate/Abort         File Based Queue       ?	

The **Source Role NAS** page displays the available NAS shares that have been deduplicated. The page also displays the current replication status for the share and information on the most recent replication that was run.

3 Select the NAS share to replicate and click Edit.

The Source Role NAS Settings page displays (see Figure 122).

Figure 12 Page

Chapter 11: Implementing a Data Replication Plan Setting Up Data Replication

Figure 122 Source Role NAS Settings Page



- 4 Select Enable Replication to enable replication.
- **5** To schedule a replication time, select **Enable scheduled replication** and enter the date and time to run the replication process.

**Note:** Replication should be scheduled to run after backups are complete. If you do not enable scheduled replication, replication will only occur if you manually run it or if you configure Directory/File Based Replication (see <u>Source Role NAS Directory/File Based Replication Configuration</u> on page 226).

6 Click Apply.

The **Source Role NAS** page displays (see Figure 121).

7 To manually run the replication process, select the NAS share and click **Replicate Now**.

The NAS share is replicated from the source system to the target system. To pause or resume the replication process, see <u>Source Role</u> <u>Configuration</u> on page 216.

## **Recovering Replicated Data**

There are two ways to recover replicated data:

- Data Recovery
- Data Failback

#### **Data Recovery**

In the event that a NAS share or VTL partition has been destroyed or corrupted on the original source system, the data recovery option recreates the share on a target system that contained the replicated data. Once recovered, the share is available for use on the target system.

The **Target Role** pages differ depending on the type of data being replicated (partition or share). Refer to the following sections for your specific data type:

Recovering a VTL Partition (DXi6700 Only)

Recovering a NAS Share (DXi6500 Only)

#### Recovering a VTL Partition (DXi6700 Only)

For a list of major steps for recovering a VTL partition, see figure 123.

Chapter 11: Implementing a Data Replication Plan Recovering Replicated Data

Figure 123 Major Steps for Recovering a VTL Partition



To recover a VTL partition (see figure 123):

Click VTL from the Target Role page to recover a VTL partition.
 The Target Role VTL page displays (see <u>figure 124</u>).

#### Figure 124 Target Role VTL Page



The **Target Role VTL** page displays the available VTL partitions that have been replicated. The page also displays information on failback jobs.

- 2 To recover a VTL partition, select the VLT partition and click Recover.
- **3** The system prompts you to enter a name for the recovered VTL partition. This name must be unique on the target system.

The partition and its cartridges are recreated on the target system. You must add tape drives and a robot and map the devices before the partition is accessible.

#### Recovering a NAS Share (DXi6500 Only)

For a list of major steps for recovering a NAS share, see Figure 125.

Chapter 11: Implementing a Data Replication Plan Recovering Replicated Data

Figure 125 Major Steps for Recovering a NAS Share On the Target DX*i* system: Select the NAS Share to Recover On the Target DX*i* system: Enter a Name for the Recovered NAS Share *Recovered NAS Share is Created on the Target DX<i>i* System!

To recover a NAS share:

1 Access the remote management pages on the target system.

Note: For more information on accessing the remote management pages, see <u>Chapter 3</u>, DXi6500 and DXi6700 <u>Concepts</u>.

- 2 From the **Replication** page, click the **Target Role** tab.
- 3 From the Target Role page, click the NAS tab.

The Target Role NAS page displays (see Figure 126).

Figure 126 Target Role NAS Page



The **Target Role NAS** page displays the available NAS shares that have been replicated. The page also displays information on failback jobs.

- 4 To recover a NAS share, select the NAS share and click **Recover**.
- **5** The system prompts you to enter a name for the recovered NAS share. This name must be unique on the target system.

The NAS share is recreated on the target system and is ready for use.

**Note:** If the source share is an NFS share, then the target NFS share must be restored as an NFS share. If the source share is a CIFS share, then the target CIFS share must be restored as a CIFS share.

#### Data Failback

In the event that a NAS share has been destroyed or corrupted on the original source system, the data failback option copies the replicated share from the target system to the source system. Once the replicated share is copied to the source system, it can be recovered on the source system and returned to normal operation.

The **Target Role** pages differ depending on the type of data being replicated (partition or share). Refer to the following sections for your specific data type:

- Failing Back a VTL Partition (DXi6700 Only)
- Failing Back a NAS Share (DXi6500 Only)

#### Failing Back a VTL Partition (DXi6700 Only)

For a list of major steps for failing back a VTL partition, see figure 127.





To failback a VTL partition:

Click VTL from the Target Role page to failback a VTL partition.
 The Target Role VTL page displays (see <u>figure 128</u>).

Page			
	Quantum.	Admin Ticket	DX;6700
	Home	Friday, June 18, 2010 10:52:49 AM America/Los_Angeles (PDT) Administrator Login Space Management Replication	Logout ? Help
VTL—	Configuration	Source Role Target Role Reports	
Replicated	Status Alerts	VTL 0 Replicated Partitions Recovery Jobs Fell*ack Jobs Cartridge Based Targets	
partitions	Data Services	Replicated Partitions	
Replicated partitions failback jobs —	Status: Normal Le	VTL partitions that have seen received from allowed replication sources.           Partition         Source Host Name or IP Address         Last Replication           0         gum_vtl01         grumpy quantum-sqa.com         Thu Jun 17 10:24:36 2010         Thu Jun 17 10:24:42 2010           Becouser         Exiling         Datate         Exiling         Started         Finished	
	Capacity: 56.00 TB Available: 55.98 TB ? Used: 17.74 GB (0.03%)		
	Data reduced by: 0.00%		

The **Target Role VTL** page displays the available VTL partitions that have been replicated. The page also displays information on failback jobs.

2 To failback a VTL partition, select the VTL partition and click Failback.

The system prompts you for a hostname or IP address of the source system.

**Note:** A hostname is allowed ONLY if DNS is configured with valid system names. If DNS is not configured with valid system names, use the IP address of the source system.

**3** Enter the hostname or IP address for the source system where you want the replicated partition to failback.

The partition is recovered to the source system.

4 Open a new browser and access the remote management pages on the **Source** system.

Figure 128 Target Role VTL

- 5 Select the **Replication** tab from the **Data Services** page.
- 6 Click VTL from the Target Role page to recover a VTL partition.
- 7 Select the recovered partition from the replicated partition list and click **Recover**.

The partition and its cartridges are recreated on the source system. You must add tape drives and a robot as well as map the devices before the partition is accessible.

#### Failing Back a NAS Share (DXi6500 Only)

For a list of major steps for failing back a NAS share, see Figure 129.



To failback a NAS share:

1 Access the remote management pages on the target system.

Note: For more information on accessing the remote management pages, see <u>Chapter 3</u>, DXi6500 and DXi6700 <u>Concepts</u>.

- 2 From the **Replication** page, click the **Target Role** tab.
- 3 From the Target Role page, click the NAS tab.

The Target Role NAS page displays (see Figure 130).

NAME     Date       September 14, 2009 9:55:26 AM AmericalLos_Angeles (PDT)     Administrator Login     Logout     2 Heige       Management     Replication       Robert     Target Role     Reports       al NAS     Actions       al NAS     Actions       al Cated Shares     Recovery Jobs       Replicated Shares     Source Host Hame       Shares that have been received from allowed replication sources.       Image Source Host Hame     Last Replication       Hame     Source Source Source Host Hame       Image Source Host Hame     Last Replication       Started     Finished       Source Source Host Hame     Last Replication       Source Host Hame     Thu Sep 3113:52:14 2000       Success     Success       Image Source Source Host Hame     Thu Sep 311:49:23 2000       Success     Success       Image Source Source Source Field Source Sourc
M ALE ALE ALE ALE ALE ALE ALE ALE ALE ALE

The **Target Role NAS** page displays the available NAS shares that have been replicated. The page also displays information on failback jobs.

4 To failback a NAS share, select the share and click Failback.

The system prompts you for a hostname or IP address of the source system.

**Note:** A hostname is allowed ONLY if DNS is configured with valid system names. If DNS is not configured with valid system names, use the IP address of the source system.

- 5 Enter the hostname or IP address for the source system where you want the replicated share to failback and click **Apply**.
- 6 Open a new Web browser and access the remote management pages on the **Source** system.
- 7 From the **Data Services** menu, click the **Replication** tab.
- 8 From the Target Role page, click the NAS tab.

**9** On the source system, select the recovered NAS share from the replicated share list and click **Recover**.

The NAS share is recreated on the source system.

## Appendix A DXi6500 and DXi6700 System Specifications

This appendix lists characteristics and specifications the DXi6500 and DXi6700. These characteristics and specifications are categorized as follows:

- **Physical Characteristics**
- <u>Performance Characteristics</u>
- <u>Environmental Specifications</u>

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

#### Physical Characteristics

The following tables provide dimensions and other physical characteristics of the DXi6500 and DXi6700 system components:

- <u>Table 42</u> <u>Physical Characteristics</u>
- <u>Table 43</u> <u>Storage Capacity</u>
- <u>Table 44</u> <u>Cable Drops</u>
- <u>Table 45</u> <u>Interfaces</u>
- Table 46 Software Capabilities
- Table 47 Power Requirements

#### Table 42 Physical Characteristics

Ch	ara	act	eris	tics	5	

	Node	Expansion Module
Height	5.2 in (13.2 cm)	3.5 in (8.9 cm)
Width (side to side)	17.2 in (43.7 cm)	17.2 in (43.7 cm)
Depth (front to back)	25.5 in (64.8 cm)	25.5 in (64.8 cm)
Weight (stand alone)	72 lbs (32.7 kg)	52 lbs (23.6 kg)
Rack Space Required	Зu	2u
Air clearance	Open 4 in (10.2 cm) behind unit	for proper air flow

#### Table 43 Storage Capacity

DXi6500 and DXi6700 Storage Capacity		
Usable capacity	8 TB to 56 TB	
Capacity increments	8 TB	

#### Table 44 Cable Drops

#### DXi6500 and DXi6700 Cable Drops

Ethernet Cable Drops	<b>Model 6510 (2 x 1GbE ports) -</b> 1 to 2 1GbE Ethernet connections for NAS or OST connectivity, replication, and remote management
	<b>Model 6520, 6530, 6540 (6 x 1GbE ports) -</b> 1 to 6 1GbE Ethernet connections for NAS or OST connectivity, replication, and remote management
	Model 6550 (2 x 1GbE ports and 2 x 10GbE ports) - 1 to 2 1GbE Ethernet connections and 1 to 2 10GbE Ethernet connections for NAS or OST connectivity, replication, and remote management
	<b>DXi6700 (2 x 1GbE ports) -</b> 1 to 2 1GbE Ethernet connections for replication and remote management.

#### DXi6500 and DXi6700 Cable Drops

Fibre Channel Drops	Model 6540, 6550 (2 x FC ports) - 1 to 2 Fibre Channel connections for path-to-tape connection DXi6700 (4 x FC ports) - 1 to 4 Fibre Channel connections for data transfer and path-to-tape connections
Power Outlets	<ul> <li>Node - 2 USA type 3-prong power outlets or 2 Continental Europe type 2-prong power outlets</li> <li>Expansion Module (each) - 2 USA type 3-prong power outlets or 2 Continental Europe type 2-prong power outlets</li> </ul>

#### Table 45 Interfaces

#### DXi6500 and DXi6700 Interfaces

Interfaces	NAS backup target: 128 shares maximum (NFS or CIFS)
	OST backup target: 100 storage servers maximum
Hardware	Model 6510
	2 ports 10/100/1000 BaseT Ethernet (RJ45 connector)
	Model 6520, 6530
	6 ports 10/100/1000 BaseT Ethernet (RJ45 connector)
	Model 6540
	6 ports 10/100/1000 BaseT Ethernet (RJ45 connector) and 2 ports 8Gb Fibre Channel (LC connector)
	Model 6550
	2 ports 10/100/1000 BaseT Ethernet (RJ45 connector), 2 ports 10,000 BaseT Ethernet (CX4 connector), and 2 ports 8Gb Fibre Channel (LC connector)
	DXi6700
	2 ports 10/100/1000 BaseT Ethernet (RJ45 connector), 2 ports 10,000 BaseT Ethernet (CX4 connector or optical LC connector), and 2 ports 8Gb Fibre Channel (LC connector)

#### Table 46 Software Capabilities

#### DXi<sup>™</sup> Software Capabilities

Policy based data	Adaptive In-line Data Deduplication: Data is deduplicated on ingest.		
deduplication options	<b>Deferred Processing Data Deduplication</b> : Data is ingested to disk first, then deduplicated in a separate process at a time set by the user.		
	<b>Note:</b> Both methodologies may be enabled for different data sets in the same DXi6500 and DXi6700.		
Replication	DXi6500 and DXi6700 models offer support for remote replication. Replication is asynchronous, one-to-one or multiple-to-one configurations; shares in same unit act as replication source or target; units with shares acting as replication targets can also support local backup.		

#### Table 47 Power Requirements

#### DXi6500 and DXi6700 Power Requirements

Power Supplies and Cords	Node	Two (2) hot swappable redundant power supplies Two (2) USA type 3-prong power cords with IEC320 C13 connectors Two (2) Continental Europe type 2-prong power cords with CEE7 connectors
	Expansion Module	Two (2) hot swappable redundant power supplies Two (2) USA type 3-prong power cords with IEC320 C13 connectors Two (2) Continental Europe type 2-prong power cords with CEE7 connectors
Voltage	Node	100–240 VAC
	Expansion Module	100–240 VAC
Frequency	Node	50–60Hz
	Expansion Module	50–60Hz

Average AC Current	Node	570 Watts, 5.7 @ 100 VAC, 1945 BTU/hr 570 Watts, 2.4A @ 240 VAC, 1945 BTU/hr
	Expansion Module	230 Watts, 2.3A @ 100 VAC, 785 BTU/hr 230 Watts, 1.0A @ 240 VAC, 785 BTU/hr
Inrush Peak AC Current	Node	1100 Watts, 11.0A @ 100 VAC 1120 Watts, 4.7A @ 240 VAC
	Expansion Module	300 Watts, 3.0A @ 100 VAC 420 Watts, 1.75A @ 240 VAC

**Caution:** To safeguard backups in the event of a power outage, Quantum recommends that you connect the DXi6500 and DXi6700 to a UPS (uninterruptable power supply).

Performance Characteristics

<u>Table 48</u> lists the performance characteristics of the DXi6500 and DXi6700 system.

Table 48PerformanceCharacteristics

Performance Characteristics		
DXi6500 and DXi6700 Product family	Adaptive ingest performance of up to 2.0 TB/hour (depending on model)	

Environmental	
Specifications	

<u>Table 49</u> provides various DXi6500 and DXi6700 environmental specifications.

## Table 49 Environmental Specifications

#### **Climatic Environment**

Temperature	Operating	10° to 35°C (50° to 95°F) up to 3048m (10,000 ft)
	Shipping and storage	–20° to 60°C (–4° to 140°F) up 12,000m (39,370 ft)
Relative humidity	Operating	20% to 80% (non-condensing)
	Shipping and storage	5% to 95% (non-condensing)
Altitude	Operating	–30m to 3048 m (–100 to 10,000 ft)
	Shipping and storage	-30m to 12,000 m (-100 to 39,370 ft)

#### Vibration and Shock

Operational Shock	Peak Acceleration	3G
	Duration	8 milliseconds
	Wave Shape	½ Sine
Operational Vibration	Mode	Swept frequency
	Frequency Range	20Hz-300Hz
	Amplitude	0.25G
	Rate/Duration	0.75 octaves/minute
	Application	X, Y, and Z axes
Shipping and Storage	Mode	Random Vibration
	Frequency Range	4Hz–300Hz
	Amplitude	0.96 Grms
	Rate/Duration	(PSD can be provided) 30 minutes X, Y, Z axes

#### Acoustic

Acoustic output	Operating	< 67 dBA at 1 meter, room temperature (20C)
-----------------	-----------	---

Agency Approvals	
Safety	IEC 60950-1 (ed. 1), CSA 60950-1-03/UL 60950-1 1st Edition
Emissions	EN55022 Class A, FCC Part 15 Class A, ICES-003 Class A, VCCI Class A, CISPR 22 Class A, CNS13438 Class A, KN22 Class A
Immunity	EN55024/KN24:
	EN 61000-3-2 - Harmonic current emissions test
	EN 61000-3-3 - Voltage fluctuations and flicker in low-voltage supply systems test
	EN 55024:1998 - Information technology equipment - Immunity characteristics - Limits and methods of measurements
	EN 61000-4-2 - Electrostatic discharge immunity test
	EN 61000-4-3 - Radiated, radio-frequency, electromagnetic field immunity test
	EN 61000-4-4 - Electrical fast transient/burst immunity test
	EN 61000-4-5 - Surge immunity test
	EN 61000-4-6 - Immunity to conducted disturbances, induced by radio- frequency fields
	EN 61000-4-8 - Power frequency magnetic field immunity test
	EN 61000-4-11 - Voltage dips, short interruptions and voltage variations immunity test

#### ^ ^ .

**Caution:** The DXi6500 and DXi6700 system is designed to be installed in a rack enclosure. Ensure that the operating temperature inside the rack enclosure does not exceed the maximum rated ambient temperature. Do not restrict air flow to the DXi6500 and DXi6700 components.

Appendix A: DXi6500 and DXi6700 System Specifications

	C
<b>.</b>	Glossary
G	
A	Adaptive In-line Data Deduplication When you select Enable Data Deduplication for the NAS share, data deduplication is running all of the time and cannot be disabled. Backup data is sent to the DXi6500 and data deduplication is performed on data as it is ingested. Data deduplication begins when the backup begins. The advantage of selecting adaptive in-line data deduplication is that disk space is saved immediately.
B	<b>Block Pool</b> A pool of all unique data blocks that were captured during the data deduplication cycle. When backup jobs occur, the data deduplication engine searches for new data entering the DXi6500 and uses a variable length compression type algorithm to compare this to existing data in the block pool. Unique blocks are added to the block pool and all known blocks are indexed.
	<b>Byte</b> The basic unit of computer memory which is large enough to hold one character.
C	<b>Compress</b> A process of removing fine-grained redundancy from data prior to storing or transmitting it. The granularity may vary, but generally compression deals with redundancy in grains of a few bytes.

D	Data D	eduplication A process of removing coarse-grained redundancy from data prior to storing or transmitting it. The granularity may vary, but generally data deduplication deals with redundancy in grains of several kilobytes.
	Deferro	ed Processing Data Deduplication When you select Enable Backup Window for the NAS share, data deduplication is disabled for a specific time period allowing better throughput performance during this period of time. All of the backup data is sent to the DXi6500 immediately in its raw form without data deduplication. After the backup window is closed and data deduplication is re-enabled, the data that was moved during the backup windows is now deduplicated on the DXi6500. The advantage of deferred processing data deduplication is that backups will complete faster with system resources dedicated for incoming backup data.
	Disk	A fixed set of sectors with sequential numbers starting from zero, directly and independently accessible and mutable by those numbers without affecting any other sector.
F	Filesys	tem An abstraction layered over storage devices (typically disks) obscuring the physical details of the storage devices it supports n favor of a presentation oriented at storing and organizing files.
н	Host	The device or devices to which the system is connected.
I	Ingest	The throughput performance of data writes to the system.
L	LSU	Logical Storage Unit

Ν	NAS	Network Attached Storage is file-level computer data storage connected to a computer network providing data access to network clients.
	NDMP	Network Data Management Protocol is a protocol meant to transport data between NAS devices, also known as filers, and backup devices. This removes the need for transporting the data through the backup server itself, thus enhancing speed and removing load from the backup server.
0	OST	Open Storage Technology
R	RAID	Redundant Array of Independent Disks is a technology through which several physical storage disks are grouped into an array that appears to an operating system as one or more physical devices.
S	SNFS	StorNext <sup>®</sup> File System
	SNMP	Short for <i>Simple Network Management Protocol</i> , a set of protocols for managing complex networks.
т	Teraby	<b>te</b> A unit of measure for digital data equal to approximately 1,000 gigabytes, or 1,099,511,627,776 bytes.
	Trunca	tion As long as free disk space is available, the DXi6500 retains native format data on disk to provide accelerated reads from cache. As disk space is required, the native format data is truncated and reads come from the data deduplication block pool.

Glossary
# 

action/alerts admin alerts 201 service tickets 203 adaptive in-line data deduplication 43 admin alerts 201 advanced settings 141 opportunistic locking 141 alerts 201

# В

browsers 58 supported 58

# С

cartridges all 90 common problems and solutions 258 compression 4 configuration accessing 79 date and time 163 NAS 113 network 150 security 164 VTL 80 contacts 180 company 181 primary/secondary 182

contents section 70 create media 88

D

data deduplication adaptive in-line 43 deferred processing 44 data reduced by section 71 data replication 213 data services data replication 213 space reclamation 209 data storage 13 date and time

configuring 163 deferred processing data deduplication 44 degraded tape cartridges 199 disk drives drive carrier 11 displayed frames 69 DXi6500 problem reporting 255 shutting down 38 turning on 37 DXi6500 remote management pages 57 DXi6500 system rebooting 250 DXi6500 web pages alerts 201 configuring the network 150 configuring the security options 164 menu items 58 DXi6500-D web pages using 69

Index

### Ε

email configuration 170 server 173 e-mail, sending service tickets 208 environmental specifications climatic environment 290 regulatory approvals 291

# F

firmware uploading 241 frames, displayed 69

# G

general 210

# Н

hard disks virtual tape storage 13 hard drives 13 hardware details 187 status 186 summary 186 home page contents section 70 data reduced by section 71 nas data services section 73 quick status section 71 system details section 72 system status buttons 74 host access 102 groups 103 target usage 111

# I

inquiry identity 84 internet browsers 58

# L

logical view 199 login type administrator 68 monitor 68

### М

media actions virtual actions 93

### Ν

NAS advanced settings 141 CIFS 12 configuration 113 NFS 12 shares 113 windows domain 132 nas data services section 73 network configuration fields 95, 117, 119, 123, 127, 140 viewing/editing 150 network performance monitor 249

### 0

opportunistic locking 141

### Ρ

partition actions 97 mode 97 move 98 unload 100 partitioning add 82-85 delete 87 edit 86 summary 82 partitions 81 performance specifications 289 problem reporting 255 problems Ethernet 261 hardware 259 replication 262 start-up 258, 259 temperature 263 protocol CIFS 12 **NFS 12** 

# Q

quick status section 71

### R

RAID 5 definition 13 rebooting 250 regulatory approvals 291 replication data transmission 215 disable 229 enable 229 namespace 216 pause 228 problems 262 replication set transmission and accounting 216 requirements 215 resume 228 source role 216 target role 229, 238

### S

screens. User Interface Send Ticket Information 208 Ticket Analysis 207, 208 security configuration 164 passwords 164 SSL 166 security options 164 Send Ticket Information screen 208 service tickets 203, 264 closing 208 modifying 207 sending by e-mail 208 viewing 204 shares NAS 113 SNMP community 177 community management 178 configuration 175 destinations 175 test 180 traps 177 source role 216 actions 227 NAS 222 VTL 218

space management general 210 schedule 212 space reclamation 209 specifications performance 289 SSL 166

configuration 168 status hardware 186 system 189 VTL 197 status pages system status 204 supported internet browsers 58 supported web browsers 58 system CPU 190 data deduplication 192 disk usage 194 Ethernet 191 **RAID 191** status 189 system details section 72 system status buttons 74 system status page 204

т

tape cartridges degraded 199 unavailable 199 target role 229, 238 NAS 234 VTL 231 Ticket Analysis screen 207, 208 tickets closing service 208 modifying service 207 sending service by e-mail 208 viewing service 204

### U

unavailable tape cartridges 199 utilities 241 firmware 241

### V

virtual create media 88 partitions 81 virtual actions 93 virtual tape storage 13 VTL 197, 199 configuration 80 host access 102 media actions 90 partition actions 97 performance view 200 physical view 198

## W

windows domain 132 joining a domain using a domain user credential 134 joining a windows domain 133 joining a windows workgroup 133 troubleshooting ADS join issues 136 Index