



ProtectTIER for the REO® 9500D

User Guide and Reference
Version 1.2

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Preface

This guide describes how to use ProtecTIER™ - the software component of the REO 9500D appliance.

This guide is intended for user-site personnel filling the three types of user roles:

ProtecTIER user A user who has been assigned this role can monitor the activity of the appliance, its connections and its VTLU libraries.

ProtecTIER operator A user who has been assigned this role can perform all the functions of the ProtecTIER user, and can also perform routine library management operations.

ProtecTIER administrator A user who has been assigned this role can perform all the functions of an operator, and can also perform these administration tasks: configuring libraries, adding storage to a library, assigning LUNs to front-end ports.

For version-specific information on product features, see the product *Release Notes*.

This preface describes the contents of the manual, lists the manuals provided with the product, and tells how you can contact Overland Storage for information.

Manual contents

This manual contains a guide to ProtectTIER, a guide to using the ProtectTIER client to access the REO 9500D appliances, and an appendix.

PART ONE - ProtectTIER Guide

Chapter 1, Introduction

Describes ProtectTIER and how it achieves high performance and transparency.

Chapter 2, Installing ProtectTIER Manager

Describes how to install and invoke ProtectTIER Manager from a workstation.

Also describes how to update and uninstall ProtectTIER Manager.

Chapter 3, Working with ProtectTIER Manager

Describes how to use the ProtectTIER Manager display to access information and invoke actions. Also contains a list of ProtectTIER Manager menu options, and describes how to invoke ProtectTIER Manager wizards for performing ProtectTIER administration tasks.

Chapter 4, Monitoring ProtectTIER

Provides an overview of activities performed by a ProtectTIER user defined with the ProtectTIER user role.

Chapter 5, Operating ProtectTIER

Provides an overview of activities performed by a ProtectTIER user defined with the ProtectTIER operator role.

Chapter 6, Administering ProtectTIER

Provides an overview of activities performed by a ProtectTIER user defined with the administrator role.

PART TWO - Using ProtecTIER

The ProtecTIER appliances at the site are accessed via the ProtecTIER Manager client.

Chapter 7, Managing appliances

Describes how to connect to one or more ProtecTIER appliances, and how to display the configuration of the appliance. Describes how to control the appliances (restart, reboot, etc.).

Chapter 8, Monitoring repositories

Provides an understanding of the repository and how to monitor fragmentation of the repository.

Chapter 9, Managing libraries

Describes how to display the configuration of a library, its front-end port configuration, performance parameters and robot information.

Describes how to access ProtecTIER Manager wizards to perform administration tasks on the library: creating and adding a library to an appliance, adding cartridges to a library, changing library dimensions (number of drives and/or slots), attaching or detaching a library from the appliance.

Chapter 10, Managing library components

Describes how to display information about the tape drives, internal slots, import/export slots and cartridges in a library.

Also describes how to unload a tape drive, and move a cartridge from one slot or drive to another.

Chapter 11, Recovering ProtecTIER

Describes the basic consistency check performed every time the system comes up. If the system is found or suspected to be corrupt, you are prompted to execute checks and recovery elements in respect to the damage found.

PART THREE - ProtecTIER Mgr Administration

Chapter 12, Manager Logs & Troubleshooting

Describes how to display and work with the warnings and error messages that are written to a log file. There may be situations where Technical Support requests that you examine this file, or forward it to them.

Chapter 13, ProtecTIER logs

Describes how to use the ProtecTIER Manager logs. As users work with ProtecTIER via the ProtecTIER Manager client, events are logged. These are not errors, but they can be used to understand what ProtecTIER was doing when an error occurred.

APPENDIX

Appendix 14, Error messages

Lists error messages that might be issued by ProtecTIER.

Appendix 15, Glossary of terms

Provides terms and acronyms used to describe ProtecTIER.

Appendix 16, Obtaining customer support

Describes how to report software problems to Technical Support.

ProtectTIER documentation

ProtectTIER documentation set

A *User Guide and Reference* and *Release Notes* are supplied with ProtectTIER.

User Guide and Reference

This guide describes how to monitor, manage and administer ProtectTIER - the software component of the REO 9500D Appliance. The guide is intended for user site personnel.

Tasks described here are performed when changes are made to the library configuration, and during day-to-day operations.

Release Notes

The product release notes contain specifications that are applicable to the current version of the product. They list new features, changes in behavior, and limitations.

Contact information

Sales and customer service contacts

For more information, or to reach Technical Support and Customer Service, please contact Overland Storage:

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Product registration

Do not forget to register your REO 9500D appliance on the Overland Storage Customer Support Website. When you access the site, If you are not yet a member, click the New member? link and follow the instructions. It's free!

Your comments

Your suggestions help us continue to improve the accuracy, organization, and overall quality of user publications. Please e-mail us at techsupport@overlandstorage.com with your feedback.

PART ONE - ProtecTIER Guide

These chapters describe ProtecTIER on the 9500D appliance. They also describe the activities performed in monitoring, operating, and administering ProtecTIER.

Introduction 1

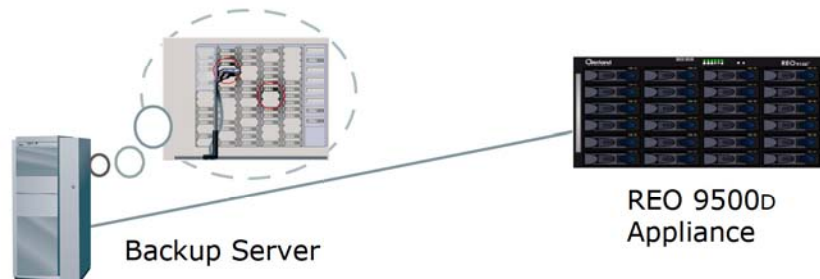
This chapter provides an overview of Diligent Technologies ProtectTIER.

About ProtecTIER

ProtecTIER virtualizes tape library units (TLUs). It emulates the tape drives, tape cartridges and the library robotics that mount and dismount the cartridges in the tape drives.

ProtecTIER software is installed on the REO 9500D. The REO 9500D is configured as one or more Virtual Tape Libraries (VTLs). The backup application writes its data directly to the VTLs on the REO 9500D.

A backup server connected to the REO 9500D appliance functions as though it is operating a real TLU, while it is actually operating the REO 9500D appliance, storing the tape data on the REO 9500D's disk arrays.



ProtecTIER integrates seamlessly into existing backup and recovery environments. Integrating ProtecTIER VT is equivalent to installing a new tape library into an existing backup and recovery environment.

ProtecTIER provides an enterprise-wide solution, helping IT managers consolidate backup and recovery of data across the organization. ProtecTIER is designed to provide scalability, flexibility, cost reduction due to significant reduction in amount of archiving storage, high performance and transparency.

HyperFactor

ProtecTIER is the first virtual tape product to contain patent-pending data factoring technology that Diligent calls *HyperFactor*[™]. This technology detects recurring data in multiple backups. The common data is merged into a single instance store, saving on disk space needed to store multiple backups without sacrificing performance or the availability of backups for restore.

HyperFactor is a breakthrough on several fronts:

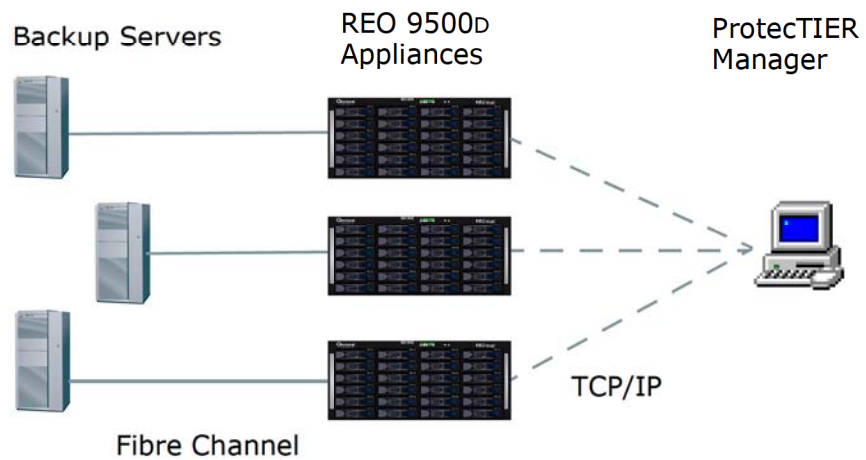
- scales up to a petabyte
- the algorithm used to find the common data between backups does not affect the backup performance of the virtual tape engine
- data integrity is not compromised, not even statistically
- merged data is stored in a format that preserves restore performance

HyperFactor saves space by taking advantage of the fact that only a very small percentage of data actually changes from backup to backup. Incremental backups include all files whose modification dates have changed since the last full or incremental backup; and full backups backup all data, changed or not.

The amount of space saved is a function of many factors, but mostly of the backup policies and retention periods and the variance of the data between them. The more full backups retained on ProtecTIER, and the more intervening incremental backups, the more space that will be saved overall.

Performance and data availability

As backup windows become smaller and downtime costs increase, backup and recovery performance can be increased linearly by adding additional REO 9500D appliances.



Multiple REO 9500D appliances are monitored, managed and administered from a workstation via ProtecTIER Manager, the GUI client.

Transparency

When a backup server connects via Fibre Channel to ProtecTIER, it views the REO 9500D appliance as if it were TLU robotics and tape drives.

Emulated robotics

ProtecTIER identifies the emulated TLU robotics to the backup server as an ATL P3000¹ TLU. A backup application running on the backup server operates the library's robot exactly as it would operate a real P3000 TLU.

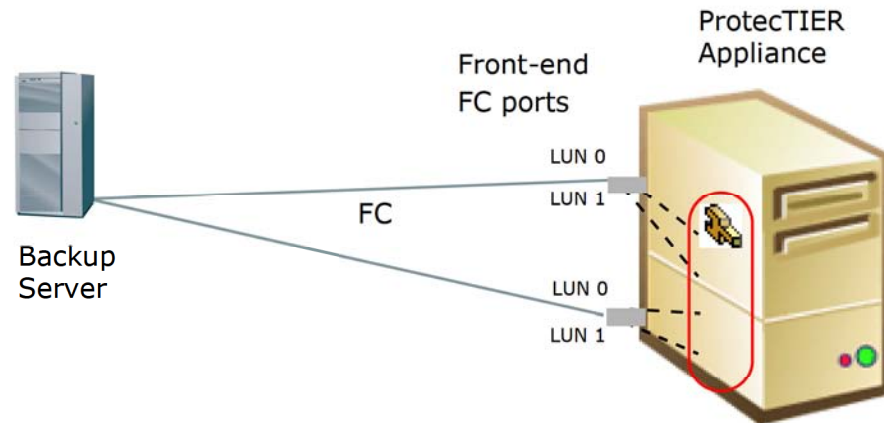
Emulated tape drives

ProtecTIER identifies the emulated tape drives to the backup server as Quantum DLT 7000² tape drives. A backup application running on the backup server writes and reads the library's tape drives exactly as it would write and read real DLT 7000 tape drives.

Front-end port assignments

ProtecTIER reports the assignment of emulated TLU robotics and emulated tape drives to front-end FC ports in the same way that a real TLU would. It assigns different SCSI LUN numbers to the robotics and to each tape drive.

The figure depicts a library with a robot and three tape drives, distributed over two front-end ports.



¹ ATL and P3000 are registered trademarks of Quantum Corporation.

² DLT 7000 is a registered trademark of Quantum Corporation.

Supported backup applications

Leading industry backup applications are able to operate ATL P3000 TLUs and Quantum DLT 7000s. Diligent has verified that the leading applications work transparently with the emulated ATL P3000 and DLT 7000s implemented by ProtecTIER.

For version-specific information, see the ProtecTIER *Release Notes*.

Best practice for off-site tape storage

ProtectTIER has the ability to store months of backup data on substantially less disk space than any other "backup to disk" products, and most customers consider ProtectTIER as an excellent platform for long-term data retention. Because ProtectTIER typically manages large quantities of data, protection of the ProtectTIER repository is an essential component of every ProtectTIER installation. Diligent's Best Practice recommendation for all ProtectTIER deployments is to create offsite tape copies on a daily basis. This method ensures that all data within ProtectTIER is protected. To adhere to this recommendation, the cloning or duplication feature of the backup application is used for each backup job to create a second copy of each backup image on tape. The tapes are collected and transported to an offsite location on a daily basis. This process protects against disasters that could simultaneously destroy the primary data sets and the backup data sets stored on ProtectTIER, as well as operational or logical errors that could impact the integrity of the ProtectTIER repository.

Installing ProtecTIER Manager 2

ProtecTIER Manager provides a graphical client interface for users, operators or administrators who will access the ProtecTIER appliances.

The ProtecTIER Manager can be installed and deployed on a Windows, Solaris or Linux workstation. It is installed via an install shield wizard.

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ProtecTIER Manager requirements

ProtecTIER Manager can be installed and deployed on a Windows, Solaris or Linux workstation.

It can be installed on any computer on the network, as long as this computer can identify the ProtecTIER appliances (the ProtecTIER Manager workstation and the appliance should not be in different subnets separated by a firewall).

Operating system requirements

The following version of the operating system must be running on the workstation:

Windows Windows 2000, 2003, or XP

Solaris SUN Solaris 8 or higher

Linux Red Hat Enterprise 3 (32 bit) or higher

Disk space requirements

At least 100 MB available space.

Memory requirements

At least 256 MB.

Graphics card and monitor

On a UNIX system, you must configure the graphics card and the X windows system. Refer to the Linux or Solaris documentation for instructions on configuring the X manually, or via the Xconfigurator utility.

Display screen resolution requirements

Display properties of screens that will be used with ProtecTIER Manager must be set as follows:

- o screen area of at least 1024 by 768 pixels
- o 24 bit colors or higher

Installing ProtecTIER Manager

ProtecTIER Manager installation files are available on CD or from Diligent's FTP site.

To install ProtecTIER Manager, invoke and run the installation wizard.

If you have been running an older version of ProtecTIER Manager, uninstall the old version before installing the new version. See *Uninstalling ProtecTIER Manager* on page 2-6.

Extracting the files from the FTP site

If you get the files from the FTP site, you must extract the files as appropriate for the operating system:

Windows

Double-click this file and unzip its contents, where <version number> is the version number:

```
ProtecTIER_Manager_V<version number>.tar
```

Solaris or Linux

Issue this command where <version number> is the version number:

```
tar -oxvf ProtecTIER_Manager_V<version number>.tar
```

Identifying the files on the CD

On the CD, the installation files must be taken from the appropriate subdirectory:

```
ProtecTIER_Manager_V<version number>/Windows
```

```
ProtecTIER_Manager_V<version number>/Solaris
```

```
ProtecTIER_Manager_V<version number>/Linux
```

Invoking the installation wizard

When you extract the files, three sub-directories are created: one for Windows, one for Solaris, and one for Linux.

Invoke the installation wizard from the appropriate sub-directory for the target operating system (Windows, Solaris or Linux).

Windows

Double-click on the file Windows\Install.exe.

Solaris

The file Solaris/install.bin is provided. Invoke the installation wizard by issuing this command:

```
sh <full path to Solaris/Install.bin>
```

Linux

The file Linux/install.bin is provided. Invoke the installation wizard by issuing this command:

```
sh <full path to Linux/Install.bin>
```

Running the installation wizard

The ProtecTIER Manager installation wizard opens to guide you through the installation. Enter the requested information in each dialog and click *Next* to proceed to the next dialog.

Choose the install folder

Indicate where you would like to install ProtecTIER Manager.

Choose the shortcut location

Indicate where you would like to create application shortcuts/links.

Invoking ProtecTIER Manager

Do not run more than one instance of ProtecTIER Manager, simultaneously, from a particular directory, under the same network user name.

Invoke ProtecTIER Manager as appropriate for the operating system.

Windows

Invoke ProtecTIER Manager via the shortcut that was created during installation, or from ProtecTIER_Manager.exe in the installation directory.

Solaris or Linux

Invoke ProtecTIER Manager via the link that was created during installation, or from the ProtecTIER_Manager file in the installation directory.

Uninstalling ProtectTIER Manager

If you have been running an older version of ProtectTIER Manager, you should uninstall the old version before installing the new version.

The uninstall procedure is operating system dependent. Invoke the uninstaller as described here, and follow the instructions provided by the wizard.

Windows

Invoke ProtectTIER Manager uninstaller in one of these ways:

- Run the Uninstall ProtectTIER Manager.exe file from the directory in which ProtectTIER Manager was installed.
- Invoke the uninstaller from the shortcut. For example, if the ProtectTIER Manager shortcut was installed in the default directory, invoke it as follows:
Start>Programs>DTC>ProtectTIER Manager>Uninstall ProtectTIER Manager

Solaris

Invoke ProtectTIER Manager uninstaller in one of these ways:

- Run the Uninstall_ProtectTIER_Manager file from the directory in which ProtectTIER Manager was installed.
- Invoke the uninstaller via the Uninstall_ProtectTIER_Manager link which was created during installation.

Linux

Invoke ProtectTIER Manager uninstaller in one of these ways:

- Run the Uninstall_ProtectTIER_Manager file from the directory in which ProtectTIER Manager was installed.
- Invoke the uninstaller via the Uninstall_ProtectTIER_Manager link which was created during installation.

Working with ProtecTIER Manager 3

ProtecTIER Manager is the client used to access one or more REO 9500D appliances at a user site.

This chapter describes how to use the ProtecTIER Manager display to access information and perform actions. It describes how ProtecTIER Manager wizards guide you in performing administration tasks.

See [Chapter 2, Installing ProtecTIER Manager](#).

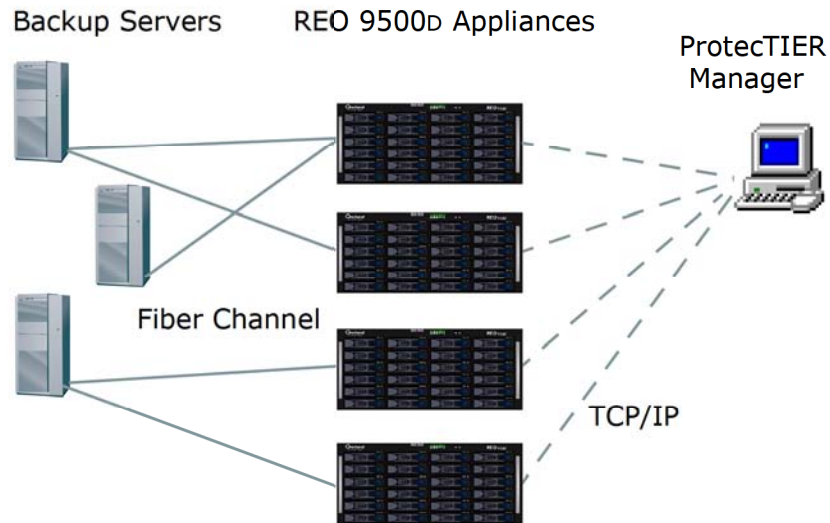
[Chapter 13, ProtecTIER logs](#) discusses the event log and the error log.

Refer to the *Release Notes* for version-specific limitations of ProtecTIER Manager.

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Using ProtecTIER wizards	3-13

Overview

The ProtectTIER Manager client is used to access the REO 9500D appliances at the user site.



ProtectTIER Manager has three user types with three different authorization rights:

- *ptuser* for monitoring ProtectTIER
- *ptoper* for operating ProtectTIER
- *ptadmin* for administering ProtectTIER

For more information on logging in to an appliance, see *Logging in to an appliance* on page 7-8.

Monitoring configuration and performance

When you log in to an appliance with a username that is only authorized to monitor ProtectTIER, you can display the configuration of that appliance, the hyperfactor and repository, and each VTLU library attached to it. You can display information about the drives, slots and cartridges in each library.

Operating ProtecTIER

If your username is authorized to operate ProtecTIER, in addition to *vtfuser* rights, you can set library HyperFactor mode, unload a drive, reset a drive or robot, set the read/write state of a cartridge, and move a cartridge.

Administering ProtecTIER

If your username is authorized to administer ProtecTIER, in addition to *vtfooper* rights, you can invoke wizards to guide you in performing configuration operations:

- creating or deleting a library
- modifying the configuration of a library
- adding or deleting cartridges to a library
- performing an integrity check on the library and cartridges, if necessary
- configuring port type and mode
- dumping ProtecTIER trace
- restarting ProtecTIER service
- rebooting ProtecTIER appliance

Using the ProtectTIER Manager interface

ProtectTIER Manager presents a standard graphical user interface (GUI).

Invoking an action

Choose an action to perform in one of these ways:

- By choosing an option from a drop-down menu on the menu bar at the top of the window.
- By clicking the equivalent icon on the toolbar under the menu bar.
- By choosing an option from a right-click menu. By right-clicking on an object in the navigation pane or in the work pane, you can access a right-click menu listing available actions. Right-click menus are context sensitive. The menu lists actions that can be performed on the object that was clicked: appliance, library, slot, etc. In general, an appliance's right-click menu has options that appear on the *Appliance* menu on the menu bar when that appliance is selected, and a library's right-click menu has options that appear on the *Library* menu on the menu bar, when that library is selected.

Disabled actions

Actions may appear dimmed on menus, icons and buttons.

These are actions that are not appropriate for the current state of the system or the display, for the selected object, or for the authorization level of the user who is choosing an action to perform.

Tool tips

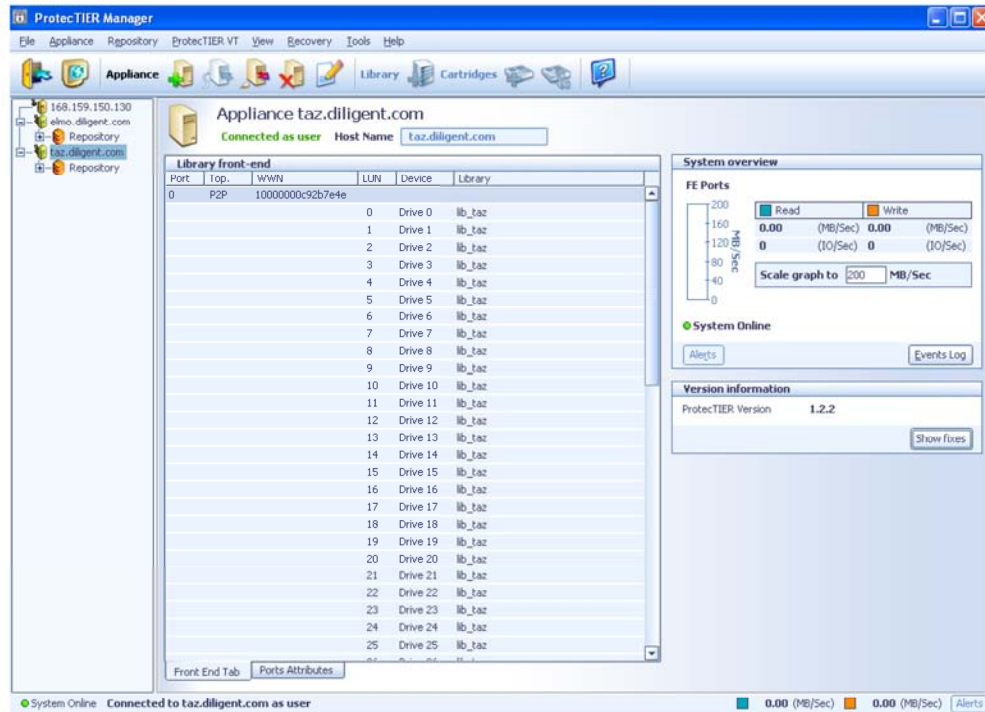
Tool tips appear describing the purpose of an object when the pointer is placed over the object.

Hot keys and shortcut keys

You can use keyboard hot keys or shortcut keys to select menu options and buttons.

The ProtecTIER Manager display

The ProtecTIER Manager display consists of a navigation pane on the left and a work pane on the right.



Navigation pane

The navigation pane contains a node for each ProtecTIER appliance for which connection properties added manually have been provided, or which have been auto-detected.

You can re-scan the network, at any time, to refresh the list of appliances listed in the navigation pane.

If you have logged on to the appliance, you can expand the node to display the repository node.

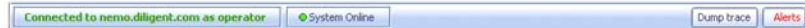
You can expand the repository node to display nodes representing its libraries.

You can expand a library node to display nodes representing its drives, slots, import/export slots and its cartridges.

Work pane

The work pane displays information about the component that is selected in the navigation pane.

A status bar appears at the bottom of the work pane indicating that the appliance is connected, the host name of the appliance, and whether or not the system is online.

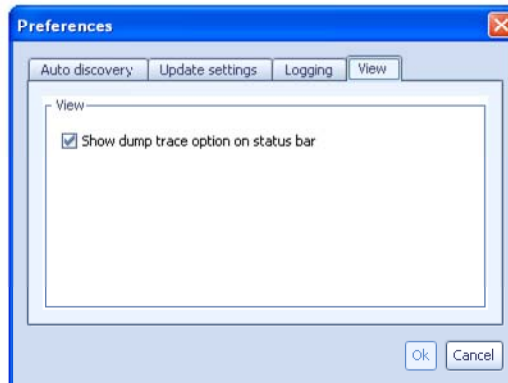


Dump trace

The Dump trace button is used to create a new dump file of the ProtectTIER internal trace. See *Dump the ProtectTIER trace* on page 7-20.

You can toggle the view of the *Dump trace* button. To view the *Dump trace* button on the status bar:

1. Choose *Tools>Preferences*. The *Preferences* dialog is displayed.
2. Choose the *View* tab.



3. Select the checkbox to display the dump trace option on the status bar.
4. Click *OK*.


Alerts !

If the *Alerts* button is flashing, messages have been added to the error log since the last time it was cleared. Click this button to display the error log. See *Displaying the Error log* on page 13-4.

ProtectTIER Manager menu options

These options are accessed via the menu bar at the top of the display, or via a right-click menu, or via icons on the toolbar. Some of the options require operator or administrator authorization.






File menu

icon	option name	function	when enabled	user role
	Exit	log out from all appliances and exit from ProtecTIER Manager	always enabled	all

Appliance menu

Some of these options are available from the right-click menu of an appliance, or on the toolbar.

Some options are enabled only when a connected (logged in) appliance is selected in the navigation pane. Others are enabled only when a disconnected (logged out) appliance is selected.


icon	option name	function	when enabled	user role
	Login	log in to the appliance selected in the navigation pane	a disconnected appliance is selected	all
	Logout	log out from the selected appliance	a connected appliance is selected	all
	Add appliance	specify connection properties for an appliance and add it to the navigation pane	always enabled	all
	Connection properties	edit or view the connection properties of an appliance	an appliance is selected (edit - for a disconnected appliance only)	all
	Remove appliance	removes appliance from the navigation pane	an appliance is selected	all
	Reboot appliance	reboots ProtecTIER appliance	a connected appliance is selected	admin

icon	option name	function	when enabled	user role
	Restart ProtecTIER service	restarts ProtecTIER service	a connected appliance is selected	admin
	Dump trace	dumps the program trace	a connected appliance is selected	operator
	Reset trace	resets the program trace	a connected appliance is selected	operator
	Set trace levels	modifies the tracing and logging levels of the ProtecTIER appliance	a connected appliance is selected	admin
	Create service report	generates a service problem report to send to Technical Support	a connected appliance is selected	all
	Save performance history	saves performance statistics of ProtecTIER VT	a connected appliance is selected	admin
	Port attributes	invokes ports attribute wizard	a connected appliance is selected	admin
	ProtecTIER patch update check	checks if a patch exists, based on the appliance's ProtecTIER version from Diligent's FTP site	a connected appliance is selected	admin
	License	displays ProtecTIER license information	a connected appliance is selected	all

ProtecTIER VT menu

ProtecTIER VT Library menu

Most of these options are available from the right-click menu of a library.

icon	option name	function	when enabled	user role
	Create new library	invokes the <i>Create new library</i> wizard to create a new library	a repository is selected	admin
	Add cartridges	invokes the <i>Add cartridges</i> wizard to add cartridges to an existing library	a library is selected	admin
	Change dimensions	invokes the <i>Change dimensions</i> wizard to change the number of drives or slots in a library and port assignments	a library is selected	admin

icon	option name	function	when enabled	user role
	Re-assign devices	invokes the <i>Re-assign devices</i> wizard to reassign robot and tape devices to different front-end ports	a library is selected	admin
	Delete library	invokes the <i>Delete library</i> wizard to delete a library and make the disk space available	a library is selected	admin
	Rename library	rename a library	a library is selected	admin
	Check library	invokes the <i>Check library</i> wizard to perform an integrity check on the library	a library is selected	admin
	Reset robot	perform a SCSI reset of the robot	a library is selected	operator
	Set library type	set library inquiry fields	a library is selected	admin

ProtectTIER VT Drive menu

This option is also available from the right-click menu of a drive.

option name	function	when enabled	user role
Load drive	load a cartridge in a tape drive	an online drive with unloaded cartridge is selected	operator
Reset drive	perform a SCSI reset of a tape drive	a drive is selected	operator

ProtectTIER VT Cartridge menu


This option is also available from the right-click menu of a cartridge.

You must unload a drive before you can move its cartridge.

option name	function	when enabled	user role
Move cartridges	move a cartridge from one drive or slot to another	one or more cartridges are selected in the drives, slots, or imp/exp views	operator
Read/write cartridge	toggle a cartridge between read/write and read-only	a cartridge in a slot is selected	operator
Rebarcode	change the barcode of an existing cartridge to a new barcode	a cartridge in imp/exp slot is selected	admin

option name	function	when enabled	user role
Delete cartridges	deletes a cartridge	in cartridges view	admin
Check cartridge integrity	verifies cartridge data integrity	a cartridge is selected	admin

View menu

icon	option name	function	when enabled	user role
	Refresh	update the display to reflect the current status of the appliance	always enabled	all
	Refresh navigation pane	update tree structure in navigation pane to reflect current status	always enabled	all


Recovery menu

icon	option name	function	when enabled	user role
	System check	performs a thorough check on ProtecTIER components	always enabled	admin
	Recover cartridges manager	fixes problems that were found in the Cartridge manager during the system check.	always enabled	admin

Tools menu


option name	function	when enabled	user role
Update	upgrades the ProtecTIER Manager to the latest version from Diligent's site	always enabled	admin
Preferences	displays auto discovery of appliances, update settings and logging properties	always enabled	all
View manager log	displays ProtecTIER Manager history log	always enabled	all
Import and Save History File		always enabled	all

Help menu

icon	option name	function	when enabled	user role
	About	display ProtecTIER version and copyright information	always enabled	all

Right-click menu

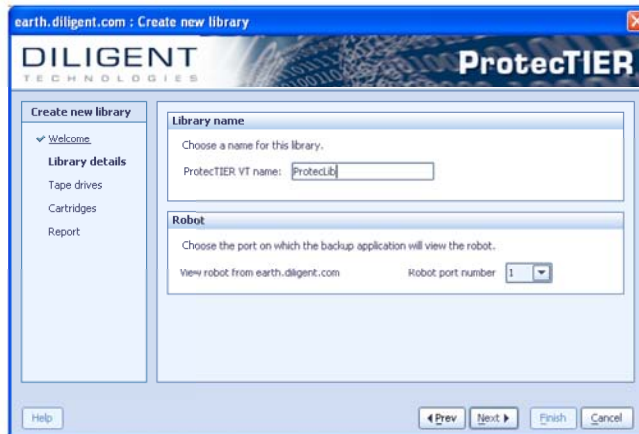
These options appear on the right-click menu invoked by right-clicking on the navigation pane, not on a node in the tree.

icon	option name	function	when enabled	user role
	Add appliance	add connection properties for an appliance	always enabled	all
	Refresh navigation pane	update tree structure in navigation pane to reflect current status	always enabled	all
	Auto discovery	re-scan the network to refresh the navigation pane with appliances found on the sub-nets	always enabled	all

Using ProtecTIER wizards

Wizards are invoked during ProtecTIER administration, to guide the administrator in performing multi-step tasks that require user input.

Each ProtecTIER wizard window has the layout shown here.



Progress pane

The pane on the left displays the name of the wizard and lists the steps to be performed.

The first step of each wizard is a welcome message that explains what the wizard will accomplish.

The last step of each wizard presents a report summarizing the outcome of the actions that will be performed when the *Finish* button is clicked.

The steps in the list are coded as follows:

✓ **Completed step** A step that has been completed has a check mark. If it is underlined, it serves as a link to bring you back to that step.

Current step The step that is currently being performed is bold.

Pending step A step that you have not performed is not bold.

Dialog pane

The pane on the right provides instructions and explanations about the current step. It displays fields in which you enter information needed to perform the step.

Buttons

The bottom of the display contains navigation buttons. They are enabled only as appropriate. For example, you cannot proceed to the next step if you have not supplied required information to the current step.

Prev goes to the previous step

Next goes to the next step

Finish finishes the wizard when all mandatory steps have been performed

Cancel exits the wizard and cancels its action

Monitoring ProtecTIER 4

When you log in to an appliance as vtfuser, you can view the activity of the ProtecTIER appliances, the HyperFactor and repositories, their connections and their libraries during day-to-day operations of the backup application.

The ProtecTIER Manager client guides you in the performance of monitoring activities.

For an introduction to using ProtecTIER Manager, see [Chapter 3, Working with ProtecTIER Manager](#).

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Logging in	4-3
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Displaying ProtecTIER license information	4-9
Monitoring a repository	4-11
Monitoring a library	4-14
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Overview of ProtecTIER user activities

Your job, as a ProtecTIER user, is to use the ProtecTIER Manager client to view the various ProtecTIER appliances connected to the backup servers at your site, just as you would monitor an actual tape-based backup system.

ProtecTIER user tasks are performed during day-to-day operations of the backup application. You can only perform those tasks that are permitted to the role assigned to your username.

You can log on to the ProtecTIER appliances at your site, and display the configuration of each appliance and its VTLU libraries.

Messages may appear on the ProtecTIER Manager display, alerting you to warning or error conditions. You must deal with these as appropriate, or notify the ProtecTIER operator or administrator. See [Appendix 14, Error messages](#).

Logging in

When you invoke ProtecTIER Manager, the ProtecTIER appliances that you can monitor are listed in the navigation pane at the left of the display.

If you cannot access ProtecTIER manager, or if no appliances are listed, contact the ProtecTIER operator for assistance.



Logging in to an appliance

In order to view the configuration of an appliance, you must connect to the appliance by logging in. You should log in to all the appliances you wish to monitor in this session.



1. Select a disconnected appliance in the navigation pane.



2. Click the *Login* button to display the *Login* dialog.



3. Enter your ProtecTIER username and password.
4. Click *Ok*.

For user types and authorization rights, see *Overview* on page 3-2.

Refreshing the display

When you log in to appliances, ProtecTIER interrogates the appliances and displays the current configuration. A node for the repository is listed in the navigation pane under the appliance node. Nodes for each library are listed in the navigation pane under the repository node.

Subsequently, the performance values of the appliances are refreshed at appropriate intervals.



You can refresh a connected appliance's configuration at any time by clicking on the *Refresh* button on the toolbar, when that appliance is selected in the navigation pane.

Monitoring an appliance

For a detailed explanation of how to configure an appliance, see *Managing the appliance front-end config* on page 7-10 and *Managing the appliance ports attributes config* on page 7-13.

Front End view

To view the *Front End* configuration of an appliance:



1. Select a connected appliance in the navigation pane.

The work pane displays a system overview and lists the devices that are visible to the backup application via each front-end port.

2. Scroll to view devices that are not visible on the screen.

The screenshot shows the ProtecTIER Manager application window. The main pane displays the configuration for an appliance named 'taz.diligent.com'. The 'Library front-end' table lists 26 drives (Drive 0 to Drive 25) connected to the appliance. The 'System overview' panel shows a graph of Read and Write speeds, both at 0.00 MB/Sec. The 'Version information' panel shows the ProtecTIER Version as 1.2.2. The status bar at the bottom indicates 'System Online' and 'Connected to taz.diligent.com as user'.

Port	Top	WWN	LUN	Device	Library
0	P2P	10000000c92b7e4e	0	Drive 0	lib_taz
			1	Drive 1	lib_taz
			2	Drive 2	lib_taz
			3	Drive 3	lib_taz
			4	Drive 4	lib_taz
			5	Drive 5	lib_taz
			6	Drive 6	lib_taz
			7	Drive 7	lib_taz
			8	Drive 8	lib_taz
			9	Drive 9	lib_taz
			10	Drive 10	lib_taz
			11	Drive 11	lib_taz
			12	Drive 12	lib_taz
			13	Drive 13	lib_taz
			14	Drive 14	lib_taz
			15	Drive 15	lib_taz
			16	Drive 16	lib_taz
			17	Drive 17	lib_taz
			18	Drive 18	lib_taz
			19	Drive 19	lib_taz
			20	Drive 20	lib_taz
			21	Drive 21	lib_taz
			22	Drive 22	lib_taz
			23	Drive 23	lib_taz
			24	Drive 24	lib_taz
			25	Drive 25	lib_taz



Appliance

The name of the displayed appliance is shown, an indication that it is connected, the host name of the appliance, and its status.

Library front-end

Information is displayed about each front-end port of the appliance, and each device assigned to the port.

System overview

Throughput of the system is shown on the graph.

If the graphs are not scaled appropriately to display throughput levels, you can specify the maximum value to be shown on the axis of the graphs.

A green dot indicates that ProtecTIER is online. A red dot indicates that ProtecTIER is offline.

HyperFactor status is displayed, as well as its throughput (in MB/sec).



If the *Alerts* button is flashing, messages have been added to the error log since the last time it was cleared. Click this button to display the error log. See *Displaying the Error log* on page 13-4.



Click the *Event log* button to display the event log. See *Displaying the Event log* on page 13-2.

Version information

This is the ProtecTIER version and patch level that is running on the selected appliance.

Ports Attributes view

Click on the Ports Attributes tab at the bottom of the work pane to view the ports attributes.

The screenshot shows the ProtecTIER Manager application window. The main work area is divided into several panels:

- Appliance Overview:** Shows the appliance name "Appliance nemo.diligent.com", connection status "Connected as operator", and host name "nemo.diligent.com".
- Port attributes table:** A table with columns: Port#, (mode), WWN, Link Speed, Topology, User setup, and Scan. It lists two ports: Port 0 (FE) with WWN 1000000c944eeb2, 1GB link speed, LOOP topology, and AUTO, LOOP user setup; and Port 1 (FE) with WWN 1000000c944eeb3, Down link speed, Down topology, and AUTO, LOOP user setup.
- System overview:** A graph showing FE Ports throughput. The Y-axis is labeled "MB/Sec" and ranges from 0 to 200. The graph shows Read and Write throughput at 0.00 MB/Sec. Below the graph, it indicates "System Online" with a green dot, "Alerts" (1), and "Events Log".
- Version information:** Shows "ProtectIER Version 1.2.0".

At the bottom of the work area, there are tabs for "Front End Tab" and "Ports Attributes".



Appliance

The name of the displayed appliance is shown, an indication that it is connected, and the host name of the appliance.

Port attributes

Information is displayed about each port defined for the appliance.

System overview

Throughput of the system is shown on the graph.

If the graphs are not scaled appropriately to display throughput levels, you can specify the maximum value to be shown on the axis of the graphs.

A green dot indicates that ProtecTIER is online. A red dot indicates that ProtecTIER is offline.

HyperFactor status is displayed, as well as its throughput (in MB/sec).



If the *Alerts* button is flashing, messages have been added to the error log since the last time it was cleared. Click this button to display the error log. See *Displaying the Error log* on page 13-4.



Click the *Event log* button to display the event log. See *Displaying the Event log* on page 13-2.

Version information

This is the ProtecTIER version and the subsequent plinux and dtcemulex RPM packages running on the selected appliance.

Additional feature (for administrator use only)

At the bottom of the *Ports attributes* screen is a *Ports attribute* button that is used to invoke the *Ports attribute* wizard.

See *Managing the appliance ports attributes config* on page 7-13 for information of configuring the port attributes.

Displaying ProtecTIER license information

You can view information about the ProtecTIER license installed on an appliance.

1. Right-click an appliance on the navigation pane. You need not be logged in to the appliance.
2. Choose *License* from the right-click menu.



The following information is displayed:

General

The *License type*, *Expiration* and *License key* are displayed.

License type

Server lock This license is granted for use on the licensed appliance only.

Expiration

The date on which the license expires, if exists.

License key

A unique key that identifies this license and encodes the information.

ProtecTIER properties

Every configuration operation performed through ProtecTIER Manger will validate the operation against the license. If the configuration operation violates a

license parameter, the operation request will be rejected with the appropriate error message.

The properties and their values that can be configured via ProtecTIER Manager under this license are displayed:

max cartridges the maximum number of cartridges per system

max drives the maximum number of drives per system

max libraries the maximum number of libraries per system

max ports the maximum number of ports per appliance

Features

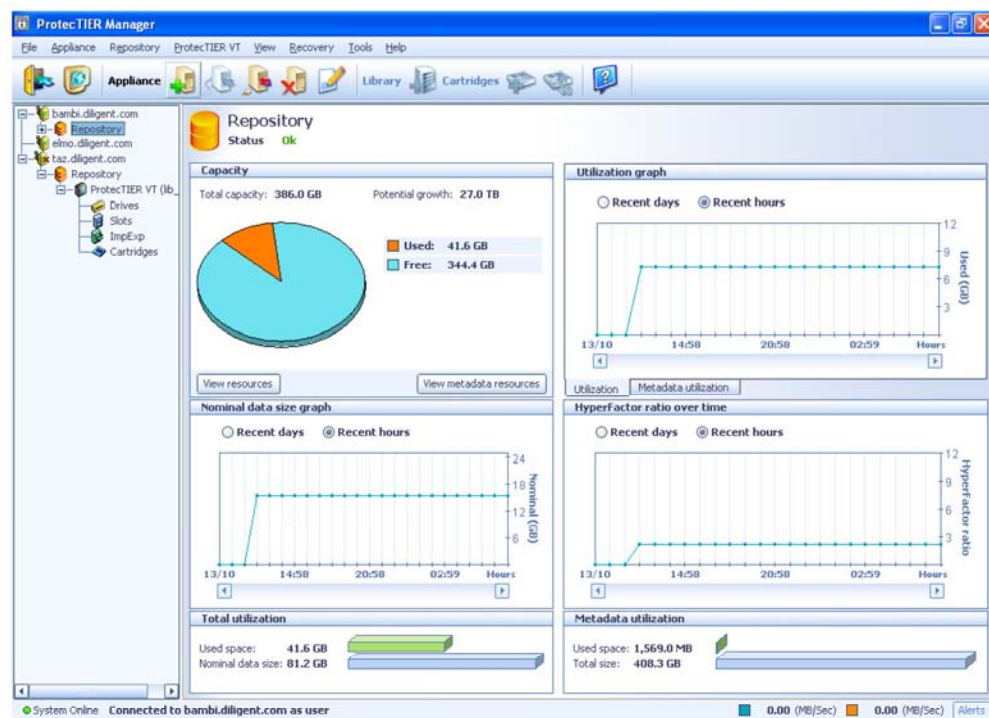
The features for which a license is needed are displayed (e.g. compression).

Monitoring a repository

For a detailed explanation on how to define and work with repositories, see *Monitoring repositories* on page 8-1.

Viewing a repository

To view a repository, select the repository appearing under the appliance in the navigation pane to which you are logged in. The repository view is displayed. The *Status* shows if the repository needs to be checked, or if it is *OK*.



Capacity

Displays the available and used user data space on the repository.

Total capacity the total capacity for user data and metadata available on the repository.

Potential growth the maximum future growth capability of the repository.

Used the physical size of the nominal data after it has been reduced by the HyperFactor and the amount of user data space it takes up on the repository.

Free user data space that is still available for backup purposes on the repository.

[View resources](#)

Displays the file systems that make up the repository.

[View metadata resources](#)

Displays the metadata file systems that make up the repository and their usage (in MB).

Nominal data size graph

Displays the history of the nominal data (in GB) that has been reduced over recent days or recent hours.

Total utilization

Displays the ratio between the nominal user data size and the actual space it occupies on the repository.

Used space the physical size of the reduced data that is written on the repository.

Nominal data size amount of user data that has already been reduced.

Utilization graph

The *Utilization* tab displays the history of the repository's physical user data utilization (in GB) during recent days or recent hours.

Metadata utilization graph

The *Metadata* utilization tab displays the history of the repository's physical metadata utilization (in GB) during recent days or recent hours.

HyperFactor ratio over time

Displays the history of the data compression ratio during recent days or recent hours.

Metadata utilization

Displays the ratio between the metadata size and the actual space it occupies on the repository.

Used space the physical amount of metadata that is written on the repository.

Total size the total physical size of the space available on the repository for metadata.

Monitoring a library

When you have logged in to an appliance, its libraries are listed in the navigation pane under the repository node. The configuration of a library can be displayed. You can display information about the ports, robot and configuration of the library. For a detailed explanation of library configuration information, see *Displaying the library configuration* on page 9-3.



Select a library in the navigation pane. The configuration of the selected library is displayed.

The screenshot shows the ProtecTIER Manager interface. The main window displays the configuration for a library named 'ProtecTIER VT NIVLID'. The status is 'OK' and 'HyperFactor enabled'. The 'Library front-end' table shows the following data:

Port	Top	WWN	LUN	Device	Throughput (MB/Sec)
0	FC-AL	10000000c93005e9		Robot	
1			0	Drive 0	1.4
2			1	Drive 1	
3			2	Drive 2	1.0
4			3	Drive 3	0.3
5			4	Drive 4	
6			5	Drive 5	
7			6	Drive 6	0.3
8			7	Drive 7	1.3
9			8	Drive 8	
10			9	Drive 9	
11			10	Drive 10	
12			11	Drive 11	0.9
13			12	Drive 12	
14			13	Drive 13	
15			14	Drive 14	1.4
16			15	Drive 15	
17			16	Drive 16	3.0
18			17	Drive 17	
19			18	Drive 18	
20			19	Drive 19	0.3

The 'Robot information' section shows:

Vendor name	ATL
Product	P3000
Revision	0100

The 'Configuration' section shows:

Drives in shrek.diligent.com	20
Slots	100
Import/export slots	0
Cartridges	100

The 'ProtecTIER VT overview' section shows:

Read (MB/Sec)	0.00	Write (MB/Sec)	10.73
(IO/Sec)	0	(IO/Sec)	159
Active streams	0	Active streams	9

The 'Version information' section shows:

ProtecTIER VT Version	4.0
-----------------------	-----



Library

The library is identified. The *Status* shows if the library is in need of being checked, or if it is *OK*. HyperFactor is enabled or disabled for all drives in this library.

Library front-end

The assignment of this library's robot and drives to front-end ports is displayed.

Robot information

This is information about the virtual robot, that will be returned to the backup server as a response to the SCSI INQUIRY command.

ProtecTIER VT overview

The read and write throughput of the drives in this library and the amount of active tape drives in the system used for backup or restore are displayed.

The number of configured drives is also displayed.

Configuration

The configuration of the library is displayed.

Version information

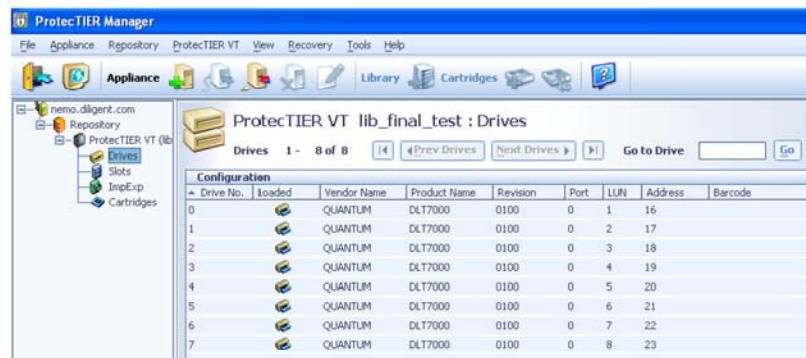
This is the version of the ProtecTIER VT.

Monitoring the components of a library

In the navigation pane, expand the node of a connected library to display a node for each type of library component: tape drive, internal slot, import/export slot and cartridge.

Monitoring a library's tape drives

Click on the *Drives* node to display information about the library's tape drives. (For an explanation of tape drive configuration information, see *Displaying tape drives* on page 10-3.)

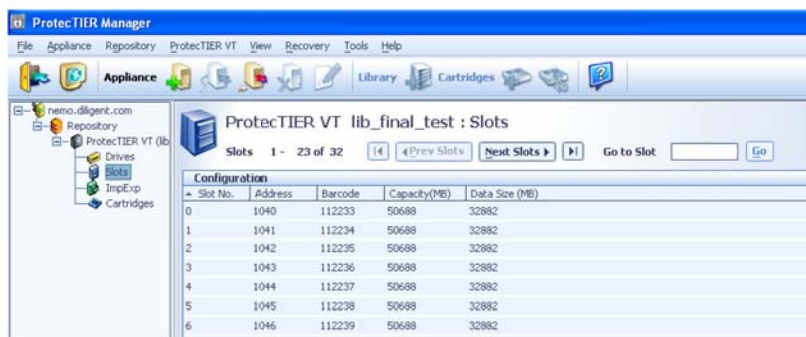


The screenshot shows the 'ProtectTIER Manager' interface. The navigation pane on the left shows the tree structure: Repository > ProtectTIER VT (lib) > Drives. The main window displays the configuration for 'ProtectTIER VT lib_final_test : Drives'. A table lists 8 drives, all of which are loaded and are Quantum DLT7000 models.

Drive No.	Loaded	Vendor Name	Product Name	Revision	Port	LUN	Address	Barcode
0	Yes	QUANTUM	DLT7000	0100	0	1	16	
1	Yes	QUANTUM	DLT7000	0100	0	2	17	
2	Yes	QUANTUM	DLT7000	0100	0	3	18	
3	Yes	QUANTUM	DLT7000	0100	0	4	19	
4	Yes	QUANTUM	DLT7000	0100	0	5	20	
5	Yes	QUANTUM	DLT7000	0100	0	6	21	
6	Yes	QUANTUM	DLT7000	0100	0	7	22	
7	Yes	QUANTUM	DLT7000	0100	0	8	23	

Monitoring a library's internal slots

Click on the *Slots* node to display information about the library's internal slots. (For an explanation of slot configuration information, see *Displaying slots* on page 10-7.)

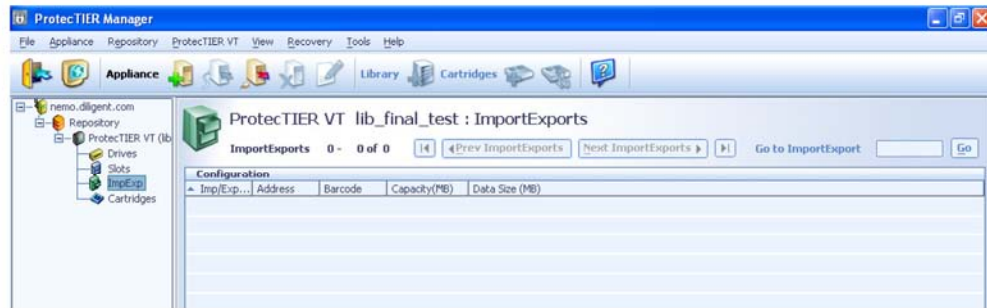


The screenshot shows the 'ProtectTIER Manager' interface. The navigation pane on the left shows the tree structure: Repository > ProtectTIER VT (lib) > Slots. The main window displays the configuration for 'ProtectTIER VT lib_final_test : Slots'. A table lists 7 slots, all of which are populated with tape cartridges.

Slot No.	Address	Barcode	Capacity(MB)	Data Size (MB)
0	1040	112233	50688	32882
1	1041	112234	50688	32882
2	1042	112235	50688	32882
3	1043	112236	50688	32882
4	1044	112237	50688	32882
5	1045	112238	50688	32882
6	1046	112239	50688	32882

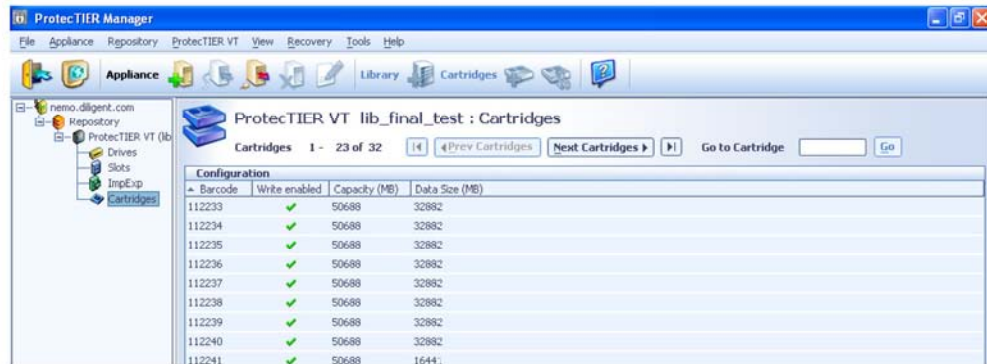
Monitoring a library's import/export slots

Click on the *Imp/Exp* node to display information about the library's import/export slots. (For an explanation of import/export slot configuration information, see *Displaying import/export slots* on page 10-11.)



Monitoring a library's cartridges

Click on the *Cartridges* node to display information about the library's cartridges. (For an explanation of cartridge configuration information, see *Displaying cartridges* on page 10-14.)



Operating ProtecTIER 5

When you log in to an appliance as vtfooper, you must respond to any situation that arises during day-to-day operation of the backup application, that requires operator intervention.

A user who has been assigned the operator role can perform the monitoring functions of the ProtecTIER user, and can also perform routine library management operations such as enabling or disabling tape drive compression, moving cartridges, unloading tape drives, or resetting tape drives or robots.

You can only perform those tasks that are permitted to the role assigned to your username.

It is assumed that you are familiar with the tasks of the vtfuser user as described in [Chapter 4, Monitoring ProtecTIER](#).

Overview of operator activities	5-2
Managing tape drives and robots	5-3
Managing cartridges	5-5

Overview of operator activities

Managing tape drives and robots

Controlling HyperFactor

You can set the HyperFactor mode of a library.

Unloading tape drives

You can unload a cartridge that resides in a tape drive.

Releasing tape drives and robots

If necessary, you can release a tape drive or a robot.

Managing cartridges

Moving cartridges

You can move a cartridge from one drive or slot to another. To move a cartridge from a tape drive, you must first unload it.

Changing cartridge properties

You can toggle a cartridge between read/write and read-only.

Managing tape drives and robots

Set HyperFactor mode

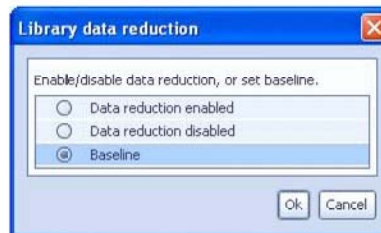
From the ProtecTIER VT > ProtecTIER VT Library menu, select the *Set HyperFactor mode* option.



Important

HyperFactor mode is for Troubleshooting only.

The HyperFactor mode of a library can be set to one of the following three modes:



HyperFactor enabled

Enabling HyperFactor is highly recommended.

Allow the HyperFactor to process the library cartridges and reduce the storage space they occupy. This is the recommended mode.



Important

The following two modes, HyperFactor disabled and Baseline, are for Troubleshooting only. Do not set these modes unless Technical Support instructs you to do so.

HyperFactor disabled

The library cartridges are not subject to the HyperFactor.

Baseline

The library cartridges are not reduced by the HyperFactor, but their data is used by the HyperFactor as reference for HyperFactor operations.

Unloading a drive, resetting a drive or robot

These actions are described in detail in *Performing tape drive actions* on page 10-5, and *Resetting the robot* on page 9-24.



Important

Do not perform these operations while the backup application is using the library. Doing so may damage the operations of the backup application.

Unloading a tape drive

If a tape drive contains a cartridge, you can unload it.

Before you move a cartridge from a tape drive, you must unload it.

1. Display the list of tape drives of a library.
2. Right-click on a full drive in the list.
3. Choose *Unload drive* from the right-click menu.

Resetting a tape drive

You can perform a SCSI reset of a tape drive.

1. Display the list of tape drives of a library.
2. Right-click on a drive in the list.
3. Choose *Reset drive* from the right-click menu.
4. Confirm the action.

Resetting the robot

You can perform a SCSI reset of a robot.

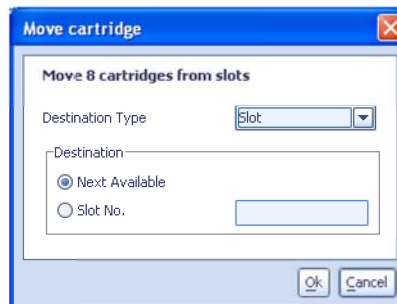
1. Display the library properties.
2. Choose *Library > Reset robot*.
3. Confirm the action.

Managing cartridges

Moving cartridges

You can move cartridges from one location to another. Before you can move a cartridge from a tape drive, you must unload it.

1. Display a list of tape drives or internal slots or import/export slots.
2. Select the cartridges you want to move.
3. Press <Shift> and right-click to choose *Move cartridges* from the menu. The *Move Cartridge* dialog is displayed.



Destination type In the *Destination type* box, choose *Drive*, *Slot* or *Import/Export*.

Destination If you have chosen to move the cartridge to a drive, choose the number of the drive. If you have chosen to move the cartridge to a slot, you can specify the slot number, or you can have the cartridge moved to the next available slot.

Changing the read/write mode of a cartridge

When a cartridge resides in a slot or an import/export slot, you can toggle its write mode between read-only and read/write. When the cartridge is located in a tape drive, its read/write mode cannot be changed.

1. Right-click on the cartridge whose read/write mode you want to change.
2. Choose *Read/write cartridge* from the right-click menu.
3. Confirm the action.

Administering ProtecTIER 6

When you log in to an appliance as ptadmin, you can perform all the functions of an operator, and you can also perform appliance configuration operations.

Only one administrator user can be logged in to an appliance at a time. If you attempt to log in to an appliance as administrator, and there is already a user logged in as administrator, you will be notified which other user is logged in, and you will be asked if you want to force the other user's session to end. If you proceed with the login, the other user will be logged out with no warning.

It is assumed that you are familiar with the information in [Chapter 4, Monitoring ProtecTIER](#) and [Chapter 5, Operating ProtecTIER](#).

Overview of administrator activities	6-2
Initial system configuration.	6-4
Modifying the configuration	6-5

Overview of administrator activities

The ProtecTIER administrator tasks are performed when virtual tape libraries are defined and a repository is created.



Important

Do not perform configuration operations while the backup application is using the library. ProtecTIER goes into an offline state temporarily, while the configuration is being changed.

Initial system configuration

The REO 9500D appliance arrives at the user site with an initial library of 8 drives, and 200 cartridges split between the two FC ports.

ProtecTIER version upgrades

After a ProtecTIER version upgrade might require upgrading the libraries to be compatible with the new ProtecTIER version. (See the release notes for details and instructions on how to execute the upgrade.)

Modifying the configuration

ProtecTIER Manager's wizards guide you in the performance of administrator activities, such as:

- creating and deleting libraries, and changing the configuration of existing libraries
- adding cartridges to a library
- assigning tape drives and robotics to front-end ports
- checking a library that appears to be damaged
- setting appliance port modes
- setting appliance port attributes

Initial system configuration

The REO 9500D appliance comes pre-installed with one library. The library has 8 drives and 200 cartridges. The robot and 4 drives are assigned to FC Port 0, and 4 drives are assigned to FC Port 1.

Modifying the configuration

As you work with the system, and gather performance statistics, you can change the library configuration to improve performance. For more information, see *PART TWO - Using ProtecTIER*.

Working with ProtecTIER Manager

Use the ProtecTIER Manager display to access information and perform actions. ProtecTIER Manager wizards guide you in performing administration tasks. For more information, see *Working with ProtecTIER Manager* on page 3-1.

Managing appliances

Use ProtecTIER Manager to log in to one or more ProtecTIER appliances for which you wish to perform user, operator or administrator activities. For more information, see *Managing appliances* on page 7-1.

Managing libraries

If your username is authorized to perform administrator tasks on libraries, you can create or delete a library, add cartridges to a library, change the number of drives and slots, detach or attach a library, perform an integrity check, and change the front-end assignment of the robot and tape drives. For more information, see *Managing libraries* on page 9-1.

Managing ProtecTIER components

You can display information about the tape drives, internal slots, import/export slots and cartridges in a library. You can unload a tape drive, and move a cartridge from one slot or drive to another, and provide other actions. For more information, see *Managing library components* on page 10-1.

PART TWO - Using ProtecTIER

These chapters describe how to access the REO 9500D appliance via the ProtecTIER Manager client, and how to perform user, operator and administrator activities.

Managing appliances 7

Use ProtecTIER Manager to log in to one or more REO 9500D appliances for which you wish to perform user, operator or administrator activities.

Getting started	7-2
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Getting started

When you invoke ProtecTIER Manager, you are not logged in to any appliances.



If you have added appliances in previous sessions, or if auto-discovery is enabled, these appliances are listed in the navigation pane at the left of the screen, as unconnected appliances.

These actions are enabled:

-  Exit from ProtecTIER Manager.
-  Add appliance.
-  If appliance is selected in the navigation pane, log in to an appliance for which connection properties have been provided.
-  If appliance is selected in the navigation pane, remove an appliance from the list in the navigation pane.
-  If appliance is selected in the navigation pane, view or edit the connection properties of an appliance.
-  Display ProtecTIER Manager version and copyright information.

Auto-discovery of appliances

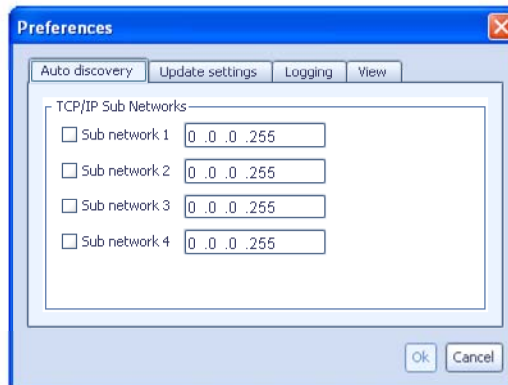
When you invoke ProtecTIER Manager, ProtecTIER Manager searches for appliances on specific subnets of the TCP/IP network.

After scanning the network, you can modify the list of appliances in the navigation pane - adding appliances manually, or deleting appliances.

You can re-scan the network, at any time, to refresh the list of appliances in the navigation pane.

Specifying subnets containing appliances

1. Choose *Tools > Preferences*.
2. For the subnets on which your appliances reside, enter the first three numbers of the IP address. The fourth number should always contain the mask value 255.
3. Click *Ok*.



When you click *Ok*, ProtecTIER Manager scans the network and lists in the navigation pane all appliances on the specified subnets.

Refreshing the navigation pane

You can re-scan the network, at any time, to refresh the list of appliances listed in the navigation pane.

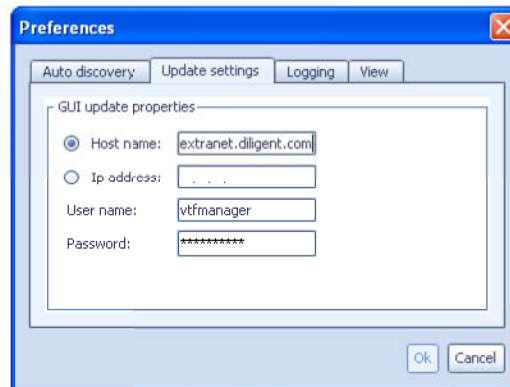
To re-scan the network, right-click on the navigation pane (not on an object listed there) and choose *Auto discovery* on the right-click menu.

Appliances discovered while scanning the network are added to the list in the navigation pane if they were not listed. Their connection properties are refreshed if they are listed.

ProtecTIER Manager update settings

The update settings are used by ProtecTIER Manager to connect to Diligent's extranet in order to update the ProtecTIER Manager software.

1. Choose *Tools > Preferences*. The *Preferences* dialog is displayed.
2. Choose the *Update settings* tab.
3. Click *OK*.



The User name and Password fields are automatically filled in.

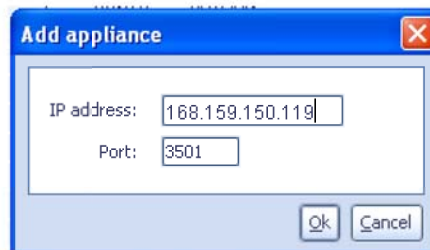
Providing connection properties for an appliance

In order to connect to an appliance that does not reside on a subnet that is scanned via the auto-discovery feature, you can provide the appliance's connection properties and store them. These properties are used when you log in to the appliance.

The connection properties you have added are saved, for your user name, when you exit ProtecTIER Manager, so that you can log in to an appliance in your next session using its stored properties.



1. Choose *Appliance > Add appliance* to invoke the *Add appliance* dialog.
2. Enter the information and click *Ok*.



You can store an IP address to connect to the appliance when you log in. The appliance is represented by its host name in the navigation pane.

IP address

The IP address of the appliance.

Port

The TCP/IP port number that is used by ProtecTIER Manager to connect to the appliance. Port number is specified by default.

It is strongly recommended that the port number not be changed.

Editing or viewing connection properties

For a disconnected appliance, you can modify the connection properties that are stored for the appliance.

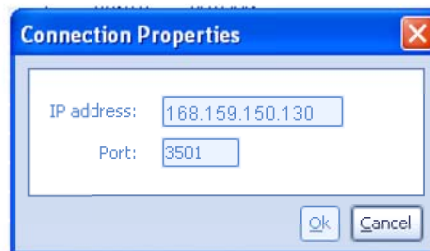
For a connected appliance, you can view the connection properties that are stored, but you cannot change them while you are logged in to the appliance. Objects on the dialog appear dimmed.



1. Select an appliance in the navigation pane.



2. Choose *Appliance > Connection properties* to invoke the *Connection properties* dialog.
3. The connection properties of the appliance are displayed. If the appliance is not connected, you can change the information and click *OK*.



You can store an IP address to connect to the appliance when you log in.

IP address

The IP address of the appliance.

Port

The TCP/IP port number that is used by ProtectTIER Manager to connect to the appliance.

It is strongly recommended that the port number not be changed.

Removing connection to an appliance

If there is an appliance listed in the navigation pane, and you no longer need to log in to this appliance, you can remove it from the list in the navigation pane.

This affects only your user sessions. The connection properties for this appliance are deleted from the list that is stored for your user name.

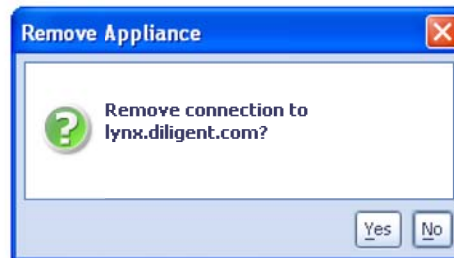


1. Select the appliance in the navigation pane. It can be either connected or disconnected.



2. Choose *Appliance > Remove appliance*.

3. Confirm the action.



If you were logged in to the appliance, you are logged out automatically.

The appliance is no longer listed in the navigation pane.



If you need to log in to this appliance in the future, you must use the *Add new appliance* option to provide its connection properties, or use the *Auto discovery setting* option.

Logging in to an appliance

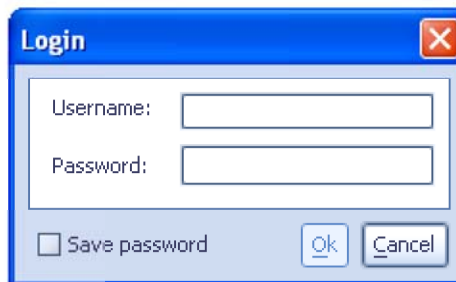
Once the connection properties of an appliance have been stored, you can log in to the appliance by providing a valid *Username* and *Password*.



1. Select a disconnected appliance in the navigation pane.



2. Click the *Login* button to invoke the *Login* dialog.
3. Type the *Username* and *Password* information and click *Ok* to log in to the appliance.



The screenshot shows a 'Login' dialog box with a blue title bar and a red close button. It contains two text input fields: 'Username:' and 'Password:'. Below the fields is a checkbox labeled 'Save password' which is currently unchecked. At the bottom right are 'Ok' and 'Cancel' buttons.

Username

Select a valid ProtecTIER username:

- *ptuser* for monitoring ProtecTIER
- *ptoper* for operating ProtecTIER
- *ptadmin* for administering ProtecTIER

Password

The password for each user is:

- *ptuser* password is *ptuser*
- *ptoper* password is *ptoper*
- *ptadmin* password is *system*

Logging out from an appliance

You can log out from an appliance in order to log in under a different user name, or to allow access from another workstation.

When you exit from ProtecTIER Manager without logging out from the appliances, you are automatically logged out.



1. Select a connected appliance in the navigation pane.



2. Choose *Logout* from the right-click menu, toolbar, or appliance menu.

Managing the appliance front-end config

When you have logged in to an appliance, the VTLU libraries attached to the appliance are listed in the navigation pane under the appliance node.



When you select a connected appliance, the work pane displays the front-end port configuration, a system overview, and information about the ProtectTIER version and patch level that is running on the appliance.

To view the ports attributes configuration, click on the *Port Attributes* tab at the bottom of the work pane. (See "Managing the appliance ports attributes config" on page 7-13. for more details.)

Port	Top	WWN	LUN	Device	Library
0	P2P	10000000c92b7e4e			
			0	Drive 0	lib_taz
			1	Drive 1	lib_taz
			2	Drive 2	lib_taz
			3	Drive 3	lib_taz
			4	Drive 4	lib_taz
			5	Drive 5	lib_taz
			6	Drive 6	lib_taz
			7	Drive 7	lib_taz
			8	Drive 8	lib_taz
			9	Drive 9	lib_taz
			10	Drive 10	lib_taz
			11	Drive 11	lib_taz
			12	Drive 12	lib_taz
			13	Drive 13	lib_taz
			14	Drive 14	lib_taz
			15	Drive 15	lib_taz
			16	Drive 16	lib_taz
			17	Drive 17	lib_taz
			18	Drive 18	lib_taz
			19	Drive 19	lib_taz
			20	Drive 20	lib_taz
			21	Drive 21	lib_taz
			22	Drive 22	lib_taz
			23	Drive 23	lib_taz
			24	Drive 24	lib_taz
			25	Drive 25	lib_taz



Appliance

The host name of the displayed appliance is shown

Connected an indication that you have logged in to the appliance

Host name the host name of the appliance

Front-end configuration

This is a display of the devices that are visible to the backup application via each front-end port.

Scroll down to display devices that are not visible on the screen.

The port number, topology and world wide name are displayed for each front-end port of the appliance.

The LUN, device type, and library are displayed for the robot and tape drives that are visible to the backup application via that port.

Port

The front-end port number, through which the backup server views the listed devices.

Top

The type of Fiber Channel topology used for the port.

P2P point-to-point.

FC-AL arbitrated loop.

DOWN no Fiber Channel connection is detected.

WWN

The world wide name of the port.

LUN

The logical unit number of the tape drive device or the robot device, with respect to this port.

Device

An indication of whether the device is the robot or a tape drive.

For a tape drive, the index number of the tape drive within the library is indicated.

Library

The library to which the device belongs.

System overview

FE ports

Read throughput (blue) and write throughput (orange), in MB/sec, of each front-end port, are shown on the graph.

Scale graph to

If the graph, above, is not scaled appropriately to display throughput levels for this appliance, you can specify the maximum value to be shown on the axis of the graph. Type the value (minimum value is 5).

Read

Read throughput in MB/sec.

Number of read I/O operations per second.

Write

Write throughput in MB/sec.

Number of write I/O operations per second.

System online/offline

A green dot indicates that ProtecTIER is online.

A red dot indicates that ProtecTIER is offline. This may indicate that ProtecTIER has been taken offline automatically to allow changes in configuration, and that it will be brought online automatically when the configuration has finished.

Alerts !

If the *Alerts* button is flashing, messages have been added to the error log since the last time it was cleared. Click this button to display the error log. See *Displaying the Error log* on page 13-4.

Events Log

Click this button to display the event log. See *Displaying the Event log* on page 13-2.

Version information

ProtecTIER version

The ProtecTIER version and the subsequent ptlinux and dtcemulex RPM packages running on the selected appliance.

Show fixes

Click this button to display the *Fixes* dialog. The version number of the patch is displayed with the list of fixes contained within the patch.

Managing the appliance ports attributes config

When you have logged in to an appliance, the VTLU libraries attached to the appliance are listed in the navigation pane under the appliance node.



When you select a connected appliance, click on the *Ports Attributes* tab at the bottom of the work pane to display the ports attributes configuration.

To view the front end configuration, click on the *Front End Tab* at the bottom of the work pane. (See "Managing the appliance front-end config" on page 7-10. for more details.)

The screenshot shows the ProtecTIER Manager web interface. The main content area displays the 'Ports Attributes' configuration for the appliance 'nemo.diligent.com'. The interface includes a navigation pane on the left, a main work pane with a table of port attributes, and a system overview panel on the right.

Port# (mode)	WWN	Link Speed	Topology	User setup	Scan
0 (FE)	1000000c944eeb2	1GB	LOOP	AUTO, LOOP	60"
1 (FE)	1000000c944eeb3	Down	Down	AUTO, LOOP	60"

The system overview panel shows 'FE Ports' with a graph of Read and Write speeds. The graph shows 0.00 MB/Sec for Read and 0.00 MB/Sec for Write. The system is online, and the version information is 1.2.0.



Appliance

The host name of the displayed appliance is shown

Connected an indication that you have logged in to the appliance

Host name the host name of the appliance

Port attributes

This is a display of the ports that are available to the appliance.

The port number, WWN, link speed, topology, user setup and scan option are displayed for each port.

Port

The port number and the port mode.

FE Front-end port connecting ProtecTIER to the backup server(s)

WWN

The world wide name of the port.

Link Speed

The actual transmission speed used on this link.

Topology

The actual type of Fiber Channel topology used for the port.

switched fabric

P2P point-to-point

FC-AL fiber channel - arbitrated loop

DOWN no Fiber Channel connection is detected

User setup

Link speed and topology as configured by the user through the *Port attribute* wizard. The link speed setting options reflect the options supported by the HBA.



Scan

Displays the WWN of the remote ports as seen through the port.



Port attributes

Invokes the *Port attributes* wizard.

System overview

FE ports

Read throughput (blue) and write throughput (orange), in MB/sec, of each front-end port, are shown on the graph.

Scale graph to

If the graphs, above, are not scaled appropriately to display throughput levels for this appliance, you can specify the maximum value to be shown on the axis of the graphs.

You must use the up-arrow or the down-arrow to change the values. Values you type in are not accepted.

Read

Read throughput in MB/sec.
Number of read I/O operations per second.

Write

Write throughput in MB/sec.
Number of write I/O operations per second.

System online/offline

A green dot indicates that ProtecTIER is online.
A red dot indicates that ProtecTIER is offline. This may indicate that ProtecTIER has been taken offline automatically to allow changes in configuration, and that it will be brought online automatically when the configuration has finished.

HyperFactor status

Displays the HyperFactor status and throughput in MB/sec.



If the *Alerts* button is flashing, messages have been added to the error log since the last time it was cleared. Click this button to display the error log. See *Displaying the Error log* on page 13-4.



Click this button to display the event log. See *Displaying the Event log* on page 13-2.

Version information

ProtecTIER version

The ProtecTIER version and patch level that is running on this appliance.

Ports attribute wizard

Click the *Port attributes* button at the bottom of the *Ports attributes* screen to invoke the *Port attributes* wizard. This wizard enables you to configure the *Link Speed* and the *Topology* for each port.



Important

Do not perform configuration operations while the backup application is using the library. ProtecTIER goes into an offline state temporarily while the configuration is being changed.

Welcome

The dialog opens the wizard. Click *Next* to proceed.



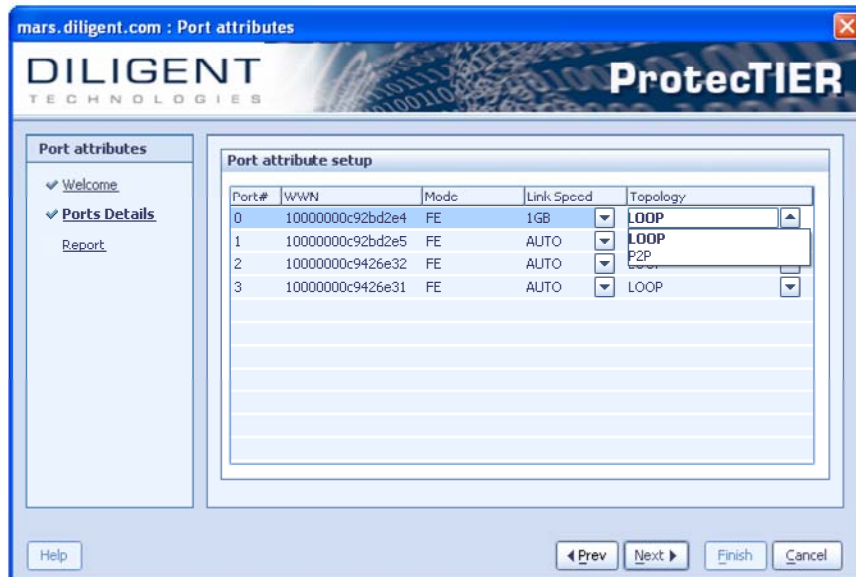
Ports Details

The dialog displays a list of the ports and their configuration values.

To change the *Link Speed* value for a port, click on the drop-down arrow in the *Link Speed* field for the port and select a new value. The values listed in the drop-down box are dependent on the HBA support.

To change the *Topology* value for a port, click on the drop-down arrow in the *Topology* field for the port and select a new value.

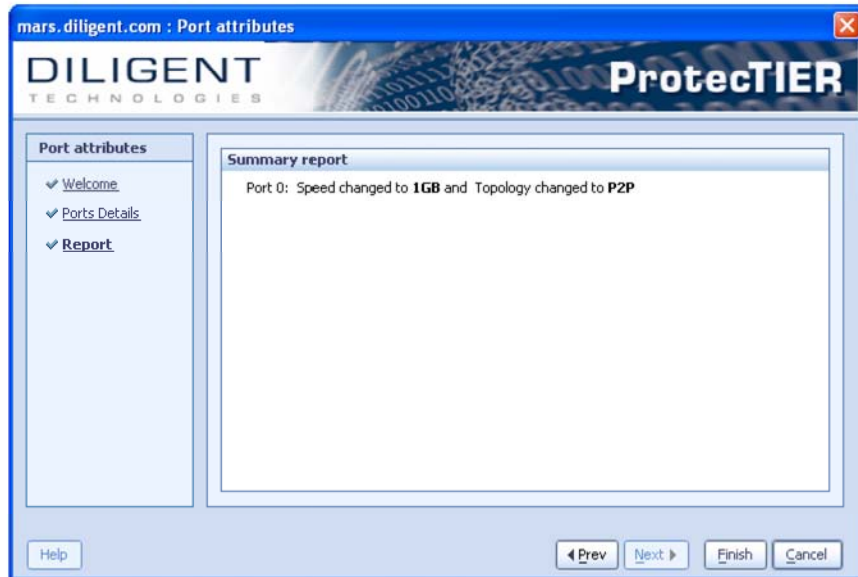
Make sure you choose the correct port *Topology* and *Link Speed* values, or you may lose your link to your backup servers.



When all desired *Link Speed* and *Topology* values have been updated, click *Next* to execute the changes.

Report

The dialog displays the ports with their updated *Link Speed* and *Topology* values. If no changes have been made, the *Summary report* will so indicate.



Click *Finish* to exit the wizard and execute the changes. The *Port attributes* screen is displayed.

Managing the ProtecTIER trace

You can set trace levels, dump or reset the ProtecTIER appliance program trace so that the appropriate trace information will be entered in the problem report.

Set the ProtecTIER trace levels

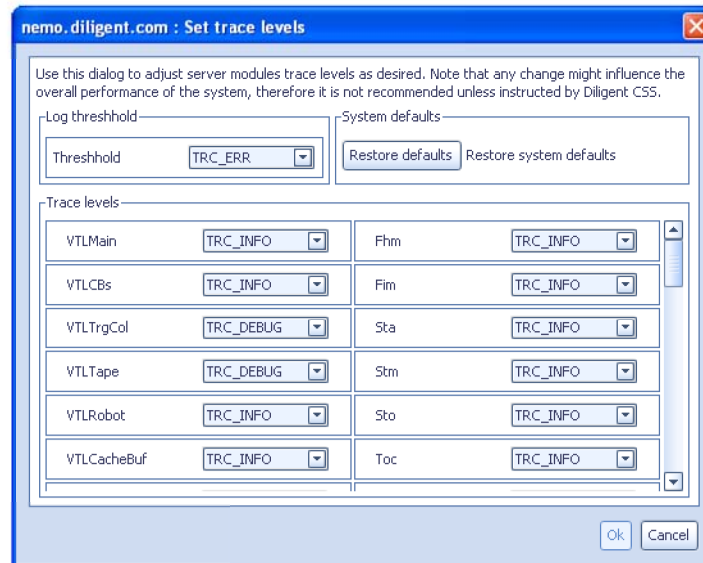


Important

Do not change the tracing and logging levels if you are not asked to do so.

Use the Set trace levels dialog to modify the tracing and logging levels of the ProtecTIER appliance. You may receive a request from Technical Support to modify the tracing or log levels of a specific ProtecTIER component for troubleshooting. Changing the levels may affect performance.

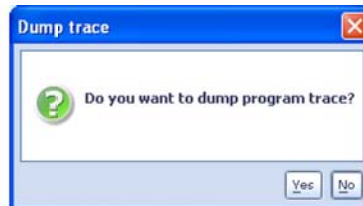
1. Log in to an appliance as administrator.
2. Select this appliance in the navigation pane.
3. Choose *Appliance > Set trace levels*.
4. Confirm your choices.



Dump the ProtectTIER trace

Use this option to create a new dump file of the ProtectTIER internal trace, to the working directory: /fx_work. This is used for troubleshooting when you are requested by Technical Support to provide trace information.

1. Log in to an appliance as administrator.
2. Select this appliance in the navigation pane.
3. Choose *Appliance>Dump ProtectTIER trace*.
4. Confirm your choice.

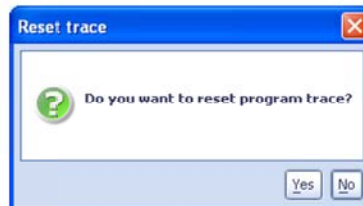


The files are saved with the current appliance timestamp, in this format:
ring_<module>_<pID>_<timestamp>.rng

Reset the ProtectTIER trace

Use this option to empty the trace memory, so that any future trace dump will start from this time stamp.

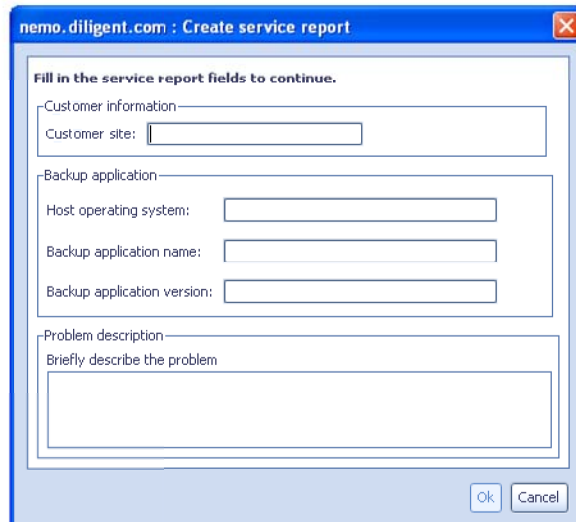
1. Log in to an appliance as administrator.
2. Select this appliance in the navigation pane.
3. Choose *Appliance>Reset ProtectTIER trace*.
4. Confirm your choice.



Creating a service report

You can generate a service problem report to send to Technical Support.

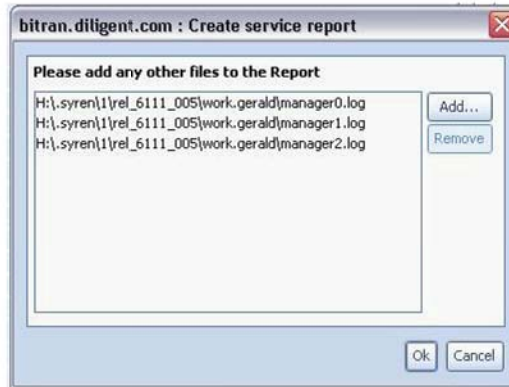
1. Choose *Appliance > Create service report*, the *Create service report* dialog is displayed.



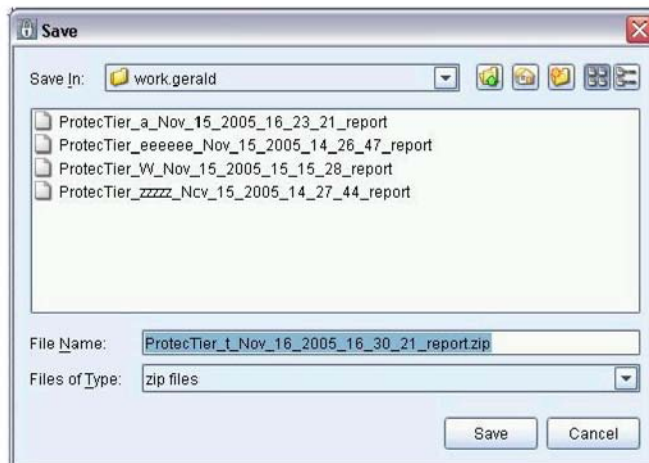
2. Complete the form with a brief description of the problem. Click *OK*.
3. A dialog is displayed asking if you want to download the file to the host (i.e. the machine running ProtecTIER manager) and add the ProtecTIER manager log files.



4. Click **Yes**, an add/remove file dialog is displayed. Select what files you want to add to the service report. Click **OK**.



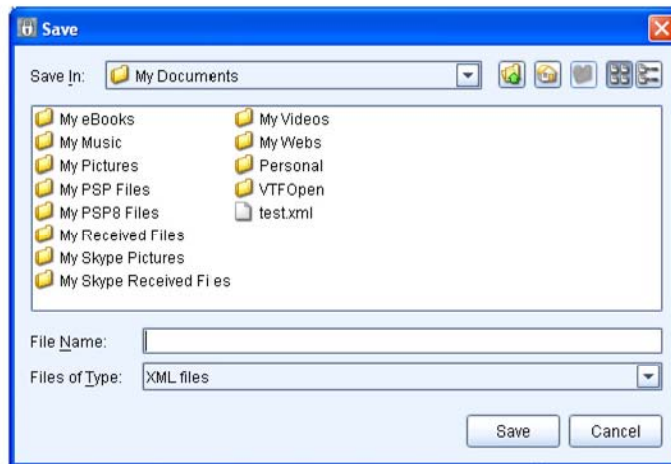
5. A zip file containing the service report and the added log files is automatically created. Name the zip file and save it in the desired directory.



Saving performance history

You can save and analyze the long-term performance statistics of ProtecTIER. The data file is saved in XML format that can be viewed in Microsoft Excel.

1. Choose *Appliance > Save performance history*. The *Save* dialog is displayed.



2. Choose the desired directory in which you want to save the file and type the desired file name. Click *Save*.

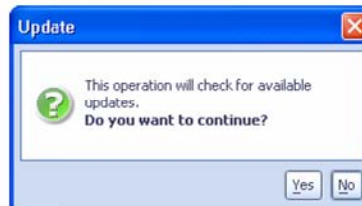
Updating ProtectTIER

You can check if there are available updates to the current releases of ProtectTIER Manager and the ProtectTIER software that you are using.

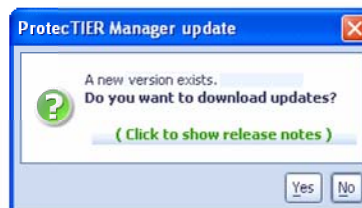
Checking for ProtectTIER Manager updates

To check if there is an available update to the current release of ProtectTIER Manager:

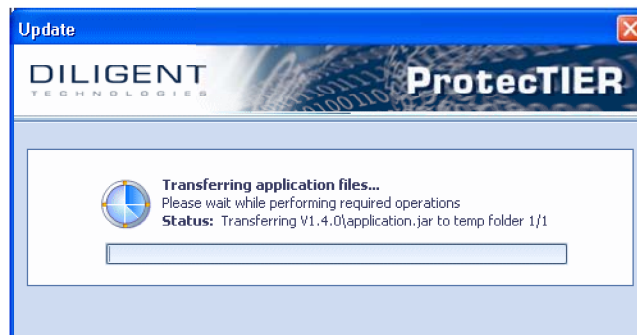
1. Choose *Tools > Update*. The *Update* dialog is displayed.



2. Click *Yes* to continue. Data is collected from the Update site regarding whether or not an update exists:
 - m If an update is available, the following dialog is displayed with a link to view the release notes relevant to the latest update.

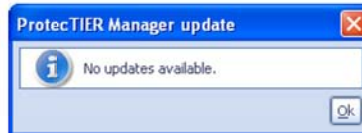


Click *Yes* to download the latest ProtectTIER Manager update. The application files are transferred to the ProtectTIER Manager directory via a temp folder.



Once the update is completed, restart the application for the changes to take effect.

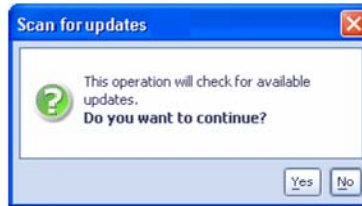
- m If the ProtecTIER Manager update is not compatible with the ProtecTIER software version, you will be prompted to download a new software package.
- m If no updates are available, the relevant dialog will be displayed.



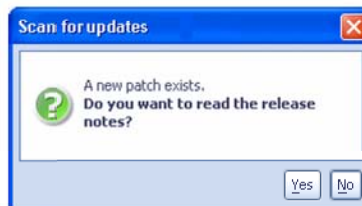
Checking for a ProtecTIER software patch

To check for a ProtecTIER software patch:

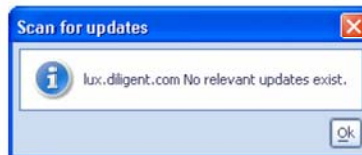
1. Select a connected appliance in the navigation pane.
2. Choose *Appliance > ProtecTIER patch update check*. The *ProtecTIER patch download* dialog is displayed.



3. Click **Yes** to check for available updates. If a patch does exist based on the appliance's ProtecTIER version, the following dialog is displayed.



If a patch does not exist based on the appliance's ProtecTIER version, the following dialog is displayed.



Monitoring repositories 8

Monitor a repository using ProtecTIER Manager.

Overview	8-2
Monitoring fragmentation in a repository	8-3

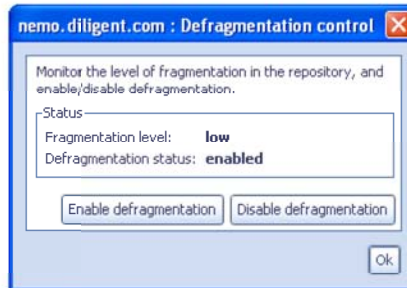
Overview

Repository

A storage repository is a basic partition of the total visible storage and it is the storage space of an instance of a compressible file system. The repository is a collection of file systems that is used to store the data and metadata. Libraries are created on a repository.

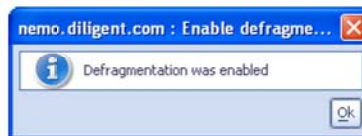
Monitoring fragmentation in a repository

ProtectTIER controls the level of fragmentation in the repository by managing defragmentation background processes. Choose *Repository > Defragmentation control*, the *Defragmentation control* dialog is displayed.

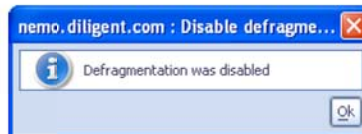


The *Fragmentation level* is displayed as *low*, *medium*, or *high*. The *Defragmentation status* of background processes can be either *enabled* or *disabled*.

Click *Enable defragmentation* to enable the defragmentation background processes.



Click *Disable defragmentation* to disable the defragmentation background processes.



Defragmentation should be disabled *only* when explicitly requested by service personnel.

Managing libraries 9

You can use ProtecTIER Manager to display the configuration of a library.

If your username is authorized to perform operator tasks, you can move cartridges, reset the robot and drives, unload drives, modify cartridge read/write permissions. For more information, see [Chapter 5, Operating ProtecTIER](#).

If your username is authorized to perform administrator tasks on libraries, you can create or delete a library, add or delete cartridges from a library, change the number of drives and slots, perform an integrity check, change the front-end assignment of the robot and tape drives, set HyperFactor mode, rename library, rebarcode cartridge.

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Creating a new library	9-7
Changing the library configuration	9-11
Re-assigning robots and drives to ports	9-15
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Adding cartridges to a library	9-19
Checking a library	9-22
Resetting the robot	9-24

Overview

When you have logged in to an appliance, its libraries are listed under the repository in the navigation pane.

Monitoring the library configuration

A library is identified in the navigation pane by the name that was chosen when the library was created. When you place your mouse pointer over the library name, the tooltip displays the unique ID of the library.

When you select a library in the navigation pane, its configuration is displayed in the work pane.

Operating the library

A user with operator authorization can send a SCSI reset to a tape drive or robot, move a cartridge, modify a cartridge's read/write permissions, and unload a drive.

Performing library administration

An appliance cannot be used by a backup application until at least one library has been defined on its repository.

A user with administrator authorization can create, modify and delete libraries.


- Additional libraries can be defined if there is space on the repository.
- An existing library can be modified - cartridges can be added or deleted, the number of tape drives and slots can be adjusted, devices can be reassigned to use different front-end ports, and HyperFactor mode can be set.

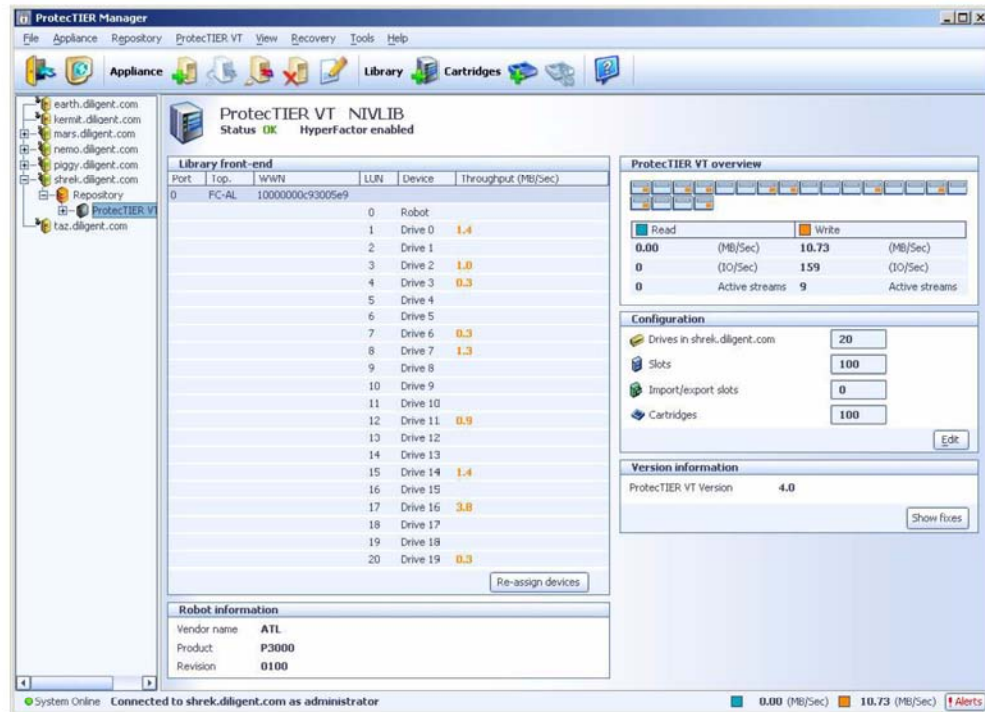


Important

Do not perform configuration operations while the backup application is using the library. ProtecTIER goes into an offline state temporarily, while the library configuration is being changed.

Displaying the library configuration

 In the navigation pane, select a library attached to a connected appliance to display its configuration.



The screenshot shows the ProtecTIER Manager application window. The main pane displays the configuration for a library named "ProtecTIER VT NIVLIB" with status "OK" and "HyperFactor enabled". The "Library front-end" table lists 20 ports, each with a device and its throughput. The "Robot information" section shows the vendor as ATL, product as P3000, and revision as 0100. The "Configuration" section shows settings for drives, slots, and cartridges. The "Version information" section shows the ProtecTIER VT Version as 4.0.

Port	Top	WWN	LUN	Device	Throughput (MB/Sec)
0	PC-AL	10000000c93005e9		Robot	
1				Drive 0	1.4
2				Drive 1	
3				Drive 2	1.0
4				Drive 3	0.3
5				Drive 4	
6				Drive 5	
7				Drive 6	0.3
8				Drive 7	1.3
9				Drive 8	
10				Drive 9	
11				Drive 10	
12				Drive 11	0.9
13				Drive 12	
14				Drive 13	
15				Drive 14	1.4
16				Drive 15	
17				Drive 16	3.8
18				Drive 17	
19				Drive 18	
20				Drive 19	0.3



Library

The library is identified.

Status The status of the library. If the status is not *OK*, the library is in need of being recovered.

HyperFactor enabled The status of HyperFactor operations.

Library front-end configuration

Information is displayed about each front-end port of the appliance to which devices are assigned (ports without devices are not shown), and about each device of this library (robot or tape drive) that is visible to the backup applications via that port.



The administrator can click the *Re-assign devices* button to invoke the Re-assign devices wizard. See *Re-assigning robots and drives to ports* on page 9-15.

Port

The front-end port number, through which the backup server views the devices.

Top

The type of Fiber Channel topology used for the port.

switched fabric

P2P point-to-point.

FC-AL arbitrated loop.

DOWN no Fiber Channel connection is detected.

WWN

The world wide name of the port.

LUN

The logical unit number of the tape drive device or the robot device, with respect to this port.

Device

An indication of whether the device is the robot or a tape drive.

For a tape drive, this column indicates the index number of the tape drive within the library.

Throughput (MB/sec)

Displays the throughput (in MB/sec) for each port in this library.

Robot information

This is information about the virtual robot, that will be returned to the backup application as a response to the SCSI INQUIRY command.

Vendor name

The virtual robot behaves like a robot from this vendor.

Product

The virtual robot behaves like a robot of this product type.

Revision

The virtual robot behaves like a robot of this revision number.

ProtectTIER VT overview

The read (blue) and write (orange) throughput for each drive in this library and the amount of active tape drives in the system used for backup and restore are displayed. The number of configured drives is also displayed.

Read

Overall read throughput in MB/sec.
Number of read I/O operations per second.
Number of active streams.

Write

Overall write throughput in MB/sec.
Number of write I/O operations per second.
Number of active streams.

The reading/writing volume (in MB/sec) appears also on the bottom-right of the status bar of each main view.

Configuration

The configuration of the library is displayed.



Number of drives

The number of tape drives defined for this library.



Number of slots

The number of internal slots defined for this library.



Number of import/export slots

The number of import/export slots defined for this library.



Number of cartridges

The number of cartridges defined for this library.



The administrator can click the *Edit* button to modify the number of tape drives and/or slots. See *Changing the library configuration* on page 9-11. (For unauthorized users, this button is disabled.)

Version information

Library version

The version of the library.



Click this button to display the *Fixes* dialog. The version number of the patch is displayed with the list of fixes contained within the patch.

Creating a new library

Before an appliance can be used by the backup application, there must be a repository and at least one VTLU library on the disk arrays.

If there are unused file systems on an appliance, you can increase the capacity of the repository. If the repository capacity allows, you can create additional libraries on the repository.

A library's definition can be modified later. See "Changing the library configuration" on page 9-11. and *Adding cartridges to a library* on page 9-19.

By default, a library is created with the number of internal slots equal to the number of cartridges, and with no import/export slots. You can change the number of internal slots and import/export slots in the library. See "Changing the library configuration" on page 9-11..



1. To create a library on a repository, select repository in the navigation pane.



2. Choose *Library > Create new library* to invoke the *Create new library* wizard.

Welcome

The storage devices are queried to make sure that a new library can be created:

- o the total number of tape drives defined on all libraries of the appliance must be less than the maximum allowed number.
- o If there is not enough space to create a library, or if no additional drives can be defined, you will not be allowed to create a library.



Library name and robot visibility

Specify a name for the new library, and how the robot of the library is to be viewed by the backup application.



The screenshot shows the 'Create new library' wizard in earth.diligent.com. The 'Library name' section has a text input field containing 'ProtectLib'. The 'Robot' section has a dropdown menu for 'Robot port number' set to '1'. The navigation pane on the left shows 'Library details' selected.

Library name


The name you choose will appear on the navigation pane to identify the library.

Robot port number

Choose the front-end port through which the backup application will view the robot. The wizard will only allow you to choose a port that is defined as a front-end port.

Tape drives

Specify the number of tape drives, and the front-end ports to which tape drives will be assigned.



The screenshot shows the 'Create new library' wizard in goofy.diligent.com. The 'Tape drives and ports assignment' section shows 'Number of tape drives (Max: 118)' set to '8' and 'Already assigned: 0'. A table lists 'Port 0 [WWN= 10000000c921e850]' with 'Number of drives: 0'. The navigation pane on the left shows 'Library details' selected.

Number of tape drives

Specify the total number of tape drives to be assigned for this library.

You cannot exceed the number of tape drives allowed for each appliance. If the appliance has other libraries attached, a reduced number of tape drives can be defined for this library.

Ports

Select the front-end ports to which tape drives should be mapped. For each port, specify how many drives should be defined on this port.

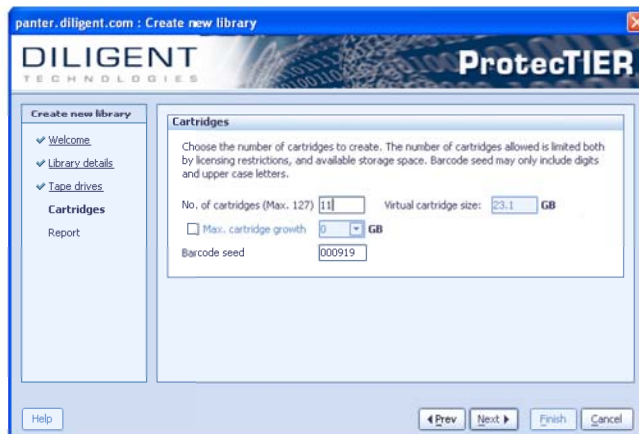
Equally divide

Click *Equally divide* if you want to distribute the drives evenly among the selected ports.

Cartridges

The virtual tape cartridges that will be used to store backup data are defined on the repository. You can define additional cartridges later. See *Adding cartridges to a library* on page 9-19.

The number of cartridges allowed is limited both by licensing restrictions and available storage space.



The screenshot shows a web-based wizard window titled "panter.diligent.com : Create new library". The window has a header with the "DILIGENT TECHNOLOGIES" logo and "ProtectTIER" branding. On the left, a navigation pane shows "Create new library" with sub-items: "Welcome", "Library details", "Tape drives", "Cartridges" (selected), and "Report". The main content area is titled "Cartridges" and contains the following text: "Choose the number of cartridges to create. The number of cartridges allowed is limited both by licensing restrictions, and available storage space. Barcode seed may only include digits and upper case letters." Below this text are four input fields: "No. of cartridges (Max. 127)" with a value of "11", "Virtual cartridge size:" with a value of "3.1 GB", " Max. cartridge growth" with a value of "0 GB", and "Barcode seed" with a value of "000919". At the bottom of the window are buttons for "Help", "Prev", "Next", "Finish", and "Cancel".

No. of cartridges

The number of cartridges defined for the library.

Max. cartridge growth

By default, due to the effect of HyperFactor operations, a cartridge might end up containing significantly more data than its nominal size.

To limit the amount of user data a cartridge can contain, you can set this option.

Barcode seed

On defining a new library, you will be prompted to input the full barcode of the initial cartridge. In each field, you may input either a number 0-9 or uppercase letters A-Z. Following the setting of the seed, the barcode number will sequence in ascending order from the seed barcode.

Barcodes with decimal number characters will increase numerically. Barcodes with uppercase letter characters will increase alphabetically.

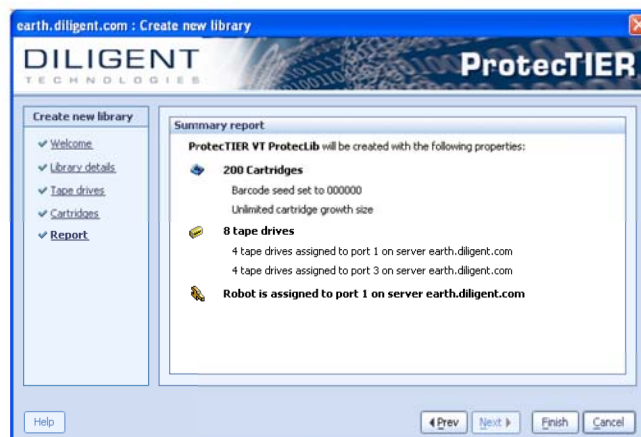
Virtual cartridge size

The virtual size of the cartridge.

The virtual cartridge size is an approximation of the user data the cartridge can contain, taking into consideration the Hyperfactor effects.

Report

The summary report lists the configuration that will be defined for the library.



Finish

Click *Finish* to exit the wizard. The library is created. This process requires some time. A progress window shows the progress of the operation.

The new library is listed in the navigation pane.

Changing the library configuration

You can change the number of tape drives, internal slots, and import/export slots in an existing library.

The administrator can invoke the *Change dimensions* wizard by clicking the *Edit* button in the library configuration or via the *Library* menu. See *Configuration* on page 9-5.



1. Select a library in the navigation pane.
2. Choose *Library > Change dimensions* to invoke the *Change dimensions* wizard.

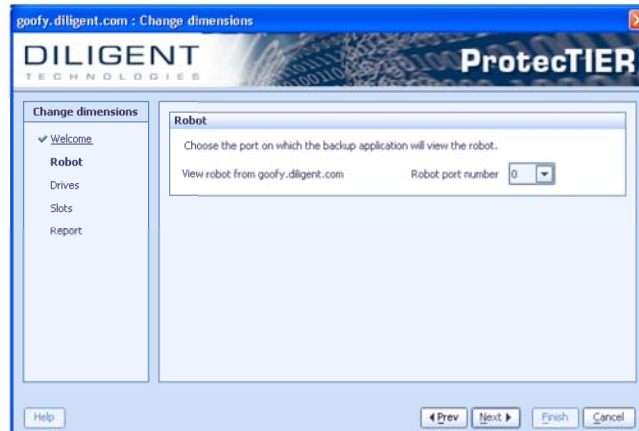
Welcome

By default, a library is created with the number of internal slots equal to the number of cartridges, and with no import/export slots. You can use this wizard to change the default settings.



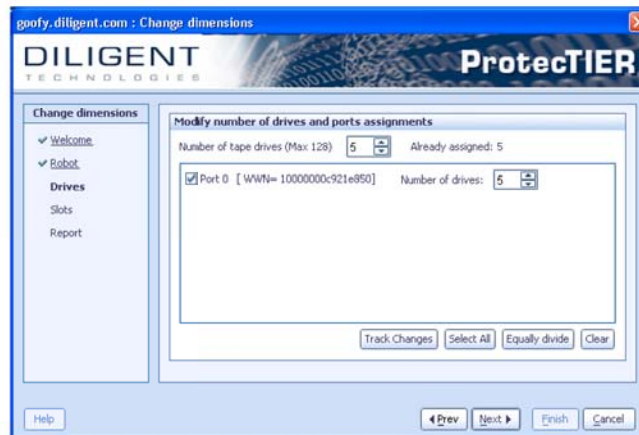
Robot

Choose the port on which the backup application will view the robot.



Drives

Modify the number of drives and port assignments.



Number of tape drives

Specify the total number of tape drives for the library.

You cannot exceed the number of tape drives allowed for each appliance. If the appliance has other libraries attached, a reduced number of tape drives can be defined for this library.

Ports

You can specify which ports to use for the virtual tape drives.

The wizard displays the current configuration. All front-end ports are listed. The ports that are currently used for tape drive assignments have a check in their check box.

By checking or un-checking the check boxes, you can change the ports to which tapes are assigned. Choose the number of tape drives to be assigned to each port. Any change that you make to the front-end port selection might affect the LUNs of the drives. If a drive is re-assigned to the same port as before, the LUN doesn't change. So ProtecTIER first tries to assign a drive to the same port to which it was assigned before, and then distributes the remaining drives equally among the other selected ports.

Track Changes

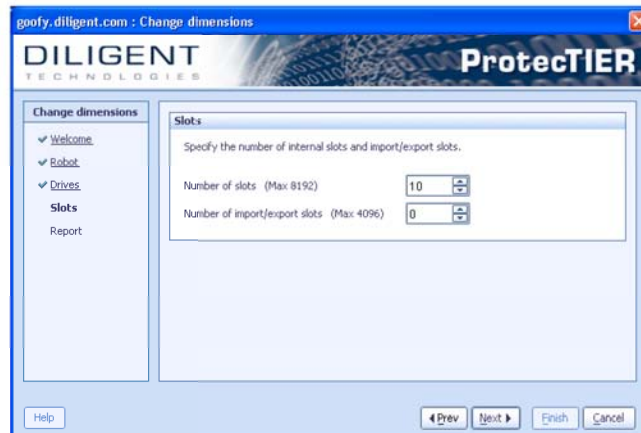
You can evaluate the effect of a particular change in ports, by clicking the *Track changes* button after you have checked or unchecked boxes. ProtecTIER displays a report listing which drives might get a new LUN because they are assigned to a new port.

Equally divide

Click *Equally divide* if you want to distribute the drives evenly among the selected ports.

Slots and import/export slots

Define the number of slots you want to define for the library. By default, a library is created with the number of internal slots equal to the number of cartridges, and with no import/export slots. You can use this wizard to change the default settings.



Number of slots

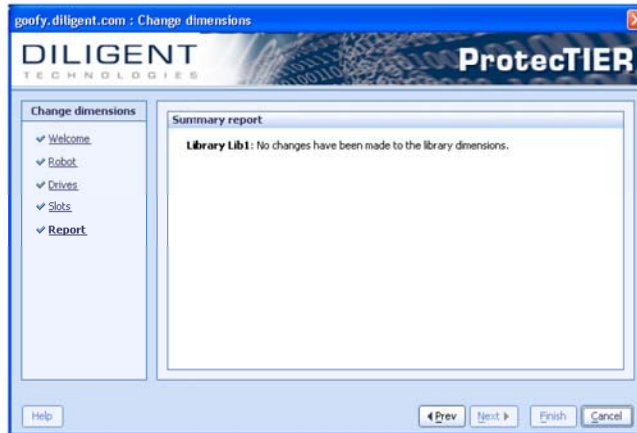
Specify how many internal slots you want to have in this library. A library must have at least as many slots as cartridges.

Number of import/export slots

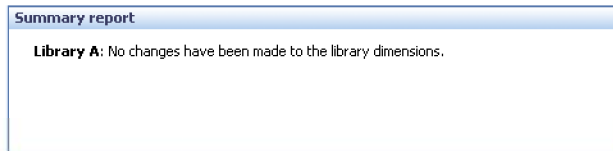
Specify how many import/export slots you want to have in this library.

Report

The summary report lists the number of slots and tape drives that will be defined for the library.



If you have gone through the steps of the task without changing any definitions, you receive the following message:



The *Finish* button is not enabled. You can go back to the *Drives and slots* step and modify the dimensions, or you can cancel the wizard.

Finish

Click *Finish* to exit the wizard. The library is changed according to your specifications.

Re-assigning robots and drives to ports

You can decide which ports to use for the library's robot, and which ports to use for the library's tape drives.

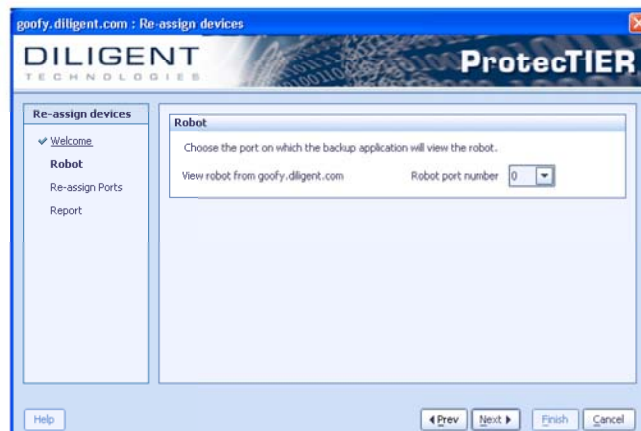
1. Select a library in the navigation pane.
2. Choose *Library > Re-assign devices* to invoke the *Re-assign devices* wizard.

Welcome



Robot

Specify how the robot is to be viewed by the backup application.



Robot port number

Choose the front-end port through which the backup application will view the robot. The wizard will only allow you to choose a port that is defined as a front-end port.

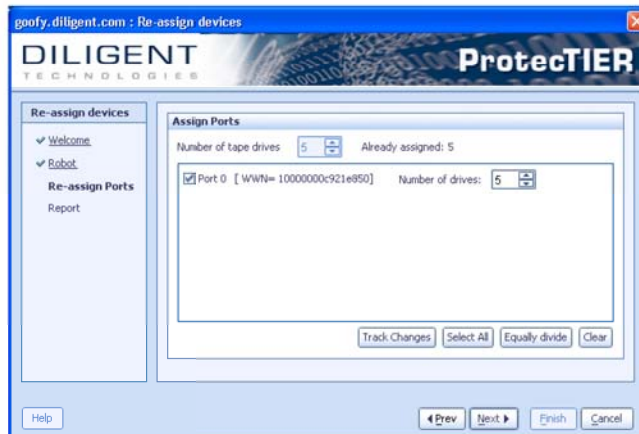
Re-assign ports

You can specify which ports to use for the virtual tape drives.

The wizard displays the current configuration. All front-end ports are listed. The ports that are currently used for tape drive assignments have a check in their check box.

By checking or un-checking the check boxes, you can change the ports to which tapes are assigned. Choose the number of tape drives to be assigned to each port.

Any change that you make to the front-end port selection might affect the LUNs of the drives. If a drive is re-assigned to the same port as before, the LUN doesn't change. So ProtectTIER first tries to assign a drive to the same port to which it was assigned before, and then distributes the remaining drives equally among the other selected ports.



Equally divide

Click *Equally divide* if you want to distribute the drives evenly among the selected ports.

Track Changes

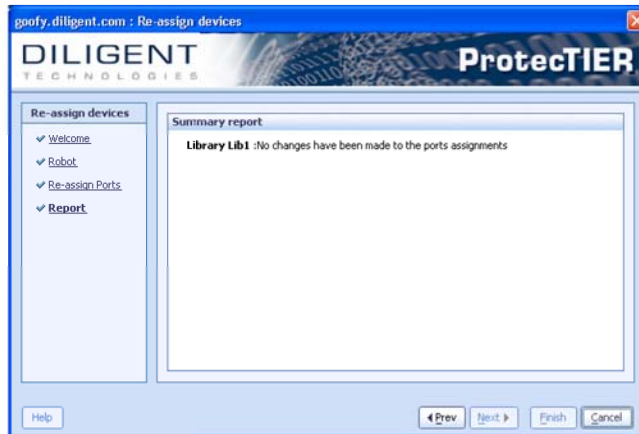
You can evaluate the effect of a particular change in ports, by clicking the *Track changes* button after you have checked or unchecked boxes. ProtectTIER displays

a report listing which drives might get a new LUN because they are assigned to a new port.



Report

The summary report lists the new device assignments.



Finish

Click *Finish* to exit the wizard.

Deleting a library

You can delete a library from the repository. The space occupied by the cartridges of the library is made available, and can be added to other libraries.



Important

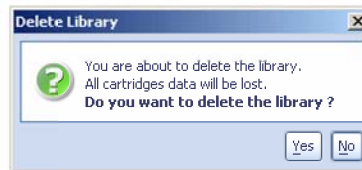
If there is data on the cartridges of the library, this data is lost. No recovery is possible.



1. In the navigation pane, select the library that you wish to delete.
2. Select *Library > Delete library*.

You are warned that the library data will be destroyed.

If you wish to delete the library and its data, confirm the action.



3. To make sure that you intend to delete the library, and that you understand that any data contained in this library will be lost, you are asked to verify that this is your intention.



Type the phrase *data loss* if you wish to delete the library. No other phrase will be accepted.

If you do not want to delete this library, click *Cancel*.

Adding cartridges to a library

If there is space on the repository, you can add cartridges to an existing library.

When you add cartridges, the number of internal slots is automatically increased, if necessary, so that there are at least as many slots as cartridges.



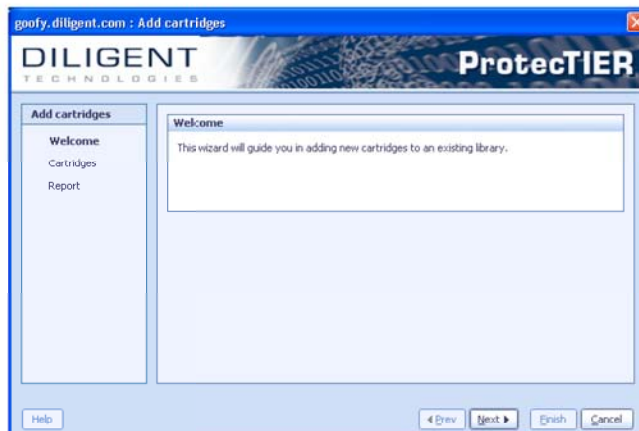
1. Select a library in the navigation pane.



2. Select *Library > Add cartridges* to invoke the *Add cartridges* wizard.

Welcome

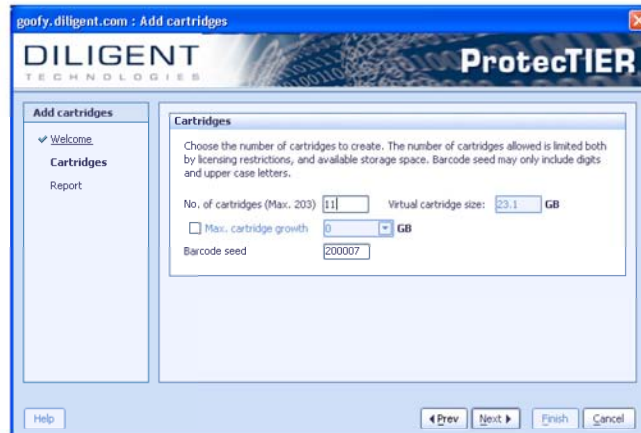
The repository is queried to make sure there is enough space to add cartridges. If there is not enough space to add cartridges to a library, you will not be allowed to add any.



Cartridges

The virtual tape cartridges that will be used to store backup data are defined on the repository.

The number of cartridges allowed is limited both by licensing restrictions and available storage space.



No. of cartridges

The number of cartridges defined for the library.

Max. cartridge growth

By default, due to the effect of HyperFactor operations, a cartridge might end up containing significantly more data than its nominal size.

To limit the amount of user data a cartridge can contain, you can set this option.

Barcode seed

On defining a new library, you will be prompted to input the full barcode of the initial cartridge. In each field, you may input either a number 0-9 or uppercase letters A-Z. Following the setting of the seed, the barcode number will sequence in ascending order from the seed barcode.

Barcodes with decimal number characters will increase numerically. Barcodes with uppercase letter characters will increase alphabetically.

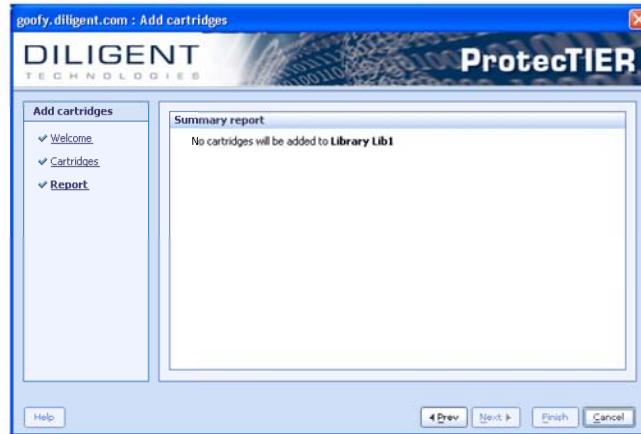
Virtual cartridge size

The virtual size of the cartridge.

The virtual cartridge size is an approximation of the user data the cartridge can contain, taking into consideration the Hyperfactor effects.

Summary report

The summary report tells you how many cartridges will be added.



Finish

Click *Finish* to add the cartridges and exit the wizard.

Checking a library

You can perform an integrity check on a library, if you suspect that the data has become corrupted.

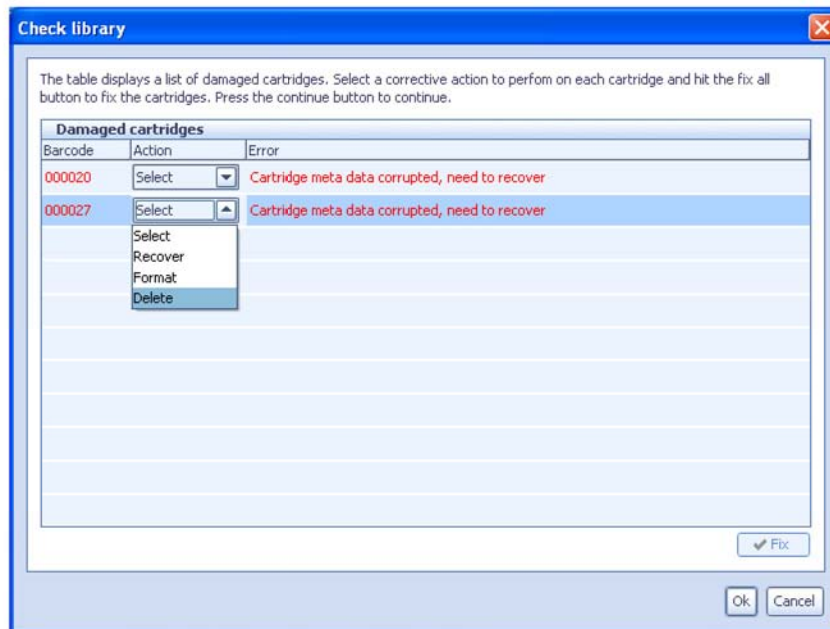
When to check a library

Check a library in the following cases:

- o the library name is listed in the navigation pane with question marks around the name; for example, *Library (?A?)*
- o you receive the message *Cannot find file system(s)*
- o cartridges are listed in red on the display
- o no data is listed for a cartridge

How to check a library

1. Select a library in the navigation pane.
2. Select *Library > Check library*.



If there are problems with the library cartridges, a table is displayed with a list of damaged cartridges.

Select an action to perform on each cartridge and press *Fix* to fix the cartridges.

Click **OK** to continue.

Resetting the robot

You can perform a SCSI reset of a robot.

1. Select a library in the navigation pane.
2. Choose *Library > Reset robot*.
3. Confirm the action.

Managing library components 10

You can display information about the tape drives, internal slots, import/export slots and cartridges in a library.

You can unload a tape drive, and move a cartridge from one slot or drive to another, and provide other actions.

Overview	10-2
Displaying tape drives	10-3
Performing tape drive actions	10-5
Displaying slots	10-7
Performing slot actions	10-9
Displaying import/export slots	10-11
Performing import/export slot actions	10-12
Displaying cartridges	10-14
Performing cartridge actions	10-15

Overview

When you select a component under the library node in the navigation pane, information is displayed in the work pane.

Sorting columns

To sort by a column of the display, click on the column header. The triangle indicates whether the column is sorted in ascending order or descending order.

Scrolling through a list of components

Up to 23 components can be listed on the ProtecTIER display at one time. Tape drives are all shown at one time.

In order to scroll to view other components, use the buttons appearing at the top of the display.

Examples are given here for displaying the cartridges of a library, but the library's tape drives, internal slots and import/export slots are displayed in the same way.

For the cartridge display, the scroll controls appear as shown.

It indicates which components are currently displayed, and the total number of components.

Cartridges 92 - 114 of 468  Go to Cartridge 

You can scroll to the next or previous groups of components, or you can jump to the first 23 or the last 23, or you can jump to a particular component.



Scroll to display the next group of components.



Scroll to display the previous group of components.



Jump to the last group of components.



Jump to the first group of components.



To jump to a particular component, type the sequence number of the component in the box and click the Go button. A screen with a group of components is displayed, with the requested component at the top.

Displaying tape drives



Expand a library node in the navigation pane. Four nodes appear under the library node: *Drives*, *Slots*, *ImpExp* and *Cartridges*.



Select the *Drives* node to display a list of tape drives defined for this library.

The screenshot shows the ProtectTIER Manager application window. The navigation pane on the left shows a tree structure with 'ProtectTIER VT' expanded to show 'Drives'. The main pane displays a table titled 'ProtectTIER VT ProtectTIER_1 : Drives' with 8 drives listed. The table has columns for Drive No., Loaded, Vendor Name, Product Name, Revision, Port, LUN, Address, and Barcode.

Drive No.	Loaded	Vendor Name	Product Name	Revision	Port	LUN	Address	Barcode
0		QUANTUM	DLT7000	0100	1	1	000000	
1		QUANTUM	DLT7000	0100	3	2	17	
2		QUANTUM	DLT7000	0100	3	3	18	
3		QUANTUM	DLT7000	0100	3	4	19	
4		QUANTUM	DLT7000	0100	3	5	20	
5		QUANTUM	DLT7000	0100	3	6	21	
6		QUANTUM	DLT7000	0100	3	7	22	
7		QUANTUM	DLT7000	0100	3	8	23	



Library

The library is identified.

Configuration

For each tape drive, the following information is displayed:

Drive No.

The index of the tape drive within the library.

Loaded

A drive icon with a cartridge inside indicates that the drive contains a cartridge and is loaded.

A drive icon with a red X indicates that the drive contains a cartridge and is not loaded.

If there is no cartridge in a drive, this column is blank.

Vendor Name

The tape drive behaves like a tape drive from this vendor.

This information about the tape drive is returned to the host as a response to the SCSI INQUIRY command.

Product Name

The tape drive behaves like a tape drive of this product type.

This information about the tape drive is returned to the host as a response to the SCSI INQUIRY command.

Revision

The tape drive behaves like a tape drive of this revision number.

This information about the tape drive is returned to the host as a response to the SCSI INQUIRY command.

Port

The front-end port to which this drive is assigned.

LUN

The LUN of this tape drive with respect to this port.

Barcode

If there is a cartridge in the drive, this is the barcode of the cartridge. If there is no cartridge in the drive, this is blank.

Offline drives

When a virtual tape drive is not assigned to any port, it is in an offline state. The offline drive appears in a different color. Any cartridge in an offline drive is automatically unloaded.

The tape drive remains offline until it is explicitly assigned to another front-end port.

Performing tape drive actions



Important

Do not perform these operations while the backup application is using the library. Doing so may damage the operations of the backup application.

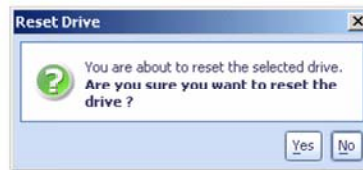
When a list of tape drives is displayed, you can right-click on a drive in the list, to access a right-click menu. You can reset the drive. If the drive contains a cartridge, you can unload or move the cartridge.

Reset drive and *Unload drive* are also available in the *Drive* menu.

Resetting a tape drive

You can perform a SCSI reset of a tape drive.

1. Right-click on a drive in the list.
2. Choose *Reset drive* from a right-click menu.
3. Confirm the action.



Unloading a tape drive

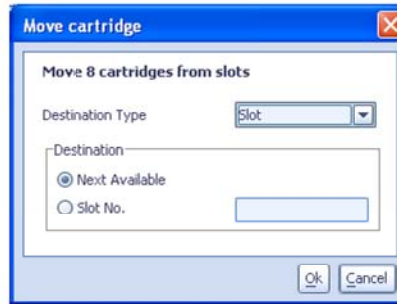
1. Right-click on a full loaded drive in the list.
2. Choose *Unload drive* from a right-click menu.

Moving cartridges from a tape drive

Before you can move cartridges from a tape drive, you must unload them.

1. Right-click on the cartridge you want to move.
2. Choose *Move cartridge* from the menu. The *Move Cartridge* dialog is displayed.

To move multiple cartridges at a time, select drives by pressing <Shift> & left-click. Without releasing the <Shift> button, right-click and select *Move cartridges* from the menu.



Destination type In the *Destination type* box, choose *Drive*, *Slot* or *Import/Export*.

Destination If you have chosen to move the cartridge to a drive, choose the number of the drive. If you have chosen to move the cartridge to a slot, you can specify the slot number, or you can have the cartridge moved to the next available slot.

If you choose to move more than one cartridge, the cartridges will be moved in a sequential order, starting with specified destination. Make sure the required number of continuous destination components is free.

Displaying slots



When you expand a library node, four nodes appear under the library node: *Drives*, *Slots*, *ImpExp* and *Cartridges*.



Select the *Slots* node to display a list of internal cartridge slots defined for this library (not including import/export slots).

The screenshot shows the 'ProtectTIER Manager' application window. The left sidebar shows a tree view with 'ProtectTIER VT (lib)' expanded to show 'Slots'. The main window displays a table of slot configurations for 'lib_final_test : Slots'. The table has columns for Slot No., Address, Barcode, Capacity(MB), and Data Size (MB). The data rows are as follows:

Slot No.	Address	Barcode	Capacity(MB)	Data Size (MB)
0	1040	112233	50688	32882
1	1041	112234	50688	32882
2	1042	112235	50688	32882
3	1043	112236	50688	32882
4	1044	112237	50688	32882
5	1045	112238	50688	32882
6	1046	112239	50688	32882



Library

The library is identified.

Configuration

For each slot, the following information is displayed:

Slot No.

The index of the slot within the library.

Address

The element address of the slot within the library.

Barcode

If there is a cartridge in the slot, this is the barcode of the cartridge. If there is no cartridge in the slot, this is blank.

Capacity (MB)

If there is a cartridge in the slot, this is the capacity of the cartridge. If there is no cartridge in the slot, this is blank.

Data size (MB)

If there is a cartridge in the slot, this is the nominal size of the user data on this cartridge. If there is no cartridge in the slot, this is blank.

Performing slot actions

When a list of slots is displayed, you can right-click on a slot in the list, to access a right-click menu. If the slot contains a cartridge, you can move the cartridge or change its read/write setting.

These options are also available from the *Cartridges* menu.

Moving a cartridge

1. Right-click on the cartridge you want to move.

If you want to move more than one cartridge, press <Shift> & left-click to select cartridges, then <Shift> & right-click on the cartridges you want to move.

2. Choose *Move cartridge* from the right-click menu. The *Move Cartridge* dialog is displayed.



Destination type In the *Destination type* box, choose *Drive*, *Slot* or *Import/Export*.

Destination If you have chosen to move the cartridge to a drive, choose the number of the drive. If you have chosen to move the cartridge to a slot, you can specify the slot number, or you can have the cartridge moved to the next available slot.

If you choose to move more than one cartridge, the cartridges will be moved in a sequential order, starting with specified destination. Make sure the required number of continuous destination components is free.

Changing the read/write mode of a cartridge

When a cartridge resides in a slot or an import/export slot, you can toggle its read/write mode between read-only and read/write. When the cartridge is located in a tape drive, its read/write mode cannot be changed.

1. Right-click on the cartridge whose read/write mode you want to change.

2. Choose *Read/write cartridge* from the right-click menu.
3. Confirm the action.



Displaying import/export slots



When you expand a library node, four nodes appear under the library node: *Drives*, *Slots*, *ImpExp* and *Cartridges*.



Select the *Imp/Exp* node to display a list of import/export cartridge slots defined for this library.



For each import/export slot, the following information is displayed:

Imp/Exp No.

The index of the import/export slot within the library.

Address

The element address of the import/export slot within the library.

Barcode

If there is a cartridge in the import/export slot, this is the barcode of the cartridge. If there is no cartridge in the import/export slot, this is blank.

Capacity (MB)

If there is a cartridge in the import/export slot, this is the capacity of the cartridge. If there is no cartridge in the slot, this is blank.

Data size (MB)

If there is a cartridge in the import/export slot, this is the nominal size of the user data on this cartridge. If there is no cartridge in the slot, this is blank.

Performing import/export slot actions

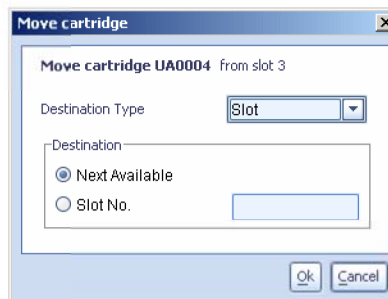
When a list of import/export slots is displayed, you can right-click on a slot in the list to access a right-click menu. If the slot contains a cartridge, you can move the cartridge, change its read/write setting, or rebarcode.

Moving a cartridge

1. Right-click on the cartridge you want to move.

If you want to move more than one cartridge, press <Shift> & left-click to select cartridges, then <Shift> & right-click on the cartridges you want to move.

2. Choose *Move cartridge* from the right-click menu. The *Move Cartridge* dialog is displayed.



Destination type In the *Destination type* box, choose *Drive*, *Slot* or *Import/Export*.

Destination If you have chosen to move the cartridge to a drive, choose the number of the drive. If you have chosen to move the cartridge to a slot, you can specify the slot number, or you can have the cartridge moved to the next available slot.

If you choose to move more than one cartridge, the cartridges will be moved in a sequential order, starting with specified destination. Make sure the required number of continuous destination components is free.

Changing the read/write mode of a cartridge

When a cartridge resides in a slot or an import/export slot, you can toggle its read/write mode between read-only and read/write. When the cartridge is located in a tape drive, its read/write mode cannot be changed.

1. Right-click on the cartridge whose read/write mode you want to change.

2. Choose *Read/write cartridge* from the right-click menu.
3. Confirm the action.



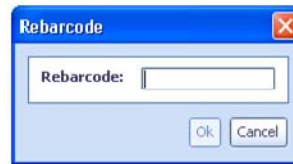
Rebarcoding a cartridge

You can change the barcode of an existing cartridge to a new barcode that you specify. ProtecTIER does not allow the new barcode to duplicate an existing cartridge. Only cartridges residing in a library Imp/Exp slot can be re-barcode.

ProtecTIER will not allow the definition of a barcode that starts with the prefix CLN.

To rebarcode a cartridge:

1. Right-click on the import/export slot and select *Rebarcode*. The *Rebarcode* dialog is displayed:



2. Enter the new barcode and click *OK*.

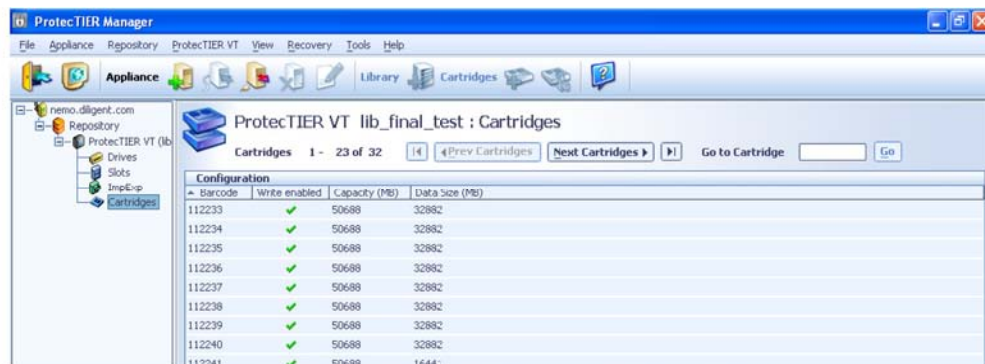
Displaying cartridges



When you expand a library node, four nodes appear under the library node: *Drives*, *Slots*, *ImpExp* and *Cartridges*.



Select the *Cartridges* node to display a list of cartridges defined for this library.



For each cartridge, the following information is displayed:

Barcode

The cartridge label.

Write enabled

This column contains a green check mark if the cartridge is available for write access.

Capacity (MB)

The storage capacity of the cartridge.

Data size (MB)

The nominal size of the user data on this cartridge.

Performing cartridge actions

When a list of cartridges is displayed, you can right-click on a cartridge in the list to access a right-click menu. These options are also available from the *Cartridge* menu.

Deleting a cartridge

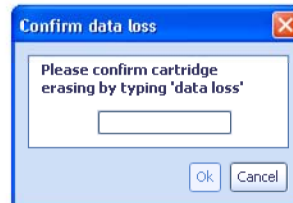
1. Right-click on the cartridge you want to delete.

If you want to delete more than one cartridge, press <Shift> & left-click to select cartridges, then <Shift> & right-click on the cartridges you want to delete.

2. Choose *Delete cartridges* from the right-click menu. The *Delete cartridges* dialog is displayed.



3. Click *Yes* to execute the *Delete cartridges* operation. The *Confirm data loss* dialog is displayed.



4. Type *data loss* and click *OK*. The cartridge is deleted from the list in the work pane.

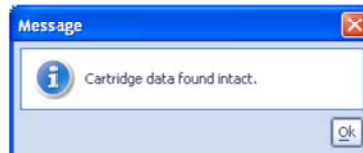
Check cartridge integrity

You can verify cartridge data integrity.

1. Right-click on the cartridge whose data integrity you want to check.
2. Choose *Check cartridge integrity* from the right-click menu. The *Check cartridge integrity* dialog is displayed.



3. Confirm the action. A message is displayed with the cartridge data condition.



Recovering ProtecTIER 11

After a crash (e.g. power failure, fatal system error, or hardware failure), while the last operation may not have successfully completed, the system must return to an operational state.

A basic consistency check will be done every time the system comes up. If the system is found or suspected to be corrupt, you will be prompted to execute checks and recovery elements in respect to the damage found.

Performing recovery operations 11-2

Performing recovery operations

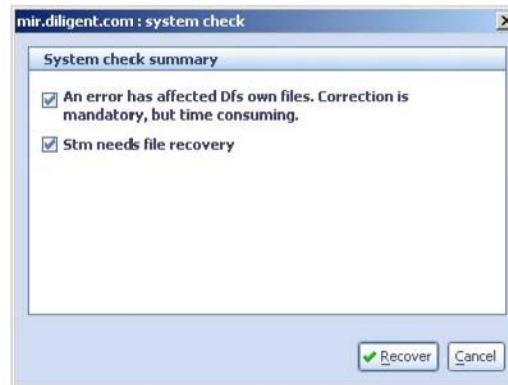
Recovery operations are generally performed by either Customer Service Support representatives or administrators *only*.

System check

If the system is found to be corrupt, you will be prompted to execute checks and recovery elements in respect to the damage found.

To run the system check operation, choose *System check* from the *Recovery* menu. Click *Recover*.

One module at a time is checked. If errors are found in a module, the system check will stop checking the other modules until the errors of the respective module are fixed. All of the errors displayed belong to the respective module currently being checked.



Only when the problems pertain to the DFS module can you choose which errors to fix.

If you do not select all the errors from the list to fix, you will be prompted again to fix any remaining errors.



Click *Yes* to view the remaining errors of that module. Once all of the module errors have been fixed, a *System check summary* dialog is displayed to rerun the

system check on the remaining modules (i.e. other than DFS). The appearing errors will be automatically selected for recovery and cannot be de-selected.

Click *Recover* to rerun the system check.



Once the system check operation completes, you can rerun the operation to verify that there are no additional errors.

Click *Yes* to rerun the system check operation.



If no errors are found, a message is displayed that the system check completed successfully.



PART THREE - ProtecTIER Mgr Admin

These chapters describe managing user files, how to access the event log and error log, and troubleshooting.

Manager Logs & Troubleshooting 12

As a user works with ProtecTIER Manager, warnings and error messages are written to a log file. There may be situations where Technical Support will ask you to examine this file or to forward it to them.

ProtecTIER Manager user files	12-2
Testing and troubleshooting	12-3

ProtecTIER Manager user files

Log files and configuration files are saved for each user, identified by the username of the user on the network.

work.<username> directory

For each user who has invoked ProtecTIER Manager, a subdirectory is created in the directory in which ProtecTIER Manager is installed, named work.<username> where <username> is the name under which the user logged in to the network.

This directory contains a configuration file for the user, named gui.cfg and log files. This file stores definitions made during the user session, so that the user's environment is preserved for the next time this user invokes ProtecTIER Manager.

manager.log files

As a user works with ProtecTIER Manager, warnings and error messages are written to a log file. There may be situations where Technical Support will ask you to examine this file or to forward it to them.

Messages written to the log file report on conditions that are local to ProtecTIER Manager, as well as conditions that apply to ProtecTIER.

The log file is stored in the work.<username> directory.

Log file name

The name of the file is manager<x>.log.

Current log is manager0.log.

Backup log files

The log file can be up to 10MB in size. When the size of the file reaches this limit, the current log file is copied to a backup file.

Up to three backup versions of the log file are saved in the log folder. They are named manager1.log, manager2.log and manager3.log.

When the current log file reaches the maximum size, the oldest backup copy is overwritten, in a cyclic manner.

Testing and troubleshooting

After installing ProtecTIER Manager, test to make sure that it has been installed properly.

You must have a ProtecTIER appliance running.

Provide appliance connection properties

1. Invoke ProtecTIER Manager. ProtecTIER Manager will attempt to scan the TCP/IP network for REO 9500D appliances.
2. If no appliances are auto-detected, supply the TCP/IP subnets to be scanned, as described in *Auto-discovery of appliances* on page 7-3. Or, add appliance properties manually.

Log in to the appliance

1. Right-click on the node of the appliance in the navigation pane. Choose *Login*.
2. In the *Login* dialog, provide a username and password that are valid on the appliance. Click *Ok*.
3. Browse the tree on the navigation pane at the left, and verify that the displayed information reflects the appliance configuration.

Troubleshooting

If ProtecTIER Manager cannot find the appliance, try to resolve the problem by one of these methods:

- o make sure that you can ping the REO 9500D platform
- o try to use the IP address instead of the DNS name
- o make sure that there is no firewall between the computers

ProtectTIER logs 13

An event log and an error log can be displayed in ProtectTIER Manager.

Displaying the Event log	13-2
Events that are logged	13-3
Displaying the Error log	13-4
Errors that are logged	13-5

Displaying the Event log

As users work with ProtecTIER via the ProtecTIER Manager client, events are logged.

The event log contains an entry for each significant event. These are not errors, but they can be used to understand what ProtecTIER was doing when an error occurred.

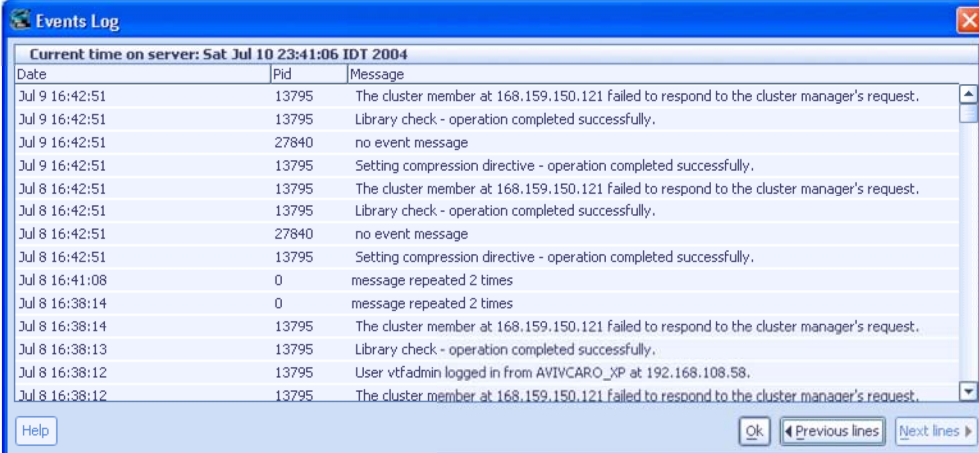
The event log also contains the errors that are listed in the error log. See *Displaying the Error log on page 13-4*.

The event log can also be viewed by logging in to the ProtecTIER appliance and using Unix tools to search, filter and view the contents of the log file `/fx_work0/log/vtf_event.log`.

Events Log

Click the *Event log* button, when appliance properties are displayed, to display the event log.

You can click on the column headers to sort the entries according to that column.



Current time on server: Sat Jul 10 23:41:06 IDT 2004		
Date	Pid	Message
Jul 9 16:42:51	13795	The cluster member at 168.159.150.121 failed to respond to the cluster manager's request.
Jul 9 16:42:51	13795	Library check - operation completed successfully.
Jul 9 16:42:51	27840	no event message
Jul 9 16:42:51	13795	Setting compression directive - operation completed successfully.
Jul 8 16:42:51	13795	The cluster member at 168.159.150.121 failed to respond to the cluster manager's request.
Jul 8 16:42:51	13795	Library check - operation completed successfully.
Jul 8 16:42:51	27840	no event message
Jul 8 16:42:51	13795	Setting compression directive - operation completed successfully.
Jul 8 16:41:08	0	message repeated 2 times
Jul 8 16:38:14	0	message repeated 2 times
Jul 8 16:38:14	13795	The cluster member at 168.159.150.121 failed to respond to the cluster manager's request.
Jul 8 16:38:13	13795	Library check - operation completed successfully.
Jul 8 16:38:12	13795	User vtfadmin logged in from AVIVCARO_XP at 192.168.108.58.
Jul 8 16:38:12	13795	The cluster member at 168.159.150.121 failed to respond to the cluster manager's request.

Date

The date and time at which the event was logged.

Pid

The ProtecTIER process ID of the message.

Message

The message describing the event.

Events that are logged

These types of events are logged:

- repository configuration (create, increase, delete)
- library configuration changes (create library, change configuration, add/delete cartridges, set HyperFactor mode, delete library)
- change HyperFactor scheduling
- start and completion of a configuration change that takes more than one second
- ProtecTIER Manager logins
- automatic recovery, e.g. failover
- VTLU status checks
- link up and link down events
- topology changes
- ProtecTIER going offline or online
- move media commands, with success or failure status, and a reason for failure, including all mounts and dismounts
- failed SCSI command, with check condition (except the following: Illegal Length Indication (ILI), Test Unit Ready that fails because of cartridge unloaded or not present, end of media)
- Fiber Channel PLOGI events and initiator WWN
- login denied
- configuration session that timed out
- successful login (user name is logged)
- each signal that is encountered
- stopping ProtecTIER for configuration
- starting ProtecTIER

Displaying the Error log

As users work with ProtecTIER via the ProtecTIER Manager client, all errors are logged.

The error log lists errors and illegal requests. When an error message has been added to the error log, the *Alerts* button on the appliance properties display is flashing.

Errors are problems or issues detected by ProtecTIER. Any event that may require operator intervention is treated as an error.

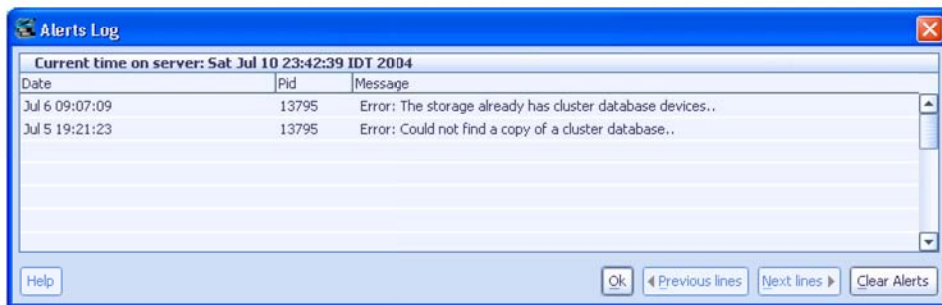
Errors are also logged to the system message log.



Click the *Alerts* button, when appliance properties are displayed, to display the error log.



The administrator can clear the list of errors (and stop the *Alerts* button from flashing) by clicking *Clear alerts*.



Date

The date and time at which the error was logged.

Pid

The ProtecTIER process ID of the message.

Message

The message describing the error.

Errors that are logged

These types of errors are logged:

- o bugchecks
- o reservation conflicts
- o SCSI resets
- o illegal SCSI commands
- o I/O failure
- o Fiber Channel port failure
- o license expiration, or license nearing expiration date
- o API call that returns an erroneous return code
- o ProtecTIER appliance going down unexpectedly

APPENDIX

Error messages **14**

Messages listed here are generated by ProtecTIER.

ProtecTIER Manager error messages.....	14-2
Sense key information.....	14-3
Event log messages.....	14-6
Error log messages.....	14-13

ProtecTIER Manager error messages

These five categories of error messages might be reported by ProtecTIER Manager.



Communication error

This indicates that the server was not found, or the ProtecTIER daemon was not found.

Authorization error

Invalid username or password was provided, or user (administrator) was logged out by a different user that logged in from another instance of the application.

System error

An error occurred between the daemon and ProtecTIER Manager.

ProtecTIER error

An error has been returned by the ProtecTIER process.

Application error

This type of error is an internal ProtecTIER Manager error, and should not occur. Contact Technical Support if the problem persists.

Sense key information

These indicate an error or other condition in a ProtecTIER virtual device. The sense key information is returned in the *Sense Key* field of the *SCSI Sense*. Additional sense codes and qualifiers are listed.

Sense key 00: No Sense

No specific sense key to information to be reported. Indicates a successful command that received a check condition status because of a filemark, end-of-medium, or illegal length indication.

code	qualifier	description
00	00	No additional sense information
00	01	Unexpected File Mark encountered
00	02	End of medium detected
00	04	Beginning of medium detected

Sense key 02: No Ready

The addressed device is not ready.

code	qualifier	description
04	02	Load command required
3A	00	Medium unloaded or not present

Sense key 03: Medium Error

Non-recoverable error condition. Might be caused by an error on the media or in the recorded data.

code	qualifier	description
00	00	Medium error
0C	00	Write error
11	00	Non recoverable read error
15	02	Position error detected by read
3B	00	Sequential positioning error
3B	08	Reposition error

Sense key 04: Hardware Error

Non-recoverable hardware error detected by the device.

code	qualifier	description
44	00	Internal target failure

Sense key 05: Illegal Request

Illegal parameter in the CDB or parameter data.

code	qualifier	description
1A	00	Parameter list length error
20	00	Illegal Opcode
21	01	Invalid element address
24	00	Invalid field in CDB
24	89	Image data over limit
26	00	Invalid field in parameter list
26	01	Parameter List Error, parameter not supported
26	02	Parameter List Error, invalid parameter value
3B	0D	Media destination element full
3B	0E	Media source element empty
53	00	Media load or reject failed
80	01	Transfer full
82	00	Not allowed if not at BOT

Sense key 06: Unit Attention

Device was reset or changed.

code	qualifier	description
29	00	Power on or reset occurred
80	00	Door was opened

Sense key 07: Data Protect

Attempt to write to a write-protected medium.

code	qualifier	description
27	80	Unable to overwrite write protected data

Sense key 08: Blank Check

The device encountered a blank medium.

code	qualifier	description
00	05	End-of-data encountered

Sense key 0D: Volume Overflow

A buffered device has reached end-of-tape and data remains in the buffer.

code	qualifier	description
00	00	Volume overflow

Event log messages

Events Log

These messages are logged in the event log that is displayed when you click the *Event log* button on the ProtecTIER Manager display.

Event messages may contain variable information. In the messages listed below, variable information is enclosed in angle brackets.

System events

ID	message in the event log	explanation
1	A configuration session has timed out.	more than one minute has passed between two consecutive configuration API calls, while ProtecTIER is offline
2	User <VTF user> logged in from <workstation> at <ip>.	a user attempted to log in
3	Login for <VTF user> from <workstation> at <ip> has been denied.	a user login was rejected
4	Received signal <signal_num>.	a signal was received
5	Stopping the ProtecTIER emulation.	ProtecTIER was brought offline for configuration purposes
6	Starting the ProtecTIER emulation.	ProtecTIER was brought online

Operation started events

ID	message in the event log	explanation
102	ProtecTIER exiting: cleaning %s.	ProtecTIER VT being stopped
103	Drives to ports assignment - operation started. Library name is <lib>.	front-end drive connections were configured
104	Robot to port assignment - operation started. Library name is <lib>.	a front-end robot connection was configured
105	Released shared memor segment with key %s (id %s).	a shared memory
107	Handle license violation.	license violation is being handled
108	Cartridge addition - operation started. Library name is <lib>.	cartridges are being added to a library
111	Library check - operation started. Library name is <lib>.	a library is being checked

ID	message in the event log	explanation
112	Library cleaning - operation started. Library name is <lib>.	a library is being cleaned
113	Library recovery - operation started. Library name is <lib>.	the database of a library is being recreated
115	Cartridge Format - operation started. Library name is <lib>.	a cartridge is being formatted to erase its contents
119	Check storage for orphan cartridges - operation started.	lost cartridges are being identified
120	Library creation - operation started. Library name is <lib>.	a new library is being installed
121	Cartridge move - operation started. Library name is <lib> source is <loc> destination is <loc>.	cartridge is being moved from a source element to a destination element
122	Cartridge rebarcode - operation started. Library name is <lib>.	the barcode of a cartridge in an import-export slot is being modified
123	Changing library configuration - operation started. Library name is <lib>.	the number of elements of a given type in a given library is being reconfigured
124	Cartridge recovery - operation started. Library name is <lib>.	cartridges are being recovered
125	Release drive - operation started. Library name is <lib> logical element address is <drive_ID>.	a drive is being released
127	Delete library - operation started. Library name is <lib>.	a library is being deleted (all data will be lost)
128	Set cartridge WriteEnabled / WriteDisabled attribute - operation started. Library name is <lib> attribute set to <write_flag>.	the WriteDisabled/WriteEnabled flag of a given cartridge is being set
130	Illegal mutex nesting trying %s%s%s%s.	illegal mutex nesting trying
131	Unload drive - operation started. Library name is <lib> logical element address is <drive_ID>.	a drive is being unloaded
132	Reset drive - operation started. Library name is <lib> logical element address is <drive_ID>.	a drive is being reset

ID	message in the event log	explanation
133	Reset robot - operation started. Library name is <lib>.	a robot is being reset
196	%s starting to %s.	the tape drive is starting to read or write
197	%s finished running %s %s commands.	tape drive has finished to read or write
198	Device %s cannot accept command %s from WWN %s, %s.	ProtecTIER VT device rejected a SCSI command
199	Device %s reserved WWN %s id %s.	ProtecTIER VT device reserved
197	Device %s released WWN %s id %s.	ProtecTIER VT device released
200	Device %s perform cmd %s %s %s.	ProtecTIER VT device got a SCSI command
201	Cartridge %s load into %s: %s %s.	ProtecTIER VT cartridge loaded into a virtual tape drive
202	Cartridge %s unload from %s: %s %s.	ProtecTIER VT cartridge unloaded into a virtual tape drive

Link events

ID	message in the event log	explanation
203	Cartridge is moved. (<status>)	cartridge move event
204	Attempted recovery of failed connection to port <port> WWN <wwn> LUN <lun>.	switch link event
206	ProtecTIER port <port> got LINK_DOWN event.	a link went down
207	ProtecTIER port <port>: Got LINK_DOWN event, setting topology to default <top>.	topology is being reset because the link went down
208	ProtecTIER port <port> got LINK_UP event.	a link came up
209	ProtecTIER port <port> connected to Switch: setting topology to P2P.	topology is being set because a switch was detected
210	ProtecTIER port <port> direct connect: setting topology to LOOP.	topology is being set because a direct connection was detected
211	ProtecTIER port <port>: Link is not ready, setting topology to default <top>.	topology is being reset because the link is not ready

ID	message in the event log	explanation
212	ProtectTIER port <port> current active topology is <top>.	current topology is being reported
213	ProtectTIER port <port> got PLOGI_RCVD event from WWN <wwn>.	PLOGI_RCVD event was received

Operation completed events

ID	message in the event log	explanation
401	Library creation - operation completed <completion_code>.	operation completed
402	Delete library - operation completed <completion_code>.	operation completed
403	Library recovery - operation completed <completion_code>.	operation completed
406	Library check - operation completed <completion_code>.	operation completed
407	Check storage for orphan cartridges - operation completed <completion_code>.	operation completed
408	Changing library configuration - operation completed <completion_code>.	operation completed
409	Cartridges addition - operation completed <completion_code>.	operation completed
410	Cartridge format - operation completed <completion_code>.	operation completed
411	Cartridges recovery - operation completed <completion_code>.	operation completed
412	Cartridge rebarcode - operation completed <completion_code>.	operation completed
413	Library cleaning - operation completed <completion_code>.	operation completed
414	Drives to ports assignment - operation completed <completion_code>.	operation completed
415	Robot to port assignment - operation completed <completion_code>.	operation completed
416	Unload drive - operation completed <completion_code>.	operation completed
417	Release drive - operation completed <completion_code>.	operation completed

ID	message in the event log	explanation
418	Reset drive - operation completed <completion_code>.	operation completed
419	Reset robot - operation completed <completion_code>.	operation completed
420	Set cartridge ReadWrite/ReadOnly - operation completed <completion_code>.	operation completed
421	Cartridge move - operation completed <completion_code>.	operation completed

Vtlu events

ID	message in the event log	explanation
425	Port %s receiving, %s from WWN %s.	ProtecTIER VT front-end got an exception error
426	Port %s rejecting, %s from WWN %s.	ProtecTIER VT front-end rejected a SCSI command
426	Port %s releasing command by xid %s on lun %s (opcode - %s).	ProtecTIER VT front-end got an abort
426	Port %s failed to release command by xid %s%s%s.	ProtecTIER VT front-end, abort to discarded command
700	Cartridge %s requesting to open %s.	ProtecTIER VT started reading/writing to a cartridge data segment
701	Cartridge %s closing %s.	ProtecTIER VT finished reading/writing to a cartridge data segment

Dfs events

ID	message in the event log	explanation
501	Dfs construction.	system being initialized
502	Dfs destruction.	system being stopped
503	Dfs initialization.	system being initialized
504	Dfs termination.	system being stopped

ID	message in the event log	explanation
505	%s%s%s%s.	a segment of ProtecTIER VT cartridge has been hyperfactored with the indicated results
506	DfsRegistration %s%s%s%s.	a segment of a ProtecTIER VT cartridge data has been accessed
507	DfsUnregistration %s%s%s%s.	a segment of a ProtecTIER VT cartridge data is no longer being accessed
508	DfsDeleteFileBegin %s%s%s%s.	the deletion of a segment of a ProtecTIER VT cartridge data has started
509	DfsDeleteFileEnd %s%s%s%s.	the deletion of a segment of a ProtecTIER VT cartridge data has completed
555	Library unique id is %s library name is %s.	translating library unique id to library name
556	Exit from the function VtfHandleLicenseViolation - operation completed %s.	ProtecTIER license violated

Hyperfactor events

ID	message in the event log	explanation
601	Compressor id %s - operation started, file %s%s%s.	the HyperFactor engine has started hyperfactoring a segment of a ProtecTIER VT cartridge data
602	Compressor id %s - operation completed, original size %s.	the HyperFactor engine has finished hyperfactoring a segment of a ProtecTIER VT cartridge data
603	Compressor id %s, throughput %s MB/s, factoring ratio %s percent, time %s seconds.	information about the ProtecTIER VT cartridge data segment HyperFactor has finished factoring
604	Calculate_representation_fatal %s %s %s %s.	HyperFactoring of a ProtecTIER VT cartridge data segment failed
605	Compress_version_file_fatal %s %s %s %s.	HyperFactoring of a ProtecTIER VT cartridge data segment failed
606	Sync_algorithm_fatal %s %s %s %s.	HyperFactoring of a ProtecTIER VT cartridge data segment failed
607	Index_manager_fatal %s %s %s %s.	HyperFactoring of a ProtecTIER VT cartridge data segment failed
608	Index_update_sync_fatal %s %s %s %s.	HyperFactoring of a ProtecTIER VT cartridge data segment failed
609	Reverse_index_fatal %s %s %s %s.	HyperFactoring of a ProtecTIER VT cartridge data segment failed
610	Compressor_proxy_fatal %s %s %s %s.	HyperFactoring of a ProtecTIER VT cartridge data segment failed
611	Compressor index sync mechanism got a file id to compress.	HyperFactor is factoring a ProtecTIER VT cartridge data segment
612	Compressor index sync mechanism deletes a file.	HyperFactor remove the reference to a ProtecTIER VT cartridge data segment
613	Vtlu event.	ProtecTIER VT management event
614	Compressor index sync mechanism got an abort before an update.	HyperFactor update aborted
615	Compressor index sync mechanism slot management events.	HyperFactor management event

Error log messages



These messages are logged in the error log that is displayed when you click the *Alerts!* button on the ProtecTIER Manager display. They are also logged in the event log.

Error messages may contain variable information. In the messages listed below, variable information is enclosed in angle brackets.

These errors have severity = 3.

ID	message in the error log	explanation
50	Error: <error>.	an error occurred while processing a client request
51	The ProtecTIER emulation process could not be found.	the ProtecTIER process could not be found, but was not stopped by the daemon
52	<message>.	the driver needs to rebuild its links, but failed to do so
53	Failed to load FE assignments for library: <lib>.	failed to load the library's front-end assignments to the configuration
54	Failed to save FE assignments for library: <lib>.	failed to save the library assignments to the database
55	System configuration database could not be found.	failed to locate system configuration database
56	System configuration database checksum error.	system configuration database, invalid checksum
57	Requesting to delete file:	a segment of a cartridge's data has been deleted

ID	message in the error log	explanation
303	I/O error on port <port> WWN <wwn> LUN <lun>.	I/O error
304	Internal error (<error_ID>) in file <file> line <line>.	internal error
305	ProtecTIER port <port> memory allocation failure.	memory allocation failure
306	ProtecTIER port <port> failed to get WWN names.	port failed to get WWN names

ID	message in the error log	explanation
307	ProtectTIER port <port> failed to take the link down.	port failed to take the link down
308	ProtectTIER port <port> setting topology failed.	port setting topology failed
309	ProtectTIER port <port> failed to init the link.	port failed to initialize the link
310	GA_NXT name server request failed.	server request failed
311	Failed to get WWN names.	failed to get WWN names
312	Failed to get link topology.	failed to get link topology
313	Failed to get peer WWN names.	failed to get peer WWN names
314	Failed to get name server peer ports.	failed to get name server peer ports
315	Device <dev> open failed.	device open failed
316	Device <dev> close failed.	device close failed
317	Device <dev> not open.	device is not open
318	Invalid read write flag, device <dev>.	invalid read/write flag
319	Unexpected residual value on successful response, device <dev> LUN <lun> WWN <wwn>.	unexpected residual value on successful response
320	Invalid FCP response info size, device <dev> LUN <lun> WWN <wwn>.	invalid FCP response info size
321	FCP response code error <error_code>, device <dev> LUN <lun> WWN <wwn>.	FCP response code error
322	User timeout, device <dev> LUN <lun> WWN <wwn>.	user timeout
323	Invalid memory address, device <dev>.	invalid memory address
324	Link down, device <dev> LUN <lun> WWN <wwn>.	link down
325	Problem connecting to WWN <wwn>.	problem connecting to port
326	Unexpected error, device <dev> LUN <lun> WWN <wwn>.	unexpected error
327	Unexpected internal error, device <dev> LUN <lun> WWN <wwn>.	unexpected internal error
328	Device <dev> not open.	device not open
329	Invalid read/write flag, device <dev>.	invalid read/write flag
330	Invalid memory address, device <dev>.	invalid memory address

ID	message in the error log	explanation
331	Link down, device <dev> LUN <lun> WWN <wwn>.	link down
332	Problem connecting to WWN <wwn>	problem connecting to port
333	Unexpected error, device <dev> LUN <lun> WWN <wwn>.	unexpected error
334	Unexpected internal error, device <dev> LUN <lun> WWN <wwn>.	unexpected internal error
335	Unexpected residual value on successful response, device <dev>.	unexpected residual value on successful response
336	Invalid FCP response info size, device <dev>.	invalid FCP response info size
337	FCP response code error <error_code>, device <dev>.	FCP response code error
338	User timeout, device <dev>.	user timeout
339	Invalid memory address, device <dev>.	invalid memory address
340	Link down, device <dev>.	link down
341	Target down, device <dev>.	target down
342	Unknown target, device <dev>.	unknown target
343	Unexpected error, device <dev>.	unexpected error
344	Unexpected internal error, device <dev>.	unexpected internal error
345	Device <dev> not open.	device not open
346	Invalid read/write flag, device <dev>.	invalid read/write flag
347	Unexpected residual value on successful response, device <dev> LUN <lun> WWN <wwn>.	unexpected residual value on successful response
348	Invalid FCP response info size, device <dev> LUN <lun> WWN <wwn>.	invalid FCP response info size
349	FCP response code error <error_code>, device <dev> LUN <lun> WWN <wwn>.	FCP response code error
350	User timeout, device <dev> LUN <lun> WWN <wwn>.	user timeout
351	Invalid memory address, device <dev>.	invalid memory address
352	Link down, device <dev> LUN <lun> WWN <wwn>.	link down
353	Problem connecting to WWN <wwn>.	problem connecting to port

ID	message in the error log	explanation
354	Unexpected error, device <dev> LUN <lun> WWN <wwn>.	unexpected error
355	Unexpected internal error, device <dev> LUN <lun> WWN <wwn>.	unexpected internal error
356	Invalid memory address, device <dev>.	invalid memory address
357	Received invalid argument, device <dev>.	received invalid argument
358	Link down, device <dev>.	link down
359	Unknown target, device <dev>.	unknown target
360	Target down, device <dev>.	target down
361	Unexpected error, device <dev>.	unexpected error
362	Invalid memory address, device <dev>.	invalid memory address
363	Received invalid argument, device <dev>.	received invalid argument
364	Link down, device <dev>.	link down
365	Unknown target, device <dev>.	unknown target
366	Target down, device <dev>.	target down
367	Unexpected error, device <dev>.	unexpected error
368	Invalid memory address, device <dev>.	invalid memory address
369	Received invalid argument, device <dev>.	received invalid argument
370	Link down, device <dev>.	link down
371	Unknown target, device <dev>.	unknown target
372	Target down, device <dev>.	target down
373	Unexpected error, device <dev>.	unexpected error
374	Failed to get port state, device <dev>.	failed to get port state
375	Failed to get port topology, device <dev>.	failed to get port topology
376	Erroneous configuration file. (<error_code>) Contents ignored!	erroneous /etc/vtl.cfg file
377	Reservation conflict: requested by id <id> WWN <wwn>, held by id <id> WWN <wwn>.	reservation conflict error
378	Illegal scsi request <req> to device <dev>, sense <code> (<qual>).	illegal SCSI request error
379	The license for this server has expired.	ProtecTIER license has expired
380	The license has been violated.	ProtecTIER license is in violation

ID	message in the error log	explanation
382	Vtf internal error: %s.	ProtecTIER VT internal error
383	Vtf internal file error: %s.	ProtecTIER VT failed to access an internal file

ID	message in the error log	explanation
423	Error on opening robot. Library name is <lib>.	error opening robot
424	Error on opening drive <drive>. Library name is <lib>.	error opening drive
485	Compressor error dumping ring.	Hyperfactor error while dumping internal trace

Glossary of terms 15

This glossary lists terms used to describe ProtecTIER.

User terms

These entries define terms that are used in the documentation and on the displays.

Terms appearing in *italics* appear as glossary entries, themselves.

administrator user	A user who has been assigned this role can perform all the functions of a manager, and can also perform administration tasks.
appliance	See <i>ProtectTIER appliance</i> .
backup application	The application running on the <i>backup server</i> . This application writes backup data to the ProtectTIER disks as though they were tape cartridges. Supported backup applications are listed in <i>Release Notes</i> .
backup server	The data center computer that runs the <i>backup application</i> . This server is connected to the ProtectTIER Appliance via Fibre Channel connections.
confirmation password	If you have invoked an operation, via the menu system, that could impact adversely on the system, you are asked to confirm the action by providing the confirmation password. If you type any other string, the operation is not performed. The confirmation password is the word <i>yes</i> .
connection properties	The TCP/IP host name or IP address of the appliance, used to connect to the appliance from the ProtectTIER Manager client.
Technical Support	Overland Storage's Technical Services and Customer Support.
HyperFactor	Diligent's patent-pending technology for detecting recurring data and storing single instances of it.
disk array	Disks on the disk arrays attached to the <i>ProtectTIER Appliance</i> are used to store data written by the <i>backup application</i> running on the <i>backup server</i> . Space on these disks is allocated as storage for <i>library</i> configuration parameters.
FC	Fibre Channel.
FC_AL	Fibre Channel arbitrated loop topology.
Fibre Channel	A serial data transfer architecture.
front-end FC port	The Fibre Channel target port through which the <i>backup server</i> is connected to the ProtectTIER Appliance.
GUI	Graphical User Interface. ProtectTIER Manager is the GUI-based client for ProtectTIER.

library	The VTLU library appears to the <i>backup application</i> as a TLU, but the storage capacity of a library is actually on disk.
LUN	Logical Unit Number. ProtecTIER virtual robots and tape drives are assigned to REO 9500D appliance front-end FC ports. Each device receives a SCSI LUN, which uniquely identifies the device in the context of the port.
manager user	A user who has been assigned this role can perform all the functions of the monitor user, and can also perform routine library management operations.
monitor user	A user who has been assigned this role can monitor the activity of the appliance, its connections and its VTLU libraries.
repository	The logical representation of the physical storage connected to ProtecTIER.
slot	An internal cartridge slot or an import/export slot.
tape virtualization	ProtecTIER software transparently directs sequential data to disk, thereby enhancing tape-based application performance, and facilitating disaster recovery. ProtecTIER emulates tape drives and a tape library and robotics.
TLU	Tape Library Unit. A VTLU library appears to the backup application as a TLU.
topology	The Fibre Channel topology on the ports can be arbitrated loop or switched fabric.
virtual cartridge	The ProtecTIER repository is configured to contain virtual cartridges which are treated by the <i>backup application</i> as real tape cartridges.
virtual device	A virtual robot or virtual tape drive.
virtual robot	Virtual robotic devices identify themselves as medium changer devices, and support all the SCSI commands relevant to robots. ProtecTIER specifically emulates the behavior of ATL P3000 tape library robotics.
virtual tape drive	Virtual tape drives identify themselves as sequential-access devices and support all the SCSI commands relevant to tape drives. ProtecTIER specifically emulates the behavior of Quantum DLT7000 tape drives.
ProtecTIER Appliance	ProtecTIER software, installed on a platform running Linux.
ProtecTIER Manager	ProtecTIER client users can log on to one or more REO 9500D appliances from a workstation running ProtecTIER's client. ProtecTIER Manager gives an overview of the configuration and data of the appliances, and can be used to perform operations on the libraries of the appliance and clusters.

ProtecTIER VT	A disk-based storage solution for applications running on open systems. Using virtualization techniques, ProtecTIER VT emulates tape library units (TLUs) and the entire tape storage and retrieval process, to the backup application running on the backup server, when in fact, the <i>backup server</i> is connected, via the REO 9500D appliance, to disk arrays and not to physical tape drives.
VTLU	Virtual Tape Library Unit. See <i>library</i> .
VTLU library	See <i>library</i> .
WWN	World wide name of a <i>Fibre Channel port</i> .

These terms are not needed to understand and use ProtecTIER. They are needed by field personnel and might be useful if a user needs to contact Technical Support.

back-end SCSI port	The SCSI (parallel SCSI, FC or iSCSI) initiator port through which disk arrays are connected to the REO 9500D appliance.
dtcutils	A component of ProtecTIER.
HBA	Host Bus Adapter. An I/O adapter situated between the host computer's bus and the Fibre Channel loop, that manages the transfer of information between the two channels.
SAN	Storage Area Network. ProtecTIER runs on a dedicated server in the SAN, effectively becoming a TLU-emulating SAN appliance that is referred to as the REO 9500D appliance.
SCSI	Small Computer System Interface. A parallel interface standard used by PCs and UNIX systems for attaching peripheral devices to computers. ProtecTIER software gives SCSI personality to each of the virtual devices defined in a VTLU library (virtual tape drives and virtual robotic arms).
SNMP	Simple Network Management Protocol. A set of protocols for managing complex networks. ProtecTIER provides SNMP compatibility.
vtl_diag	A component of ProtecTIER that processes the user's commands issued via the menu system or via ProtecTIER Manager actions.
vtfd	The vtfd daemon handles ProtecTIER Manager client users logging on to an appliance, and serves as a watch-dog for the VTL process.

Obtaining customer support 16

Overland Storage Technical Support will be better able to provide the assistance you need, if you provide all relevant information.

Perform these diagnostic steps before you contact Technical Support:

- Read the relevant product documentation.
- Reconstruct the events leading up to the problem.
- Run some test cases to reproduce the problem.

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Providing site information

Keep the following information available before calling Technical Support or your customer support representative:

User and problem identification

- your company's name and address, your name, your telephone number and email address
- the urgency of the problem, so that it can be assigned a priority level
- for a problem that has already been reported, the problem tracking ID and the name of your support representative, if these have been assigned.

Software configuration

- release level of ProtecTIER that you are running
- ProtecTIER platform type
- operating system and release number
- functions of ProtecTIER that you were using when the problem arose

Providing problem information

Be ready to provide the following information:

Scope of the problem

- whether or not you can reproduce the problem
- past occurrences of the problem
- whether ProtecTIER has worked correctly until now, or whether it has been newly installed
- if ProtecTIER worked properly in the past, provide the following information:
 - time period during which ProtecTIER worked properly
 - conditions under which ProtecTIER worked properly
 - changes to your system between the time ProtecTIER worked properly and when the problem began
- sequence of events that led to the problem

Diagnostic information

- if Technical Support has instructed you to generate a problem report, include the resulting file
- log files produced by ProtecTIER Manager, if relevant
- message numbers and complete text of any messages produced by the system
- results of tests that you have run
- other related system output
- other information that may help solve the problem

Contacting the customer support center

Contact Overland Storage Technical Support in one of the following ways to obtain assistance or to send documentation of the problem to the Overland Storage Technical Support Center:

Mail

Overland Storage, Inc.
4820 Overland Avenue
San Diego, CA 92123
USA

Phone

US: +1 585-571-5555 or US Toll Free: +1-877-654-3429
International: +1 858-571-5555 Option 5

Technical Support is available on normal business days, 6 AM through 5 PM (PST), excluding Overland holidays. At all other times we will respond to technical support calls within 4 hours.

Technical support for EMEA customers is available as well from our United Kingdom office at:

+44 (0) 118-9898050
9:00 AM to 5:00 PM (GMT)
Monday through Friday

Fax

+1-858-495-4202

E-mail

technicalsupport@overlandstorage.com

Website

<http://www.overlandstorage.com/>

Extranet

<http://support.overlandstorage.com/>

If you are not yet a member, click the New member? link and follow the instructions. It's free!

FTP site

<ftp://ftp.overlandstorage.com>

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