IBM TS7610 and TS7620 ProtecTIER® Deduplication Appliance Express

Maintenance Guide PN 38L6404, EC M13180

V3.3.6

GA32-2232-04

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This edition applies to version 3.3.6 of the IBM TS7610 and TS7620 ProtecTIER Deduplication Appliance Express system with ProtecTIER and to all subsequent releases and modifications until otherwise indicated in new editions.

Read This First

This Maintenance Information (MI) is intended for use only by trained, IBM service personnel.

Send Us Your Feedback

Send us your comments about this MI by email to *starpubs@us.ibm.com*. When sending your comments, be sure to include:

- Exact publication title
- Form number, or part number and EC level (on the back cover)
- Page numbers to which you are referring

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Homologation Statement

Attention: This product may not be certified in your country for connection by any means whatsoever to interfaces of public telecommunications networks. Further certification may be required by law prior to making any such connection. Contact an IBM representative or reseller if you have any questions.

Preface

This manual is for use by customers who maintain their ProtecTIER® V3.3.6 TS7610 Appliance Express® or TS7620 Appliance Express server.

The manuals are available on the *IBM TS7610 ProtecTIER Deduplication Appliance Express and IBM TS7620 ProtecTIER Deduplication Appliance Express Publications* CDare:

- *IBM TS7610 ProtecTIER Deduplication Appliance Express Introduction and Planning Guide*, v3.3, GA32-0914
- *IBM TS7620 ProtecTIER Deduplication Appliance Express Installation and Setup Guide for VTL, and OpenStorage Systems*, v3.3, GA32-0914
- *IBM TS7610 and TS7620 ProtecTIER Deduplication Appliance Express Service Guide*, v3.3, GA32-0915
- *IBM System Storage TS7610 ProtecTIER Service Guide,* IBM form number GA32-0778

Access instructional videos and the latest updated service information in the TS7610 Appliance Express and TS7620 Appliance Express Information Center. Go to the TS7610 Appliance Express and TS7620 Appliance Express Information Center web page at: http://pic.dhe.ibm.com/infocenter/ts7610/cust/index.jsp.

The content of this information center is also available on CD-ROM. However, information contained on the

CD-ROM might not be as current as the information available online.

- *IBM TS7610 ProtecTIER Deduplication Appliance Express and IBM TS7620 ProtecTIER Deduplication Appliance Express Customer Information Center* DVD
- *IBM TS7610 ProtecTIER Deduplication Appliance Express and IBM TS7620 ProtecTIER Deduplication Appliance Express Service Information Center* DVD

About this document

This document has instructions on how to maintain TS7610 or TS7620 Appliance Express servers.

Intended audience for this TS7620 Appliance Express, ProtecTIER V3.3.6 document

This publication is intended for customers who are maintaining their TS7610 or TS7620 Appliance Express server.

What's new in this edition

Summary of the new functions available in ProtecTIER v 3.3.6.

The following information is new in the TS7610 or TS7620 Maintenance Guide for the ProtecTIER v 3.3.6 release:

- A new procedure for setting timezone, date and time, and time server.

Getting information, help, and service

If you need help, service, technical assistance, or want more information about IBM® products, a wide variety of sources are available from IBM. Available services, telephone numbers, and web links are subject to change without notice.

Information

IBM maintains pages on the World Wide Web where you can get information about IBM products and services and find the latest technical information. For more information, seeTable 1.

Table 1. IBM websites for help, services, and information

Description	Web address (URL)
IBM home page	http://www.ibm.com Product update and fixes are available on the IBM Service website. Register for product update and fix notifications. For registration Help and FAQs: https://www.ibm.com/account/profile/us?page=faqhelp
Directory of worldwide contacts	http://www.ibm.com/planetwide

Table 1. IBM websites for help, services, and information (continued)

Description	Web address (URL)
Support for IBM System Storage® and TotalStorage products	http://www.ibm.com/storage/support **Note:** Go to this site for information about the TS7610 or TS7620 and do the steps: Under **1. Choose your products**, select: 1. Browse for a Product 2. Hardware 3. System Storage 4. Tape Systems 5. Tape Virtualization 6. TS7610 or TS7620 Deduplication Appliance Express Under **2. Choose your task**, select one of the options: • **Overview:** View product overview content • **Downloads:** Find downloads for your product • **Troubleshooting:** Troubleshoot a product issue • **Documentation:** Find product documentation • **Forums & communities:** Join forums and communities • **Planning:** Find planning information • **Installation:** Find installation information • **Usage:** Find information about how to use Under **3. See your results**, select: • View your page
IBM System Storage ProtecTIER TS7610 Customer Information Center	Go to: http://pic.dhe.ibm.com/infocenter/ts7610/cust/index.jsp

Help and service

You can call 1 (800) IBM SERV for help and service if you are in the US or Canada. You must choose the software or hardware option when calling for assistance.

Note: This product is equipped with a Software Call Home feature. When enabled, Call Home notifies IBM Service of software error events. Not all countries currently support this feature, contact your next level of support for more information.

Before calling for support, be sure to have your Software Customer Number available.

Choose the software option when you are uncertain if the problem involves TS7610 Appliance Express software or TS7610 Appliance Express hardware. Choose the hardware option *only* if you are certain the problem solely involves the TS7610 Appliance Express hardware.

When calling IBM for service regarding the TS7610 Appliance Express follow these guidelines for the software and hardware options:

Software option
: Identify the TS7610 Appliance Express as your product and supply your customer number as proof of purchase. The customer number is a 7-digit

numeric (0000000 - 9999999) assigned by IBM. When the PID is purchased, the customer number is on the customer information worksheet or on the invoice from the software purchase.

Note: If asked for an operating system, say "Storage".

CAUTION:
If you supply an incorrect customer number you might be denied support for your software. Track important information at the time of purchase.

Hardware option
Provide the serial number and appropriate 4-digit machine type for the hardware component that sent the problem notification (for example, 3959 SM1 or 3959 SM2).

Getting help online

Visit the support page for the IBM System Storage TS7600 with ProtecTIER. The support page has FAQs, parts information, technical hints and tips, technical publications, and downloadable files. See:

http://www.ibm.com/servers/storage/support/tape.

For additional websites, see “Websites” on page xviii.

Before you call for service

Some problems can be solved without outside assistance. See printed documentation that comes with the TS7610 and TS7620 Appliance Express, or by consulting the support web page.

Be sure to also read the information in any README files and release notes that come with the TS7610 or TS7620 Appliance Express server.

Getting help by telephone

With the original purchase of the IBM TS7610 ProtecTIER Deduplication Appliance Express, you have access to extensive support coverage. During the product warranty period, you can call the IBM Support Center (1-800-426-7378 in the US) for product assistance covered under the terms of the hardware IBM warranty or the software maintenance contract that comes with product purchase.

Important: The TS7610 Appliance Express) hardware components have additional support requirements and restrictions. If you experience problems with the hardware after installation, see the support information in the *IBM TS7610 and TS7620 ProtecTIER Deduplication Appliance Express User's and Maintenance Guide*, v3.3, GA32-0916.

Have the following information ready when you call:

- Either machine type and model or software identifier. The software identifier can be either the product name (TS7610 Appliance Express) or the Product Identification (PID) number.
- Either the serial numbers of the components or your proof of purchase.
- Description of the problem.
- Exact wording of any error messages.
- Hardware and software configuration information

If possible, have access to your computer when you call.

In the U.S. and Canada, these services are available 24 hours a day, 7 days a week. In the U.K., these services are available Monday through Friday, from 9:00 a.m. to 6:00 p.m. In all other countries, contact your IBM reseller or IBM marketing representative.

Websites

The most up-to-date information about your product, including documentation and the most recent downloads, can be found at the websites:

TS7610 documentation and information centers:

- The translated publications for this product are included with the product. These documents and product specification sheets are also available from the website:

  http://www-947.ibm.com/systems/support/supportsite.wss/brandmain?brandind=5345868
- You can order or download publications through the IBM Publications Ordering System at the following website:

  http://www.elink.ibmlink.ibm.com/publications/servlet/pbi.wss
- Access installation and technical support information by way of the web at:

  http://www.ibm.com/support
- Access the IBM System Storage ProtecTIER TS7610 Customer Information Center at:

  http://pic.dhe.ibm.com/infocenter/ts7610/cust/index.jsp

TS7610 hardware information:

- For the latest information about operating system and HBA support, clustering support, SAN fabric support, and Storage Manager feature support, see the DS4000 Interoperability Matrix at the website:

  http://www-03.ibm.com/servers/storage/disk/ds4000/interop-matrix.html
- Hardware troubleshooting, go to the website and search for TS7610:

  http://www-947.ibm.com/systems/support/storage/disk/
- For accessibility information, go to the website:

  http://www-03.ibm.com/able/product_accessibility/index.html

TS7610 software information:

- For product firmware and software downloads, and associated driver code, go to the website:

  http://www-947.ibm.com/systems/support/supportsite.wss/selectproduct?brandind=5000034&familyind=0&oldbrand=0&oldfamily=0&oldtype=0&taskind=1&psid=bm

Terminology

Cold-swappable components
: Components that cannot be removed or replaced while the system is running. Input/output (I/O) activity must be stopped and the server must be disconnected from the A/C power source before removal or replacement is started.

Attention: Failure to adhere to the above guidelines could result in component or system damage, data loss, or personal injury.

Customer-replaceable unit (CRU)
CRU components can safely and easily be self-serviced by the customer.

External component
External components are accessible with the server's cover in place.

Field-replaceable unit (FRU)
FRU components require a higher degree of technical expertise and system knowledge for removal and replacement than CRUs and are to be serviced by IBM personnel only.

FRU ID
Each component has a unique FRU ID (part number). In the event that you need to order a replacement CRU, or schedule a service call for a FRU, you will need to provide the FRU ID to the IBM customer support representative.

Hot-swappable components
Components that do not require stopping I/O activity or disconnecting the server from A/C power before removing or replacing.

Internal component
Internal components are located inside the server chassis, and are accessible only if the server's top cover is removed.

OpenStorage
OpenStorage allows ProtecTIER to be integrated with NetBackup to provide the means for backup-to-disk without using a virtual tape library (VTL) emulation. Using a plug-in that is installed on an OpenStorage-enabled media server, ProtecTIER can implement a communication protocol that supports data transfer and control between the backup server and the ProtecTIER server. Therefore, to support the plug-in, ProtecTIER implements a storage server emulation.

replication
A process that transfers logical objects like cartridges from one ProtecTIER repository to another. The replication function allows ProtecTIER deployment to be distributed across sites. Each site has a single or clustered ProtecTIER environment. Each ProtecTIER environment has at least one ProtecTIER server. The ProtecTIER server that is a part of the replication grid has two dedicated ethernet ports that are used for replication. Replication ports are connected to the customer's WAN and are configured on two subnets as default.

replication grid
A set of repositories that share a common ID and can potentially transmit and receive logical objects through replication. A replication grid defines a set of ProtecTIER repositories and actions between them. It is configured by using the ProtecTIER Replication Manager. The ProtecTIER Replication Manager is a software component installed on a ProtecTIER server or a dedicated host. The ProtecTIER Replication Manager should be able to recognize all of the members of the entire network that it handles on both replication subnets. The ProtecTIER Replication Manager manages the configuration of multiple replication grids in an organization. An agent on every node in each ProtecTIER server interacts with the server and maintains a table of its grid members.

Note: Customers must license the Replication features on all ProtecTIER systems participating in the replication grid whether the system is sending or receiving data (or both).

replication grid ID
A number from 0 to 63 that identifies a replication grid within an organization.

replication grid member
A repository that is a member in a replication grid.

replication policy (FSI and VTL only)
A policy made up of rules that define a set of objects (for example, VTL cartridges) from a source repository to be replicated to a target repository.

repository unique ID (RID)
A number that uniquely identifies the repository. The RID is created from the replication grid ID and the repository internal ID in the grid.

replication timeframe (FSI and VTL only)
A scheduled period of time for replication to take place for all policies.

shelf A container of VTL cartridges within a ProtecTIER repository.

TS7610 Appliance Express
The short name for IBM's self-contained virtualization solution with an integrated server and storage hardware platform, IBM TS7610 ProtecTIER Deduplication Appliance Express.

TS7620 Appliance Express
The short name for IBM's self-contained virtualization solution with an integrated server and storage hardware platform, IBM TS7620 ProtecTIER Deduplication Appliance Express.

virtual tape library (VTL)
The ProtecTIER virtual tape library (VTL) service emulates traditional tape libraries. By emulating tape libraries, ProtecTIER ProtecTIER VTL allows you to switch to disk backup without replacing your entire backup environment. Your existing backup application can access virtual robots to move virtual cartridges between virtual slots and drives. The backup application perceives that the data is being stored on cartridges while ProtecTIER actually stores data on a deduplicated disk repository.

visibility switching
The automated process that transfers the visibility of a VTL cartridge from its master to its replica and vice versa. The visibility switching process is triggered by moving a cartridge to the source library Import/Export (I/E) slot. The cartridge will then disappear from the I/E slot and appear at the destination library's I/E slot. To move the cartridge back to the source library, the cartridge must be ejected to the shelf from the destination library. The cartridge will then disappear from the destination library and reappear at the source I/E slot.

How to send your comments

Your feedback is important in helping to provide the most accurate and highest quality information.

To submit any comments about this book or any other IBM System Storage TS7600 with ProtecTIER documentation:

- Send your comments by e-mail to starpubs@us.ibm.com. Be sure to include the following information:
  - Exact publication title and version
  - Publication form number (for example, GC53-1196-03)
  - Page, table, or illustration numbers that you are commenting on with a detailed description of any information that should be changed

Chapter 1. Before you contact TS7610 or TS7620 ProtecTIER V3.3.6 customer support

This topic provides information about how to resolve hardware issues in order to avoid unnecessary calls to IBM customer support.

About this task

Before you contact IBM customer support to order a replacement component or schedule an on-site service call, review the conditions listed in Table 2:

Table 2. Easily resolved fault conditions

If you experience a problem related to...	Possible condition	Resolution
Loss of connectivity to the ProtecTIER Manager	An Ethernet cable might be disconnected from the adapter installed in Slot 3 or from the on-board Ethernet port (NIC 2).	Reconnect the cables to the applicable ports. The port LEDs illuminate.
	An Ethernet cable might be damaged or faulty.	Completely disconnect and remove the existing Ethernet cable and replace it with a new cable. The port LED illuminates.
HDD	The HDD might be improperly seated in the drive bay.	Push the HDD fully into the bay until the front of the drive is flush with the front of the server chassis. The HDD LED illuminates.
	After replacing an HDD, the new HDD did not set as the hot spare	1. Remove the drive. 2. Wait for GUI to show drive is missing. 3. Use GUI repair wizard for missing drive. This wizard will guide the user to insert the drive and it will set it to hot spare.
PSU	The power cord might be loose or unplugged from the PSU or power source.	Fully insert the power cord into the outlets on the PSU and the power source. The PSU LED illuminates.
	The PSU might be improperly seated in the bay.	Push the PSU into the bay until it is fully inserted. The PSU LED illuminates.
Cooling fan	The fan might be improperly seated in the fan tray.	Perform substeps a and b of step 1 on page 56. Check to see that the fan is properly seated then perform substep b of step 2 on page 57.

Table 2. Easily resolved fault conditions (continued)

If you experience a problem related to...	Possible condition	Resolution
RAID BBU	The internal cable from the BBU to the MegaRAID controller might may be disconnected.	Perform step 1 on page 66 and substeps a and b of step 2 on page 66. Check to make sure that the cable from the RAID controller to the BBU is securely connected then perform substep f of step 3 on page 66 and step 4 on page 67.
DIMM	One or more DIMMs might be improperly seated in the slot.	Perform step 1 on page 52 and substeps a and b of step 2 on page 52. Check to make sure each of the DIMMs is fully seated then perform substeps d and e of step 3 on page 54 and step 4 on page 55.
Dual-port Ethernet adapter	An Ethernet cable might be disconnected from the adapter installed in Slot 3 or from the on-board Ethernet port (NIC 2).	Reconnect the cables to the applicable ports. The port LEDs illuminate.
	An Ethernet cable might be damaged or faulty.	Completely disconnect and remove the existing Ethernet cable, and replace it with a new cable. The port LEDs illuminate.
Fibre Channel HBA	One, or both, of the Fibre Channel cables might be disconnected from the adapter installed in Slot 5.	Reconnect the cables to the adapter.
	One, or both, of the Fibre Channel cables might be damaged or faulty.	Completely disconnect and remove the existing Fibre Channel cables and replace them with new cables. The port LEDs illuminate.

If none of the conditions listed in Table 2 on page 1 apply or after you try the suggested resolution, the problem persists, contact IBM customer support. Refer to "Ordering a replacement CRU or scheduling a FRU service call" for information and instructions.

Ordering a replacement CRU or scheduling a FRU service call

This topic provides information about how to order a replacement component or schedule an on-site service call.

About this task

If a component must be repaired or replaced, contact IBM customer support. The IBM Customer Support Representative (CSR) can assist you in placing an order for a new CRU, or scheduling an on-site service call for a FRU. When you contact IBM, you might be asked to provide some or all of the following information:

- Machine type (3959)
- Machine model (SM1) or (SM2)
- Machine serial number (typically found on a bar-coded label attached to the top or rear of the server chassis)
- Component name or type, and FRU ID (found in the ProtecTIER Manager alert windows, the email and SNMP trap reports).

  Note: The FRU ID (part number) for both CRU and FRU components, is expressed as a FRU ID.
- Name, phone number, address, and ZIP code of the location where the hardware is installed. (*For example: Do not provide information for the home office of your company if the hardware is installed in a branch office*.)

To contact IBM customer support:

Procedure

1. Visit **www.ibm.com/planetwide**.

   You will see the **IBM Directory of worldwide contacts**.
2. Click the **View by Alpha order** or **View by Region** tabs to display the contacts list in the format you prefer.
3. Select your location from the alphabetic or regional list.

   Your regional contact page displays.
4. Proceed as appropriate:
   - If a **Customer support** link is provided on your regional contact page:
     a. Click the link.

        Your regional **Customer Support Online** page displays.
     b. Dial the number provided in the **Other support request** box.
     c. Go on to step 5.
   - If a **Customer support** link is not provided on your regional contact page:
     a. Dial the number provided for obtaining hardware support.
     b. Go to step 5.
5. Respond to the voice prompts by making selections or entering information.

   When you have completed the series of prompts, you are connected with an IBM CSR. The CSR will ask you for additional information and issue you a reference number. One of two support methods occur:
   - You are immediately transferred to an IBM Technical Services Representative (TSR) who can assist you with placing your order or scheduling a service call.
   - An IBM TSR will call you back and assist you with placing your order or scheduling a service call.

   If you ordered a new CRU, the component is shipped to the address you provided. Refer to the applicable instructions in "Ordering a replacement CRU or scheduling a FRU service call" on page 2 when you are ready to perform the replacement.

   If you scheduled a service call, an IBM System Services Representative (SSR) will come to your facility at the agreed-upon date and time, to repair or replace the defective FRU.

Chapter 2. Troubleshoot by using ProtecTIER V3.3.6 diagnostic tools

This section explains how to use ProtecTIER Service Menu and ProtecTIER Manager to troubleshoot the TS7610 Appliance Express or TS7620 Appliance Express server.

About hardware alerts

This section contains information about the alerts which the system issues when a hardware component fails.

About this task

If hardware degradation or failure occurs, the components listed in Table 3 on page 6, generates one or more of the following types of alerts:

- Beeps or other audible indicators
- Changes in LED state
- Hardware faults reported through the ProtecTIER Manager
- Email alerts or SNMP trap reports (if you enabled either, or both, of these options during system configuration)

Important: Fault occurrences in the MegaRAID controller, SAS expander, Fibre Channel adapter, Ethernet adapter, or DIMM might prevent communication between ProtecTIER Manager and the server. As a result, ProtecTIER Manager might not be able to report the hardware fault.

Because of this limitation, enabling email alerts and SNMP reports is recommended. By doing so, you receive fault notifications regardless of ProtecTIER Manager availability. Email alert and SNMP report messages might take up to 45 minutes to arrive after a fault occurrence. The alert (or report) provides information about the faulty component, the nature of the fault, and suggestions for resolution.

To enable email alerts or SNMP traps, refer to the chapter on ProtecTIER configuration, in the *IBM TS7620 ProtecTIER Deduplication Appliance Express Installation and Setup Guide for VTL, and OpenStorage Systems*, v3.3, GA32-0914.

This table provides an overview of the types of alerts each component generates.

- Components identified by a square (■) has those alert options.
- Components identified by a triangle (▲) might generate an alert in ProtecTIER Manager. This type of failure can be seen as an LED change or in an email alert/SNMP trap report.
- If the component cell in the table does not contain a square or triangle, then that type of alert does not occur. For example there is no audible alarm for dual-port Ethernet adapter.

Refer to step 1 on page 9 for information about using ProtecTIER Manager alert windows, email alert messages, and SNMP trap reports.

Table 3. Alerts by component type

Component	Type	Audible alarm	LED change	ProtecTIER Manager	Email alert / SNMP trap report
1 TB SATA hard disk drives (HDDs)	CRU	■	■	■	■
Power supply units (PSUs)	CRU	■	■	■	■
Cooling fans	CRU	■	■	■	■
Dual-port Ethernet adapter	CRU		■	▲	■
RAID battery backup unit (BBU)	CRU		■	■	■
Dual in-line memory modules (DIMMs)	CRU		■	▲	■
USB portable DVD drive	CRU		■		
Fibre Channel host bus adapter (HBA)	FRU	■	■		■
MegaRAID controller	FRU				■
SAS expander	FRU				■
Internal boot drive	FRU			■	■

Where to go for information

About this task

In addition to using the step-by-step procedures provided in this document, you can access instructional videos that demonstrate removing and replacing the HDDs and PSUs. The videos, located in the **Resolution guides,** are easily accessible from ProtecTIER Manager. Instructions for accessing the Resolution guides are provided in "Accessing the Resolution guides from the ProtecTIER Manager Node menu" and "Accessing the Resolution guides from the Hardware faults window" on page 8.

Instructional videos demonstrating CRU replacement, are available online in the TS7610 Information Center at: http://pic.dhe.ibm.com/infocenter/ts7610/cust/index.jsp.

Accessing the Resolution guides from the ProtecTIER Manager Node menu

About this task

Note: The Resolution guides provide information and instructions for resolving HDD and PSU faults, only. The guides are accessible only when ProtecTIER Manager communicates with the affected server. If ProtecTIER Manager is not available, use email alerts or SNMP reports.

Procedure

1. If it is not already running, launch ProtecTIER Manager as described in 1 on page 9.
2. Log in to the system that includes the TS7620 Appliance Express server (node) with the faulty component, as described in 3 on page 10.
3. Return to this page and continue with step 4 on page 7.

4. On the menu bar at the top of the ProtecTIER Manager window, click: **Node** > **Hardware**.

   The list of Resolution guides, displays:

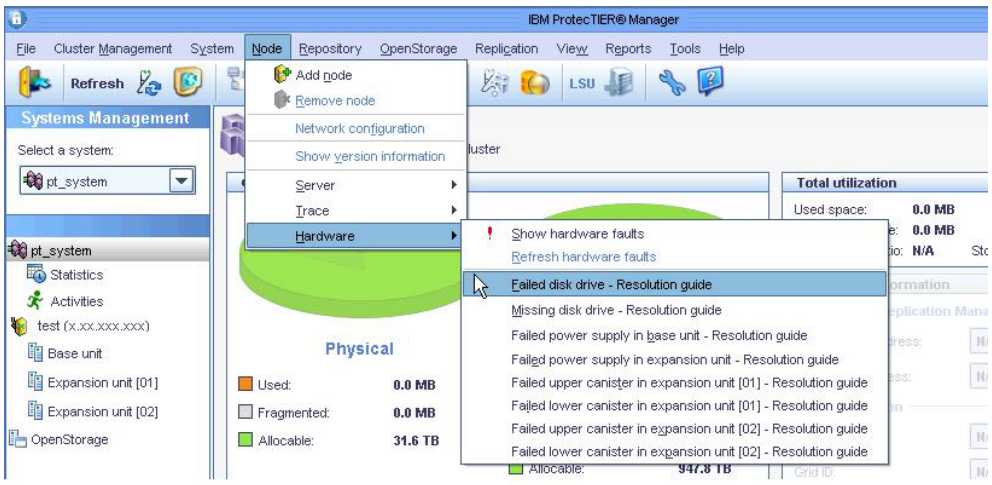

Figure 1. Resolution guides

5. Select the guide that is applicable for the task you must perform.

   The guide opens with information and instructions for the task displayed, as shown:

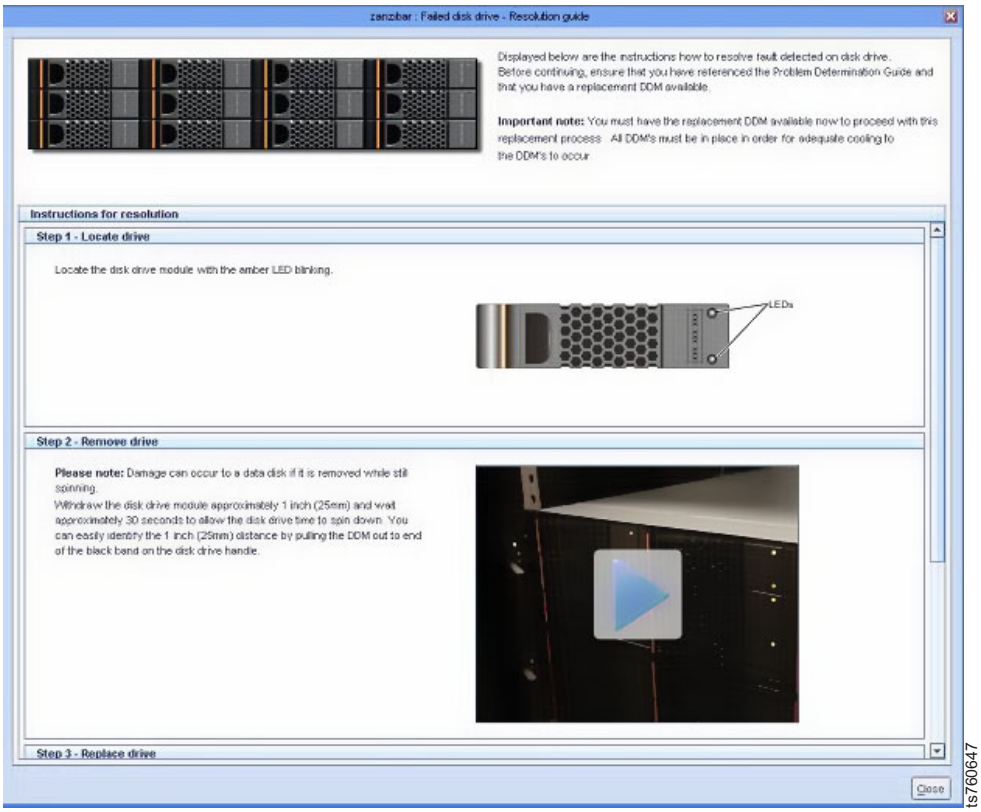

Figure 2. Failed disk drive Resolution guide

6. Scroll down to display any content not currently visible in the window.

7. Click the  (play button) to start the video.
8. When you are finished with the Resolution guide, click **Close.**

Accessing the Resolution guides from the Hardware faults window

About this task

Note: The Resolution guides provide information and instructions for resolving HDD and PSU faults, only. The guides are accessible only when the ProtecTIER Manager can communicate with the affected server. If the ProtecTIER Manager is not available, refer to email alerts or SNMP reports.

Procedure

1. If it is not already running, launch ProtecTIER Manager as described in 1 on page 9.
2. Log in to the system that includes the TS7620 Appliance Express server (node) with the faulty component, as described in 3 on page 10.
3. Return to this page and continue with step 4.
4. Click the **Hardware faults** button at the bottom of the ProtecTIER Manager window.

   The **Hardware faults** window displays, with all hardware faults for the selected server, listed.
5. In the **Actions** column for an HDD or PSU, click the **Resolve fault** link.

   Note: If the **Actions** column is not currently visible, scroll the display to the right.

   The **Resolution guide** for the selected component type displays.
6. Read the information in the guide.
7. Click the  (play button) to start a video.
8. Follow the instructions provided to resolve the fault condition.
9. When you finished performing the required actions, return to the **Resolution guide**.
10. Click the **Recheck Faults** button.

    A confirmation dialog box displays.
11. Click **Yes** to continue.

    The **Refresh Action** dialog box displays, indicating that the refresh is in progress. When the refresh completes, the dialog box closes.

    The **Hardware faults** window displays. If your actions successfully resolved the fault, the associated hardware alert is no longer displayed.
12. When you are finished with the **Resolution guide**, click **Close**.

Accessing instructional videos and other information in the Information Center

Procedure

1. Go to the TS7620 Appliance Express Information Center web page at: http://pic.dhe.ibm.com/infocenter/ts7610/cust/index.jsp.

2. Follow the navigation instructions provided on the Information Center page to locate and open the videos.
3. Click the  (play button) to start the video.
4. When you are finished with the **Resolution guide,** click **Close.**

Receiving and responding to hardware alerts

Upon receiving an alert, you must identify which component generated the alert (if it is not readily apparent). Analyze the cause and severity of the fault, and decide on a course of corrective action. Methods for doing so are described in the sections that follow.

ProtecTIER Manager Hardware Resources window

About this task

The Hardware resources window provides information such as component status, FRU ID (part number), and resource fault details; for all of the CRU components, and many of the FRU components.

When ProtecTIER Manager communicates with the server on which one or more hardware faults have occurred, the information provided in the Hardware resources window helps identify, diagnose, and resolve the problem.

If ProtecTIER Manager is unavailable, and your system is configured for email alerts or SNMP traps, refer to the hardware fault alert and resolution information provided in those resources. See “Email alerts” on page 13 and “Using SNMP traps” on page 14, for more information.

Use this procedure to access the Hardware resources window.

Procedure

1. If ProtecTIER Manager is not running, launch it using this method :
   - **On a Windows-based PC**, click: **Start** > **All Programs** > **IBM** > **ProtecTIER Manager** > **IBM ProtecTIER Manager**.
   - **On a Linux-based PC**, double-click the **ProtecTIER Manager** icon on the Linux Desktop.

   The **ProtecTIER Manager** window opens.
2. Log in to the system that includes the TS7610 Appliance Express orTS7620 Appliance Express ProtecTIER V3.3.6 server (node) with the faulty component.

   Note: If you are unsure which system contains the faulty node, log in to each system in turn, until you find the system that has its name displayed in red text in the **Systems** list.
   a. In the left-side navigation pane of the ProtecTIER Manager, click the applicable system.

      The **Login to system** dialog box opens.
   b. Click **Login**.
   c. In the **Username** field, type: **ptadmin**
   d. In the **Password** field, type: **ptadmin**
   e. Select the **Save password** checkbox, click **Ok**, and then wait while ProtecTIER Manager saves your information and logs you into the system.

The message displayed:

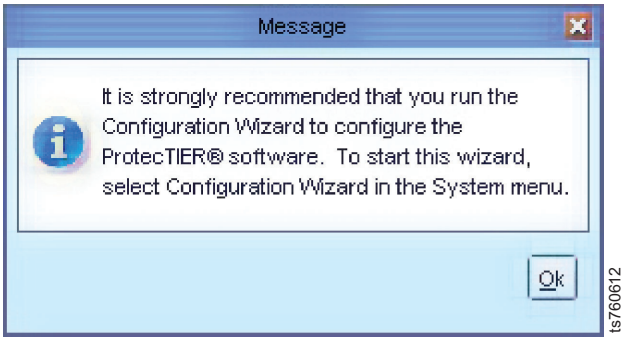

Figure 3. Configuration wizard reminder

f. Click **Ok** to dismiss the message.

3. In the **Nodes** section of the **Systems Management** pane, click the TS7610 Appliance Express or TS7620 Appliance Express server on which a fault has occurred. Nodes with faults appear in red in the list, as shown:

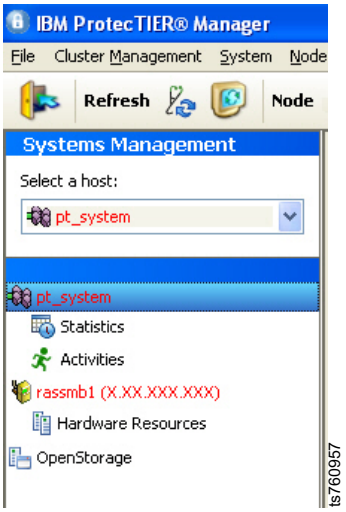

Figure 4. Faulty nodes displayed in red

The **ProtecTIER Manager** window refreshes and changes to **Nodes** view, with information for the selected server displayed.

4. In the **Hardware resources** window, click the tab in the middle pane of the ProtecTIER Manager for the component for which you need information.

   You might see these icons if the selected component is degraded ( ) or has failed ( ), or has another type of fault.

   In the next example, the disk drive component was selected and disk drive 12 has a small blue information icon. To see details of the information warning, scroll to the pane on the right.

   ProtecTIER Manager shows disk drive 12 is rebuilding.

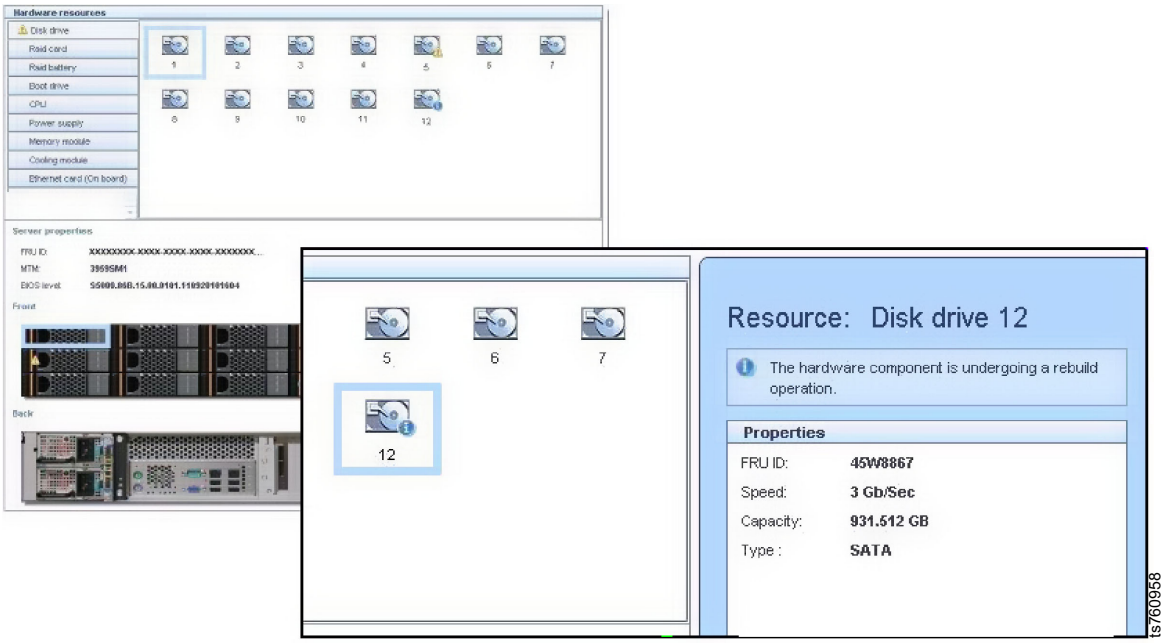

Figure 5. Hardware resources window, disk drive 12 rebuilding

The following example shows the disk drive component where all the disk drives are working.

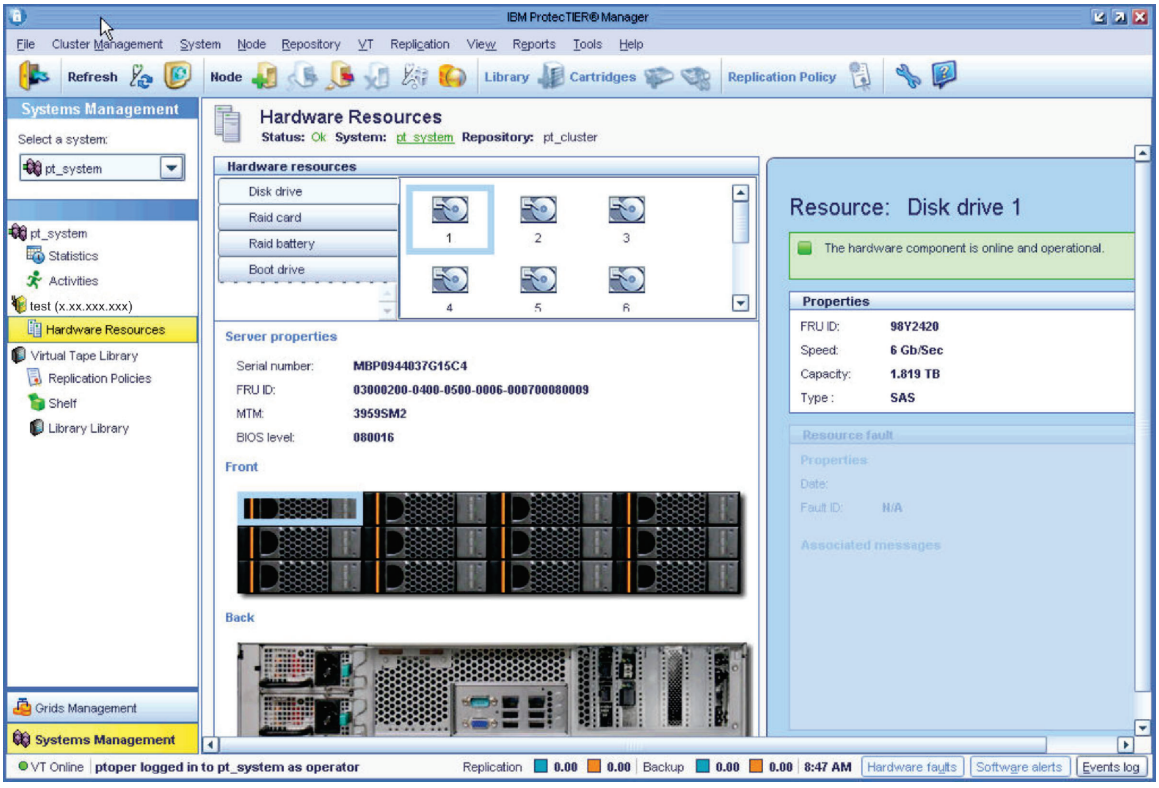

Figure 6. Hardware resources window

5. In the **Resource** pane, on the right side of the window:
   a. Note the name of the component that generated the alert.
   b. Read the problem description to determine what caused the alert.

c. Under **Properties**, note the **FRU ID**.

   Note: The FRU ID (part number) for both CRU and FRU components, is expressed as a FRU ID.

d. Under **Resource fault**, read the information in the **Associated Messages** area, and follow any instructions provided.

6. When you are finished reviewing fault and component information, use one of the following methods to exit the ProtecTIER Manager:
   - Click **File** > **Exit**.

     OR
   - Click the **X** in the upper-right corner of the window.
7. Verify that the alert received was not caused by an easily resolved condition, such as a loose power cord or a defective cable.

ProtecTIER Manager Hardware Faults window

About this task

The Hardware faults window provides information on all of the hardware faults currently in effect for the specified server. When the ProtecTIER Manager is able to communicate with the server on which one or more hardware faults has occurred, the information in the Hardware faults window may help you to identify, diagnose, and resolve the problem. If the ProtecTIER Manager is unavailable, and your system is configured for email alerts or SNMP traps, refer to the hardware fault alert and resolution information provided in those resources.

Use the procedures below to access the Hardware faults window.

Procedure

1. If it is not already running, launch PT Manager as described in ProtecTIER Manager Hardware Resources window.
2. Login to the system that includes the TS7610 Appliance Express or TS7620 Appliance Express server (node) with the faulty component, as described in 2 on page 9.
3. Select the server (node) on which the fault occurred, as described in 3 on page 10.
4. When the **Nodes** view displays, click the **Hardware faults** button, located at the bottom right of the **ProtecTIER Manager** window.

   The **Hardware Faults** window opens, with one or more fault messages displayed in the **Associated messages** column:

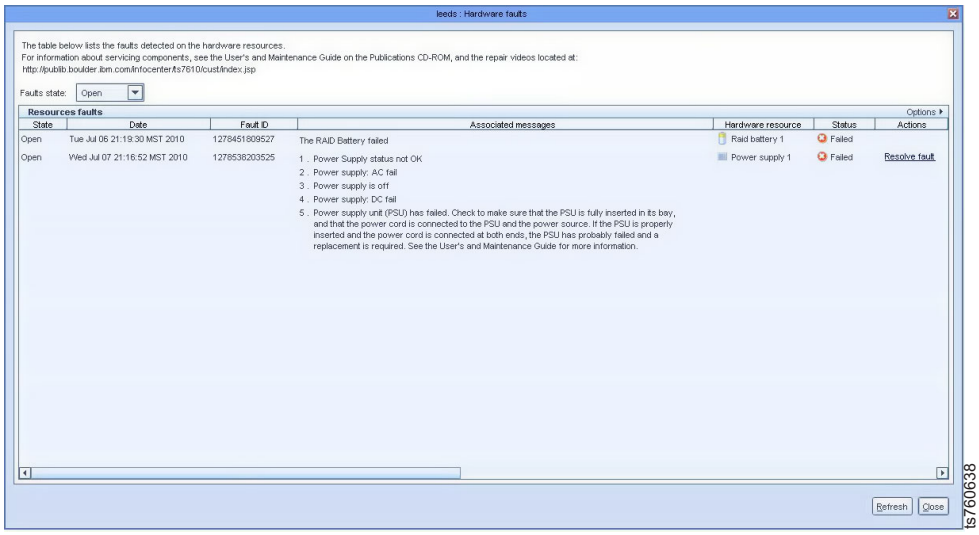

Figure 7. Hardware faults window

5. Review the information provided, and make note of the defective components name (or type) and FRU ID.

   Note: The FRU ID (part number) for both CRU and FRU components, is expressed as a FRU ID.
6. Verify the alert received was not caused by an easily-resolved condition, such as a loose power cord or a defective cable.
7. Refer to 4 on page 7

Email alerts

About this task

In the event of hardware degradation or failure, systems configured to use email alerts will send a problem report message to the designated alert recipient(s). Email alerts allow you to receive hardware fault notifications, whether or not you have access to the ProtecTIER Manager. When a hardware fault occurs, the system generates and sends a problem report, similar to the one shown in Figure 8:

```
The following hardware alert has been issued for the indicated IBM TS7610 Deduplication Appliance Express.
Alert issued for part: Node 0/Enclosure 63,Eth Card 1

# Report time and date.................= 07/09/10 09:15:02 MST
# Source Host Name.....................= rassmb1
# Source IP............................= 9.11.219.152
# Business/Company Name................= A
# Customer Number......................= 2,USA
# Product serial number................=
# Product Software ID..................= 5639-TAA
# Product Machine Type and Model ......= 39595M1
# Date and Time of fault occurrence.....= 07/09/10 08:50:09 MST
# Problem ID...........................= 1278690619611
# Problem Type.........................= Hardware
# Alert issued for part................= Node 0/Enclosure 63,Eth Card 1
# Failing part FRU id..................= 39Y6127
# Problem Severity.....................= FAILED
# SRN..................................= 0xAA030001
# Problem Description..................= Adapter link is down. Verify cabling
```

ts760637

Figure 8. Email alert

Procedure

1. Upon receiving an email alert:
   a. Open the message and review the information provided in the report.

b. Make note of the defective components name (or type) and FRU ID.

   Note: The FRU ID (part number) for both CRU and FRU components, is expressed as a FRU ID.

2. Verify the alert received was not caused by an easily-resolved condition, such as a loose power cord or a defective cable.

Using SNMP traps

About this task

If a hardware or software degradation or failure ocurs, ProtecTIER systems, which are configured to use Simple Network Management Protocol (SNMP) can send a problem notification to designated recipients. SNMP notifications, or traps, can be sent even if the ProtecTIER Manager interface is unavailable.

To use SNMP traps, you need the following items:

- SNMP trap receiver software that is installed on an SNMP trap server. Follow the instructions from the manufacturer to install and configure the SNMP trap receiver software.
- The file name and location of the management information base (MIB) file for the SNMP trap receiver. On the ProtecTIER server, the file name is: `IBM-TS7600-SNMP-MIBV2.mib` in: `/usr/share/snmp/mibs`. The full path is: `/usr/share/snmp/mibs/IBM-TS7600-SNMP-MIBV2.mib`.
- The `IBM-TS7600-SNMP-MIBV2.mib` file needs to be copied onto the SNMP trap receiver and the trap receiver software must point to the directory location of the MIB file for translation of the trap messaging.
- SNMP trapping enabled on one or more of your ProtecTIER servers. Use the ProtecTIER Manager Configuration wizard to enable the SNMP trap option on 3959 SM1 servers. See the *IBM TS7620 ProtecTIER Deduplication Appliance Express Installation and Setup Guide for VTL, and OpenStorage Systems*, v3.3, GA32-0914 for instructions on SNMP configuration. For 3958 AP1 or 3958 DD4 servers, see the *IBM ProtecTIER User's Guide for Enterprise Edition and Appliance Edition*, V3.3.6, GA32-0922.

The ProtecTIER servers have the following improvements in SNMP support.

- ProtecTIER software events that send specific notifications that are based on the error that occurred.
- ProtecTIER hardware events that trigger specific notifications are based on the error that occurred, such as a processor event or power event.
- Send enough detailed information with the SNMP notification so that you can understand the problem. The ProtecTIER Manager Configuration menu gives you the option to filter SNMP traps that are based on severity.
  - Error-level severities can be filtered by:
    - Error
    - Warning
    - Information
    - Software error categories include the following:
      - VTL
      - Replication
      - OpenStorage
      - FSI

        - Repository storage
        - Cluster
        - System
      - Hardware error categories include the following:
        - Processor memory module
        - Cooling module (fan)
        - Internal boot drives
        - Ethernet cards
        - Power supplies
        - RAID card
        - RAID battery
        - Front-end adapter, if VTL enabled
        - General server errors
        - General network errors
        - Ethernet switch, if cluster enabled with SMC switch (TS7650 or TS7650G only)
        - Network power switch, if cluster enabled with new network power switch (TS7650 or TS7650G only)
        - 3958 AP1 specific
        - Back-end adapter (TS7650 or TS7650G only)
        - Disk controller (TS7650 or TS7650G only)
        - Disk expansion (TS7650 or TS7650G only)
        - 3959 SM1 specific
        - SAS expander
        - SATA hard disk drives
    - Warning-level severity includes the following:
      - Replication warnings
      - VTL warnings
      - OpenStorage warnings
      - FSI warnings
      - Capacity warnings
      - RAS warnings
    - Information-level severity includes the following:
      - VTL configuration change events
      - OpenStorage configuration change events
      - FSI configuration change events
      - Replication events
- SNMP in ProtecTIER version 3.1 or higher supports threshold monitoring and allows the user to specify thresholds for the following system runtime behavior:
  - Repository space issues
    - Nominal capacity
    - Physical capacity
  - There are two threshold levels a user can set:
    - Information level: a trap is sent when the repository regains free space and rises about the information level.

- Warning level: a trap is sent when the free space in the repository falls below the warning level

  – Going below the informational threshold issues an SNMP trap only if the warning threshold is crossed. This method is to ensure that the user is not flooded with alerts when the normal operation crosses the low water mark threshold frequently.

  – Capacity thresholds can be set specifying % from the repository or specifying space (GBs).

- Using an IBM-registered management information base (MIB) file.
  – The MIB file is implemented in a tree structure and has a unique OID for each message supported.
  – The MIB file ships on the ProtecTIER server.
- Provide reporting to the network management application software.
- Improved communication options:
  – SNMP traps are sent through the customer network (eth0) by using the UDP protocol.
  – By default, port 162 is used and up to five destinations are supported.
  – Customers can optionally select a different port for SNMP traffic by using the ProtecTIER Manager Configuration menu.

On systems that are configured to use SNMP traps, an agent monitors the ProtecTIER server and reports fault information to a network management application. Periodically the data is sent to the designated SNMP server in the form of an SNMP trap report, a portion of which is shown in Figure 9 on page 17. SNMP trap reports notify you of hardware or software faults even if you do not have access to the ProtecTIER Manager interface. The display format of the trap report varies between different trap receiver software applications. Your trap report might not look exactly like the following example.

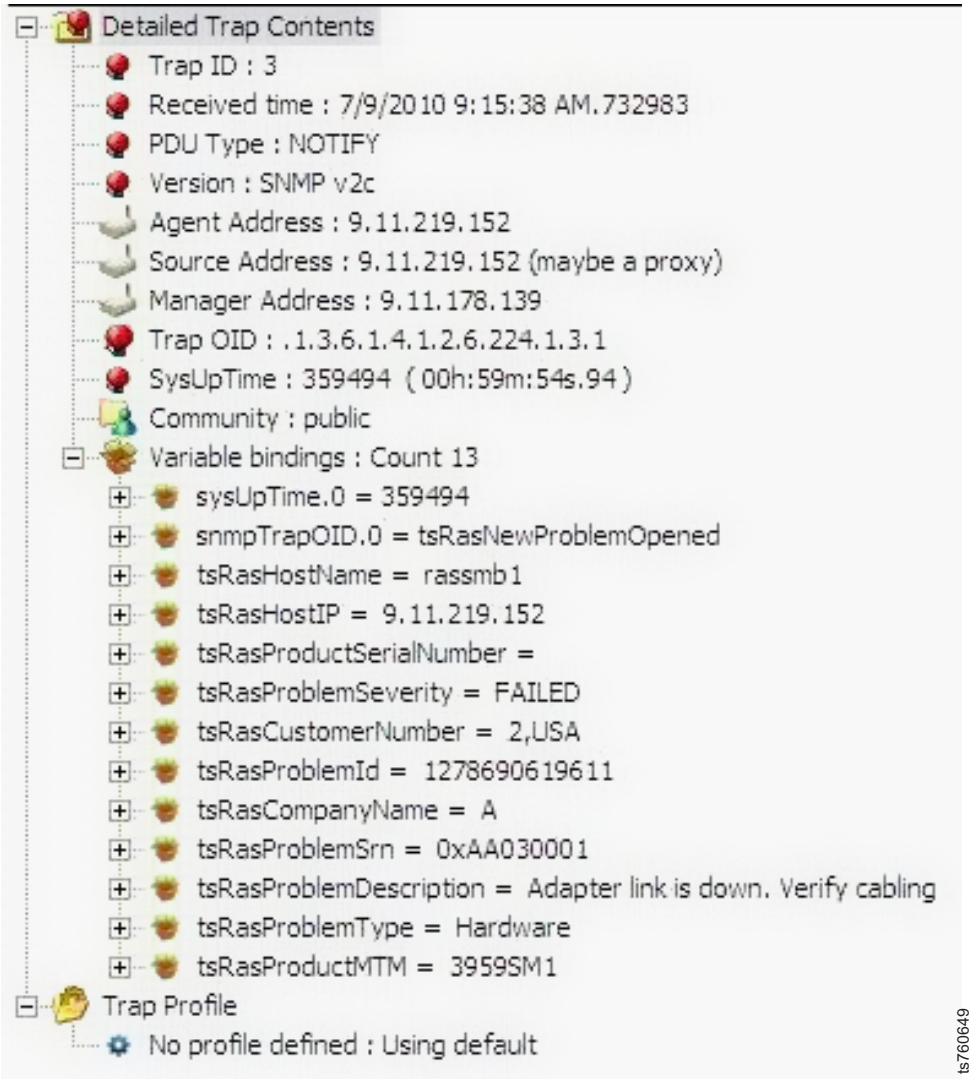

Figure 9. SNMP trap report

Procedure

1. Run the SNMP trap catcher program on the SNMP server.
2. Open the SNMP report and review the information.
3. Make note of the defective component's name (or type) and FRU ID.

   Note: The FRU ID (part number) for both CRU and FRU components, is expressed as a FRU ID.
4. Verify that the alert received was not caused by an easy to resolved condition, such as a loose power cord or a defective cable.

Verifying hardware faults

About this task

Procedure

1. If necessary, start **ProtecTIER Manager** and log into the system that includes the TS7620 Appliance Express server (node) with the faulty component.

For detailed ProtecTIER Manager login instructions, refer to *IBM TS7610 and TS7620 ProtecTIER Deduplication Appliance Express User's and Maintenance Guide*, v3.3, GA32-0916.

Note: If you are unsure which system contains the faulty node, log in to each system in turn, until you find the system that has it's name displayed in red text in the Systems list.

2. In the **Systems Management** pane, click the TS7620 Appliance Express server on which a fault has occurred. Nodes with faults appear in red in the list, as shown below:

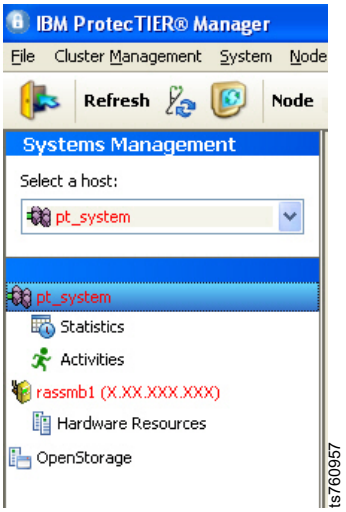

Figure 10. Faulty nodes displayed in red

The **ProtecTIER Manager** window refreshes and changes to **Nodes** view, with information for the selected server displayed.

3. Make sure the alert you received was not caused by an easily-resolved condition, such as a loose power cord or a defective cable.
4. The FRU ID for both CRU components and FRU components is expressed as a FRU ID. To find the FRU ID of the defective component:
   a. Select **Hardware Resources** in the ProtecTIER Manager navigation menu on the left.
   b. Select the specific hardware resource in the middle pane of the ProtecTIER Manager window.
   c. The FRU ID appears in the ProtecTIER Manager **Resource** pane on the right.

Tip: You can watch instructional videos of the procedures by going to the IBM System Storage TS7610 ProtecTIER Deduplication Appliance Express Customer Information Center.

ProtecTIER Service menu health monitoring and problem notification

This section explains ProtecTIER Service menu system health monitoring and problem notification tools.

About this task

Complete the following steps to access the Health Monitoring menu. Use Health Monitoring to either diagnosis a hardware problem or verify if hardware replacement fixed the problem

Health Monitoring

Procedure

1. If necessary, power-on the server and the monitor, and wait for the login prompt to display.

   For power-on instructions, see "TS7610 or TS7620 power off sequence" on page 27.
2. Access the **ProtecTIER Service Menu** with a monitor and keyboard plugged into the TS7610 Appliance Express or TS7620 Appliance Express server. Log on with ID **ptconfig**, password **ptconfig**
3. When the **ProtecTIER Service Menu** appears, select the **ProtecTIER Configuration** option.

```
--------------------------------------------------------------------------------
 ProtecTIER Service Menu running on rassmx
--------------------------------------------------------------------------------
  1) ProtecTIER Configuration (...)
  2) Manage ProtecTIER services (...)
  3) Health Monitoring (...)
  4) Problem Alerting (...)
  5) Version Information (...)
  6) Generate a service report
  7) Generate a system view
  8) Update ProtecTIER code

  E) Exit
--------------------------------------------------------------------------------
>>> Your choice?
```

4. Select **Health Monitoring.**

   Health Monitoring contains the following options:
   - Display system health summary - this option reports the current state of the system, without underlying components details
   - Display detailed system health state - this option reports the current state of the system, with details of all the underlying components
   - Run a full system check - this option reports the state of the all the hardware components
   - List open problems - this option lists hardware or system problems
   - Service mode - Select this option before servicing the system to prevent adding false system errors during system maintenance. Exit this mode once system maintenance is done.

```
--------------------------------------------------------------------------------
 ProtecTIER Service Menu running on rassmx
 Health Monitoring (...)
--------------------------------------------------------------------------------
  1) Display system health summary
  2) Display detailed system health
  3) Run a full system check
  4) List open problems
  5) Service Mode

  B) Back
  E) Exit
--------------------------------------------------------------------------------
>>> Your choice?
```

Select **Run a full system check**.

5. If a disk drive is missing or defective, you might see this when you run your health check. This example shows that disk drive 5 is missing.

```
+----------------------------------------+
>>> Your choice? 1
Begin Processing Procedure
TS7610 Checkout Version 7123.122-0 executed on: 2011-05-05T20:36:10
================================================
Summary of NON-OK Statuses:
Offline 0
Failed 0
Unknown 0
Degraded 0
Rebuilding 0
Missing 1
================================================
Verify state of DDM 5 (Node 0/Enclosure 8).............MISSING
============================================================
*MISSING: Component Location: Node 0/Enclosure 8/DDM5
*MISSING: FRU ID: 45W8867
*MISSING: Enclosure 8
*MISSING: capacity: 931.512
*MISSING: speed: 3.0
*MISSING: capacityUnit: GB
*MISSING: SpeedUnit: Gb/s
*MISSING: diskType: SATA
*MISSING: SRN: 0xAA100001
*MISSING: The hard disk drive is missing. Check that the disk drive is
*MISSING: present in the dive bay and is properly seated. If not
properly
*MISSING: seated, try reseating the drive. See User's and Maintenance
*MISSING: Guide for more information.
================================================
```

6. If disk drive 12 has been replaced and you rerun the health check, the health check report shows that disk drive 12 is rebuilding.

```
+----------------------------------------+
>>> Your choice? 1
Begin Processing Procedure
TS7610 Checkout Version 7123.122-0 executed on: 2011-05-05T22:46:17
================================================
Summary of NON-OK Statuses:
Offline 0
Failed 0
Unknown 0
Degraded 0
Rebuilding 1
Missing 0
================================================
Verify state of DDM 12 (Node 0/Enclosure 8).............REBUILDING
============================================================
*REBUILDING: Component Location: Node 0/Enclosure 8/DDM12
*REBUILDING: FRU ID: 45W8867
*REBUILDING: Enclosure 8
*REBUILDING: capacity: 931.512
*REBUILDING: speed: 3.0
*REBUILDING: capacityUnit: GB
*REBUILDING: SpeedUnit: Gb/s
*REBUILDING: diskType: SATA
================================================
End Processing Procedure
```

7. Once a component has been successfully replaced or rebuilt than you will see this output when you rerun your health check:

```
TS7610 Checkout Version 7123.122-0 executed on: 2011-05-05T24:46:17
================================================
Summary of NON-OK Statuses:
Offline 0
Failed 0
Unknown 0
Degraded 0
Rebuilding 0
Missing 0
================================================
```

8. To exit the system **ProtecTIER Configuration** menu, type: **E <enter>**.
   You are then returned to the server command prompt.

Problem Alerting

Procedure

1. If necessary, power-on the server and the monitor, and wait for the login prompt to display.
   For power-on instructions, see "TS7610 or TS7620 startup" on page 29.

2. Access the **ProtecTIER Service Menu** with a monitor and keyboard plugged into the TS7610 Appliance Express or TS7620 Appliance Express server. Log on with ID **ptconfig** password **ptconfig**
3. When the **ProtecTIER Service Menu** appears, select the **ProtecTIER Configuration** option.

```
--------------------------------------------------------------------------------
 ProtecTIER Service Menu running on rassmx
--------------------------------------------------------------------------------
  1) ProtecTIER Configuration (...)
  2) Manage ProtecTIER services (...)
  3) Health Monitoring (...)
  4) Problem Alerting (...)
  5) Version Information (...)
  6) Generate a service report
  7) Generate a system view
  8) Update ProtecTIER code

  E) Exit
--------------------------------------------------------------------------------
>>> Your choice?
```

4. Select **Problem Alerting.**

   The system **Problem Alerting** contains the following options:

   - Enable/Disable Call Home - depending on your current Call Home state, select this option to either enable or disable Call Home
   - Send a Test Call Home
   - Configure Call Home Heartbeat frequency - sets how often the Call Home communication path is checked
   - Send a Heartbeat Call Home - this option checks the Call Home communication path
   - Enable/Disable Notification by email - depending on your current Notification by email state, select this option to either enable or disable Notification by email
   - Test Email Notification - sends a test email to verify email address
   - Activate Call Home Polling Function

```
--------------------------------------------------------------------------------
 ProtecTIER Service Menu running on rassmx
 Problem Alerting (...)
--------------------------------------------------------------------------------
  1) Enable/Disable Call Home
  2) Send a Test Call Home
  3) Configure Call Home Heartbeat frequency
  4) Send a Heartbeat Call Home
  5) Enable/Disable Notification by email
  6) Test Email Notification
  7) Activate Call Home Polling Function

  B) Back
  E) Exit
--------------------------------------------------------------------------------
>>> Your choice?
```

5. To exit the **Problem Alerting** menu, type: **E <enter>**.

   You are then returned to the server command prompt.

ProtecTIER V3.3.6 Call Home

IBM recommends that you enable the Call Home feature on each of your ProtecTIER servers. Doing so speeds-up problem determination and fault resolution. When enabled on the TS7610 Appliance Express and TS7620 Appliance Express, Call Home uses a connection on your Ethernet network to transmit hardware and software problem reports to IBM. For detailed instructions on enabling Call Home on your TS7610 Appliance Express and TS7620 Appliance Express servers, see the *IBM TS7620 ProtecTIER Deduplication Appliance Express Installation and Setup Guide for VTL, and OpenStorage Systems*, v3.3, GA32-0914.

When the Reliability, Availability, and Serviceability (RAS) software on the TS7610 Appliance Express and TS7620 Appliance Express server detects an error condition, Call Home sends detailed error information to IBM (home). If the error indicates a problem with a field replaceable unit (FRU), an IBM Service Representative can then prepare an action plan to handle the problem before traveling to your site.

The TS7610 Appliance Express and TS7620 Appliance Express provides three Call Home capabilities: Problem Call Home, Heartbeat Call Home, and Test Call Home; described below. RAS sends data files that may be helpful to IBM Support Center personnel for all three types of Call Home. These data files include error logs and configuration information, such as the Machine Reported Product Data (MRPD) log.

The customer can also chose to have IBM service enable their Call Home. IBM service can activate the customer's Call Home through the TS7620 Appliance Express ProtecTIER Service Menu.

Call Home through the ProtecTIER Service Menu

To access Call Home options through the ProtecTIER Service Menu, you will need the following:

- administrator logon access into the customer's ProtecTIER V3.3.6 TS7610 Appliance Express or TS7620 Appliance Express server
- the ProtecTIER V3.3.6 TS7610 Appliance Express or TS7620 Appliance Express server must have already been installed and configured

Enabling or disabling Call Home

Use the ProtecTIER Service Menu to enable or disable the server's ability to place a Call Home call and alert IBM if a system problem occurs.

About this task

If this is the first time Call Home is being enabled on the server, **you must** do so using the ProtecTIER Configuration window. Refer to *IBM TS7620 ProtecTIER Deduplication Appliance Express Installation and Setup Guide for VTL, and OpenStorage Systems*, v3.3, GA32-0914, for detailed configuration instructions. Should you need to disable or re-enable Call Home in the future, you will have the choice of doing so using the ProtecTIER Configuration menu or the Configuration window in the ProtecTIER Manager.

Accessing the ProtecTIER Service Menu

Procedure

1. If necessary, power-on the server and the monitor, and wait for the login prompt to display.

   For power-on instructions, see "TS7610 or TS7620 startup" on page 29.
2. At the **login** prompt, type: **ptconfig** and press **<enter>**.
3. At the **Password** prompt, type: **ptconfig** and press **<enter>**

   The **ProtecTIER Service Menu** displays:

```
--------------------------------------------------------------------------------
 ProtecTIER Service Menu running on rassmx
--------------------------------------------------------------------------------
  1) ProtecTIER Configuration (...)
  2) Manage ProtecTIER services (...)
  3) Health Monitoring (...)
  4) Problem Alerting (...)
  5) Version Information (...)
  6) Generate a service report
  7) Generate a system view
  8) Update ProtecTIER code

  E) Exit
--------------------------------------------------------------------------------
>>> Your choice?
```

   Choose **Problem Alerting**

```
--------------------------------------------------------------------------------
 ProtecTIER Service Menu running on rassmx
 Problem Alerting (...)
--------------------------------------------------------------------------------
  1) Enable/Disable Call Home
  2) Send a Test Call Home
  3) Configure Call Home Heartbeat frequency
  4) Send a Heartbeat Call Home
  5) Enable/Disable Notification by email
  6) Test Email Notification
  7) Activate Call Home Polling Function

  B) Back
  E) Exit
--------------------------------------------------------------------------------
>>> Your choice?
```

4. Go to "Enabling Call Home" or "Disabling Call Home" on page 25.

Enabling Call Home

About this task

Procedure

1. On the **Enable/Disable Call HomeMenu** in step 1, select **Enable/Disable Call Home**. Type: **1** and press **<enter>**.

   The following messages, display:

   `Getting Call Home state [ Done ]`

   `Call Home successfully set.`
2. When the `Call Home is currently Disabled, do you wish to enable it? (yes|no)` prompt displays, type: **y <enter>**.

   `The Configuring Call Home [ Done ]` message displays.
3. When the `Press the ENTER key to continue...` message displays, press **<enter>**. You are returned to the **ProtecTIER Service Menu**.

4. You can select **q** to quit the menu and log out (it will close the connection), or proceed to another menu item task.

Disabling Call Home:
About this task

Use the procedure below to disable Call Home functionality.

Procedure

1. Access the ProtecTIER Configuration Menu. See 1 on page 24.
2. Select the **Enable/Disable Call Home** option, as described in step 1 on page 24, above.
3. When the `Call Home is currently Enabled, do you wish to disable it? (yes|no)` prompt displays, type: **y <enter>**.

   message displays:

   ```
   Call Home is disabled          [ Done ]
   Call home succesfully set to false
   ```

4. When the `Press the ENTER key to continue...` message displays, press **<enter>**. You are returned to the **ProtecTIER Service Menu**.
5. You can select **q** to quit the menu and log out (it will close the connection), or proceed to another menu item task.

Chapter 3. General service procedures

This section contains general instructions that are referenced by the component replacement procedures.

Electrostatic discharge procedures

When removing and replacing CRU components, take the precautions listed below to avoid static electricity damage:

- Whenever possible, wear an Electrostatic discharge (ESD) wrist strap. When doing so, ensure that the flexible grounding cord remains connected to you and to the frame of the machine. Because the wrist strap has a high resistance (>1 megohm) resistor in series with the grounding clip, there is no danger to you. The resistor discharges the static electricity from your body. To use the ESD wrist strap:
  1. Place the elastic band around your wrist.
  2. Connect the clip on the flexible grounding cord to an unpainted frame ground point on the rack.
  3. Keep the strap on and connected while you touch, insert, or remove any ESD-sensitive part.
- Do not open the static-protective package that contains the component until you are instructed to do so.
- Limit your movement. Movement can cause static electricity to build up around you.
- Always handle components carefully. Handle adapters and memory modules by the edges. Never touch any exposed circuitry, including the gold connectors along the bottom edge of the PCI adapters.
- Prevent others from touching the components.
- When possible, remove the component and install it directly in the computer without setting the component down. When this is not possible, place the static-protective package on a smooth level surface and then place the component on top of the package.

TS7610 or TS7620 power off sequence

About this task

This is the recommended manual power off sequence for a TS7610 or TS7620 server.

Procedure

1. Attach a keyboard and monitor to the server and access the **ProtecTIER Service Menu**. Log on with the ID **ptconfig** and the password **ptconfig**.
2. In the **ProtecTIER Service Menu**, select the **Manage ProtecTIER Services (...)** option.

```
--------------------------------------------------------------------------------
 ProtecTIER Service Menu running on rassmx
--------------------------------------------------------------------------------
  1) ProtecTIER Configuration (...)
  2) Manage ProtecTIER services (...)
  3) Health Monitoring (...)
  4) Problem Alerting (...)
  5) Version Information (...)
  6) Generate a service report
  7) Generate a system view
  8) Update ProtecTIER code

  E) Exit
--------------------------------------------------------------------------------
>>> Your choice?
```

3. In the **Manage ProtecTIER Services (...)** menu, select **Stop all services**.

```
--------------------------------------------------------------------------------
 ProtecTIER Service Menu running on rassm1
 Manage ProtecTIER Services (...)
--------------------------------------------------------------------------------
  1) Display services status
  2) Start all services
  3) Stop all services
  4) Stop ProtecTIER services only (including GFS)
  5) Stop VTFD service only
  6) Poweroff This Node
  7) Reboot This Node

  B) Back
  E) Exit
--------------------------------------------------------------------------------
>>> Your choice?
```

4. When the services are stopped, the system shows the following messages:

```
   Stopping ptrasd                                                [ Done ]
   Stopping vtfd                                                  [ Done ]
   Stopping ptcluster                                             [ Done ]
```

5. Press <enter> to return to the **ProtecTIER Service Menu**.
6. In the **Service Menu**, select **Manage ProtecTIER Services (...)**.
7. In the **Manage ProtecTIER Services (...)** menu, select **Poweroff This Node** to poweroff the server.

```
--------------------------------------------------------------------------------
 ProtecTIER Service Menu running on rassm1
 Manage ProtecTIER Services (...)
--------------------------------------------------------------------------------
  1) Display services status
  2) Start all services
  3) Stop all services
  4) Stop ProtecTIER services only (including GFS)
  5) Stop VTFD service only
  6) Poweroff This Node
  7) Reboot This Node

  B) Back
  E) Exit
--------------------------------------------------------------------------------
>>> Your choice?
```

When the power off processes complete, the power LED on the chassis operator panel is off and the monitor screen goes blank.

TS7610 or TS7620 startup

About this task

This is the recommended manual startup sequence for a TS7610 or TS7620 server.

Procedure

1. Verify the power cords are connected to each PSU and secure the cords with the wire bales.

   If the TS7610 or TS7620 chassis is installed within a frame, restore power to the frame by frame's UPO switch or the customer's circuit panel.

2. Press the power button on the TS7610 or TS7620 chassis operator panel to power on the chassis.

   The chassis operator panel has the following buttons and LEDs:

Table 4. Chassis operator panel

1	USB socket
2	Power active
3	Unit fault
4	ID LED
5	On/Off button
6	System reset
7	ID LED switch

   Press the **On/Off** button (5) on the server operator panel.

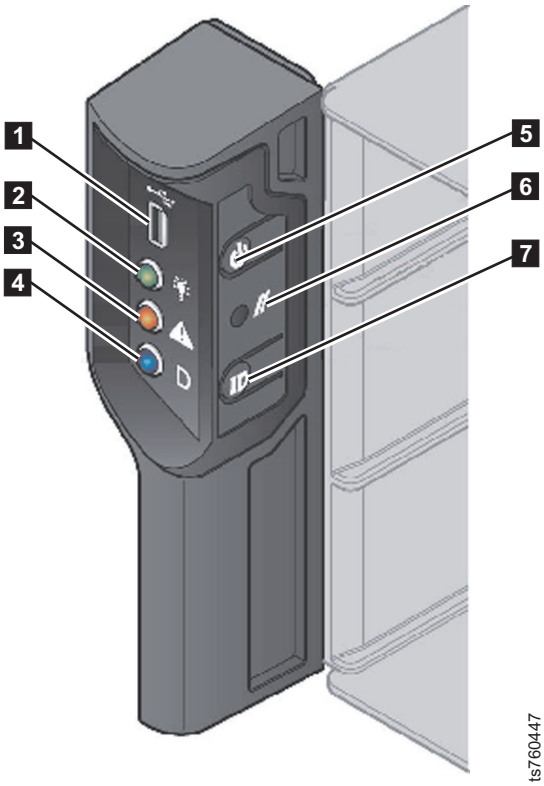

Figure 11. Chassis operator panel

Approximately 15 minutes after the server is powered-on, you will be able to log in to the **ProtecTIER Service Menu**.

3. Attach a monitor and keyboard to the server and access the **ProtecTIER Service Menu**. Log on with the ID **ptconfig** and the password **ptconfig**.
4. In the **ProtecTIER Service Menu**, select the **Manage ProtecTIER Services (...)** option.

```
--------------------------------------------------------------------------------
 ProtecTIER Service Menu running on rassmx
--------------------------------------------------------------------------------
  1) ProtecTIER Configuration (...)
  2) Manage ProtecTIER services (...)
  3) Health Monitoring (...)
  4) Problem Alerting (...)
  5) Version Information (...)
  6) Generate a service report
  7) Generate a system view
  8) Update ProtecTIER code

  E) Exit
--------------------------------------------------------------------------------
>>> Your choice?
```

5. In the **Manage ProtecTIER Services (...)**, select **Display services status**.

CAUTION:
When a hardware component is replaced, a firmware update will automatically start after a reboot or server startup. Please do NOT power off the system during this operation, as interrupting the update may corrupt your system or risk data integrity.

```
--------------------------------------------------------------------------------
 ProtecTIER Service Menu running on rassm1
 Manage ProtecTIER Services (...)
--------------------------------------------------------------------------------
  1) Display services status
  2) Start all services
  3) Stop all services
  4) Stop ProtecTIER services only (including GFS)
  5) Stop VTFD service only
  6) Poweroff This Node
  7) Reboot This Node

  B) Back
  E) Exit
--------------------------------------------------------------------------------
>>> Your choice?
```

When the display shows all the services have started, the startup process is complete.

Placing the TS7610 or TS7620 to service position

About this task

To service the internal CRU components, you must place the server in service position. In this position, the server is extended outside of the frame, and is suspended on the slide rails and support tray.

To place the server in service position, follow the procedure below.

Tip: An instructional video of this procedure is available in TS7610 and TS7620 Appliance Express ProtecTIER V3.3.6 Information Center. To access the video, go to: http://pic.dhe.ibm.com/infocenter/ts7610/cust/index.jsp.

Procedure

1. Working from the front of the frame, press the thumb latches on the front of the server downward, to release the catches.
2. Carefully slide the server, tray, and rails, forward, ensuring that no cables are binding or cable tension is exceeded at the back of the server. Continue to slide forward fully until the rails are locked in place. **1** .

   See Figure 12 on page 32.

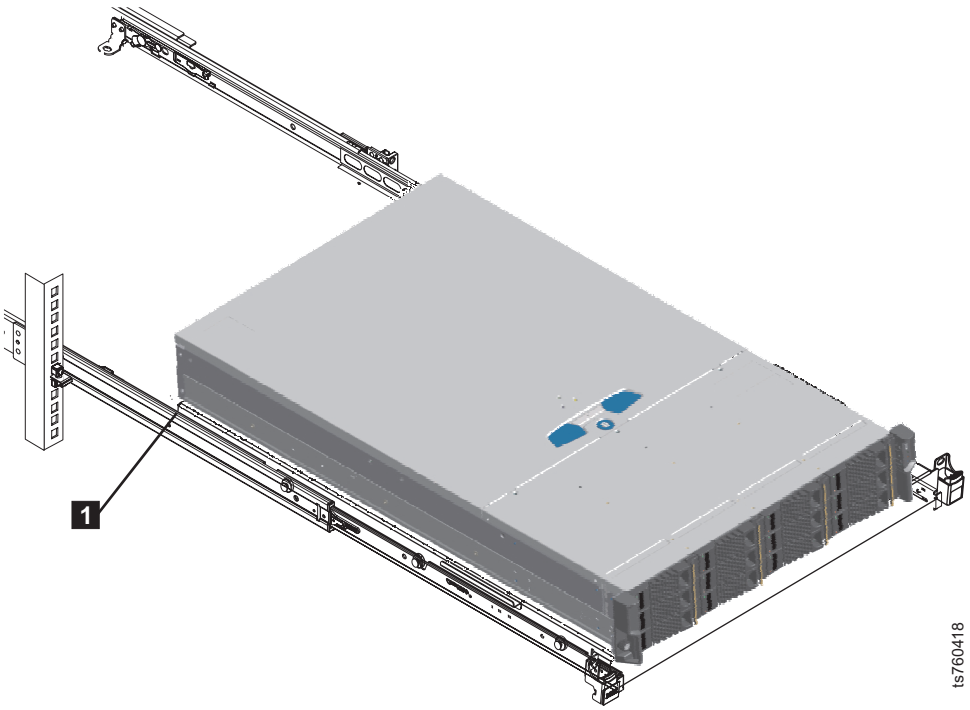

Figure 12. Server extended onto rails

Removing the server's top cover

About this task

With the exception of the cooling fans, you must completely remove the server's top cover to gain access the internal CRUs. There is one locking screw that secure the TS7610 or TS7620 server cover. To do so:

Procedure

Loosen the cover's locking screw **1** 1/4 turn, press the silver button **2** , and slide the cover back and up to remove it **3** . See Figure 13 on page 33.

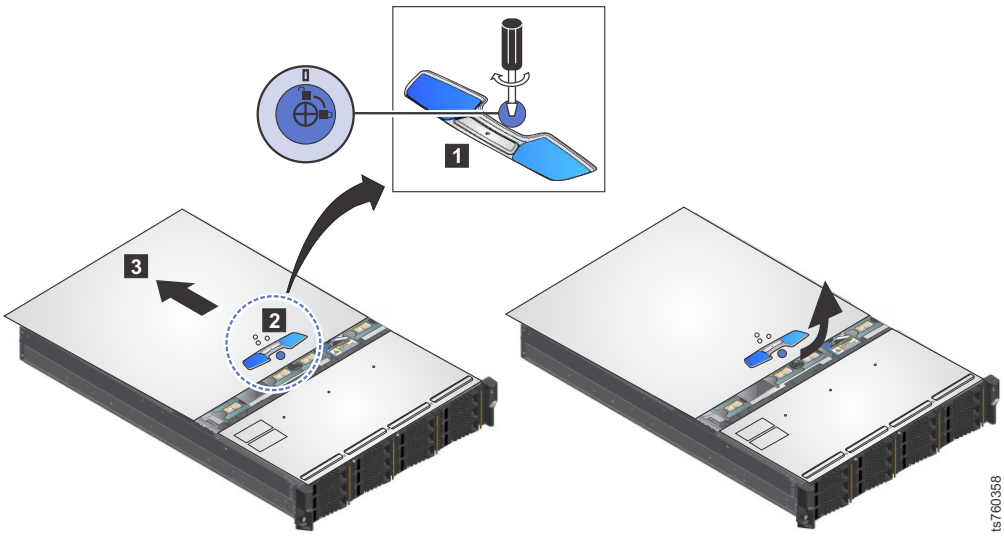

Figure 13. Removing the top cover

Note: If the cover does not slide back

Placing the TS7610 or TS7620 to operational position

About this task

Following service, use the procedure below to replace the server's top cover, and return the server to the operational position inside the frame.

Procedure

1. Working from the front of the frame, slide the top cover into place over the chassis **1** .
2. Tighten the cover's locking screw **2** .

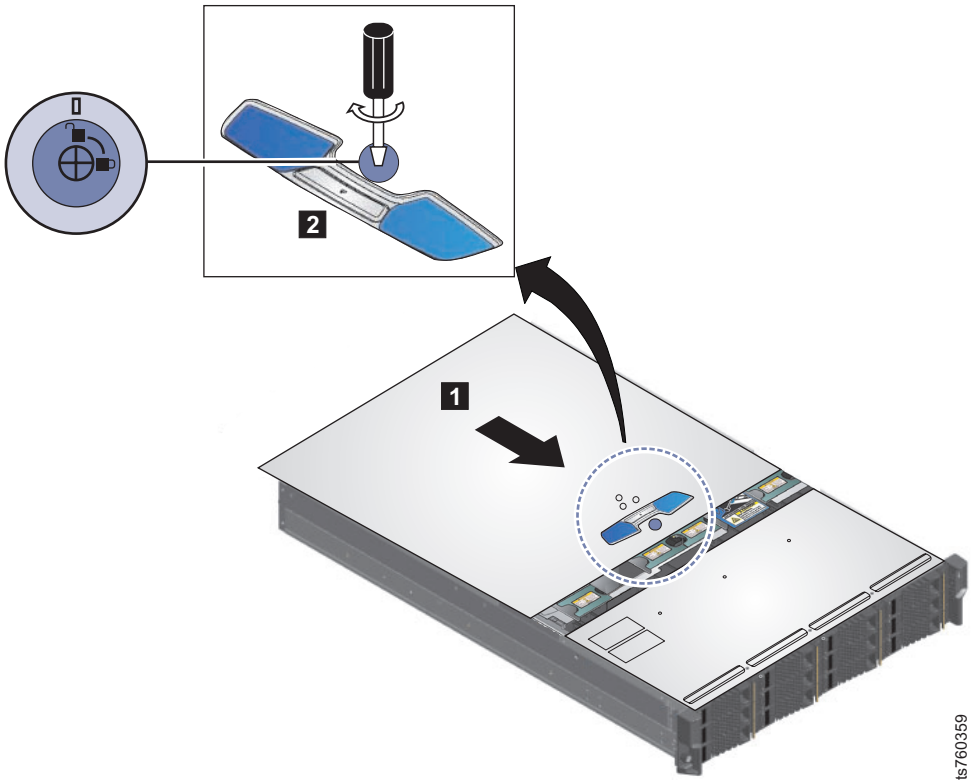

Figure 14. Replacing the top cover

3. Lift up on the blue clips located on the sides of the slide rails, to release the safety catches.
4. Carefully slide the server back into the frame until it is fully retracted and locked into place.

Verifying and updating the TS7610 or TS7620 firmware with the ProtecTIER Service Menu

This procedure explains how to update the firmware for all TS7610 Appliance Express and TS7620 Appliance Express hardware components.

About this task

Firmware automatically updates when the server is rebooted.

Do this procedure if you choose to manually insure that the firmware level of the hardware component is at a level that is supported by your currentProtecTIER server software level.

To update firmware level the TS7610 Appliance Express or TS7620 Appliance Express server must be installed and configured.

Procedure

1. If necessary, power-on the server and the monitor, and wait for the login prompt to display.
2. Access the **ProtecTIER Service Menu** with a monitor and keyboard plugged into the TS7610 or TS7620 server. Log on with ID **ptconfig** password **ptconfig**

3. When the **ProtecTIER Service Menu** appears, select the **ProtecTIER Configuration** option.

```
--------------------------------------------------------------------------------
 ProtecTIER Service Menu running on rassmx
--------------------------------------------------------------------------------
  1) ProtecTIER Configuration (...)
  2) Manage ProtecTIER services (...)
  3) Health Monitoring (...)
  4) Problem Alerting (...)
  5) Version Information (...)
  6) Generate a service report
  7) Generate a system view
  8) Update ProtecTIER code

  E) Exit
--------------------------------------------------------------------------------
>>> Your choice?
```

4. Once in the **ProtecTIER Configuration** Menu, select **Update Firmware** to update all the firmware in your TS7610 or TS7620 server.

```
--------------------------------------------------------------------------------
 ProtecTIER Service Menu running on rassmx
 ProtecTIER Configuration (...)
--------------------------------------------------------------------------------
  1) Configure ProtecTIER node
  2) Recover Configuration for a replaced server
  3) Configure enclosure serial number for a replaced enclosure
  4) Update Time, Date, Timezone & Timeserver(s)
  5) Configure replication (...)
  6) IP Network configuration (...)
  7) Update Firmware
  8) Update the System's name
  9) Validate configuration
 10) Single node - code upgrade (For Support Use ONLY)

  B) Back
  E) Exit
--------------------------------------------------------------------------------
>>> Your choice?
```

   When the Update Firmware option is selected, the system shows the following prompt:

   ```
   In order to update the Node's firmware level, all the services will be
   stopped. Would you like to update the Node's firmware level? (yes|no)
   ```

5. Type yes and press <enter> to stop all services before updating the firmware.

   Important: Do not power off the server during a firmware update. Powering the server will interrupt a firmware update which can damage a hardware component.

6. The firmware version can be viewed through yourProtecTIER Service Menu **Version Information** option. From the Version Information Menu select **Display Firmware Version**

```
--------------------------------------------------------------------------------
 ProtecTIER Service Menu running on rassmx
 Version Information (...)
--------------------------------------------------------------------------------
  1) Display version information
  2) Display Machine Reported Product Data (MRPD)
  3) Display Firmware Versions

  B) Back
  E) Exit
--------------------------------------------------------------------------------
>>> Your choice?
```

Configuring the ProtecTIER V3.3.6 TS7610 or TS7620 system

About this task

Once the TS7610 or TS7620 hardware is installed, you are ready to perform the software configuration to set up and customize the system for your working environment. In "Configuring the ProtecTIER V3.3.6 TS7610 or TS7620 system" through "Updating customer network settings" on page 41, use **IP Network Configurations** on the **ProtecTIER Configuration Menu**, to update the system and network server settings.

If you experience problems during the TS7610 Appliance Express hardware setup or server configuration process, refer to the *IBM TS7610 and TS7620 ProtecTIER Deduplication Appliance Express User's and Maintenance Guide*, v3.3, GA32-0916, on the *IBM TS7610 ProtecTIER Deduplication Appliance Express and IBM TS7620 ProtecTIER Deduplication Appliance Express Publications* CD.

Accessing the ProtecTIER Service Menu

About this task

Procedure

1. If necessary, power on the server and the monitor, and wait for the login prompt to display.
2. With a monitor and keyboard plugged into the TS7610 or TS7620 server. Log on with ID **ptconfig** password **ptconfig**
3. Log in to access the **ProtecTIER Service Menu**. Select the **ProtecTIER Configuration** option.

```
--------------------------------------------------------------------------------
 ProtecTIER Service Menu running on rassmx
--------------------------------------------------------------------------------
  1) ProtecTIER Configuration (...)
  2) Manage ProtecTIER services (...)
  3) Health Monitoring (...)
  4) Problem Alerting (...)
  5) Version Information (...)
  6) Generate a service report
  7) Generate a system view
  8) Update ProtecTIER code

  E) Exit
--------------------------------------------------------------------------------
>>> Your choice?
```

4. Once in the **ProtecTIER Configuration** Menu, select **Update Time, Date, Timezone & Timeserver(s)** to set your server Time, Date, Timezone & Timeserver(s).

```
--------------------------------------------------------------------------------
 ProtecTIER Service Menu running on rassmx
 ProtecTIER Configuration (...)
--------------------------------------------------------------------------------
  1) Configure ProtecTIER node
  2) Recover Configuration for a replaced server
  3) Configure enclosure serial number for a replaced enclosure
  4) Update Time, Date, Timezone & Timeserver(s)
  5) Configure replication (...)
  6) IP Network configuration (...)
  7) Update Firmware
  8) Update the System's name
  9) Validate configuration
 10) Single node - code upgrade (For Support Use ONLY)

  B) Back
  E) Exit
--------------------------------------------------------------------------------
>>> Your choice?
```

5. Go to "Configuring the ProtecTIER V3.3.6 TS7610 or TS7620 system" on page 36.

Setting the timezone

Use the procedures in this task to change the time zone setting to match that of your location. *You must set the timezone to ensure accurate system timekeeping*.

Procedure

1. On the **ProtecTIER Configuration (...)** menu (see "Configuring the ProtecTIER V3.3.6 TS7610 or TS7620 system" on page 36), select the **Update Time, Date, Timezone & Timeserver(s)** option. Type the corresponding number for this selection and press Enter.

   The **Date, Time, Timezone & Timeserver(s) configuration** menu, displays:

```
--------------------------------------------------------------------------------
 ProtecTIER Service Menu running on rassmx
           Date, Time, Timezone & Timeserver(s) configuration
--------------------------------------------------------------------------------
  1. Set date & time
  2. Set Timezone
  3. Set Timeserver(s)

  c. Commit changes and exit
  q. Exit without committing changes
--------------------------------------------------------------------------------
>>> Please Choose:
```

Figure 15. Date, Time, Timezone & Timeserver(s) configuration menu

   Note: To prevent selections from scrolling off the screen, consider setting the paging to show fewer lines of information.

2. Select the **Set Timezone** option. Type the corresponding number and press Enter.
3. If you are in the United States, when prompted for a country code, type: `US` and press Enter.

   For locations outside the United States, you must enter an international country code. Refer to Worldwide time zone codes to locate your information, then

return to this task and enter the appropriate country code in step "Configuring the ProtecTIER V3.3.6 TS7610 or TS7620 system" on page 36.

The time zones for the specified country display. A sample of the US time zones list is shown in "Configuring the ProtecTIER V3.3.6 TS7610 or TS7620 system" on page 36:

```
Time zones under US:
====================

1. America/New_York
2. America/Detroit
3. America/Kentucky/Louisville
4. America/Kentucky/Monticello
5. America/Indiana/Indianapolis
6. America/Indiana/Vincennes
7. America/Indiana/Winamac
8. America/Indiana/Marengo
9. America/Indiana/Petersburg
10. America/Indiana/Vevay
11. America/Chicago
12. America/Indiana/Tell_City
13. America/Indiana/Knox
14. America/Menominee
15. America/North_Dakota/Center
16. America/North_Dakota/New_Salem
17. America/Denver
18. America/Boise
19. America/Shiprock
20. America/Phoenix
21. America/Los_Angeles
22. America/Anchorage
23. America/Juneau
24. America/Yakutat
25. America/Nome
26. America/Adak

Press <Enter>

27. Pacific/Honolulu

Please choose a timezone:
```

Figure 16. Sample of US time zones

4. If the `Press enter to continue` prompt displays, the time zone list is too long to display on the screen at once. Press Enter to advance the list.
5. At the `Please choose a timezone:` prompt, type the number that corresponds to your timezone and press Enter to return to the **Date, Time, Timezone & Timeserver(s) configuration** menu. Type: `c` for commit and press Enter.

   The current time, date, and timezone settings display for review.
6. At the `Do you wish to apply those settings? (yes|no)` prompt, type: `yes` and press Enter.

   The following message appears: `The cluster & VTFD services on all nodes must be stopped in order to continue. Do you wish to continue? (yes|no).` Type: `yes` and press Enter.

   A series of status messages appears as the services are stopped and restarted. This process might take up to 10 minutes. When the service restart is complete, the `Press the ENTER key to continue...` message appears.
7. Press Enter to continue and return to the **ProtecTIER Configuration (...)** menu.

Setting the date and time

Each server contains a battery that must be calibrated.

About this task

Use the procedures in this task to check the time and date on the server. If necessary, change the settings to match the time and date at your location.

Important: With Version 3.3.6 and later, you must apply each change you make to the timezone, date and time, and time server individually before proceeding to the next task.

Procedure

1. On the **ProtecTIER Configuration (...)** menu (see "Configuring the ProtecTIER V3.3.6 TS7610 or TS7620 system" on page 36), select the **Update Time, Date, Timezone & Timeserver(s)** option. Type the corresponding number for this selection and press Enter.

   The **Date, Time, Timezone & Timeserver(s) configuration** menu, displays:
2. On the **Date, Time, Timezone & Timeserver(s) configuration** menu (see "Configuring the ProtecTIER V3.3.6 TS7610 or TS7620 system" on page 36), select the **Set date & time** option. Type the corresponding number and press Enter.
3. When prompted for the date:
   - If the default date [displayed in brackets] is correct, press Enter.
   - If the default date is incorrect, type the current date in DD/MM/YYYY format and press Enter. For example, `09/01/2012`.
4. When prompted for the time:
   - If the default time [displayed in brackets] is correct, press Enter.
   - If the default time is incorrect, type the current time in HH:MM:SS format and press Enter. For example:`08:32:58`.
5. At the `Please choose:` prompt, commit your date and time settings To commit, type: `c` and press Enter.

   The current time, date, and timezone settings display for review.
6. At the `Do you wish to apply those settings? (yes|no)` prompt, type: `yes` and press Enter.

   You are notified as follows: `The cluster & VTFD services on all nodes must be stopped in order to continue. Do you wish to continue? (yes|no).` Type: `yes` and press Enter.

   A series of status messages appears as the services are stopped and restarted. This process might take up to 10 minutes. When the service restart is complete, the `Press the ENTER key to continue...` message displays.
7. Press Enter to continue and return to the **ProtecTIER Configuration (...)** menu.

Specifying a time server

Each server contains a battery that must be calibrated.

About this task

If you have an FSI system on which you plan to implement Active Directory user authentication, you must complete this task. Failure to do so will cause your FSI configuration to fail.

If you already completed "Configuring the ProtecTIER V3.3.6 TS7610 or TS7620 system" on page 36 and "Configuring the ProtecTIER V3.3.6 TS7610 or TS7620 system" on page 36, skip this task and go directly to "Updating the System Name" on page 41.

Important: With Version 3.3.6 and later, you must apply each change you make to the timezone, date and time, and time server individually before proceeding to the next task.

Procedure

1. Before you start this task, proceed as appropriate:
   - If you already know the IP address of the primary (and optionally, secondary) time server you plan to use, go on to step "Configuring the ProtecTIER V3.3.6 TS7610 or TS7620 system" on page 36.
   - Otherwise, do the following:
     a. Locate a primary (and optionally, secondary) time server. There are many websites (for example, `http://www.ntp.org/`) which provide lists of time servers available for public use.
     b. After selecting one or more time servers, make note of the IP addresses on your Pre-Installation Checklist.
     c. Go on to step "Configuring the ProtecTIER V3.3.6 TS7610 or TS7620 system" on page 36.
2. On the **ProtecTIER Configuration (...)** menu (see "Configuring the ProtecTIER V3.3.6 TS7610 or TS7620 system" on page 36), select the **Update Time, Date, Timezone & Timeserver(s)** option. Type the corresponding number and press Enter.

   The **Date, Time, Timezone & Timeserver(s) configuration** menu, see "Configuring the ProtecTIER V3.3.6 TS7610 or TS7620 system" on page 36, displays.

   Note: Selecting this menu option will allow entry of a timeserver's IP address, and also include an option for a backup timeserver IP.
3. Select the **Set Timeserver(s)** option. Type the corresponding number and press Enter.
4. When prompted, type the IP address of the primary network timeserver and press Enter.

   Refer to your completed Pre-installation Checklist for the IP address of the primary network timeserver.
5. At the `Would you like to set a secondary timeserver? (yes|no)` prompt, type: `yes` or `no`, as appropriate.
   - If you typed `yes`, type the IP address of the secondary network timeserver at the prompt, press Enter, and go to step "Configuring the ProtecTIER V3.3.6 TS7610 or TS7620 system" on page 36.

     Refer to your completed Pre-installation Checklist for the IP address of the secondary network timeserver.
   - If you typed `no`, go to step "Configuring the ProtecTIER V3.3.6 TS7610 or TS7620 system" on page 36.
6. At the `Do you wish to apply those settings? (yes|no)` prompt, type: `yes` and press Enter.

   You are notified as follows: `The cluster & VTFD services on all nodes must be stopped in order to continue. Do you wish to continue? (yes|no).` Type: `yes` and press Enter.

A series of status messages displays as the services are stopped and restarted. This process can take up to 10 minutes. When the service restart is complete, the `Press the ENTER key to continue...` message displays.

7. Press Enter to continue and return to the **ProtecTIER Configuration (...)** menu.
8. Leave the menu open and go on to "Updating the System Name."

Updating the System Name

About this task

In this task, you will specify the unique system name that will be used to identify the TS7610 Appliance Express server in the ProtecTIER Manager graphical user interface (GUI).

Procedure

1. On the **ProtecTIER Configuration Menu** ("Accessing the ProtecTIER Service Menu" on page 36), select option 2, **Update System's Name**. Type: **8** and press **<enter>**.

   A series of status messages display:
2. At the **Please enter a new system name [pt_system]: prompt**, type the name you want to use to identify the TS7610 Appliance Express server and press **<enter>**.

   Additional status messages display as the system name is updated.
3. When the update is complete, and the **Press the ENTER key to continue...** message displays, press **<enter>**. You are returned to the **ProtecTIER Configuration Menu**.
4. Go to "Updating customer network settings."

Updating customer network settings

About this task

In this task, you will provide your network IP address, netmask address, default gateway, and hostname; information.

Procedure

1. On the **ProtecTIER Configuration Menu** ("Accessing the ProtecTIER Service Menu" on page 36), select option **6**, **IP Network configuration**. Type: **3** and press **<enter>**.

   A series of status messages similar to the following, display:

   ```
   Starting cluster, please wait...
   Starting cluster
   Cluster started
   ```
2. When the `Would you like to stop the vtfd service (yes/no)` prompt displays, type: **y <enter>**.

   The `Stopping vtfd` message displays.
3. At each of the prompts listed below, provide the information requested (or leave the field blank to use the defaults within the brackets) and press **<enter>**.

   ```
   Customer Network, IP Address [192.168.167.161]:
   Customer Network, Netmask [255.255.255.0]:
   Customer Network, Default Gateway:
   Customer Network, Hostname [node1]:
   ```

(For the Hostname, enter the same name that you specified in "Updating the System Name" on page 41, step 2 on page 41, above.)

A series of status messages display as the services are stopped and restarted and the network settings are configured. This process may take up to 10 minutes. When the service restart is complete, the `Press the ENTER key to continue...` message displays.

4. When the update is complete, and the `Press the ENTER key to continue...` message displays again, press **<enter>**. You are returned to the **ProtecTIER Configuration Menu**.
5.
6. In the **Service Menu**, select **Manage ProtecTIER Services (...)**.
7. In the **Manage ProtecTIER Services (...)** menu, select **Poweroff This Node** to poweroff the server.

```
--------------------------------------------------------------------------------
 ProtecTIER Service Menu running on rassm1
 Manage ProtecTIER Services (...)
--------------------------------------------------------------------------------
  1) Display services status
  2) Start all services
  3) Stop all services
  4) Stop ProtecTIER services only (including GFS)
  5) Stop VTFD service only
  6) Poweroff This Node
  7) Reboot This Node

  B) Back
  E) Exit
--------------------------------------------------------------------------------
>>> Your choice?
```

When the power off processes complete, the power LED on the chassis operator panel is off and the monitor screen goes blank.

When the reboot completes you are returned to the login prompt. You are now done replacing you chassis FRU.

Chapter 4. Servicing TS7610 or TS7620 components

This section contains tables of the CRU or FRU hardware components information of the TS7610 or TS7620 Appliance Express, graphics that show the location of components and replacement procedures for each of the hardware components.

TS7610 and TS7620 Appliance Express ProtecTIER V3.3.6 Parts list and hardware component replacement

This section displays the TS7610 Appliance Express and TS7620 Appliance Express chassis and hardware component layout.

Before you begin, take time to review the following information:

- About the TS7610 or TS7620 hardware
- Powering-on the server
- Electrostatic discharge procedure
- How to verify a hardware fault before servicing the component by running a **Health check** through the ProtecTIER Manager Service menu, refer to "Health Monitoring" on page 19 or through ProtecTIER Manager **Hardware resources**, refer to the Figure 7 on page 13.

The TS7610 Appliance Express, ProtecTIER V3.3.6 (SM1) supports either VTL or OpenStorage depending on the servers hardware configuration.

The TS7620 Appliance Express, ProtecTIER V3.3.6 (SM2) supports either VTL, OpenStorage or FSI depending on the servers hardware configuration.

There are two hardware component tables below, one for TS7610 (SM1) and the other for TS7620 (SM2). Each hardware component listed in the tables below is installed in, or connected to their TS7610 or TS7620 server. The components are categorized according to the following criteria:

- **Customer replaceable unit (CRU) vs. Field replaceable unit (FRU) –** Components that can safely and easily be self-serviced by the customer are CRU components. Components for which removal and replacement requires a higher degree of technical expertise and system knowledge are FRU components, and are to be serviced by IBM personnel, only.
- **Internal vs. External –** Internal components are located inside the server chassis, and are accessible only if the servers top cover is removed. External components are accessible with the servers cover in place.
- **Hot-swappable vs. Cold-swappable –** Hot-swappable components do not require stopping input/output (I/O) activity or disconnecting the server from A/C power before removing or replacing the component. Cold-swappable components cannot be removed or replaced while the system is running. I/O must be stopped and the server must be disconnected from the A/C power source before removal or replacement is started.

  Attention: Failure to adhere to the above guidelines could result in component or system damage, data loss, or personal injury.
- **FRU ID –** Each component has a unique FRU ID (part number). The customer schedules a service call for a FRU and provides the FRU ID to you, the IBM customer support representative.

Note: The FRU IDs in this table may become outdated after this document is produced. It is recommended that you first try to locate FRU IDs through one of the resources discussed in "About hardware alerts" on page 5.

Failure to follow the guidelines and procedures in the mentioned sections may result in component or system damage or personal injury.

The hardware differences between VTL, FSI and OpenStorage SM2 servers are:

- The VTL version is the only ProtecTIER 3959 server that has a Fibre channel, Emulex HBA.
- The VTL version is the only ProtecTIER 3959 server that has one Intel Dual-port Ethernet adapter.
- The OpenStorage and FSI versions of the ProtecTIER server has two Intel Dual-port Ethernet adapters.

Table 5. VTL, FSI and OpenStorage **3959 SM2** *component categories and FRU IDs*

Component name / hardware name if listed in the ProtecTIER Manager GUI Hardware Resources view	**Quantity**	**CRU**	**FRU**	**Internal**	**External**	**Hot-swappable**	**Cold-swappable**	**FRU ID (Part number)**
Quad Port Ethernet Adapter installed in the SM2 FSI or OST base unit for connection to expansion units	1		■	■			■	49Y4242
CMOS coin battery	1		■				■	33F8354
2TB NL LFF 3.5″ SAS hard disk drives (HDDs)**/ Disk drive**	12	■			■	■		98Y2420
Power supply units (PSUs) **/ Power supply**	2	■			■	■		98Y3253
Cooling fans **/ Cooling module**	10	■		■		■		45W8018
RAID Battery Backup Unit (BBU battery and adapter card) **/ RAID battery**	1	■		■			■	35P1271
BBU replacement battery only (iBBU08)	1	■		■			■	35P2359
DIMM (8GB Dual in-line memory modules) **/ Memory module**	6	■		■			■	35P1121
USB Drive (portable DVD drive)	1	■			■	■		95P9229
Intel Dual-port Ethernet adapter - • one ethernet card for VTL SM2 • two ethernet cards for OST or FSI SM2 **/Ethernet port 0-7**	1 or 2	■		■			■	49Y4232
Fibre channel, Emulex HBA- only VTL SM2	1		■	■			■	42D0500
LSI MegaRAID SAS9280-4i4e (Repository RAID) **/ SAS Expander**	1		■	■			■	35P1368
LSI MegaRAID SAS9240-4i (Boot RAID) **/ Raid card**	1		■				■	35P1369
Seagate 500GB SFF 2.5″ SATA (internal boot drives) **/ Boot drive**	2		■	■			■	35P1193

Table 5. VTL, FSI and OpenStorage **3959 SM2** *component categories and FRU IDs (continued)*

Component name / hardware name if listed in the ProtecTIER Manager GUI Hardware Resources view	**Quantity**	**CRU**	**FRU**	**Internal**	**External**	**Hot-swappable**	**Cold-swappable**	**FRU ID (Part number)**
3959 SM2 MECH ASM (chassis, SAS EXPANDER CARD, ONBOARD ETH CARD, and CPU) **/ CPU, SAS Expander, Ethernet port (On board)**	1		■	■	■		■	00V6991
Power cable - do not use the wire bail if it does not fit over the cable.	2	■			■		■	46X6880
Boot CAGE (Dual Boot Drive Cage Assembly)	1		■	■			■	35P1190
Mounting Tray (support tray)	1	■		■			■	46X1946
AIRDUCT, Air Flow (plastics, 2 parts)	1	■		■		■		35P1191
RAID-SAS Expander mini-SAS cable	1		■	■			■	00V7085
Boot Drive SAS Cable	1		■	■			■	35P1192
Slide Rails for Tray (No Screws)	1	■			■		■	69Y5085
Cable Management Arm	1	■			■	■		49Y4817

Table 6. TS7620 Appliance Express 3959-EXP 11.5 expansion drawer component categories and FRU IDs

Component name / hardware name if listed in the ProtecTIER Manager GUI Hardware Resources view	**Quantity**	**CRU**	**FRU**	**Internal**	**External**	**Hot-swappable**	**Cold-swappable**	**FRU ID (Part number)**
Power Cooling Module includes SUPPLY and Power Cooling Module **/ Power supply (99Y1243) or Cooling module(45W8018)**	2	■			■	■		00L4605
CABLE - SAS 1x to 2x	1	■			■		■	35P2255
HARD DRIVE - carrier w/HDD **/ Disk drive**	12	■			■	■		98Y2420
CHASSIS (the chassis base assembly includes the **SAS Expander (35P2384)**)	1		■		■		■	35P2383
ESM (Enclosure SAS module) Canister **/Canister**	2		■		■	■		35P2384
CABLE POWER (2.8M IEC 320-C13)	2	■			■		■	46X2536
CABLE POWER (2.8M NEMA C-13)	2	■			■		■	46X6880
RAIL KIT (Rail kit for EXP)	1	■			■		■	85Y5852
SAS CABLE 1 to 1	2	■			■		■	44V4041

Table 7. VTL, FSI and OpenStorage **3959 SM1** *component categories and FRU IDs*

Component	**Quantity**	**CRU**	**FRU**	**Internal**	**External**	**Hot-swappable**	**Cold-swappable**	**FRU ID (Part number)**
CMOS coin battery	1		■				■	33F8354
1TB SATA hard disk drives (HDDs)	12	■			■	■		45W8867
Power supply units (PSUs)	2	■			■	■		98Y3253
Cooling fans	10	■		■		■		45W8018
RAID battery backup unit (BBU)	1	■		■			■	46X2051

Table 7. VTL, FSI and OpenStorage **3959 SM1** *component categories and FRU IDs (continued)*

Component	Quantity	CRU	FRU	Internal	External	Hot-swappable	Cold-swappable	FRU ID (Part number)
4GB Dual in-line memory modules (DIMMs)	6	■		■			■	45W7764
USB portable DVD drive	1	■			■	■		46X4472
Dual-port Ethernet adapter - • one ethernet card for VTL SM1 • two ethernet cards for OST SM1	1 or 2	■		■			■	39Y6128
Fibre channel host bus 4GB adapter (HBA) or Fibre channel host bus 8GB adapter (HBA)	1		■	■			■	43W7512 or 42D0500
LSI MegaRaid SAS8888ELP	1		■	■			■	46X6759
300GB HDDs (internal boot drives)	2		■	■			■	49Y1840
3959 SM1 chassis (SAS EXPANDER CARD, ONBOARD ETH CARD, and CPU)	1		■	■	■		■	46X1944
Power cable- this cable accommodates the wire bail on the power supply, the previous version 39M5081 did not.	2	■			■		■	46X6880
Dual Boot Drive Cage Assembly	1		■	■			■	46X2434
Mounting Tray (support tray)	1	■		■			■	46X1946
Air Flow plastics (all 3)	1	■		■			■	46X2032
RAID-SAS Expander mini-SAS cable	1		■	■			■	46X2700
Fan tray	1		■	■			■	46X2033
Rails for Tray (No Screws)	1	■			■		■	49Y4817

When a hardware fault occurs on a component that is one of a set, as in the case of the HDDs, PSUs, cooling fans, and DIMMs; you must isolate the specific component (*for example, HDD 5*) that generated the fault, and diagnose the cause and severity of the problem. Refer to the figures below to see how the HDDs, cooling fans, adapters, DIMMs, and PSUs; are arranged and numbered. In the case of the DIMMs, only six of the eight slots (A1, A2, B1, B2, C1, and D1) are used. Slots C2 and D2 are left empty.

- **1** : cooling fans
- **2** : boot drive assembly
- **3** : sysplanar
- **4** : pci card adapters
- **5** : power supplies
- **6** : SAS expander

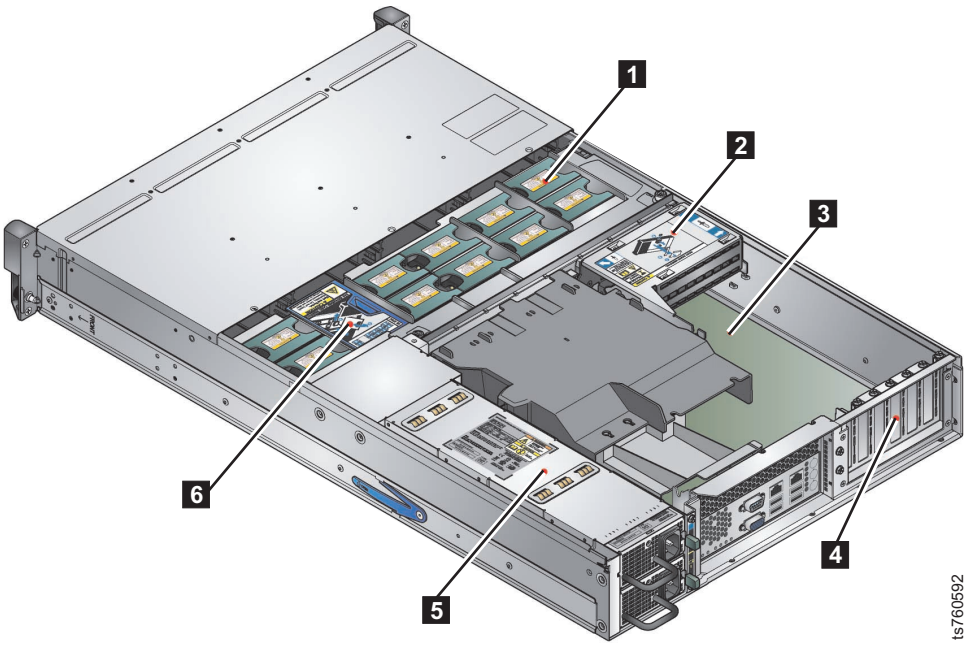

Figure 17. Chassis top view

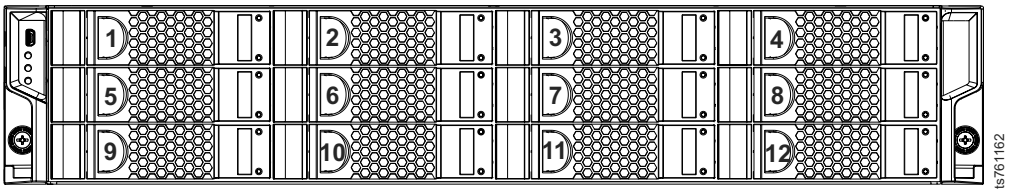

Figure 18. HDD layout

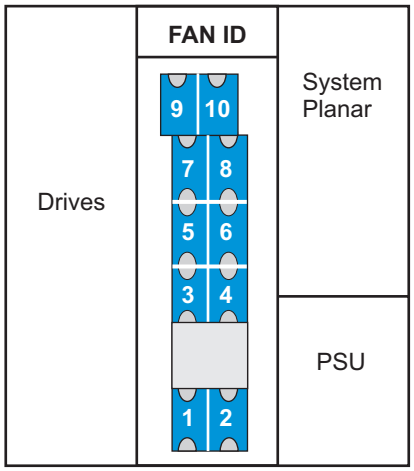

Figure 19. Cooling fan layout

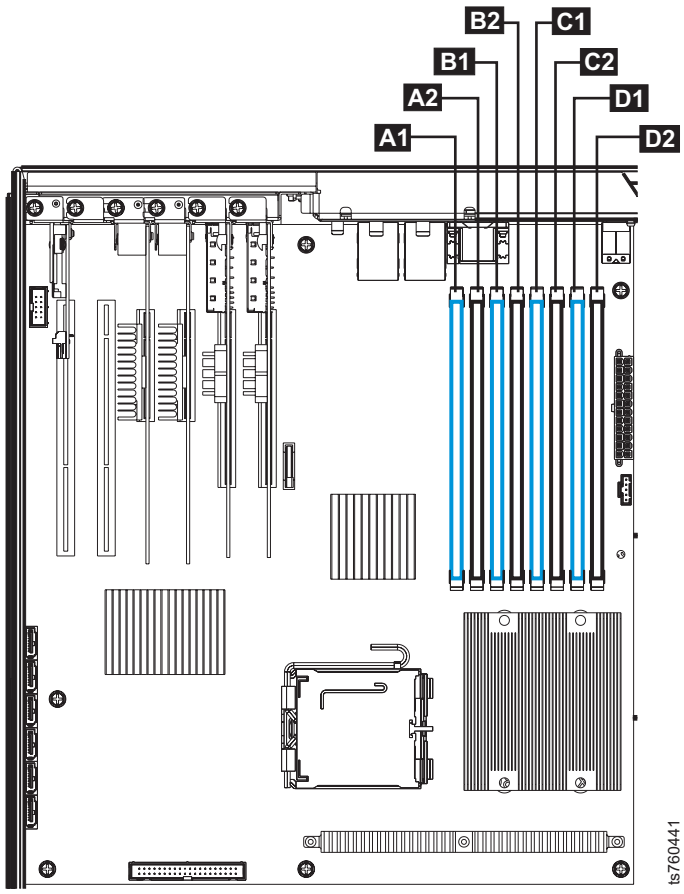

Figure 20. DIMM layout

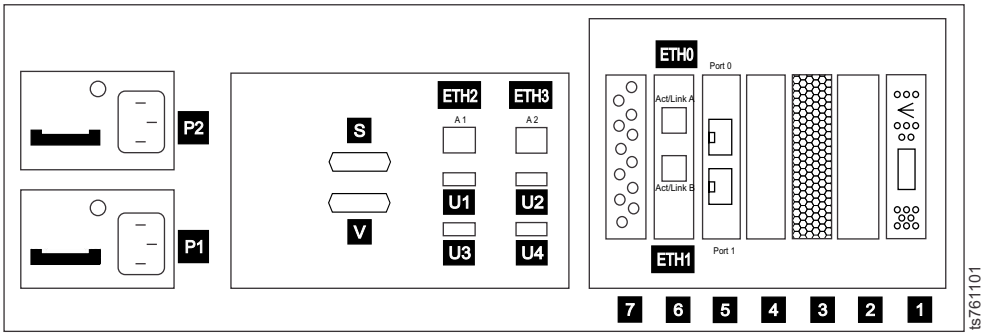

Figure 21. **3959 SM2** *server for VTL Systems rear view*

Table 8. **3959 SM2** *server for VTL Systems slot assignments, ports, and connectors*

P2 Power supply 2	**U** USB ports: Upper left = 1, upper right = 2, lower left = 3, lower right = 4
P1 Power supply 1	**7** RAID Battery Backup Unit (BBU)
M PS/2 mouse port	**6** **ETH0** (Act/Link A) port: LAN **ETH1** (Act/Link B) port: Replication
K PS/2 keyboard port	**5** Fibre Channel Adapter

Table 8. **3959 SM2** *server for VTL Systems slot assignments, ports, and connectors (continued)*

S RS-232 serial port	**4** Unused (Empty)
V Video port	**3** Boot Drive MegaRAID Controller
ETH2 (A1) on-board (Port 0) Ethernet port: Replication	**2** Unused (Empty)
ETH3 (A2) on-board (Port 1) Ethernet port: LAN	**1** (A2) on-board (Port 1) Ethernet port: LAN

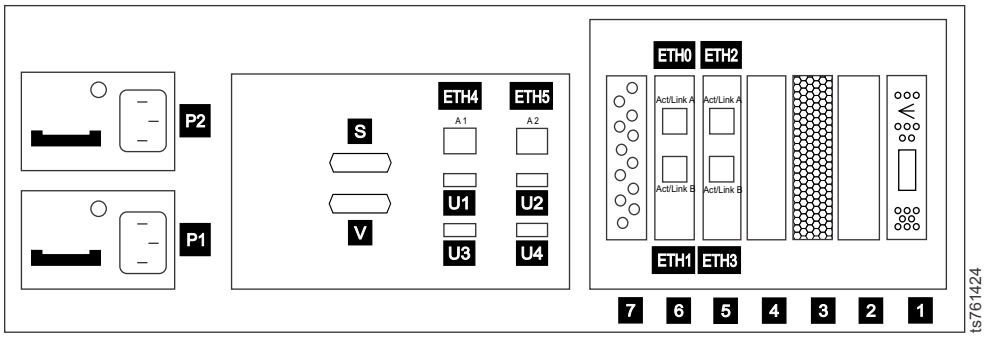

Figure 22. **3959 SM2** *server for OpenStorage or FSI Systems rear view*

Table 9. **3959 SM2** *server for OpenStorage or FSI systems slot assignments, ports, and connectors*

P2 Power supply 2	**7** RAID Battery Backup Unit (BBU)
P1 Power supply 1	**6** **ETH0** (Act/Link A) port: LAN **ETH1** (Act/Link B) port: Replication
S RS-232 serial port	**5** **ETH2** (Act/Link A) port: OpenStorage or FSI **ETH3** (Act/Link B) port: OpenStorage or FSI
V Video port	**4** **ETH4** (Act/Link A) port: SM2 expansion unit **ETH5** (Act/Link B) port: SM2 expansion unit **ETH6** (Act/Link C) port: SM2 expansion unit **ETH7** (Act/Link D) port: SM2 expansion unit
ETH4 (A1) On-board (Port 0) Ethernet port: Replication	**4** Unused (Empty)
ETH5 (A2) On-board (Port 1) Ethernet port: LAN	**3** Boot Drive MegaRAID Controller
U USB ports: Upper left = 1, upper right = 2, lower left = 3, lower right = 4	**2** Unused (Empty)
	1 Repository MegaRAID Controller

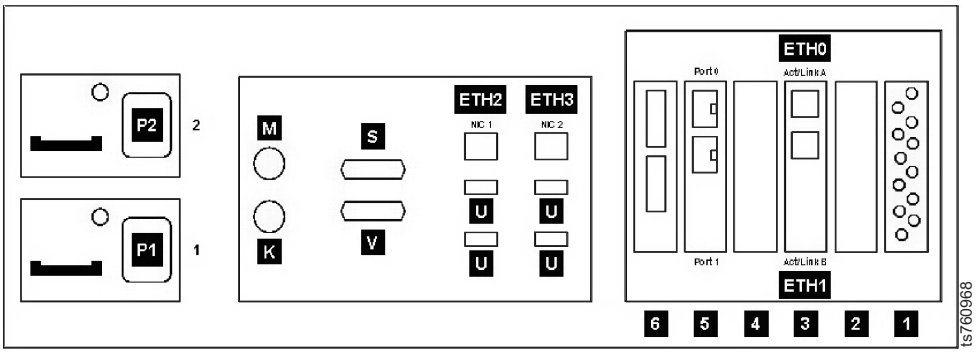

Figure 23. **3959 SM1** *server for VTL Systems rear view*

Table 10. **3959 SM1** *server for VTL Systems slot assignments, ports, and connectors*

2 Power supply 2	**U** USB ports: Upper left = 1, upper right = 2, lower left = 3, lower right = 4
1 Power supply 1	**6** MegaRAID Controller
M PS/2 mouse port	**5** Fibre Channel Adapter
K PS/2 keyboard port	**4** Unused (Empty)
S RS-232 serial port	**3** Ethernet Adapter **ETH0** (Act/Link A) port: LAN **ETH1** (Act/Link B) port: Replication
V Video port	**2** Unused (Empty)
ETH2 (NIC 1) on-board Ethernet port: Replication	**1** RAID Battery Backup Unit (BBU)
ETH3 (NIC 2) on-board Ethernet port: LAN	

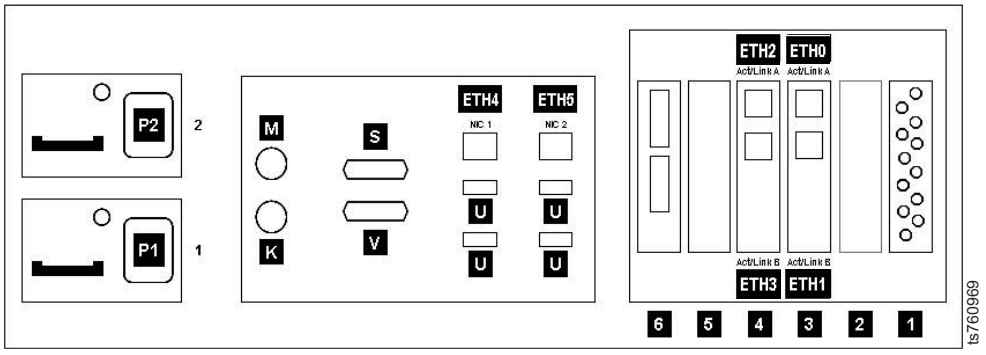

Figure 24. **3959 SM1** *server for OpenStorage Systems rear view*

Table 11. **3959 SM1** *server for OpenStorage Systems slot assignments, ports, and connectors*

2 Power supply 2	**U** USB ports: Upper left = 1, upper right = 2, lower left = 3, lower right = 4
1 Power supply 1	**6** MegaRAID Controller
M PS/2 mouse port	**5** Unused (Empty)

Table 11. **3959 SM1** *server for OpenStorage Systems slot assignments, ports, and connectors (continued)*

K PS/2 keyboard port	**4** Ethernet Adapter **ETH0** (Act/Link A port): LAN **ETH1** (Act/Link B port): Replication
S RS-232 serial port	**3** Ethernet Adapter **ETH2** (Act/Link A port): OpenStorage **ETH3** (Act/Link B port): OpenStorage
V Video port	**2** Unused (Empty)
ETH4 (NIC 1) On-board Ethernet port: Replication	**1** RAID Battery Backup Unit (BBU)
ETH5 (NIC 2) On-board Ethernet port: LAN	

Removing and replacing a DIMM

About this task

The TS7610 or TS7620 server is equipped with six, 4GB dual in-line memory modules (DIMMs), for a total of 24GB.

Figure 25 on page 52 shows the numbering order of the eight DIMM slots. The six installed DIMMs occupy slots A1 and A2, B1 and B2, C1, and D1. Slots C2 and D2 are left empty.

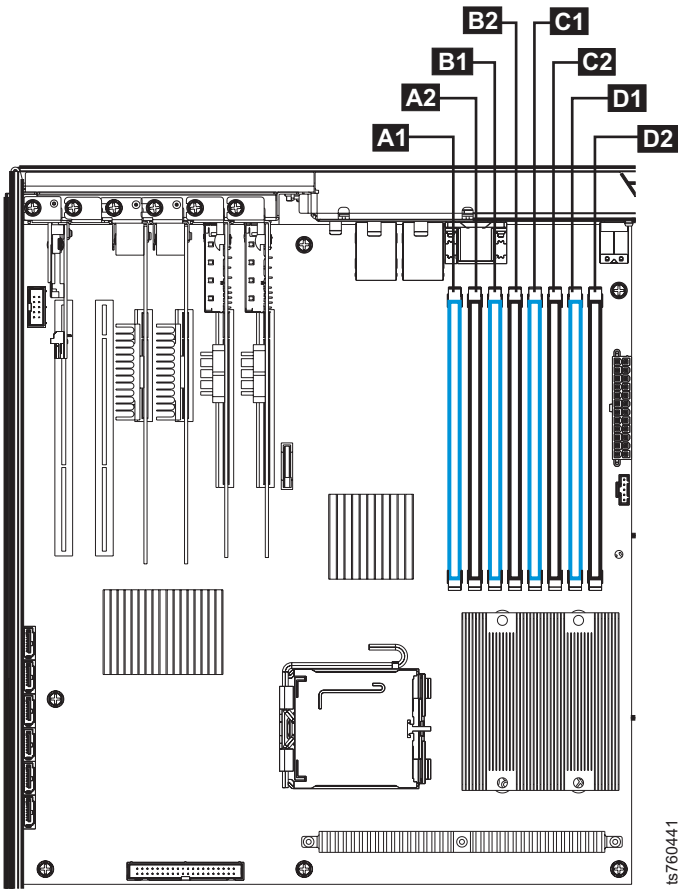

Figure 25. DIMM layout

Important:

- DIMMs are internal and cold-swappable.
- Before you begin, review the information in "Electrostatic discharge procedures" on page 27.
- Take care to avoid touching the gold contacts along the lower edge of the memory modules.

Note: To see a complete list of the TS7610 repair videos, go to the TS7610 Customer Information Center, located at: http://pic.dhe.ibm.com/infocenter/ts7610/cust/index.jsp. Once in the TS7610 Customer Information Center, search for **repair video** and click **Go**. The video list will appear in the left column.

Procedure

1. Power-off the server. To do so, refer to "TS7610 or TS7620 power off sequence" on page 27.

   After the server is fully powered-off, return to this page and continue with step 2.
2. To remove a DIMM:
   a. Place the TS7610 or TS7620 server in the service position, as described in "Placing the TS7610 or TS7620 to service position" on page 31, and remove the server's top cover.

b. Lift and remove the plastic airflow baffle and set it aside. See Figure 26.

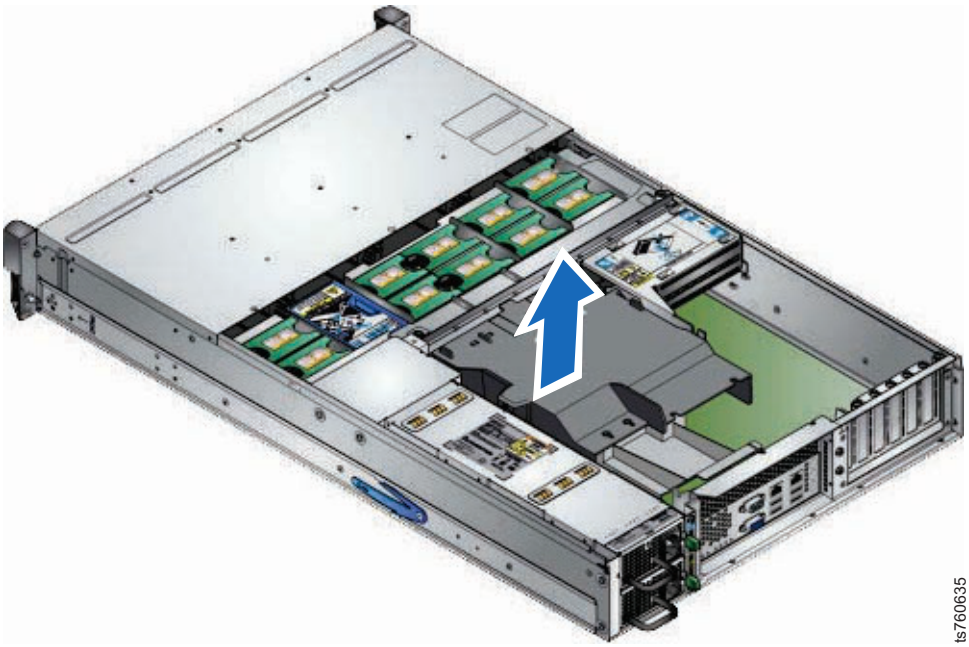

Figure 26. Remove airflow baffle

c. Locate the defective DIMM, and simultaneously press the white release latches, located on either side of the DIMM, downward and outward until the latches lock in the open position. See Figure 27.

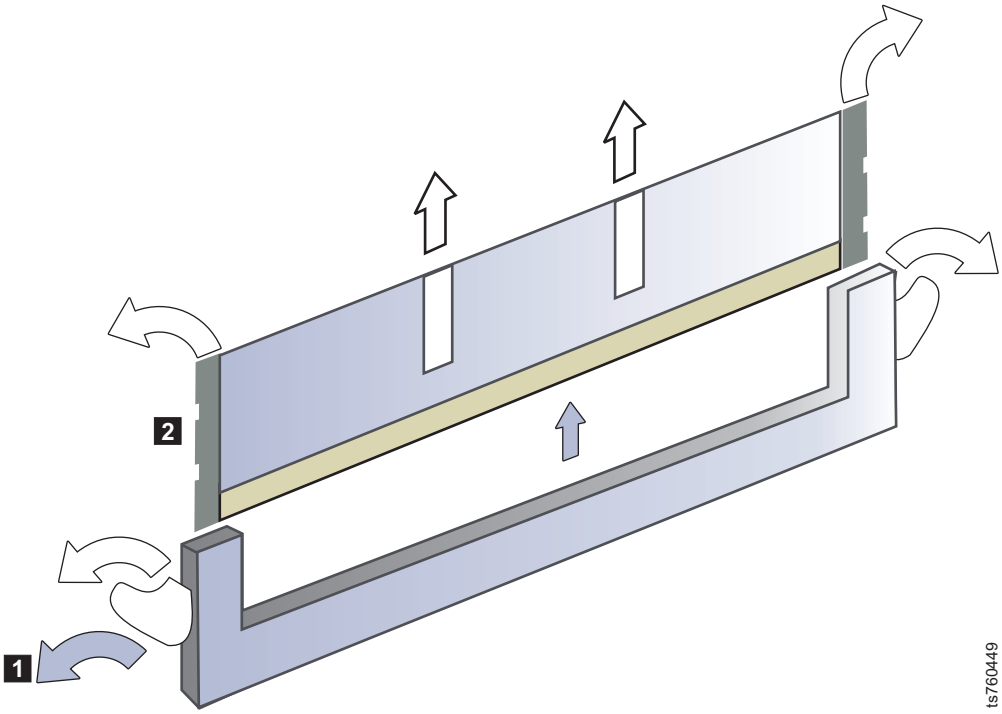

Figure 27. Remove DIMM

d. Carefully grasp the DIMM by the upper corners and lift it up and out of the slot.

3. To replace a DIMM:
   a. Remove the new DIMM from its anti-static packaging.
   b. Carefully grasp the new memory module by the upper corners and position the bottom corners of the DIMM in the upright columns.
   c. Press down gently, taking care to align the notch in the lower edge of the DIMM with the cross-piece in the bottom of the slot, as the DIMM modules are keyed to fit in only one direction.. Continue to press downward until the new DIMM is firmly seated in the slot, and the white release latches return to the closed position.

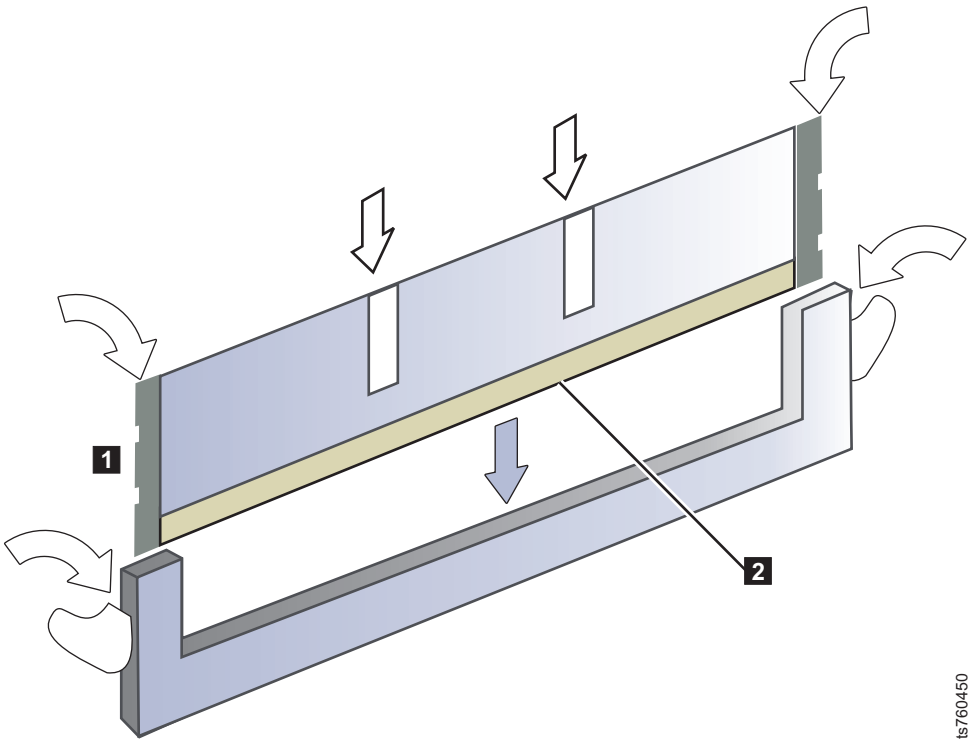

Figure 28. Replace DIMM

d. Replace the plastic airflow baffle. See Figure 29 on page 55.

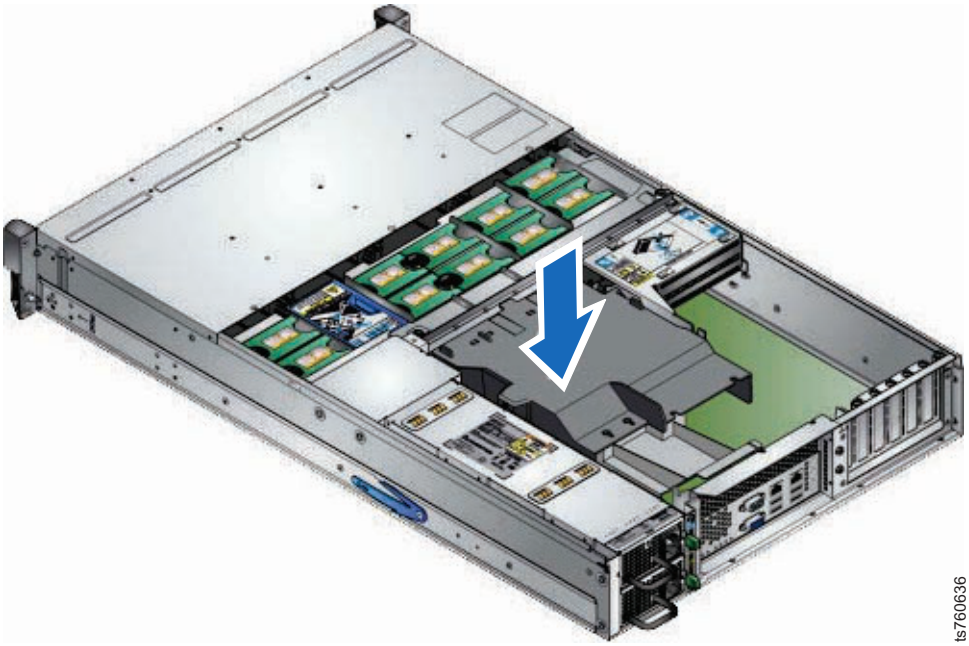

Figure 29. Replace airflow baffle

e. Return the TS7610 or TS7620 server to the operational position, as described in "Placing the TS7610 or TS7620 to operational position" on page 33.

4. Power-on the server. To do so, refer to "TS7610 or TS7620 startup" on page 29, and then return to this page and continue with step 5.
5. To clear hardware faults following the maintenance, the ProtecTIER Manager GUI must be refreshed. If the ProtecTIER Manager GUI is not available, verify that replacing the component resolved the hardware fault, as described in "Verifying fault resolutions in the TS7610 or TS7620 ProtecTIER Service menu" on page 82.

   After you have verified that the steps taken to resolve a fault were successful and that residual fault alert information is cleared from the ProtecTIER Manager GUI, the component replacement is complete.

Removing and replacing a TS7610 or TS7620 ProtecTIER V3.3.6 cooling fan

About this task

The TS7610 or TS7620 server is equipped with ten cooling fans. In the event of a hardware failure, the remaining fans automatically increase their speed to compensate for the loss. This allows the server to maintain an acceptable operating temperature and continue functioning.

Important:

- Cooling fans are internal and hot-swappable.
- Before you begin, review the information in "Electrostatic discharge procedures" on page 27.
- Immediately after a hardware failure, it may take a few moments for the fan blades to come to a complete stop. Use caution to avoid injury.

- To prevent system damage, replace a cooling fan within 72 hours. Leave the defective cooling fan in place until you have the new component and are ready to perform the replacement.

Note: To see a complete list of the TS7610 repair videos, go to the TS7610 Customer Information Center, located at: http://pic.dhe.ibm.com/infocenter/ts7610/cust/index.jsp. Once in the TS7610 Customer Information Center, search for **repair video** and click **Go**. The video list will appear in the left column.

Procedure

1. To remove a cooling fan:
   a. Place the TS7610 or TS7620 server in service position, as described in "Placing the TS7610 or TS7620 to service position" on page 31.
   b. Loosen the cover's holding screw **1**, press the silver button **2**, and slide the cover back to expose the fans **3**.
      See Figure 30.

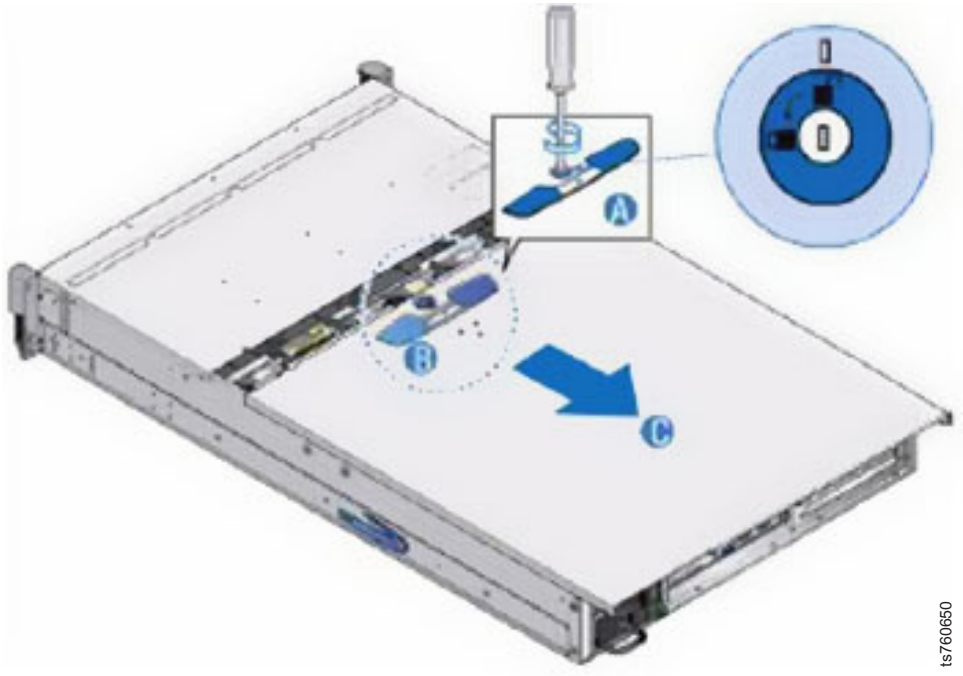

Figure 30. Expose cooling fans

   c. Using Figure 31 on page 57 for reference, locate the defective cooling fan.

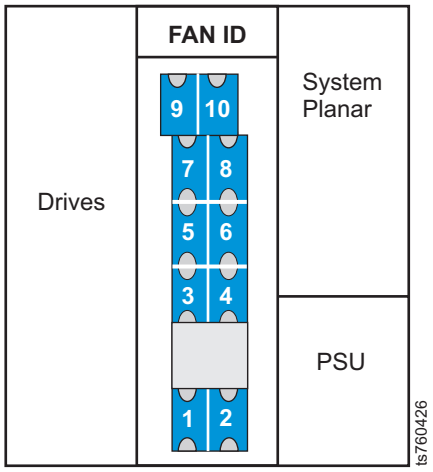

Figure 31. Cooling fan layout

d. Grasp the defective fan by the finger-holds on the top, and lift the fan up to remove it.

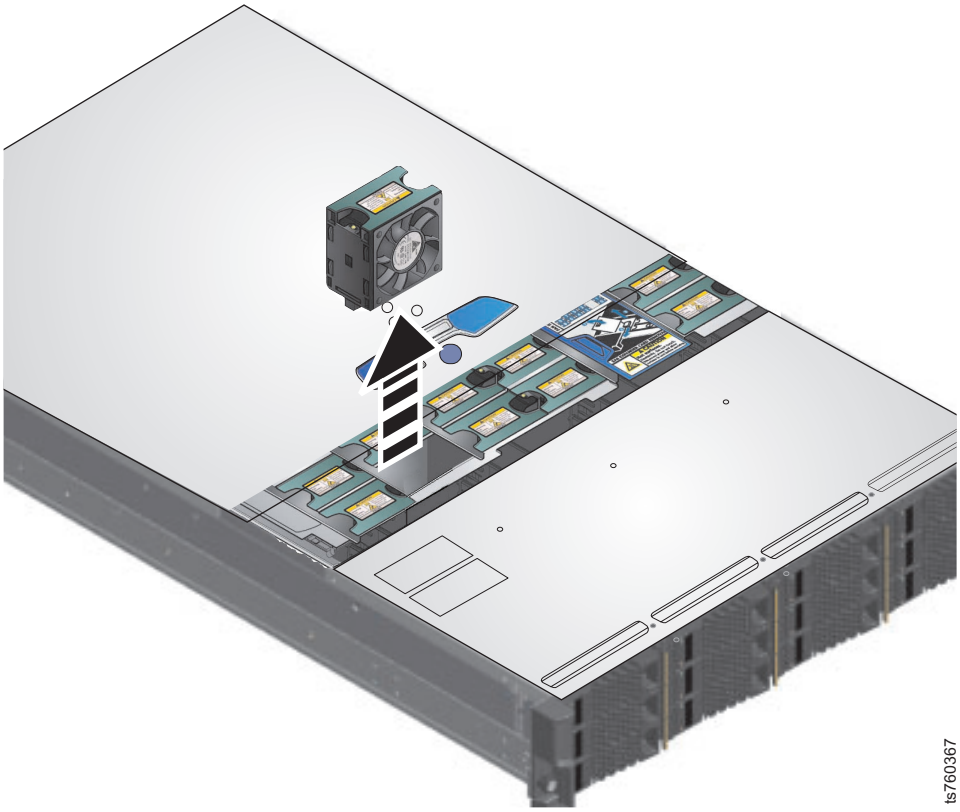

Figure 32. Removing a cooling fan

2. To replace a cooling fan:
   a. With the TS7610 or TS7620 server in service position, as described in "Placing the TS7610 or TS7620 to service position" on page 31, grasp the new fan by the finger-holds on the top and drop it into place inside the chassis:

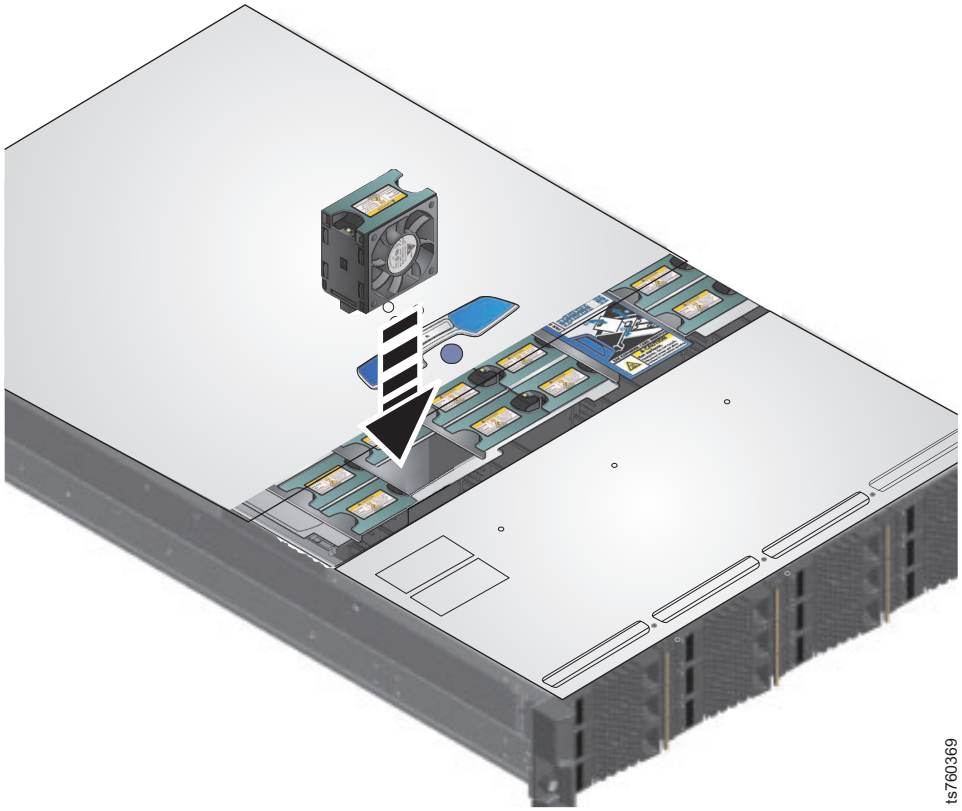

Figure 33. Replacing a cooling fan

The new fan's LED comes on and stays illuminated until the system recognizes the component. The LED then goes off and the other fans return to regular operating speed.

b. Replace the top cover, and return the TS7610 or TS7620 server to the operational position, as described in "Placing the TS7610 or TS7620 to operational position" on page 33.

3. Verify that replacing the component resolved the hardware fault, as described in "Verifying fault resolutions in the TS7610 or TS7620 ProtecTIER Service menu" on page 82.

   After you have verified that the steps taken to resolve a fault were successful, and that any residual fault alert information is cleared from the ProtecTIER Manager, the component replacement is complete.

4. Use the shipping instructions and materials that were provided in the package to return the defective item to IBM.

Removing and replacing the Ethernet adapter

About this task

The Ethernet adapter provides connectivity from the server to your local area network (LAN).

Important:

- The Ethernet adapter is internal and cold-swappable.
- Before you begin, review the information in "Electrostatic discharge procedures" on page 27.

- Take care to avoid touching the gold contacts along the lower edge of the adapter.

Note: To see a complete list of the TS7610 repair videos, go to the TS7610 Customer Information Center, located at: http://pic.dhe.ibm.com/infocenter/ts7610/cust/index.jsp. Once in the TS7610 Customer Information Center, search for **repair video** and click **Go**. The video list will appear in the left column.

Procedure

1. Power-off the server. To do so, refer to "TS7610 or TS7620 power off sequence" on page 27.

   After the server is fully powered-off, return to this page and continue with step 2
2. To remove the Ethernet adapter:
   a. Disconnect the Ethernet cable from the adapter.

      If you are unsure of the Ethernet adapter's location, refer to "TS7610 and TS7620 Appliance Express ProtecTIER V3.3.6 Parts list and hardware component replacement" on page 43.
   b. Place the TS7610 Appliance Express in the service position, as described in "Placing the TS7610 or TS7620 to service position" on page 31, and remove the server's top cover.
   c. Remove the retention screw from the adapter's mounting bracket, and set the screw aside.
   d. Carefully grasp the adapter by the upper corners and lift it up and out of the slot.

      Note: You may need to gently wiggle the adapter from side-to-side to free it from the slot.

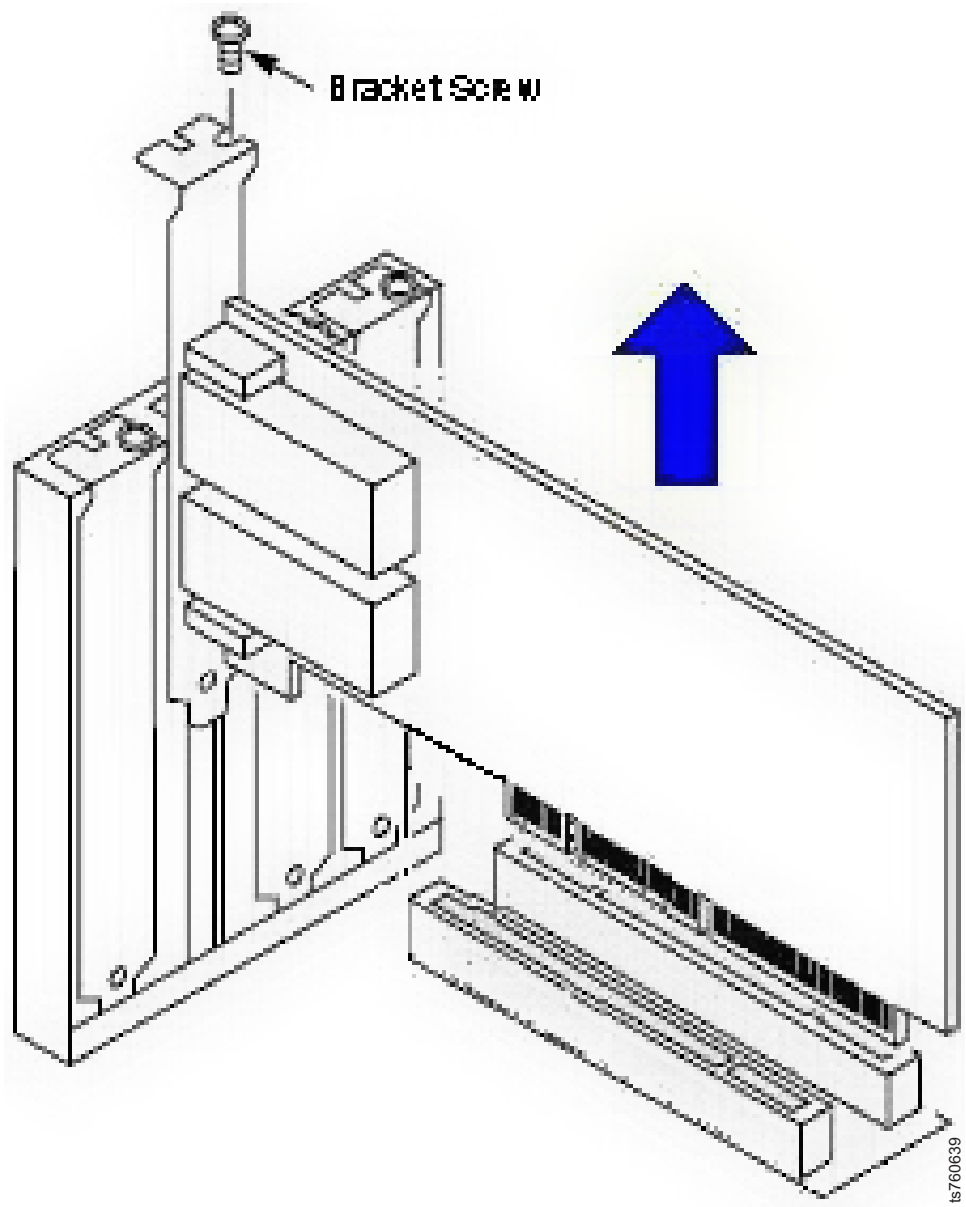

Figure 34. Remove Ethernet adapter

3. To replace the Ethernet adapter:
   a. Remove the new adapter from its anti-static packaging.
   b. Carefully grasp the adapter by the upper corners and align it with the appropriate slot.

      Note: When the component is installed correctly, the tapered tab on the lower edge of the mounting bracket will be visible when viewed from inside the chassis.
   c. Press down gently until the adapter is firmly seated.

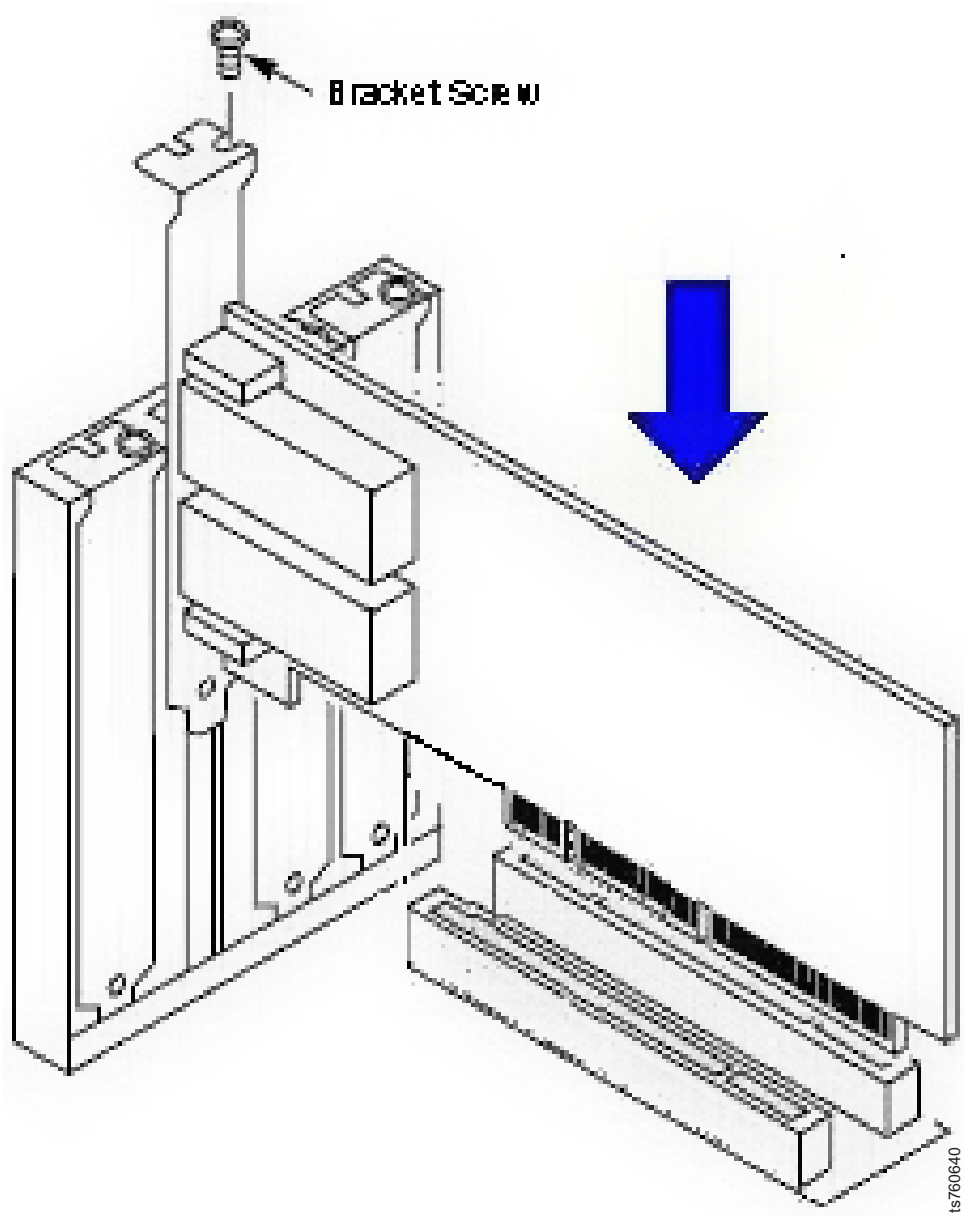

Figure 35. Replace Ethernet adapter

d. Replace the retention screw, tightening it to secure the mounting bracket to the server chassis.

e. Return the TS7610 or TS7620 server to the operational position, as described in "Placing the TS7610 or TS7620 to operational position" on page 33.

f. Reconnect the Ethernet cable to the new adapter.

4. Power-on the server. To do so, perform the steps in "TS7610 or TS7620 startup" on page 29.

   While the server is powering on the display may blink on and off. A number of status messages, which may include one or more failure notices, display on the screen. As long as the failures do not disrupt the boot cycle, ignore the messages and allow the process to continue.

   Note: During the power-on, the system auto-starts the ProtecTIER vtfd and ptcluster services. The server login prompt displays on the monitor before vtfd

and ptcluster services have finished loading. However, you cannot use the ProtecTIER Manager to access the server until the services have started completely, which may take up to 10 minutes. When service startup is complete, communication between the server and the ProtecTIER Manager is restored, and the server is ready to resume normal operation.

As the boot cycle nears completion, messages similar to those shown below, display:

```
registered calypso with major device 248
GFS: fsid=xuxoqugedahide:gfs_lv_vg0.0:fast statfs start time =
1276105582
GFS: fsid=xuxoqugedahide:gfs_lv_vg1.0:fast statfs start time =
1276105582
GFS: fsid=xuxoqugedahide:gfs_lv_vg2.0:fast statfs start time =
1276105582
GFS: fsid=xuxoqugedahide:gfs_lv_vg3.0:fast statfs start time =
1276105583
GFS: fsid=xuxoqugedahide:gfs_lv_vg4.0:fast statfs start time =
1276105583
```

5. When message activity has ceased, press **<enter>**.

   The server login: prompt displays.

6. Verify that replacing the component resolved the hardware fault. See "Verifying fault resolutions in the TS7610 or TS7620 ProtecTIER Service menu" on page 82.

   After you have verified that the steps taken to resolve a fault were successful, and that any residual fault alert information is cleared from the PT Manager GUI, the component replacement is complete.

7. Use the shipping instructions and materials that were provided in the package to return the defective item to IBM.

Removing and replacing a TS7610 Appliance Express and TS7620 Appliance Express power supply unit

About this task

The TS7610 or TS7620 server is equipped with dual power supply units (PSUs). This allows the system to temporarily continue functioning if one of the power supplies becomes disconnected from the AC source, or in the event of a hardware failure.

Important:

- PSUs are external and hot-swappable.
- Before you begin, review the information in "Electrostatic discharge procedures" on page 27.
- Before removing a PSU, confirm that the hardware fault was not the result of a loose or unplugged power cord.
- Only one PSU can be replaced at a time. The second PSU must remain connected to AC power.
- To prevent system damage, replace a faulty PSU within 24 hours. Do not remove a PSU until you have a replacement available.

Tip: You can access instructional videos for removing and replacing a PSU in the *Failed power supply Resolution guide*, located in the ProtecTIER Manager GUI. For instructions on accessing the Resolution guide, see "Where to go for information" on page 6.

Procedure

1. To remove a power supply:
   a. Working from the rear of the frame with the TS7610 or TS7620 server in operational position, disconnect the power cord from the faulty PSU.
   b. Squeeze and hold the PSU's green locking tab to the left:

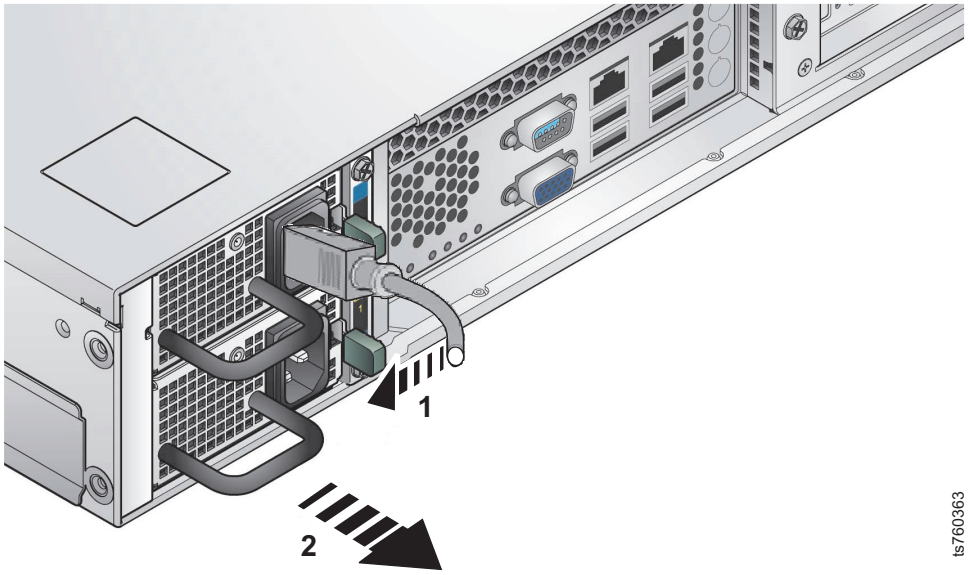

Figure 36. Squeeze the locking tab

   c. Grasp the handle and carefully pull the PSU forward to remove it from the chassis:

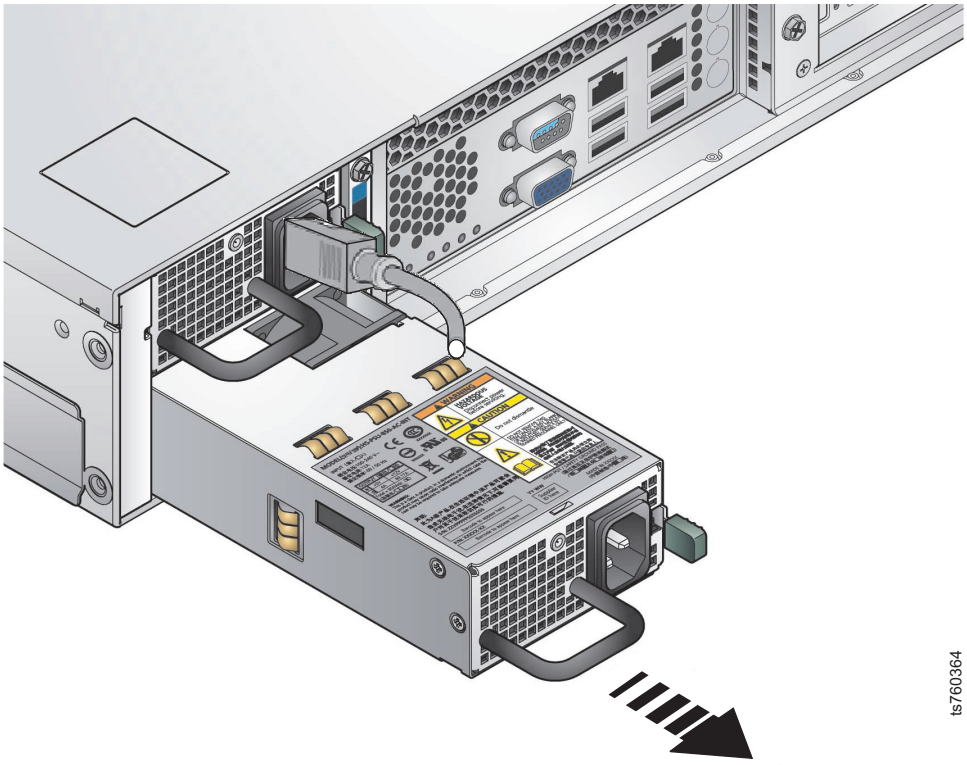

Figure 37. Remove the PSU

2. To replace a power supply:
   a. Working from the rear of the frame with the TS7610 or TS7620 server in operational position, align the new PSU with the bay in the chassis.
   b. Press the PSU forward until is firmly seated and clicks into place:

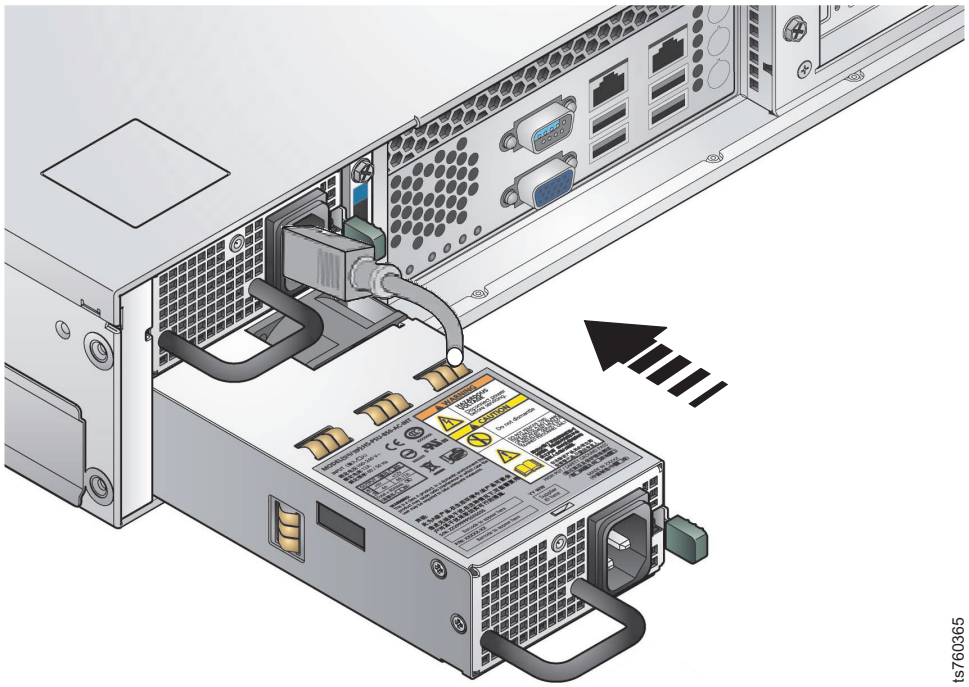

Figure 38. Replace the PSU

c. Connect the power cord from the power source to the new PSU:

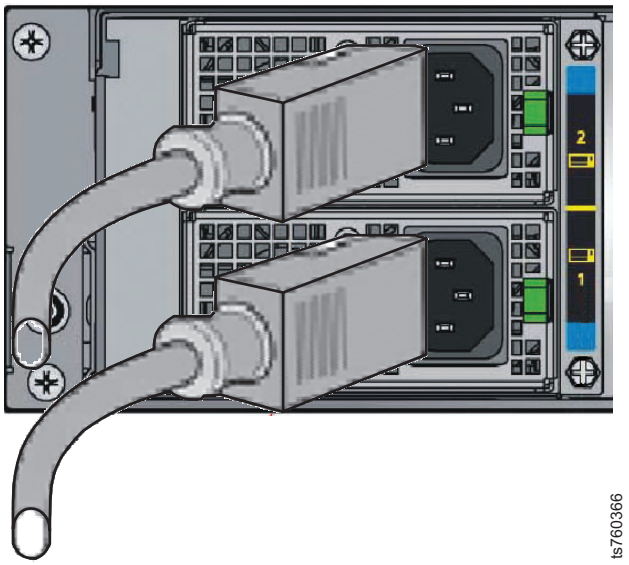

Figure 39. Connect the power cord to the new PSU

d. Fasten the wire bale across the plug to secure the cord to the server's chassis.

3. Verify that replacing the component resolved the hardware fault, as described in "Verifying fault resolutions in the TS7610 or TS7620 ProtecTIER Service menu" on page 82.

   After you have verified that the steps taken to resolve a fault were successful, and that any residual fault alert information is cleared from the PT Manager GUI, the component replacement is complete.

4. Use the shipping instructions and materials that were provided in the package to return the defective item to IBM.

Removing and replacing the RAID battery backup unit

About this task

For up to 72 hours following a power outage or power failure, the RAID battery backup unit (BBU) protects the integrity of any data residing on the MegaRAID controller.

Important:

- The RAID BBU is internal and cold-swappable.
- Before you begin, review the information in "Electrostatic discharge procedures" on page 27.
- Take care to avoid touching the gold contacts along the lower edge of the battery.

Note: Tip: You can watch the instructional video of putting the TS7610 or TS7620 server into service position by going to the TS7610 Customer Information Center, located at: http://pic.dhe.ibm.com/infocenter/ts7610/cust/index.jsp.

Once you are in the TS7610 Customer Information Center, search for **videos** and click **Go**. From the list that appears, select **Removing and replacing the RAID Battery backup unit**.

Procedure

1. Power-off the server. To do so, refer to "TS7610 or TS7620 power off sequence" on page 27.

   After the server is fully powered-off, return to this page and continue with step 2.
2. To remove the RAID BBU:
   a. Place the TS7610 or TS7620 server in the service position, as described in "Placing the TS7610 or TS7620 to service position" on page 31, and remove the server's top cover.
   b. Carefully disconnect the cable from the top of the BBU.

      If you are unsure of the BBU's location, refer to "TS7610 and TS7620 Appliance Express ProtecTIER V3.3.6 Parts list and hardware component replacement" on page 43.
   c. Remove the retention screw from the BBU's mounting bracket, and set the screw aside.
   d. Carefully grasp the BBU by the plastic shield and lift the BBU up and out of the slot.

      Note: You may need to gently wiggle the BBU from side-to-side to free it from the slot.
3. To replace the RAID BBU:
   a. Remove the new BBU from its anti-static packaging.
   b. Carefully grasp the BBU by the plastic shield and position it in the appropriate slot.

Note: When the component is installed correctly, the tapered tab on the lower edge of the mounting bracket will be visible when viewed from inside the chassis.

c. Press down gently until the BBU is firmly seated.

d. Replace the retention screw, tightening it to secure the mounting bracket to the server chassis.

e. Reconnect the cable from the MegaRAID controller to the top of the BBU.

Note: When connecting the cable, make sure that the side of the connector with the double row of silver contacts faces **away** from the BBU.

f. Return the TS7610 or TS7620 server to the operational position, as described in "Placing the TS7610 or TS7620 to operational position" on page 33.

4. Power-on the server. To do so, refer to "TS7610 or TS7620 startup" on page 29, and then return to this page and continue with step 5.
5. Verify that replacing the component resolved the hardware fault, as described in "Verifying fault resolutions in the TS7610 or TS7620 ProtecTIER Service menu" on page 82.

   After you have verified that the steps taken to resolve a fault were successful, and that any residual fault alert information is cleared from the PT Manager GUI, the component replacement is complete.
6. Use the shipping instructions and materials that were provided in the package to return the defective item to IBM.

Removing and Replacing a SATA hard disk drive

About this task

The TS7610 or TS7620 server is equipped with 12 serial advanced technology attachment (SATA) hard disk drives (HDDs), located on the front of the server. Drives 0 - 11 store your repository meta-and customer data. In the event of an HDD failure, the MegaRAID controller automatically redistributes the stored data from the failed HDD to drive 11, which is used as a hot spare.

Important: The figure below shows the HDDs' numbering sequence. You must maintain the original numbering order. Rearranging the order in which the drives were originally installed will result in data loss.

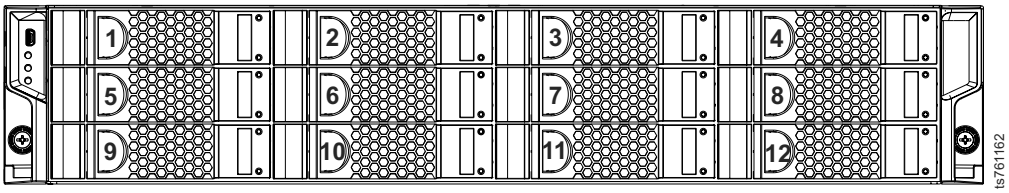

Figure 40. HDD numbering sequence

Important:

- HDDs are external and hot-swappable.
- Before you begin, review the information in "Electrostatic discharge procedures" on page 27.
- Always replace a failed hard drive with the exact manufacturer, model, and capacity; as the one that you removed.

- Be sure to install the new hard drive into the same bay that was previously occupied by the failed hard drive. Do not rearrange the original order of the drives.
- Each HDD is enclosed in a drive carrier. There is no need to remove the drive from the carrier to replace the drive.
- Slot 12 contains the Hot Spare for the array. If there is a failure of the Hot Spare drive, and replacement is required, and if a replacement drive is inserted that contains any previous information or data, you will be prompted to format that drive. If prompted, answer: Yes.

Tip: You can access instructional videos for removing and replacing an HDD in the *Failed disk drive Resolution guide* and the *Missing disk drive Resolution guide*, located in the ProtecTIER Manager. For instructions on accessing the guides, see "Where to go for information" on page 6.

Procedure

1. Verify the hardware fault once more before servicing the component by running a **Health check** either through the ProtecTIER Manager Service menu, refer to "Health Monitoring" on page 19 or through ProtecTIER Manager **Hardware resources**, refer to the Figure 7 on page 13.
2. To remove an HDD:
   a. Working from the front of the frame with the TS7610 or TS7620 server in operational position, confirm that the LEDs on the front of each hard drive have stopped blinking.
   b. Squeeze and hold the release latch on the defective drive's carrier to the right, toward the hinge:

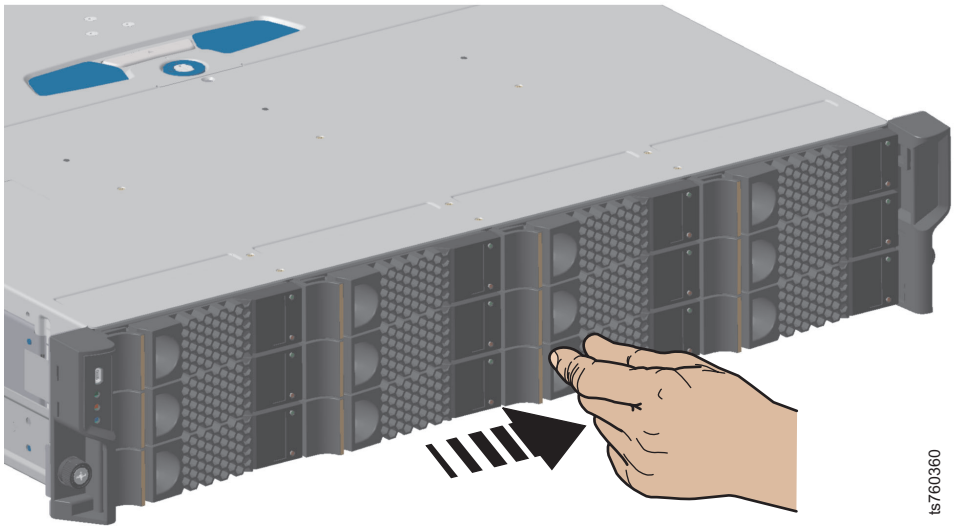

Figure 41. Squeeze drive carrier release latch

   c. Carefully slide the carrier toward you, until it is free of the drive bay.

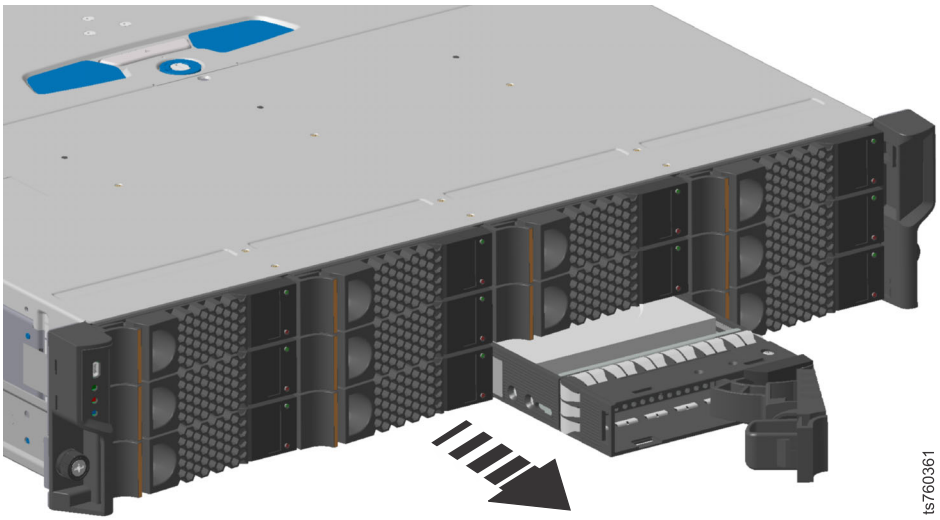

Figure 42. Remove the drive carrier

3. To replace a SATA hard drive:
   a. Working from the front of the frame with the TS7610 or TS7620 server in operational position, carefully slide the new drive carrier into the empty drive bay:

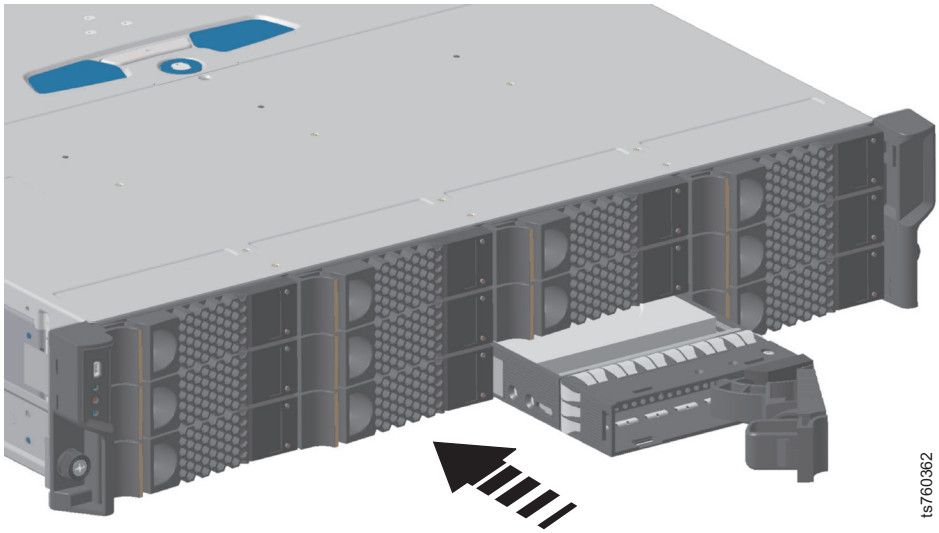

Figure 43. Replace the drive carrier

   b. Press the new drive carrier forward until it is firmly seated and the handle engages and snaps into place.

      When inserted correctly, the new drive carrier will be flush with the other drives in the bay.

4. Once replaced, the rebuilding starts automatically. The component status appears as **rebuilding** in the Health check output during the rebuild process. It might take 5 to 12 hours to complete rebuilding depending on the amount of data.
5. Verify that replacing the component resolved the hardware fault or check if the hard disk is still rebuilding, by running a **Health check** through the ProtecTIER Manager Service menu, refer to "Health Monitoring" on page 19 or check the ProtecTIER Manager **Hardware resources**, refer to the Figure 7 on page 13

   After you have verified that the steps taken to resolve a fault were successful, and that any residual fault alert information is cleared from the ProtecTIER Manager, the component replacement is complete.
6. Use the shipping instructions and materials that were provided in the package to return the defective item to IBM.

Chapter 5. Servicing the TS7620 Expansion unit

The expansion unit is an addition to the TS7620 where you can add an addition 10GB with each drawer up to 2 additional drawers.

For complete instructions on installing the TS7620 expansion unit, refer to the *IBM System Storage® TS7620 ProtecTIER® v.3.3 Deduplication Appliance Express - Feature Code 9345 (3959 EXP), Field Installation of Expansion Drawer, SC27-5413-01*.

Important: The DVD that is included in the TS7620 expansion unit ship group allows you to upgrade the base unit from 3.3 12TB to 3.3 23TB, 3.3 12TB to 3.3 35TB or 3.3 23TB to 3.3 35TB. It should not be used to upgrade from 3.2 to 3.3.

Before increasing the capacity to 23TB or 35TB on the base unit (3959 SM2), if the base unit is at:

- ProtecTIER version 3.2 6TB repository capacity:
  - Upgrade the base unit from ProtecTIER version 3.2 6TB repository capacity to ProtecTIER version 3.3 6TB repository capacity, then;
  - Upgrade the base unit from ProtecTIER version 3.3 6TB repository capacity to ProtecTIER version 3.3 12TB repository capacity (FC 9317)
- ProtecTIER version 3.2 12TB repository capacity:
  - Upgrade the base unit from ProtecTIER version 3.2 12TB repository capacity to ProtecTIER version 3.3 12TB repository capacity
- ProtecTIER version 3.3 6TB repository capacity
  - Upgrade the base unit from ProtecTIER version 3.3 6TB repository capacity to ProtecTIER version 3.3 12TB repository capacity (FC 9317)
- ProtecTIER version 3.3 12TB repository capacity
  - No need to upgrade as base unit is at minimum capacity
- ProtecTIER version 3.3 23TB repository capacity
  - No need to upgrade as base unit is above minimum capacity

Table 12. TS7620 Appliance Express 3959-EXP 11.5 expansion drawer component categories and FRU IDs

Component name / hardware name if listed in the ProtecTIER Manager GUI Hardware Resources view	**Quantity**	**CRU**	**FRU**	**Internal**	**External**	**Hot-swappable**	**Cold-swappable**	**FRU ID (Part number)**
Power Cooling Module includes PWR SUPPLY and Cooling modules / **Power supply (99Y1243) or Cooling module(45W8018)**	2	■			■	■		00L4605
CABLE - SAS 1x to 2x	1	■			■		■	35P2255
HARD DRIVE - carrier w/HDD / **Disk drive**	12	■			■	■		98Y2420
CHASSIS (the chassis base assembly includes the **SAS Expander (35P2384)**)	1		■		■		■	35P2383
ESM (Enclosure SAS module) Canister **/Canister**	2		■		■	■		35P2384
CABLE POWER (2.8M IEC 320-C13)	2	■			■		■	46X2536
CABLE POWER (2.8M NEMA C-13)	2	■			■		■	46X6880
RAIL KIT (Rail kit for EXP)	1	■			■		■	85Y5852

Table 12. TS7620 Appliance Express 3959-EXP 11.5 expansion drawer component categories and FRU IDs (continued)

Component name / hardware name if listed in the ProtecTIER Manager GUI Hardware Resources view	Quantity	CRU	FRU	Internal	External	Hot-swappable	Cold-swappable	FRU ID (Part number)
SAS CABLE 1 to 1	2	■			■		■	44V4041

Table 13. TS7620 expansion unit solutions

Problem detected	Component to change	Maintenance procedure
Disk drive	HARD DRIVE - carrier w/HDD	1. This is a CRU. Get the part number of the part number from Table 12 on page 71. 2. To order the replacement part, refer to "Ordering a replacement CRU or scheduling a FRU service call" on page 2. 3. To replace the hard drive, refer to "Replacing a drive module" on page 76.
Power supply	Power Cooling Module includes PWR SUPPLY and Cooling modules	1. This is a CRU. Get the part number of the part number from the Table 12 on page 71. 2. To order the replacement part, refer to "Ordering a replacement CRU or scheduling a FRU service call" on page 2. 3. To replace a power cooling module, refer to "Replacing the power cooling module" on page 74.
Cooling module	Power Cooling Module includes PWR SUPPLY and Cooling modules	1. This is a CRU. Get the part number of the part number from the Table 12 on page 71. 2. To order the replacement part, refer to "Ordering a replacement CRU or scheduling a FRU service call" on page 2. 3. To replace a power cooling module, refer to "Replacing the power cooling module" on page 74.
SAS Expander	CHASSIS (base assembly includes SAS expander)	1. This is a FRU. To schedule a service call, refer to "Ordering a replacement CRU or scheduling a FRU service call" on page 2. 2. To find the replacement part number for the chassis, refer to "Ordering a replacement CRU or scheduling a FRU service call" on page 2.
Canister	Canister (Encl for SAS module)	1. This is a CRU. Get the part number of the part number from the Table 12 on page 71. 2. To order the replacement part, refer to "Ordering a replacement CRU or scheduling a FRU service call" on page 2. 3. To replace a canister, refer to "Replacing a canister" on page 78.

Canister LED problem determination

About this task

The following section explains how to interpret the different canister LEDs conditions in the problem determination of the ProtecTIER expansion unit.

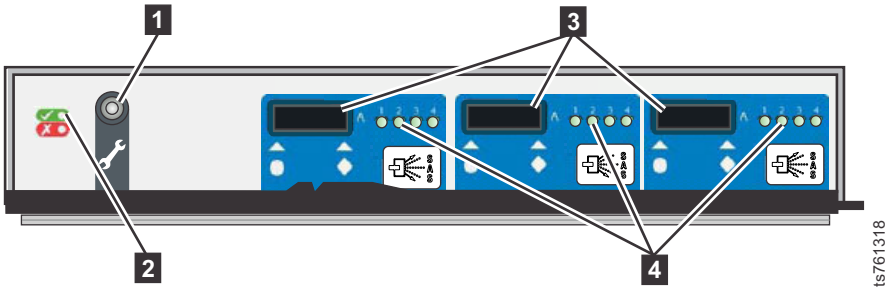

Figure 44. Canister module connectors and indicators (viewed from rear of the chassis)

Table 14. Canister problem determination

	LED	State	Description	Resolution
1	Factory use only serial port		Factory use only serial port	
2	I/O Module Power (green)	On	Module powered.	n/a
		Off	No power.	• Make sure the PCMs are on • Reseat the canister • Replace canister
	I/O Module Fault (amber)	On	A fault condition.	Replacement is needed, dev to review the logs
		Off	Module is operating normally	n/a
3	Connectors, SAS ports A-C			
4	External Port Activity 1-4, ProtecTIER unique Y shaped cable, External port activity 1-2	On, Leds 1&2 on the right Hand side port On	Ready, no traffic	n/a
		Flashing, Same two flashing and two off	Active, I/O traffic.	n/a
		All flashing	Not ready, no power	Wait for 30 sec to determine if this is a booting cycle. If it stays on flashing mode, replace the canister.
		Off	Not ready, no power	• Make sure the PCMs are on • Reseat the canister • Replace canister

Replacing the power cooling module

Instructions to replace a TS7620 expansion unit power cooling module.

About this task

Each expansion unit drawer contains two power cooling units which provides redundant power control and cooling for the expansion drawer. The PCM (power cooling modules) is hot-pluggable and once one is removed another has to be put in it's place within 24 hours. Any missing modules will disrupt the airflow and the drives will not receive sufficient cooling.

To remove the power cooling module:

1. Identify the faulty PCM
2. Leave on the TS7620 Expansion unit on but switch the faulty PCM power off or unplug the faulty PCM.
3. Grasp the latch and the PCM handle. The PCM handle is a frame on the back end of the PCM. Squeeze the latch to open the handle.

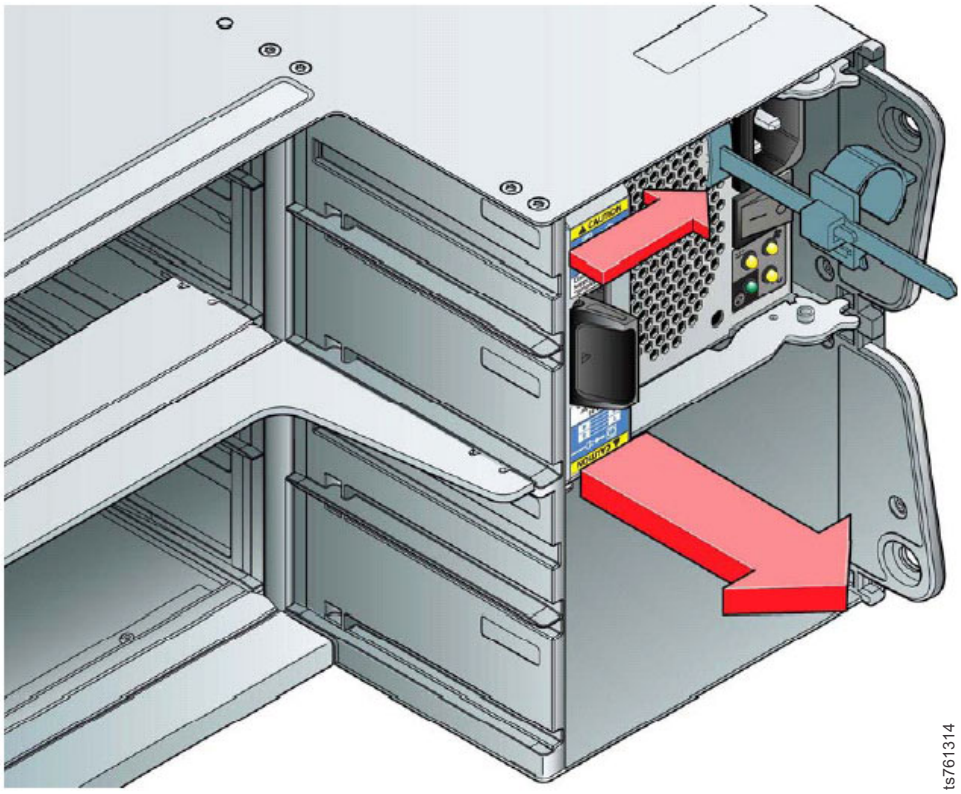

Figure 45. Squeeze latch to open handle

4. Pull the handle to pull out the PCM out of drawer.

   Note: Do not remove covers from the PCM – there is a danger of electric shock inside.

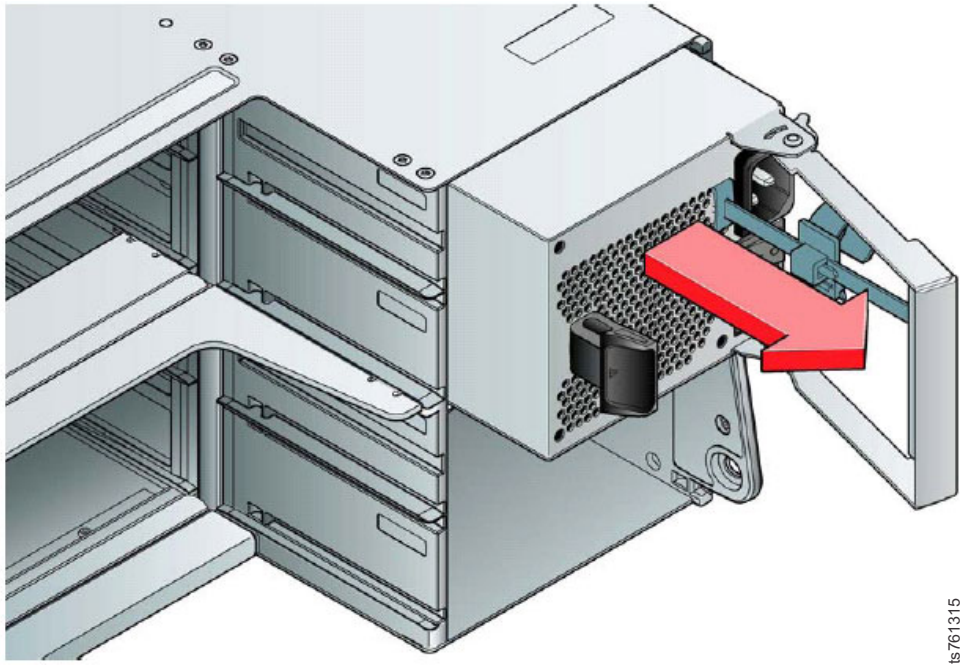

Figure 46. Pull PCM handle

To install a power cooling module

1. Check the new power cooling unit connector pins. Do not install the PCM if any of the pins re bent.
2. With the PCM handle in the open position, slide the PCM into the expansion unit drawer.

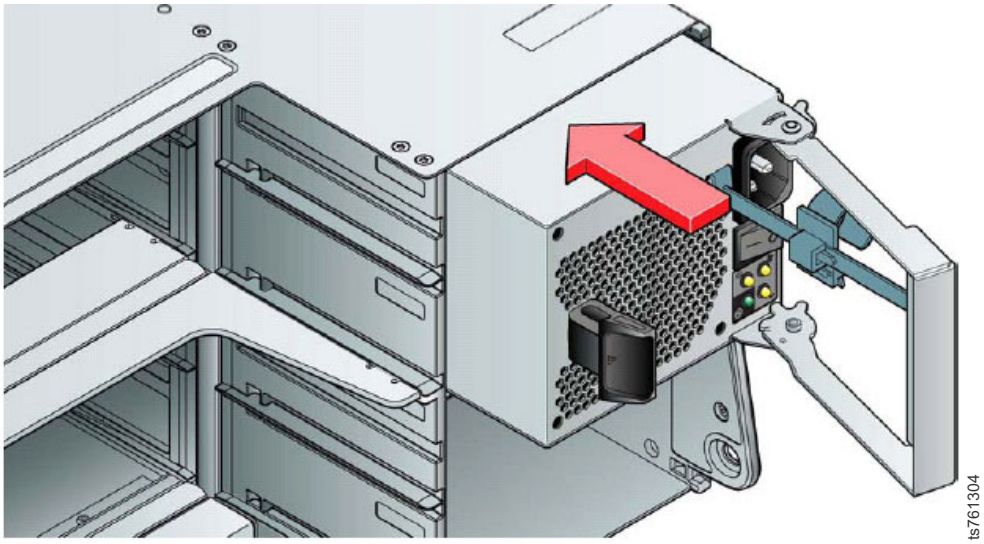

Figure 47. Open latch and push PCM unit in

3. Close and secure the handle, a click will be heard once the handle latch engages.

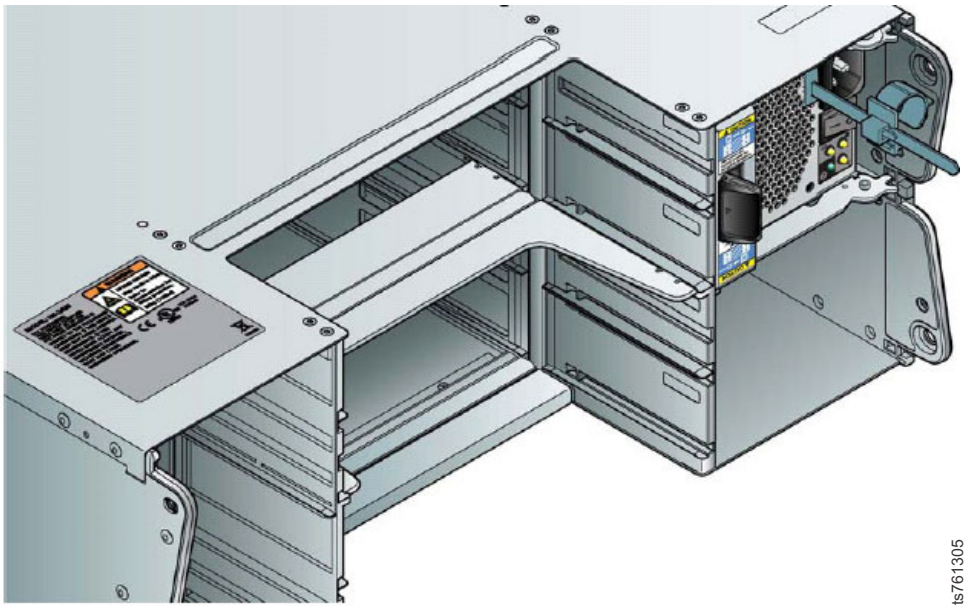

Figure 48. Latch PCM handle

4. Connect the power cables to the PCM.

Replacing a drive module

Instructions to replace a TS7620 expansion unit drive module.

About this task

Important: Damage can occur to a drive if it is removed while it still spins. If possible use the operating system to spin down the drives prior to removal. If this is not possible we recommend that you perform all steps of the following procedure to make sure that the drive has stopped prior to removal.

To remove a drive carrier module:

1. Press the latch in the handle towards the handle hinge to release the carrier.

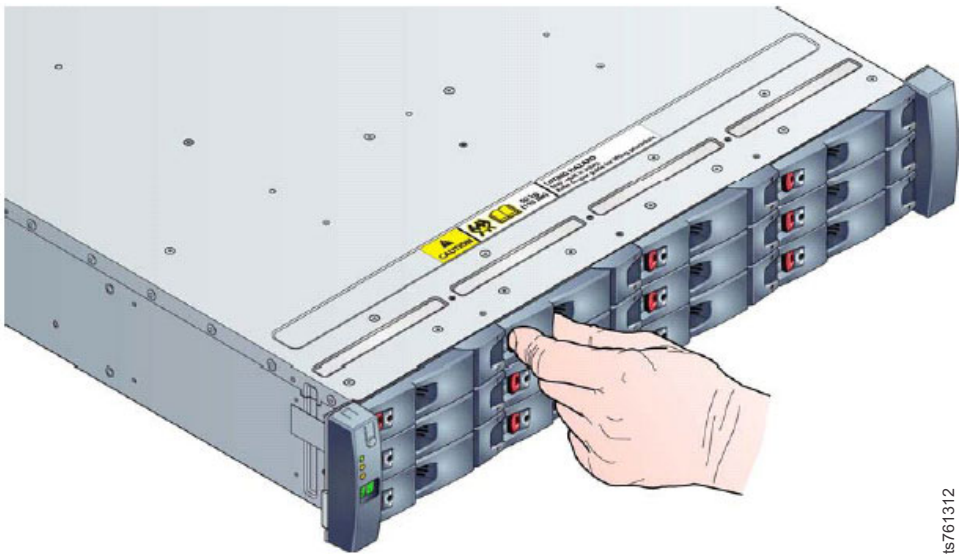

Figure 49. Press latch to release carrier

2. Gently remove a drive carrier module.
3. Remove the module fully from the drive bay.

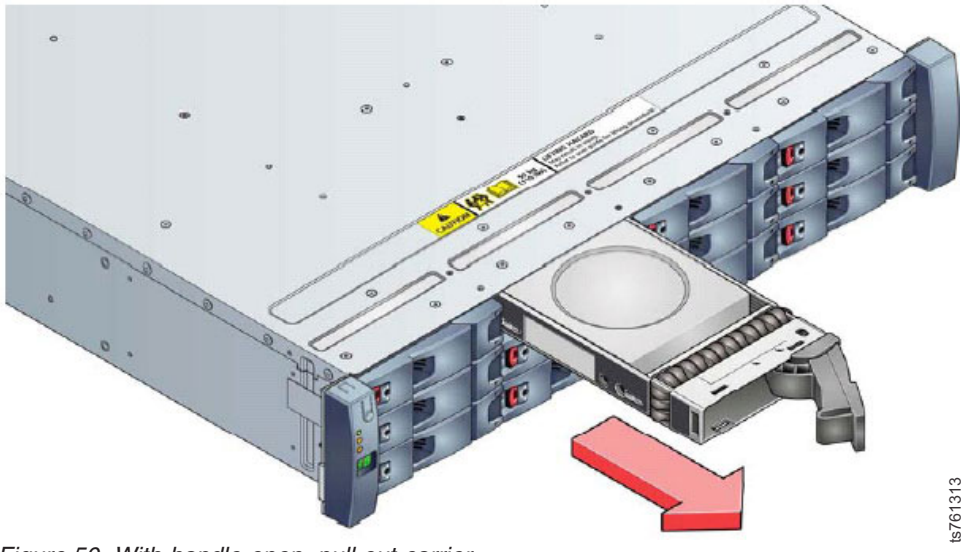

Figure 50. With handle open, pull out carrier

To install a drive carrier module:

1. Release the drive carrier handle, by depressing the latch in the handle. Pull out the handle.
2. Put the drive carrier module into the enclosure. Make sure that the drive carrier is in a position so that the drive points up. The latch handle swivels on the right and is open on the left.

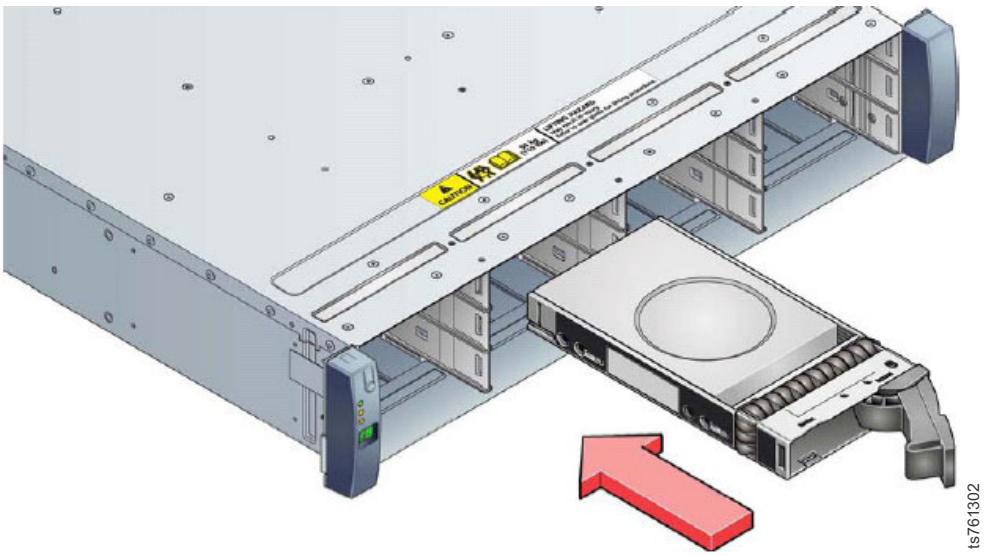

Figure 51. Push in carrier

3. Slide the drive carrier fully into the enclosure.
4. Push the latch to close until the handle is locked. A click should be heard as the latch engages and holds the handle closed.

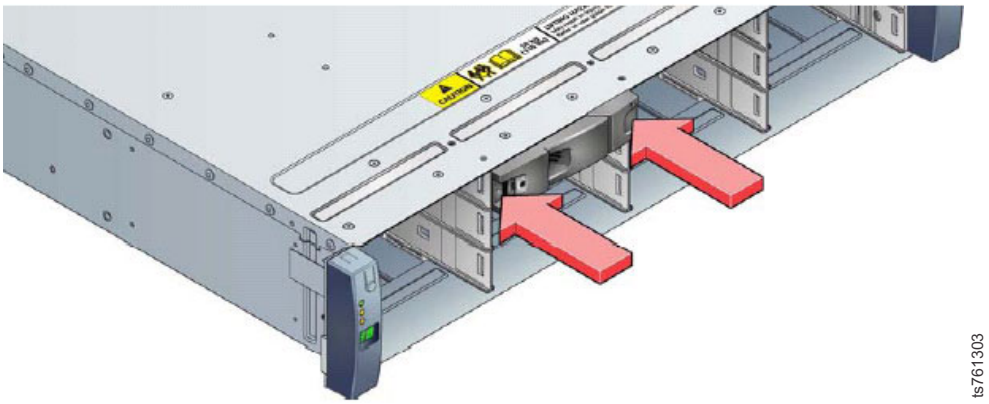

Figure 52. Press handle close

Replacing a canister

Instructions to replace a TS7620 expansion unit canister.

About this task

The canister is hot-swappable and therefore removal or replacement may be done by the user while the power supply is on. Each expander unit drawer contains two canisters. Each canister contains a SAS expander card. If the ProtecTIER Manager GUI display a hardware error for a sas expander card , than you will need to replace the canister that contains that defective card.

To remove a canister:

1. At the front bottom of each canister is a latch that secure the canister in place. Put your forefinger in the ring and your thumb will be near the locking clip of the latch. To unlock the latch, press the clip in with your thumb while you pull on the ring.

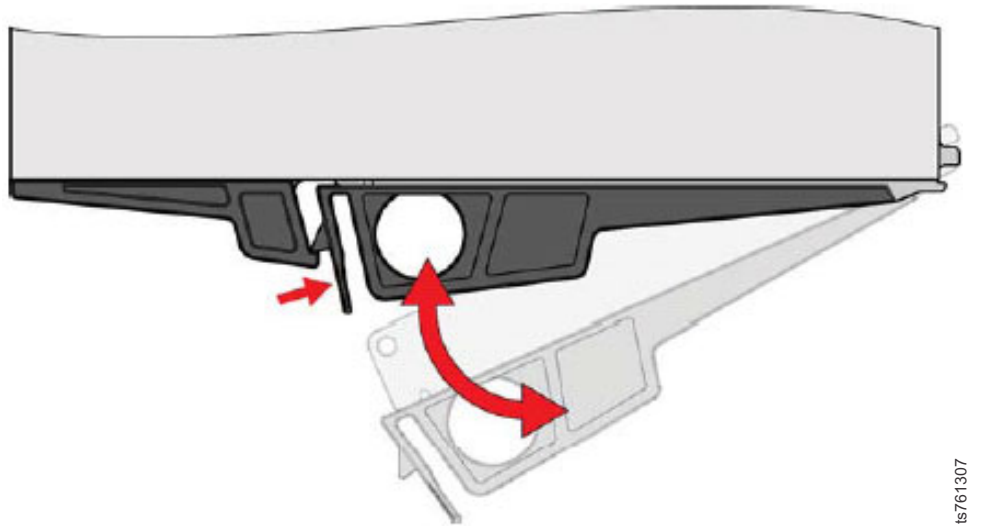

Figure 53. Press latch to open handle

2. After the latch is opened, grip the latch handle and pull the canister from the drawer enclosure.

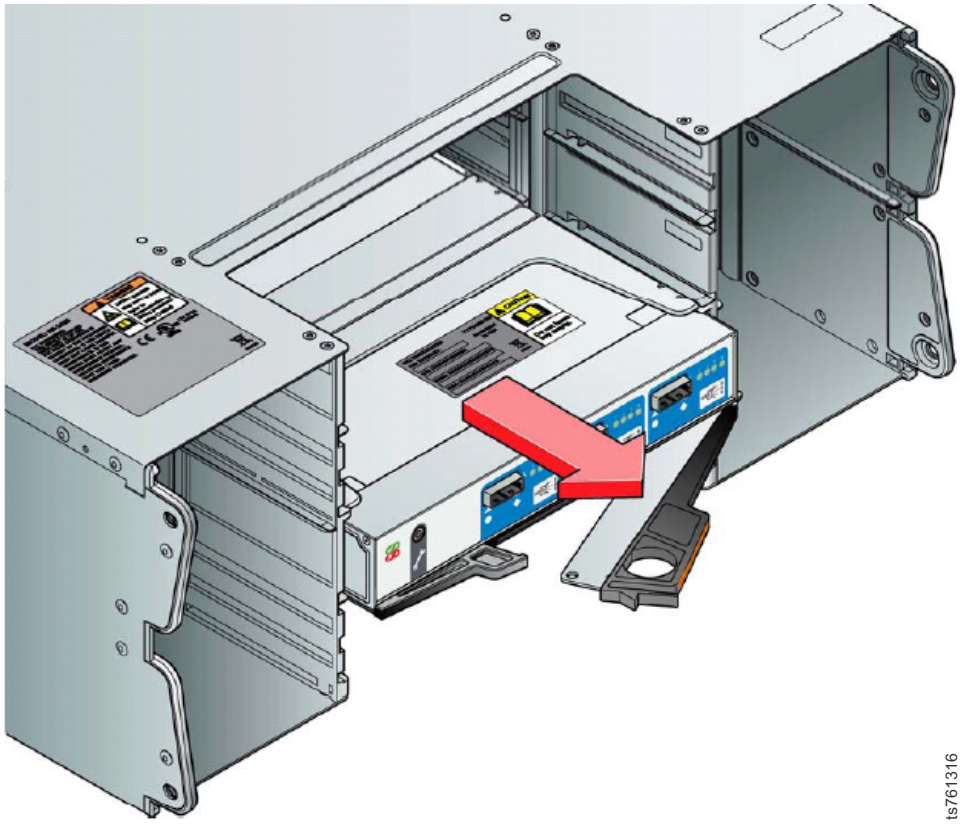

Figure 54. With open handle, pull out canister

To install a new canister:

1. Examine for damage, closely inspect the interface connector. Do not install it if the pins are bent.
2. If the pins are ok, unlock and open the latch of the canister.
3. With the latches in the open position, slide the canister into the drawer until the latches engage.

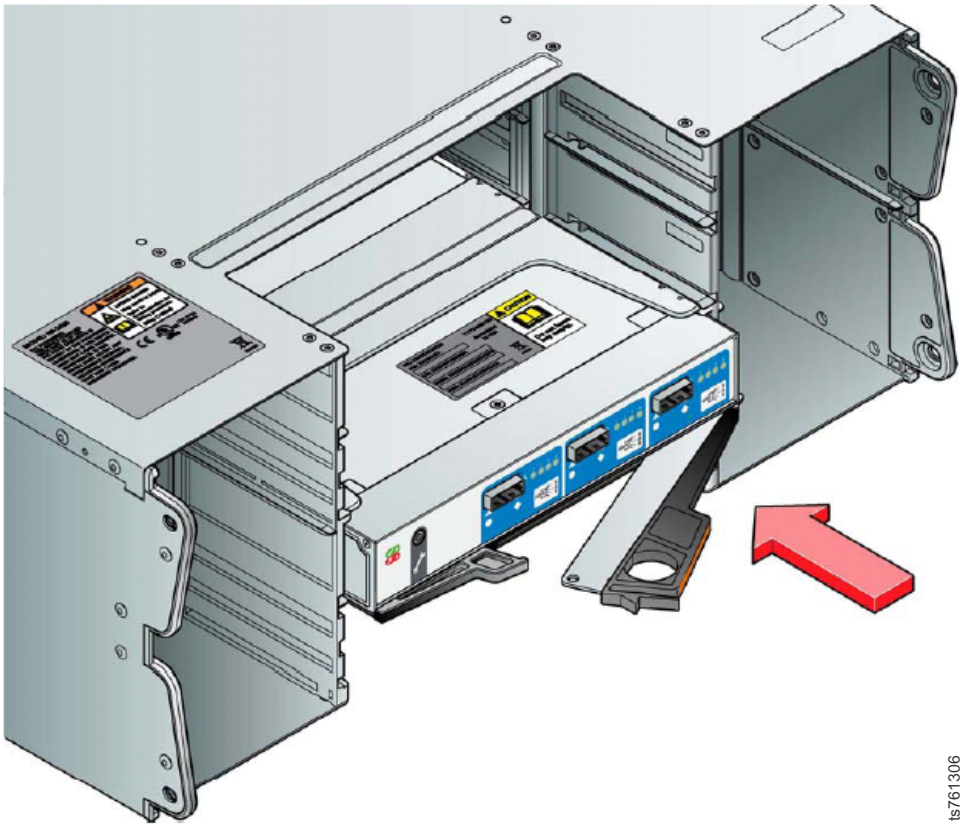

Figure 55. Press canister in

4. Close the latch. A click should be heard as the latch is locked

Note: The canister may take up to one minute to re-initialize after the cables are inserted.

Chapter 6. Verifying hardware replacements

To clear hardware faults following CRU or FRU maintenance, the GUI must be refreshed. If an IBM Service Representative was unable to do so because the GUI was not available, the customer should then perform this action.

After you have resolved a hardware fault, you will need to verify that the resolution was successful and the fault no longer exists. You can do so from the server by using the ProtecTIER service menu, or from the ProtecTIER Manager workstation, using the Hardware Faults window.

Note: It is recommended that if you first verify the resolution using the ProtecTIER service menu, that you also make sure that the fault information is cleared from ProtecTIER Manager, as described in "Rechecking faults in the Hardware Faults window."

Rechecking faults in the Hardware Faults window

About this task

Using this method to confirm that a fault was successfully resolved helps avoid residual fault information being displayed in the ProtecTIER Manager GUI.

Note: In order to perform the procedure below, communication must first be restored between the server and PT Manager.

Procedure

1. If it is not already running, launch PT Manager as described in "Receiving and responding to hardware alerts" on page 9.
2. Login to the system that includes the TS7610 or TS7620 server (node) with the faulty component, as described in "Receiving and responding to hardware alerts" on page 9.
3. Return to this page and continue with step 4.
4. In the **Hardware faults** window, click the **Recheck faults** button.

   The **Confirm Operation** dialog box displays.

   Note: The refresh may take up to ten minutes to complete. During this time you will be unable to perform any other tasks in the GUI.
5. To continue with the refresh, click **Yes**.

   The **Refresh** dialog box displays, and then closes when the refresh is complete.

   The **Hardware faults** window displays:
   - If replacing the component successfully resolved the fault, the associated hardware alert details no longer appear.
   - If the Hardware faults window indicates that the problem persists, repeat the fault resolution process and repeat the verification.
6. Close the **Hardware faults** window.

Verifying fault resolutions in the TS7610 or TS7620 ProtecTIER Service menu

About this task

After you have resolved a hardware fault, you will need to verify that the resolution was successful and the fault no longer exists. You can do so from the server by using the ProtecTIER Service Menu, or from the ProtecTIER Manager workstation, using the Hardware faults window in the GUI.

Note: It is recommended that if you first verify the resolution using the ProtecTIER Service Menu, that you also make sure that the fault information is cleared from ProtecTIER Manager, as described in "Rechecking faults in the Hardware Faults window" on page 81.

Using the ProtecTIER Service Menu

Procedure

1. Access the **ProtecTIER Service Menu** with a monitor and keyboard plugged into the TS7610 Appliance Express. Log on with ID **ptconfig**, password **ptconfig**
2. When the **ProtecTIER Service Menu** appears, select the **ProtecTIER Configuration** option.

```
--------------------------------------------------------------------------------
 ProtecTIER Service Menu running on rassmx
--------------------------------------------------------------------------------
  1) ProtecTIER Configuration (...)
  2) Manage ProtecTIER services (...)
  3) Health Monitoring (...)
  4) Problem Alerting (...)
  5) Version Information (...)
  6) Generate a service report
  7) Generate a system view
  8) Update ProtecTIER code

  E) Exit
--------------------------------------------------------------------------------
>>> Your choice?
```

3. Select **Health Monitoring**. Type: **3 <enter>**.
   The **Health Monitoring** sub-menu displays:

```
--------------------------------------------------------------------------------
 ProtecTIER Service Menu running on rassmx
 Health Monitoring (...)
--------------------------------------------------------------------------------
  1) Display system health summary
  2) Display detailed system health
  3) Run a full system check
  4) List open problems
  5) Service Mode

  B) Back
  E) Exit
--------------------------------------------------------------------------------
>>> Your choice?
```

4. Select **Run a full system check**. Type: **3 <enter>**.
   The `Begin Processing Procedure` message displays.

   Note: This menu option may take several seconds to complete.

When the check completes, a Checkout summary displays. The summary indicates whether the checked items (components, applications, and system utilities) are functioning properly or in a compromised (NON-OK) state, and lists the individual items that were included in the check. Items that are functioning properly are listed as Normal. Items not in use by the system are listed as Unconfigured. Items with faults are listed as Failed, Degraded, etc., and include additional details about the fault. An example checkout summary with no items in NON-OK status, is shown below:

```
TS7610 Checkout Version 7121.130-0 executed on: 2010-06-22T16:44:09
====================================================================
Summary of NON-OK Statuses:
Offline 0
Failed 0
Unknown 0
Degraded 0
Rebuilding 0
Missing 0
====================================================================
Verify state of Server 1 (Node 0/Enclosure 78) ..........Normal
Verify state of CPU 1 (Node 0/Enclosure 78) .............Normal
Verify state of Memory 1 (Node 0/Enclosure 78) ..........Normal
.
.
Verify state of Memory 6 (Node 0/Enclosure 78) ..........Normal
Verify state of Fan 1 (Node 0/Enclosure 78) .............Normal
.
.
Verify state of Fan 10 (Node 0/Enclosure 78) ............Normal
Verify state of Boot Drive 1 (Node 0/Enclosure 78) ......Normal
Verify state of Boot Drive 2 (Node 0/Enclosure 78) ......Normal
Verify state of Eth Card 1 (Node 0/Enclosure 78) ........Normal
Verify state of Eth Card 2 (Node 0/Enclosure 78) ........Unconfigured
Verify state of Eth Card 3 (Node 0/Enclosure 78) ........Unconfigured
Verify state of PowerSupply 1 (Node 0/Enclosure 78) .....Normal
Verify state of PowerSupply 2 (Node 0/Enclosure 78) .....Normal
.
.
Verify state of Local FS (Node 0) .......................Normal
End Processing Procedure
Press any key to continue
```

An example checkout summary with one item in Failed status, is shown below. In this example, a PSU failure was detected and reported. Detailed information about the failed PSU is provided below the PSU's entry in the list:

```
TS7610 Checkout Version 7121.130-0 executed on: 2010-06-22T16:44:09
====================================================================
```

```
Summary of NON-OK Statuses:
Offline 0
Failed 1
Unknown 0
Degraded 0
Rebuilding 0
Missing 0
=====================================================================
Verify state of Server 1 (Node 0/Enclosure 78) ..........Normal
.
.
Verify state of PowerSupply 1 (Node 0/Enclosure 78) .....Normal
Verify state of PowerSupply 2 (Node 0/Enclosure 78) .....Failed
-----------------------------------------------------------
*Failed: Component Location: Node 0/Enclosure 78/PowerSupply 2
*Failed: FRU ID: 45W0425
*Failed: FRU ID: 45W0425
*Failed: SRN: 0xAB030001
*Failed: Power Supply status not OK
*Failed: SRN: 0xAB030004
*Failed: Power supply: AC fail
*Failed: SRN: 0xAB030002
*Failed: Power supply is off
*Failed: SRN: 0xAB030005
*Failed: Power supply: DC fail
*Failed: SRN: 0xAB030003
*Failed: Power supply is failed
-----------------------------------------------------------
.
.
End Processing Procedure
Press any key to continue
```

5. After reviewing the summary and list, press any key to return to the parent menu.
6. Exit the **ProtecTIER Service Menu**. Type: **E <enter>**.
   You are returned to the server command prompt.
7. If a problem was reported on the component you just repaired or replaced, repeat the fault resolution process and repeat the verification.

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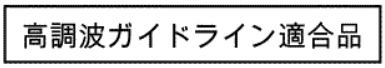

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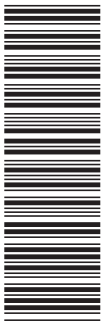

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