StorageTek SL3000 Modular Library System

User's Guide

Part Number: E20875-02
February 2012

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E20875-02

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Summary of Changes

Current Version: E20875-02, February 2012

Updates were made to support versions FRS_3.60 and SL Console FRS_5.60. The new features are:

- Generate Log Snapshot. See "Generate and Transfer the Library Log Snapshot File" on page 524.
- Audit Indicator for the StorageTek Library Console. See "Audit Indicator" on page 490.

Additional updates not related to the new release include the following:

- Moved the Transfer MIB File from the SNMP chapter to the SLC Diagnostics chapter. See "Transfer the Library MIB File" on page 521.
- Updates to the SLConsole Help, including instructions on saving favorite topics in Help. See "Navigating Help" on page 65.
- Added SL Console password limitations from 5-8 characters as of SL Console FRS 4.50.
- Added chapter on handling cartridges. See "Cartridge Handling" on page 627.
- Added a glossary. See "Glossary" on page 641.
- Edited the Partitioning chapter. See "Library Partitioning" on page 195.
- Added section on finding customer documentation. See "Obtaining Customer Documentation" on page 21.

Revision History

Revision E20875-01, March 2011

Assigned new Oracle document part number and revision: E20875-01. Part number is referenced on the title page of this document.
Sun part number (316194401) and revision numbering system have been retired.

Updates to support the following features:

- New Oracle hardware activation files. See Chapter 3, “Hardware Activation Files.”
- Distribution of the SL Console Web server and client via the Oracle Software Delivery Cloud. See “Standalone SLC Installation Tasks” and Appendix C, “Web-launched SLC Server.”
- Redundant Electronics feature. See Chapter 7, “Redundant Electronics Management.”
- Library auto clean. See Chapter 11, “Drive Cleaning.”
- Cleaning cartridge import/export. See “Importing and Exporting Cleaning Cartridges.”
- Diagnostic cartridge import/export. See “Importing and Exporting Diagnostic Cartridges.”
- Multi Port Fibre Channel feature. See “Multi-Path Connections” and “Display HLI Port Status.”

Revision AD, June 2010 (Sun Document Part Number: 316194401)

Former Chapter 3, “SL3000 Automated Library Operations.” Separated into the following chapters:

- Chapter 5, “Library Management”
- Chapter 7, “CAP Management”
- Chapter 8, “Drive Management”
- Chapter 9, “Cartridge Management”
- Chapter 10, “Drive Cleaning”
- Chapter 11, “Robot and Power Supply Management”

Hardware Activation Files for reviewing optional features activated on the library: See Chapter 3, Hardware Activation Files” for details.

Revision AC, September 2009

Updated for the following features:

- Cleaning cartridge import. See the following sections for details:
  - “CAP Assignment Mode” on page 81

    - “Managing Automatic Cleaning Through the SL Console” on page 92
    - “Change the CAP Assignment Mode for an FC-SCSI Library” on page 138
    - “Enter Cleaning or Diagnostic Cartridges” on page 183
    - “Eject Cleaning or Diagnostic Cartridges” on page 184
- SCSI FastLoad. See the following sections for details:
    - “SCSI FastLoad Feature” on page 94
    - “Configure SCSI FastLoad in a Non-Partitioned Library” on page 189
    - “Configure SCSI FastLoad for a Partition” on page 191
- Barcode presentation. See the following sections for details:
    - “Barcode Presentation” on page 88
    - “Configure Barcode Presentation in a Non-Partitioned FC-SCSI Library” on page 147
    - “Configure Cartridge Barcode Presentation for an FC-SCSI Partition” on page 149
- Cartridge Table report. See the following sections for details:
    - “Display Library Cartridge Information in Tabular Format” on page 151
- Linux local operator panel. See the following sections for details:
    - “Virtual Keypad” on page 41
    - “Touch Screen Calibration” on page 42
    - “Re-calibrate the Local Operator Panel” on page 71
    - “Reset the Local Operator Panel Calibration” on page 74

Revision AB, May 2009

Updated for the following features:

- Access Expansion Module (AEM). See the following sections for details:
    - “Access Expansion Module” on page 15
    - “CAP Operations” on page 79
    - “AEM Operations” on page 84
    - “Rotational and AEM CAP Management Tasks” on page 126
    - “Cartridge Management Tasks” on page 140
    - “AEM Safety Door Management Tasks” on page 198
    - “Partitions and Rotational and AEM CAPs” on page 159
    - “AEM Safety Door Utility Tasks” on page 205
    - “Manual Operation Tasks” on page 212
    - FIGURE B-5, “Access Expansion Module Walls” on page 248
- Non-disruptive library capacity changes. See “Non-disruptive Capacity Changes” on page 227.

- Non-disruptive partitioning. See “Non-Disruptive Partitioning” on page 164.
- Status alert messages. See “Status Alert Messages” on page 78.
- Library energy monitor reports. See the following:
  - “Display the “Last 24 Hours” Library Energy Monitor Report” on page 120
  - “Display the “Last Month” Library Energy Monitor Report” on page 122
  - “Display the “Last Year” Library Energy Monitor Report” on page 124
- Drive and media events reports. See the following:
  - “Display the Media Events Report” on page 165
  - “Display the Drive Events Report” on page 176
  - “Display the Drive Media Events Report” on page 178
- Log snapshot file. See the following:
  - “Library Log Snapshot File” on page 239
  - “Transfer the Library Log Snapshot File” on page 289

Revision A, April 2008

Initial release.

Preface

This book is about Oracle's StorageTek SL3000 modular library system hardware, StorageTek Library Console management software, and related operations. For specific drive information or for client application software commands, see the appropriate drive or software documentation.

Audience

This guide is intended primarily for administrators and operators of Oracle's StorageTek SL3000 modular library system. It can also be used by Oracle partners and support representatives.

Access to Oracle Support

Oracle customers have access to electronic support through My Oracle Support. For information, visit http://www.oracle.com/support/contact.html or visit http://www.oracle.com/accessibility/support.html if you are hearing impaired.

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To obtain current product documentation:

1. **Point your Web browser to:** http://www.oracle.com/technetwork/documentation/tape-storage-curr-187744.html
2. **Bookmark this location. The page lists all available document libraries by product family.**
3. **To view and download documents, scroll down to the section that lists documents for the type of product that interests you.**

   Sections include Storage- and Library-Management Software, Tape Libraries, Tape Drives, Storage Encryption, Storage Virtualization, Archiving Systems, and Local Area Networking.
4. **To view a list of documents contained within the table, click "View Library" in the "Link" column to the left of the "Product Description" column. Click any of the links on the library index to download the corresponding document.**

5. **To download a compressed archive file that contains the *entire suite* of documents, click the "Download" link.**

1

SL3000 Introduction

This chapter introduces you to the SL3000 library and its components and configurations, including the following topics:

SL3000 Features

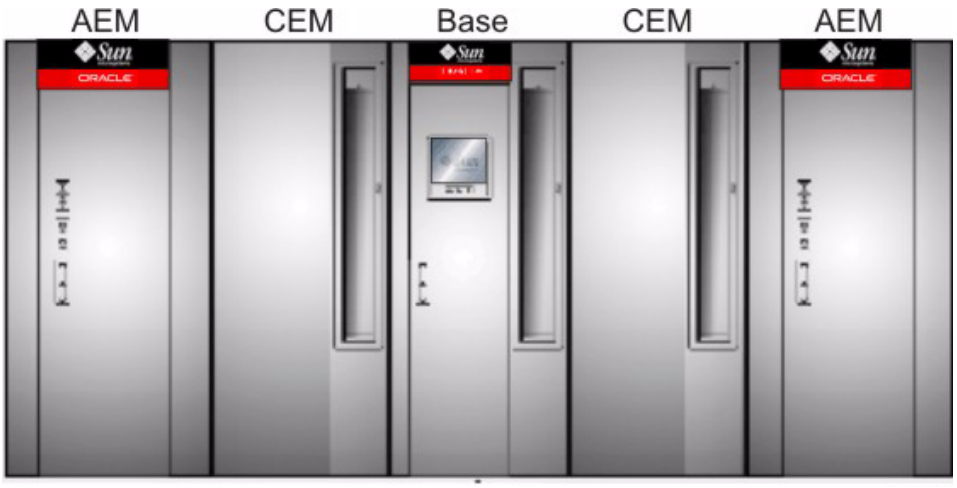
The SL3000 library, shown in FIGURE 1-1, offers you the benefits of:

- Scalability in storage capacity from 200 to 5925 storage cells
- Performance from 1 to 56 tape drives
- Support of a variety of tape drives
- Oracle's StorageTek Any Cartridge, Any Slot support of mixed-media
- Heterogeneous attachments using standard interfaces
- Multiple library management software options and programs
- Support for Internet Protocol, version 4 (IPv4)

The SL3000 was designed to:

- Address medium to large open systems and entry-level mainframe markets.
- Occupy a standard datacenter footprint with measurements of approximately:
  - Height: 198 cm (78 in.)
  - Depth: 124 cm (48.8 in.)

FIGURE 1-1 SL3000 Modular Library System



  - Length: Varies from 91.5 cm (36 in.) with one base module, to 966.24 cm (380.4 in.) with the maximum twelve modules (base, DEM, eight CEMs, and two AEMs)

Modular Design

The SL3000 library provides a modular design, which enables you to meet the demands of a rapidly growing and constantly changing environment.

Modules

There are five types of modules in an SL3000 library. The base module is the only one that is required.

- Base Module: One only
- Drive Expansion Module (DEM): One only, attached directly to the left side of the base module
- Cartridge Expansion Module (CEM): Up to eight total, with up to four on the left side of the base module (and optional DEM) and up to four on the right
- Parking Expansion Module (PEM): Installed always in pairs, one on each end of the library configuration
- Access Expansion Module (AEM)\ One or two, always installed on the end of the library configuration.

Note – AEMs and PEMs cannot be installed in the same library.

The modules consist of:

- Walls, columns, and rows that house cartridge storage cells
- Tape drives
- Cartridge access ports (CAPs)
- Robotics units (TallBots)

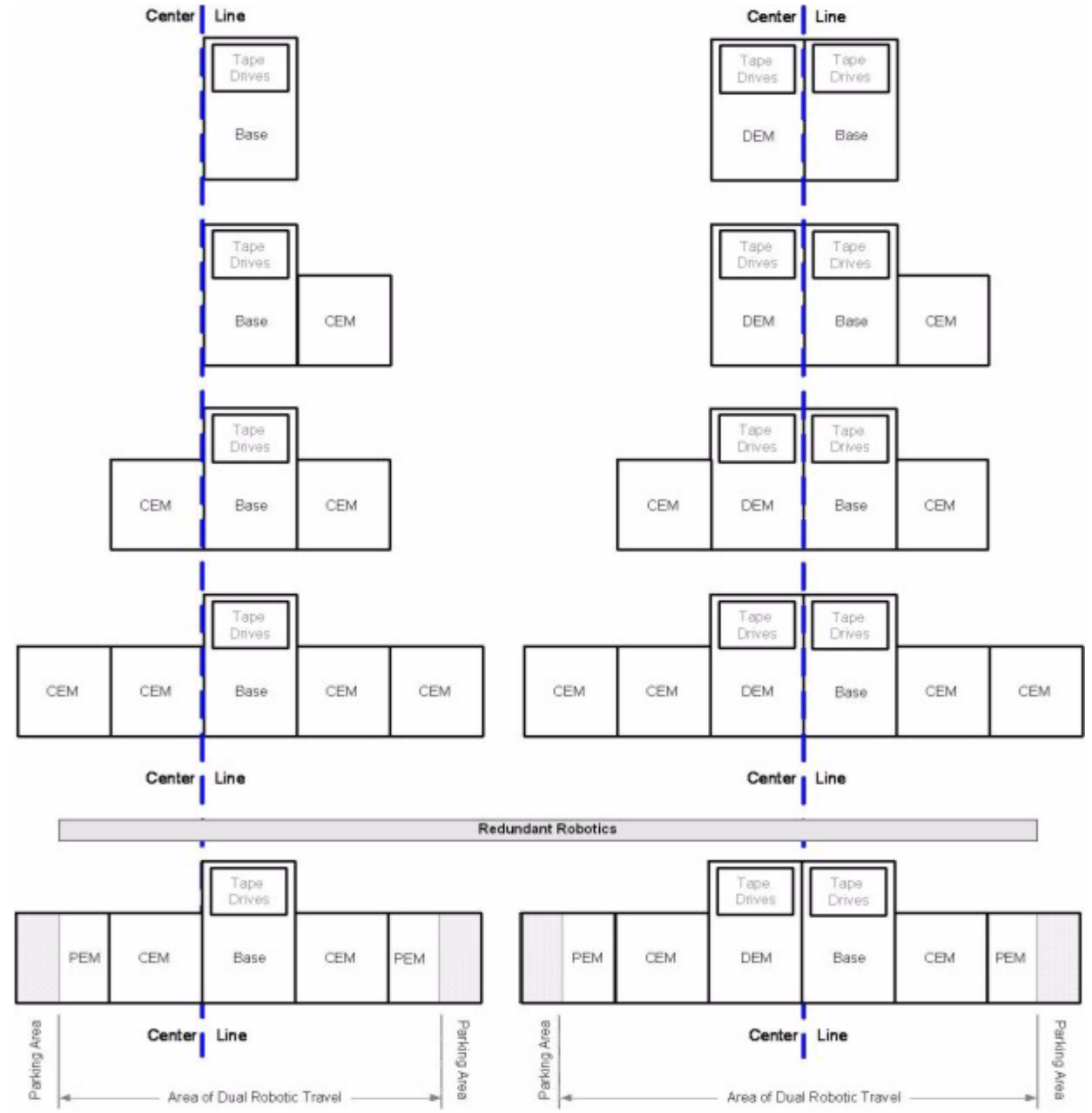
CenterLine Technology

The SL3000 modular design uses CenterLine technology to help balance the work load and improve the performance of the library. The left side of the base module serves as the centerline. You can add other modules to the left and right of the base module. Columns to the right of the centerline have positive (+) numbers, while columns to the left have negative (–) numbers.

FIGURE 1-2 on page 26 shows the library centerline and some possible module configurations, including:

- Base module only (the left side of the figure)
- Base module and drive expansion module (the right side of the figure)
- Addition of cartridge expansion modules (CEMs) and parking expansion modules (PEMs)

FIGURE 1-2 Library Configurations Around CenterLine



Any Cartridge, Any Slot Technology

Mixed-media storage cells hold the cartridges. This enables the SL3000 library to support Oracle's StorageTek Any Cartridge, Any Slot technology and accept a variety of media types without reconfiguring the library.

Cartridges lie flat and are placed in the storage cells with hub down and parallel to the floor. To prevent slippage, internal retainer clips hold cartridges in place.

Physical Capacities

The SL3000 is scalable, with physical storage capacities from 200 to 5925 storage cells. In addition, the Capacity on Demand feature enables you to pay for only the capacity you actually use and expand capacity with minimal disruption to library operations.

See "Capacity on Demand" on page 149 for details about installing and managing library storage capacity.

See TABLE 1-1 on page 28 for detailed physical capacities for each module type. To calculate the total accessible physical storage cells for a configuration, start with the standard configuration cell count, outlined with a heavy border in TABLE 1-1, and then make the appropriate adjustments for options and positioning. Following are some examples:

- Base module with operator's panel, a module installed on the right, and three total drive arrays:

  320 + 0 + 13 – 55 – 60 = 218

- DEM, a module installed on the left, window arrays, a CAP, and four drive arrays:

  410 + 88 + 23 – 77 – 66 – 72 – 78 = 228

- CEM installed to the left of CenterLine, a module installed on the left, and a CAP:

  516 + 104 – 78 = 542

- PEMs (always installed in pairs), one with a CAP, one without:

  308 + 312 – 78 = 542

Optional Fire/Smoke Detection

Access ports in the ceilings of the modules provide for installation of optional fire suppression or smoke detection equipment. You are responsible for installation and maintenance of this equipment.

TABLE 1-1 Accessible Physical Cell Count Per Module

Module Options	Standalone or Position-Independent	Adjacent Module Installed on the: Right	Adjacent Module Installed on the: Left	Total Count
Base Module				
Standard (with viewing window), standalone	320	+13	+88	
With operator's panel	+0			
With window storage arrays	+23			
With second drive array	-55		-66	
With third drive array	-60		-72	
Drive Expansion Module (DEM)				
Standard (with viewing window and no CAP)	—	410	+88	
With window storage arrays	—	+23		
With CAP	—	-77		
With second drive array	—	-55	-66	
With third drive array	—	-60	-72	
With fourth drive array	—	-65	-78	
Cartridge Expansion Module (CEM)				
Standard (no CAP), to the left o f CenterLine	516	+0	+104	
Standard (no CAP), to the right of CenterLine	620	+0	+0	
With CAP	-78			
Parking Expansion Module (PEM)				
Standard (no CAP), to the left o f CenterLine	—	308		
Standard (no CAP), to the right of CenterLine	—		312	
With CAP	-78			
Access Expansion Module (AEM)				
Cannot be used for long-term storage	0		+104	
Total accessible storage cell count				

Base Module

The base module provides both cartrid ge storage and a minimum of eight tape drives. This module includes:

- Power configurations
- Robotics
- Electronic modules
- Cartridge access port
- Cartridge storage cells
- Tape drives
- Operator controls

The base module centralizes the infrastructure for all other m odules in the library. Only one base module is required for every library installation. See FIGURE 1-3 for a front view of the base module.

FIGURE 1-3 Base Module, Front View

Dimensions of Base Module

The dimensions of the base module are as follows:

- Height: 197 cm (77.625 in.) t o 200 cm (78.63 in.) fully adjusted.
- Width: 76.8 cm (30.23 in.) w ithout covers, 91.5 cm (36 in.) with covers. (When additional modules are installed, the covers are removed from the base module and placed on the ends of the last module in the series.)
- Depth: 121.9 cm (48 in.) with out handles, 124 cm (49 in.) with handles.
- Weight: 265 kg (584 lb) frame only .

- Service clearance:
  - Front 46 cm (18 in.), Rear 81 cm (32 in.).
  - With both doors open: 262 cm (10 3 inches).
  - Side clearance:
    - Cooling: 5 cm (2 in.) (Side clearance is required to install or remove the side covers. Covers swing out and lift off brackets.)
    - Installation: 91 cm (36 in.)

Front Components of Base Module

The front of the base module includes the following components:

- Single, 26-cartridge, dual-magazine cartridge access port (CAP)
- Service door for library access
- Front panel with three LEDs: Library Active, Service Required, and Wait
- Standard viewing window, which can be replaced by one of the following options:
  - Touch-screen operator panel
  - Cartridge storage cells

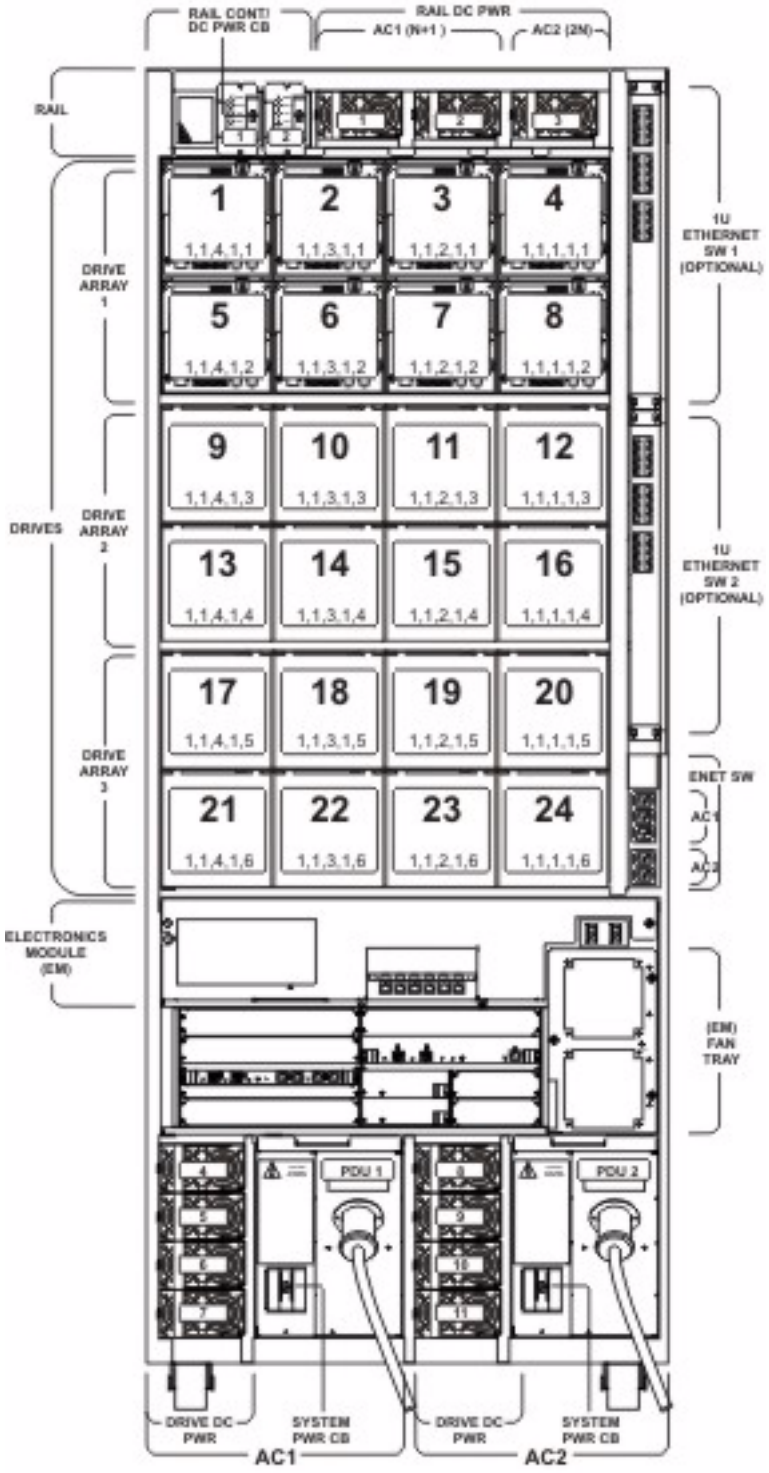
The base module can hold up to 24 tape drives in any combination the library supports. See "Tape Drives" on page 43 for a list and description. The minimum configuration includes one drive bay that can hold from one to eight drives. Two additional drive bays can be added to accommodate either 8 or 16 more drives, for a maximum of 24 drives.

> **Note –** Adding a drive bay displaces approximately 55 to 72 additional storage cells, depending on the library configuration. See TABLE 1-1 on page 28 for the exact number.

Rear Components of Base Module

FIGURE 1-4 shows the components of the base module from the back.

FIGURE 1-4 Base Module, Rear View



The rear door of the base module (see FIGURE 1-4 on page 31) allows access to the following:

- Rail and robotics DC power supplies.
- Three sets of drive arrays or bays with tape drives: The first drive array is standard, and optional drive arrays are added from the top down.
- Two one-unit rack spaces (1 unit = 44.5 mm [1.75 in .]) for vertically mounting auxiliary equipment, such as Ethernet switches.

  Note – The base module does not contain any general-purpose 19-inch rack space.

- Electronics control module (ECM):
  - HBC and HBT cards.
  - MPU2 Fibre Channel card (not shown).
  - Two cooling fans
  - Two cPCI power supplies.
  - Two power switches (N+1 and 2N).
- AC power distribution units (up to two): PDU 1 and PDU 2.
- Drive DC power supplies (up to eight): DC power supplies 4 through 1 1

See FIGURE B-1, "Base Module Walls" on page 618 for a detailed diagram of the wall layout.

Drive Expansion Module

The optional Drive Expansion Module (DEM) provides the library with additional tape drives and cartridge storage capacity. One DEM can be included in a library installation, always to the left of the base module.

FIGURE 1-5 Drive Expansion Module, Front View

Dimensions of Drive Expansion Module

The dimensions of the base module are as follows:

- Height: 197 cm (77.625 in.) to 200 cm (78.63 in.)
- Width:
  - DEM only, 76.8 cm (30.23 in.).
  - 168.3 cm (66.26 in.) with covers. (When additional modules are installed, the covers are removed from the base module and placed on the ends of the last module in the series.)
- Depth:121.9 cm (48 in.) without handles, 124 cm (49 in.) with handles.
- Weight: 265 kg (584 lb) frame only.
- Service clearance:
  - Front 46 cm (18 in.), Rear 81 cm (32 in.).
  - With both doors open: 262 cm (10 3 inches).
  - Side clearance:
    - Cooling: 5 cm (2 in.) (Side clearance is required to install or remove the side covers. Covers swing out and lift off brackets.)

- Installation: 91 cm (36 in.)

Front Components of the Drive Expansion Module

The front of the DEM includes space for the following components:

- Service door for library access (standard)
- Front panel with three LEDs: Library Active, Service Required, and Wait
- Optional 26-cartridge, dual-magazine cartridge access port (CAP)
- Standard viewing window, which can be replaced by either of the following options:
  - Touch-screen operator panel, if not already in the base module
  - Cartridge storage cells

The DEM comes standard with drive slots to support up to eight tape drives. DEM drive slots can optionally be increased, in increments of eight, to a maximum of 32.

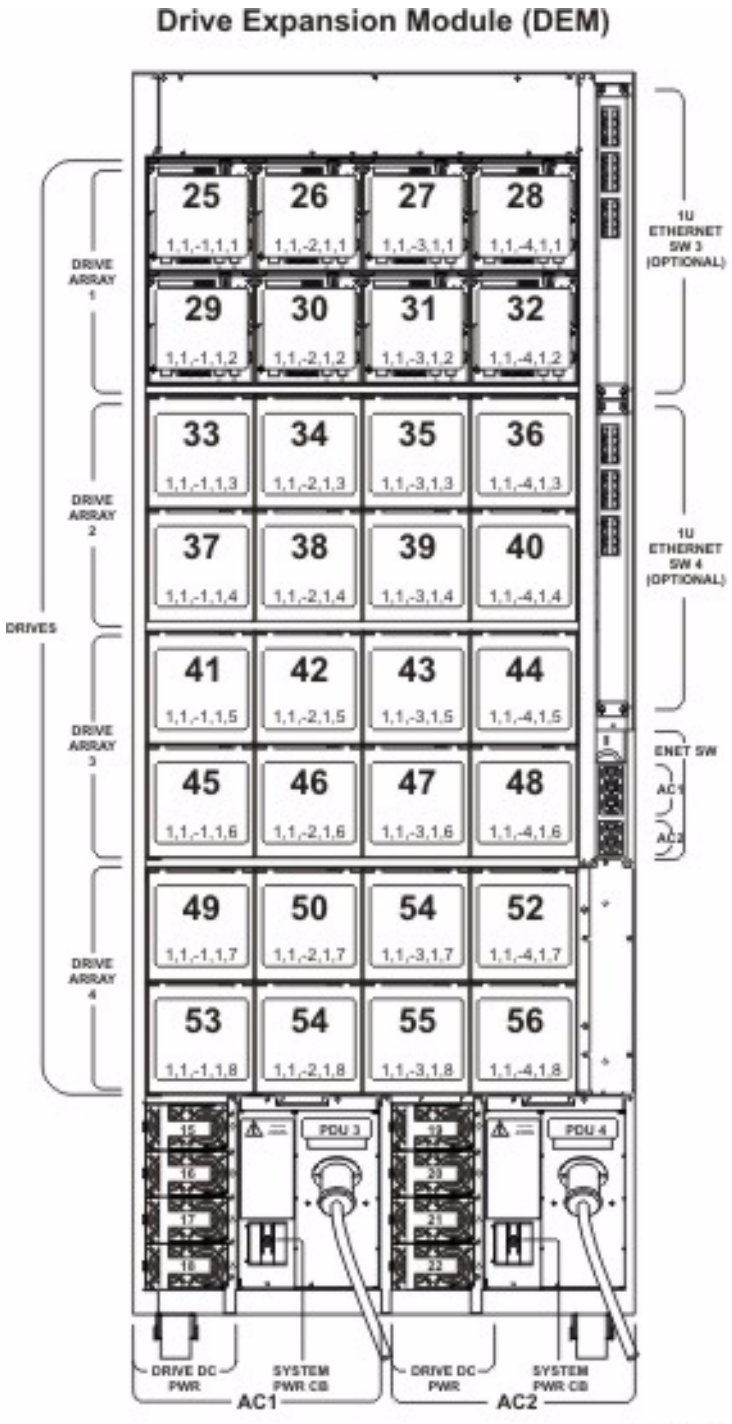
> **Note –** Adding a drive bay displaces approximately 55 to 78 additional storage cells, depending on the library configuration. See TABLE 1-1 on page 28 for the exact number.

There is an additional power system integral to the DEM to support the additional tape drives.

Rear Components of the Drive Expansion Module

FIGURE 1-6 shows the components of the Drive Expansion Module from the back.

FIGURE 1-6 Drive Expansion Module, Rear View



The rear door of the Drive Exp ansion Module (see FIGURE 1-6 on page 35) allows access to the following:

- Four sets of drive arrays or bays with ta pe drives. Drive arrays are added from the top down.
- Two one-unit rack spaces (1 unit = 44.5 mm [1.75 in .]) for vertically mounting auxiliary equipment, such as Ethernet switches.
- AC power distribution units (up to two): PDU 1 and PDU 2.
- Drive DC power supplies (up to eight): DC power supplies 15 through 22

See FIGURE B-1, “Base Module Walls” on page 618 for a detailed diagram of the wall layout.

Cartridge Expansion Module

The optional Cartridge Expansion Module (CEM) provides additional storage cell capacity and growth for cartridges only. A maximum of eight CEMs are supported in a single library .

The following considerations will maximize library ef ficiency:

- As a best practice, place CEMs on either side of the base m odule and optional Drive Expansion Module, with the initial CEM installed directly to the right of the base module. This decreases the amount of robotics travel and provides the best use of cartridge storage cells.
- If the Dual Robotics feature is installed without the use of Access Expansion Modules, the two outside CEMs are converted to Parking Ex pansion Modules. This provides areas for theTallBots to park when service is req uired.

Each CEM adds up to 620 data cartridge physical storage cells. The capacity varies depending on the direction of growth (left or right) and the presence of a CAP.

FIGURE 1-7 Cartridge Expansion Module with Base Module

Dimensions of Drive Expansion Module

The dimensions of t he base module are as follows:

- Height: 197 cm (77.625 in.) t o 200 cm (78.63 in.) fully adjusted
- Width:
  - DEM only, 76.8 cm (30.23 in.) without covers. (When additional modules are installed, the covers are removed from the base module and placed on the ends of the last module in the series.) One side cover adds 7.62 cm (3 in.).

- Depth: 77.5 cm (30.5 in.).
- Weight: 265 kg (584 lb) frame only .
- Side clearance (When additional modules are installed, the cov ers are removed from the base module and placed on the ends of the last module in the series.):
  - Cooling: 5 cm (2 in.) .
  - Installation: 91 cm (36 in.) .
- Service clearance: None required.

See FIGURE B-3, “Cartridge Expansion Module Walls” on page 620 for a detailed diagram of the wall layout.

Parking Expansion Module

The optional Parking Expansion Modules (PEMs) provide additional storage cell capacity and growth, as well as space for a redundant TallBot to be “parked.” The parking space makes the three outer-most columns of storage cells on the front and rear walls inaccessible. The inaccessible cells can be left out of the module, or they can be installed to allow later conversion of the PEM to a CEM. PEMs do not include tape drives.

PEMs are only used with the Dual Robotics feature, and they are always installed in pairs. They must be the last modules on the right and left sides of the library series.

Note – AEMs and PEMs cannot be installed in the same library.

FIGURE 1-8 Parking Expansion Module

Dimensions of the Parking Expansion Module

The dimensions of the base module are as follows:

- Height: 197 cm (77.625 in.) to 200 cm (78.63 in.) fully adjusted
  - 76.8 cm (30.23 in.) without covers. (When additional modules are installed, the covers are removed from the base module and placed on the ends of the last module in the series.) One side cover adds 7.62 cm (3 in.).
- Depth: 77.5 cm (30.5 in.).
- Weight:103.4 kg (277 lb) frame only.
- Side clearance (When additional modules are installed, the covers are removed from the base module and placed on the ends of the last module in the series.):
  - Cooling: 5 cm (2 in.).

  - Installation: 91 cm (36 in.).
- Service clearance: None required.

See FIGURE B-4, “Parking Expansion Module Walls” on page 621 for a detailed diagram of the wall layout.

Access Expansion Module

The optional Access Expansion Module (AEM) provides the following capabilities:

- Bulk loading and unloading of up to 234 cartridges at a time to and from the SL3000 library through the AEM CAP. The AEM is essentially a very large CAP, with all the characteristics of a CAP, such as online/offline state, ability to be shared by partitions, etc. The cartridge slots in the AEM cannot be used for long-term cartridge storage.
- Non-disruptive robot maintenance through the use of a sliding safety door, which separates the area for a defective robot from the other library modules. An Oracle service representative can safely access the disabled robot through the AEM access door while the library remains online. If the Dual Robotics feature is installed, the library can continue normal operations through the remaining functional robot.

The library can include one or two AEMs. The AEM must be installed at the very end of the library string. If the library includes redundant TallBots, two AEMs must be installed, one on each end of the library.

Note – AEMs and PEMs cannot be installed in the same library.

AEMs do not include tape drives.

See "AEM Operations" on page 389 for additional details about AEM functions and usage.

FIGURE 1-9 Access Expansion Module

Dimensions of the Access Expansion Module

The dimensions of the base module are as follows:

- Height: 197 cm (77.625 in.) to 200 cm (78.63 in.) fully adjusted
- Width: 76.8 cm (30.23 in.) without covers. (Required to install or remove side covers. Covers swing out and lift off brackets.) One side cover adds 7.62 cm (3 in.).

- Depth: 77.5 cm (30.5 in.).
- Weight:204.12 kg (450 lb).
- Side clearance (When additional modules are installed, the cov ers are removed from the base module and placed on the ends of the last module in the series.):
  - Cooling: 5 cm (2 in.) .
  - Installation: 91 cm (36 in.) .
- Service clearance:
  - Front: 58.7 cm (23.1 in.).
  - Rear: Need access for Ethernet. There is no cover.

Tape Drives

The following TABLE 1-2 lists the tape drives, data path interfaces, and media types supported by the SL3000 library.

TABLE 1-2 Tape Drives Supported by the SL3000 Library

Manufacturer	Drive Type	Interface Type	Media
Oracle StorageTek	T9840C T9840D	Fibre Channel FICON ESCON	9840 VolSafe-capable
Oracle StorageTek	T10000A T10000B	Fibre Channel FICON	T10000 Standard, Sport, and VolSafe
HP IBM	LTO 3	Fibre Channel	LTO 3, LTO 3 WORM LTO 2 LTO 1 (read only)
HP IBM	LTO 4	Fibre Channel	LTO 4, LTO 4 WORM LTO 3, LTO 3 WORM LTO 2 (read only)
HP IBM	LTO 5	Fibre Channel	LTO 5, LTO 5 WORM LTO 4, LTO 4 WORM LTO 3 (read only)

You can install up to 56 drives within one library, as follows:

- Up to 24 in the base module
- Up to 32 in a DEM

The actual number of drives varies, depending on the AC power option and the media types. See the following TABLE 1-3 for details.

TABLE 1-3 Power Options and Number of Drives

	110–127 PDU		220–240 PDU	
Drive Type	**Base Module**	**DEM**	**Base Module**	**DEM**
T9840	12	14	24	32
T10000	13	16	24	32
LTO 3, 4	24	32	24	32
Mixed media	varies		any intermix	

Drive Trays

In the SL3000, a single, universal drive tray accommodates all types of tape drives and interfaces. The SL3000 drive trays have two layers, as follows:

- The power supply and connections are on the top.
- The tape drive is under the power supply.

Each drive tray slides into an eight-drive bay. Drive tray measurements are:

- Height: 16.5 cm (6.5 in.)
- Width: 16.5 cm (6.5 in.)
- Depth:45 cm (18.5 in.)

FIGURE 1-10 shows the front and back view of a drive tray .

FIGURE 1-10 Drive Tray Front and Back View

Internal power supply cards and cabling are unique, depending on the drive type and interface within the drive tray. Cabling to the drive itself is located at the rear of the drive tray and library, and then routed through the strain relief system. Both floor and ceiling cabling access is allowed.

Cartridge Access Ports

The cartridge access port (CAP) is a vertically-mounted, rotating cylinder with two removable 13-slot magazines (26 cells total). CAPs are used to enter or eject cartridges from the library.

The base module comes with one CAP as a standard feature. Optionally, one CAP can be installed in each expansion module, up to a maximum of ten CAPs for the library.

Each CAP has its own set of controls, consisting of a small keypad and indicators. The CAP and its magazines rotate as a single unit. FIGURE 1-11 shows two CAPs. The CAP on the left is shown closed. The CAP on the right is shown open.

See "Most CAP functions described in this section apply to AEMs as well as regular CAPs. In cases where there is a distinction between the two, the term "rotational CAP" is used to refer to regular CAPs." on page 385 for details about using CAPs.

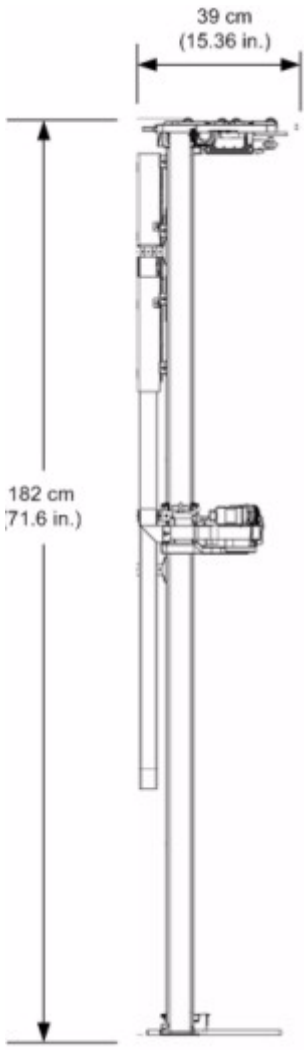
FIGURE 1-11 Cartridge Access Port Locations

Robotics Units

The robotics unit in an SL3000 library is called a TallBot. Each library can have either one (standard) or two (redundant) TallBots.

TallBots are responsible for the movement and cataloging (or auditing) of cartridges throughout the library.

FIGURE 1-12 TallBot



TallBot measurements are:

- Width: 30 cm (11.84 in.)
- Depth: 39 cm (15.36 in.)
- Weight: 8.6 kg (19 lb)

TallBots are driven along two rails on the rear wall of the library, one rail at the top and one attached to the floor.

Two copper strips are inserted into the top rail to provide both power and signal paths for TallBot operation.

- Power comes from +48 VDC, 1200 Watt, load-sharing power supplies.
- Signals are received and transmitted between the TallBots and the library controller.
- A Rail Power Enable module is installed as a safety circuit for rail power.

Handling of the cartridges by the TallBots include:

- Retrieving cartridges from a CAP
- Inserting cartridges into a CAP
- Inserting and retrieving cartridges to and from storage cells
- Mounts and dismounts of cartridges to and from tape drives

TallBots contain a laser bar code scanner that:

- Reads the configuration blocks in each module during library initialization. See FIGURE B-5 “Configuration Block” on page 623 for an example.
- Targets on cartridge storage/CAP cells and tape drives. Targets have the following shape, similar to the letter “N”:

  |\|

- Identifies volume IDs (VOLIDs) of cartridges during:
  - CAP entries
  - Audits

  The TallBot reads cartridge VOLIDs during audits and CAP enters only. Each cartridge’s assigned location is stored in the library controller database, and the TallBot uses that location to retrieve the cartridge.

Redundant (Dual) Robotics

The Redundant Robotics feature is offered as a high availability option. This affords:

- A speed increase for library operations
- A backup TallBot in case one should fail

This option requires PEMs at each end of the library. A defective TallBot will take itself offline and may move, or can be pushed, into one of the PEMs or AEMS, allowing the library to continue operations with one TallBot until time can be scheduled to replace the defective one. If AEMs are installed, the downed TallBot can be serviced without disruption to library operations.

The requirements for redundant TallBot operation are:

- A 240 VAC, 2N power configuration
- PEMs on each end of the library
- Dual TallBot hardware activation key

Power Options

Power options for the SL3000 include AC, DC and power redundancy.

AC Power Configurations

The following AC power source options are available:

- Limited features: 110 VAC, 50/60 Hz, at 20 Amps (range: 100–127 VAC, 50–60 Hz, 16 Amps)
- Full features: 220 VAC, 50/60 Hz, at 30 Amps (range: 200–240 V AC, 50–60 Hz, 24 Amps)

Power Distribution Units (PDUs) are located at the rear of the base module and optional DEM.

Power Redundancy

The SL3000 provides full redundancy for tape drives, robotics units, and electronics. The following redundancy options are available:

- N+1: One AC PDU, with one extra DC power supply for DC power redundancy. This is the standard power configuration for the SL3000. This configuration requires at least a 20 Amp circuit breaker at the customer's branch service panel.
- 2N: Two PDUs for AC redundancy; each PDU has a set of DC power supplies (N DC power supplies). This configuration requires a second, separate customer power source.
- 2N+1: Two PDUs for AC redundancy; each PDU has extra DC power supplies for N+1 redundancy for each PDU. The second PDU does not have N+1 for the TallBot.

DC Power

Load sharing 1200 Watt DC power supplies are required for distribution of +48 VDC for TallBot and tape drive operation. The number of DC power supplies required depends on the power configuration and total number of drives in the library.

A Rail Power Enable module is also installed as a safety circuit for rail power. Two cPCI power supplies (200 Watts each) distribute power to the Electronics Control Module. These power supplies are located below the HBT card: two on the left for N+1, or one on each side for 2N.

Library Environment Specifications

The following lists the library environment specifications. Refer to your tape drive and media publications for their specifications.

TABLE 1-4 Library Environment Specifications

	Specifications		
Item	**Operating**	**Storage**	**Transporting**
Temperature	+16 to +32ºC (+60 to +90ºF)	+10 to +40ºC (+50 to +104ºF)	-40 to +60ºC (-40 to +140ºF)
Humidity	20 to 80%	10 to 95%	10 to 95%
Wet bulb (maximum, noncondensing)	+29.2ºC (+84.5ºF)	+35ºC (+95ºF)	+35ºC (+95ºF)
Airborne Contamination	Tape drives and media are subject to damage from airborne particulates. The operating environment must adhere to the ISO 14644 Class 8 requirements.		
Altitude	-76 to 3048 m (-250 to 10,000 ft)		

Cooling

Cooling within the SL3000 is divided into three areas:

- Library electronics
- Tape drives
- DC power supplies

Library Electronics

There are two fans located to the right of the electronics control module that provide cooling for the electronics in the library. Air is drawn from the floor and sides of the library and flows through the fans to the rear of the library.

- These fans are monitored by the HBC card for proper operation.
- An amber **Fault** indicator is on the fan assembly to indicate a failure.

While there are two dedicated fans, one fan is sufficient to provide adequate cooling for the library/electronics. Nevertheless, since the fans can be replaced without interfering with library operations, it is best to replace a defective fan when it is detected.

Tape Drives

Each tape drive tray contains one or two fans for drive cooling.

Power for the fans is supplied through the tape drives power converter card. Air is drawn from the front of the drive and flows through the fan to the rear of the drive/library.

DC Power Supplies

Each 1200 Watt DC power supply contains a fan that pulls air from the front of the library, through the rear of the supply, and out the rear of the library.

Interfaces

The SL3000 library supports the following types of interfaces:

- Library Control Path: Transfers library management commands, such as cartridge mounts and dismounts, between the host and the library components. No host data is present on this interface.
- Data Path: Transfers data between the host and the tape drives.
- Command Line Interface: Enables an Oracle support representative to configure and diagnose the library.
- SNMP: Enables system administrators to query the library and receive information about potential problems.
- SL Console: Enables library operators and administrators to configure and manage the library from a graphical user interface.

Library Control Path

> **Note –** When a new library is integrated into a network, it is strongly recommended that the system/network administrator work closely with a Oracle StorageTek representative to define the configuration.

The control path provides for the transfer of library management commands between the host and the library. The SL3000 supports the following host connection types for the control path:

- TCP/IP Interface: TCP/IP protocol using Ethernet 10/100 Base-T and CAT-5 cables
- FC-SCSI Interface: Small Computer System Interface (SCSI) protocol and command set over a physical Fibre Channel interface

A non-partitioned library can only use either the FC-SCSI interface or the TCP/IP interface. Using the optional Partitioning feature, a library can connect to multiple hosts over a combination of the two interface types. See “Library Partitioning” on page 195 for details.

Library addressing depends on the host connection type:

- TCP/IP hosts use a panel, row, column (PRC) numbering scheme.
- FC-SCSI hosts use a sequential element numbering scheme, with each element type (storage cells, tape drives, and CAPs) having its own sequential range.

See “Library Resource Addresses” on page 601 for full details.

Multi-Path Connections

For both TCP/IP and FC-SCSI connections, the standard SL3000 library configuration includes a single port for host-to-library communications. You can add a second port through the following optional features:

- Dual TCP/IP (or Dual Port): For TCP/IP connections
- Multi Port Fibre: For FC-SCSI connections

These features must be installed and enabled by your Oracle support representative. See “Hardware Activation Files” on page 111 for details.

Once the optional second port is activated, both ports can be connected to the same host or to two different ones. The ports operate independently, and the library always responds to a host request on the same port that the request was received.

In the event of a port failure, automatic failover is managed by the host software, not the library. See the appropriate host software documentation for details about the provided failover support.

Any problems with the ports are reported in the system Event Log and the **Status Module** screen. See "Library Events" on page 483 and "Status Alert Messages" on page 352 for details.

TCP/IP Interface

The TCP/IP interface type uses the TCP/IP protocol over an Ethernet physical interface (CAT-5, Ethernet, 10/100 BaseT cable). This interface enables either of the following host platforms to connect to and communicate with the library:

- Open system platforms with ACSLS (see "Automated Cartridge System Library Software" on page 56 for details)
- Enterprise-level mainframes with ELS (see "Enterprise Library Software" on page 55 for details)

The library TCP/IP interface complies with the Institute of Electrical and Electronics Engineers standard IEEE 802.3 for Ethernet networks. The ports are capable of auto-negotiating the following functions:

- Method of transmission
  - Half-duplex: Transmits data in just one direction at a time
  - Full-duplex: Transmits data in two directions simultaneously
- Speed of the transmission
  - 10Base-T: 10 megabits per second (Mbps)
  - 100Base-T: 100 megabits per second (Mbps)

Network Configuration

The SL3000 should be installed on a secure private network. Use the following configuration guidelines to maximize throughput and minimize resource contention.

- Directly connect the library to a switch.
- Place the library on its own subnet.
- Use a managed switch that can:
  - Set priorities on ports to give the host and library higher priority.
  - Provide dedicated bandwidth between the host and the library.
  - Create a VLAN between the host and the library.
- Use a virtual private network (VPN) to insulate host-to-library traffic.

Oracle StorageTek's 9300 Control Path Adapter provides the hardware connection for mainframe hosts. This interface adapter is installed on the mainframe and converts data on the Ethernet network to compatible Host Library Interface (HLI) commands.

Library Controller Redundant Electronics

> **Note –** This feature is available starting with SL3000 firmware version FRS_3.0 and SL Console version FRS_5.00.

The optional Redundant Electronics feature provides failover protection in HLI libraries. If the library controller experiences errors, it automatically switches operations to an alternate library controller with minimal disruption to library and host operations. This enables your Oracle support representative to replace the faulty card while the library continues normal operations.

The Redundant Electronics feature also provides minimal disruption of library operations during firmware upgrades.

FC-SCSI Interface

The FC-SCSI interface type uses the SCSI command set over a physical Fibre Channel connection. The Oracle StorageTek implementation of Fibre Channel conforms to the following standards:

- American National Standards Institute (ANSI)
- National Committee for Information Technology Standards (NCITS)

Applications supporting the SCSI-3 protocol are required for FC-SCSI hosts.

Topology

The recommended Fibre Channel topology for the SL3000 is switched fabric. A switched fabric provides dynamic interconnections between nodes, and multiple, simultaneous Fibre Channel connections for the network.

If the SL3000 is connected to a Fibre Channel switch or fabric-capable host, it automatically configures itself as a switched topology and can support up to 16 million ports logged into the fabric.

See the *SL3000 Interface Reference Manual* for complete information. This manual contains information about the SCSI command set, plus information about Fibre Channel operations, command implementations, topologies, cables, and connectors.

> **Note –** While the SL3000 supports the arbitrated loop topology, this topology is not recommended. The SL3000 does not support forcing arbitrated loop connection by setting Hard ALPAs (Arbitrated Loop Physical Addresses).

Library Internal Network

The library's internal network handles all communication between the library controller and the private system ports, such as:

- CAPs
- Drive control path

- Local operator panel

Data Path

The data path, which is separate and distinct from the library control path, supports the transfer of data between the host and the tape drive. Host data paths to the tape drives can be Fibre Channel, FICON, or ESCON, depending on the operational characteristics of the drive type. See "Tape Drives" on page 43 for details.

Command Line Interface

The SL3000 command line interface (CLI) is a library interface for trained and qualified Oracle support representatives only. This interface enables support representative to configure and diagnose problems with the library.

Note – Customers do not have access to the CLI interface.

SNMP

By using Simple Network Management Protocol (SNMP), system administrators and network managers can monitor and receive library status information, including the following:

- Operational state of the library (such as microcode level, serial number, online/offline status)
- Status of the CAPs (such as open, closed, number of cells)
- Library elements (number of TallBots, storage cells, CAPs)
- Number of storage cells and media types in the library
- Number and types of tape drives installed in the library

Note – By default, the SNMP agent is turned off and must be activated by your Oracle support representative through the command line interface (CLI).

The SL3000 supports the following SNMP versions:

- SNMPv2c: For machine status queries; the information transmitted is not secure.
- SNMPv3: For Oracle Confidential: Internal Use Only information, since it supports encryption and strong user identification. SNMPv3, therefore, is the preferred protocol for proprietary data.

Note – See the *SL3000 SNMP Guide* (PN 3161945*xx) for d*etailed information concerning SNMP and the setup procedures.

SL Console

The StorageTek Library Console (SL Console) is a Java-based software application that provides a graphical user interface (GUI) for monitoring and managing the StorageTek SL3000 library. See "StorageTek Library Console" on page 59 for complete details.

Library Management Software

Library management software components control the library to perform activities such as mounts and dismounts, enters and ejects. They also manage their own cartridge databases, containing volume location and attribute information.

Oracle offers several software components depending on the platform, connection type, and operating system. These include the following:

- Direct-attach SCSI over Fibre Channel interface
- ACSLS
- Enterprise Library Software (ELS), which includes:
  - CDRT (Concurrent Disaster Recovery Test)
  - CSC (Client System Component)
  - ExHPDM (Extended High Performance Data Mover)
  - ExPR (Expert Performance Reporter)
  - LibraryStation
  - MSM (MegaRAID Storage Manager)
  - VTCS (Virtual Tape Control System)
  - VSM (Virtual Storage Manager) GUI
- Library Content Manager (formerly ExLM)

> **Note –** See the appropriate library management software documentation for the version levels required to support the SL3000.

Nearline Control Solutions

The SL3000 supports the following Oracle Nearline Control Solutions (NCS) software products.

- Enterprise Library Software
- Storage Management Component
- StorageTek HTTP Server

Enterprise Library Software

Oracle's StorageTek Enterprise Library Software 7.0 (ELS) packages together multiple components along with many enhancements, which are all designed to reduce complexity, boost productivity, and improve reliability and availability in your data center. Compared to ELS and VTCS individual software, StorageTek Enterprise Library Software 7.0 delivers enhancements in several areas to provide more functions and increased usability at a lower price, including:

- Parameter pre-validation of storage management policies
- Improved CDS recovery and logging
- Integrated task-oriented documentation

- Improved migration system
- Enhanced disaster recovery
- Higher availability clustering solution
- SMC simulation
- Improved client/server virtual tape volume mount processing through
- Storage Management Component (SMC)

Storage Management Component

Oracle's Storage Management Component (SMC) is the interface between IBM's OS/390 and z/OS operating systems and a Oracle StorageTek library. SMC performs the allocation processing, message handling, and SMS processing for the NCS solution. SMC resides on the MVS host system with ELS, or on a remote system using the Oracle StorageTek HTTP server to communicate with the ELS. SMC communicates with ELS to determine policies, volume locations, and drive ownership.

Library Content Manager

Oracle's Library Content Manager (LCM) provides automated library management for z/OS environments. It enhances and optimizes the overall performance of automated tape libraries by providing content management to assure there are adequate storage resources (tape drives, tape cartridges, etc.) available to run scheduled jobs and to run them at optimum efficiency. It also provides reporting of the overall operations of the library.

StorageTek HTTP Server

Oracle's StorageTek HTTP Server for OS/390 and z/OS optionally provides the middleware to allow communication between the SMC (client) and a remote ELS subsystem (server). The HTTP server executes as a separate subsystem on the MVS host where the remote ELS subsystem resides.

Automated Cartridge System Library Software

Oracle's Automated Cartridge System Library Software (ACSLS) functions as the central service provider for all library operations, efficiently sharing library resources with ACSLS-enabled applications on any system. Using ACSLS, you can manage multiple libraries from a single point of control. The key benefits of using ACSLS in your tape environment include:

- Centralized library control across multiple StorageTek libraries, including legacy technology
- Optimized library performance by load-balancing hardware and executing parallel commands
- Reduced downtime through dynamic configuration capabilities and queuing commands during short-term library outages
- Enriched reporting and management capabilities for ease of use

Operating Modes

Four modes of operation are possible for the SL3000:

- Automated Mode
- Manual Mode
- Maintenance Mode
- Degraded Mode

Automated Mode

When in automated mode of operation, the library automatically mounts and dismounts cartridges without physical intervention by a person.

Automated operations include the following activities:

- Mounting and dismounting cartridges
- Entering and ejecting cartridges through the CAP
- Logging library events
- Drive cleaning

See "Automated Mode" on page 57 for complete details.

Manual Mode

Manual mode of operation occurs when the library is unavailable for system use and human intervention is required. An example of this situation would be when a library experiences an unrecoverable error, making automated mounts and dismounts impossible.

Another example would be where a library component cannot perform a mount to a drive for a particularly important job request. In this case, the library may require a person to enter a library, locate the cartridge, and manually mount it into the requested drive.

> **Warning – Anyone entering the library must be advised of the safety procedures required of them.**

See "Manual Operations" on page 587 for complete details.

Maintenance Mode

In the case of a failure in a non-redundant library component (for example, a single TallBot for the entire library), the library is said to be "unavailable" to the system. In this case, the entire library must be placed offline until the repair is accomplished.

After the defective component has been repaired or replaced, the library can be placed in maintenance mode while verification tests are performed.

Degraded Mode

When in degraded mode, the library is still operational and online, but its operational efficiency is degraded due to a failing component. Examples of degraded mode are:

- In a redundant TallBot configuration, one TallBot has failed. The other TallBot has assumed all mount and dismount operations for the entire library .
- A single tape drive has experienced a failure and must be replaced.

2

StorageTek Library Console

Oracle's StorageTek Library Console (SL Console) is a Java-based software application that provides a graphical user interface (GUI) for monitoring and managing the StorageTek SL3000 library.

This chapter contains the following topics:

Using the SL Console

You can perform activities with the SL Console such as:

- Manage available library storage capacity
- Manage and configure library partitions (optional feature)
- View and modify status and properties of the library and associated devices (drives, CAP, robots)
- Perform an audit on all or part of the library
- Perform a self-test on the library or an associated device
- Perform a diagnostic move (exercise a robot)
- Locate a cartridge
- Move a cartridge from one location to another
- Display library logs
- Display library status event messages
- Display error explanations
- Download new library firmware while the library is in operation

- Display context-sensitive help

SL Console Modes

Depending on your needs, you can run the SL Console in any of the following modes. For details and procedures, see:

- "Local Operator Panel" on page 68
- "Web-launched SL Console" on page 69
- "Standalone SL Console" on page 71

SL Console Security

Security features built into the SL Console control both user authentication and user authorization. The security features include:

- User IDs: User IDs control user authentication. Each user must have a valid, active user ID and password to log in to the SL Console.
- Access permissions: Access permissions control user authorization. Each user ID is assigned a set of access permissions, which determine the types of requests the user can submit through the SL Console. For example, to modify the system properties of a drive, a user must log in with a user ID that has the proper access permissions.

When you log in to the SL Console with a valid user ID, password, and library name, the system authenticates your identity and then authorizes your access to the various SL Console functions.

Note – Beginning with SL Console FRS 4.50, passwords are limited to 5 - 8 characters.

User IDs

To log in to the SL Console, you must have a valid, active user ID. Each user ID must be assigned a password.

There are a fixed set of user IDs at a site. The user IDs include:

- `admin`: customer administrator
- `service`: Oracle support representative
- `oem`: third-party field service technician

When you log in successfully, the SL Console displays your user ID in the status bar of the screen.

Only one user at a time can be logged in to the local operator panel. Any number of users can connect to a library through the standalone SL Console or Web-launched SL Console.

Activation Password

Before any users at your site can use the SL Console for the first time, your library administrator must activate the "admin" user ID with a special activation password. Your Oracle support representative provides your administrator with the activation password, which is valid for one-time use only.

After logging in with the activation password, the administrator must change the admin user ID password to ensure system security.

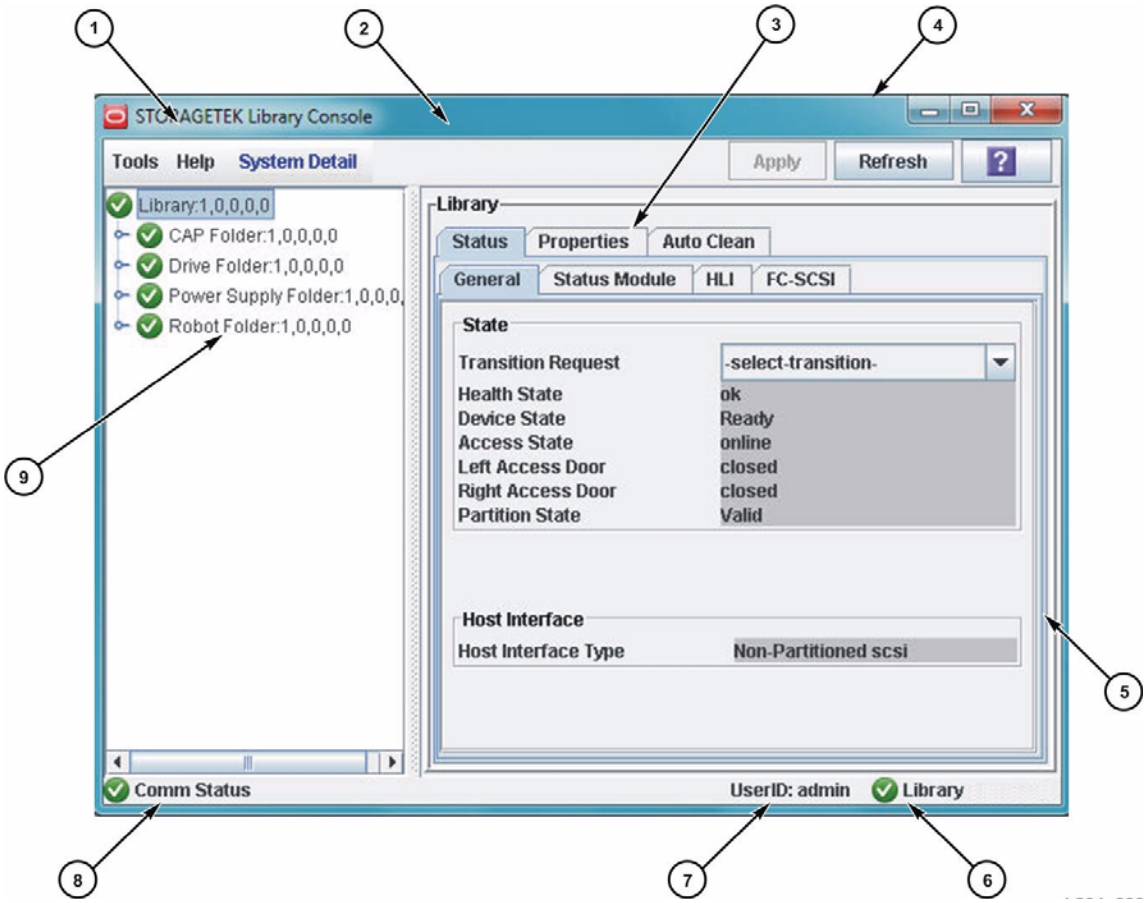
> **Note –** Beginning with SL Console FRS 4.50, your password must be limited from 5 - 8 characters. Enter the first 8 characters of the initially assigned password. After initial login, you can change the password.

For details about this process, see the appropriate library *Installation Guide*.

SL Console Screen Display

The following TABLE 2-1 explain the components of the SL Console screen shown in FIGURE 2-1.

FIGURE 2-1 SL Console Screen Display



See TABLE 2-1 on page 62 for details.

TABLE 2-1 SL Console Component Description

	Component Name	Description
1	Menu bar: Includes the Tools Menu and the Help Menu	Tools menu provides access to System Detail, Reports, Monitors, Utilities, Partitioning, User Management, and Log off functions. Help menu provides access to the table of contents of the help system. It also identifies the version of the SL Console in use.
2	Title bar	Displays the title of the current screen
3	Function tabs	Identifies the available functions for a screen
4	Options bar	Location of buttons related to the screen (for example, **Apply**, **Refresh**, **Print**). Always includes the SL Console **Help** button (**?**). See "Synchronizing the Display With the Controller Database" on page 63 for details on using the **Apply** and **Refresh** buttons.
5	Work area	Location of the screen data
6	Library health indicator	Identifies the library to which the SL Console is connected, and displays a graphical representation of the library health
7	UserID indicator	Displays the user ID currently logged in to the SL Console
8	Server communication health indicator	Displays a graphical heartbeat monitor indicating the state of server communication health
9	Navigation tree	Lists the devices included in the library

Modifying the Screen Layout

Note – This feature is available starting with SL Console version FRS_3.30. It is available on selected screens only.

You can modify the layout and display of selected SL Console screens as listed in TABLE 2-2.

TABLE 2-2 SL Console Display Options

Display Option	Instructions
Sort the display by any column	Click the heading of the column you want to sort by. Initially the sort is in ascending order. Click the heading again to switch between ascending and descending order.
Arrange the columns in any order	Click and drag a column heading horizontally to any position in the heading row.
Resize the columns	Click the border of the column heading and drag it left or right to change the column width.

Synchronizing the Display With the Controller Database

Logging In

The SL Console gets all library configuration data from the library controller. Therefore, be careful when logging in to the SL Console before the library has fully initialized. You may see warnings that configuration data is not yet available. In such a case, you must exit and log in again at a later time. Additionally, if a library audit is performed as part of initialization, until the audit is complete, any configuration data displayed may not be completely up to date and accurate.

Library Configuration Updates

When you first bring up an SL Console screen, the display reflects the most recently saved data from the library controller database. If you have changed the configuration in some way (such as taking a drive offline, or removing or adding a cartridge), it is important that you sychronize the status of the library with the SL Console screen.

If you are making major modifications to the library configuration (such as adding modules, defining partitions, etc.), you should coordinate these changes with other library users. Failure to do so could result in conflicts within the controller database.

Apply Button

If you use the screen to modify the library contents or configuration, your changes do not update the controller database until you commit your changes by clicking the **Apply** button. Multiple users can access the library at the same time, using the SL Console or command line interface to make changes. Various host applications can also access the library to make their own changes to the library contents and configuration.

Refresh Button

If other users make changes and apply them to the controller database, you will not see these changes until you click the **Refresh** button on your screen. If you have made changes to the library (such as removing a cartridge or taking a drive offline), the status of the library and its components will not be updated to the SL Console until you click **Refresh**. Using **Refresh**, you can select all of the library for synchronizing or one or more library components.

SL Console Reports

The SL Console library reports provide information on the library and its associated devices (for example, drives, robots, and CAPs), events, and tape cartridges. You can use the reports to monitor library activity and identify potential problems. In addition to displaying the reports on-screen, you can save the report data to a file, which you can then print or include in e-mail.

All report output is a static display of information sent from the library controller at the time the report is generated. The SL Console does not update the information dynamically unless you explicitly select the **Update** button on the Options bar.

Note – Running multiple instances of the standalone SL Conso le or Web-launched SL Console on the same PC or workstation can cause problems such as inconsistent data on reports. It is recommended that only one user at a time produce SL Console reports on a PC or workstation, unless all instances of the SL Console are the same version.

Report Types

The SL Console provides the following typ es of reports:

- Log: Detailed system event logs
- Statistics: Statistical information on library operations
- Status Detail: Details on the status of the library and associated devices, such as CAPs, drives, and robots
- Status Summary: Summary information on the status of the librar y and associated devices
- Version: Details about library hardware and software versions

Report Options Bar

The Options bar on each report allows you to perform the following functions:

- "Search a Library Report" on page 92.
- Update the report with current data.
- "Save Library Report Data to a File" on page 94.

Report Procedures

For report procedures, see "General SL Console Report Tasks" on page 89.

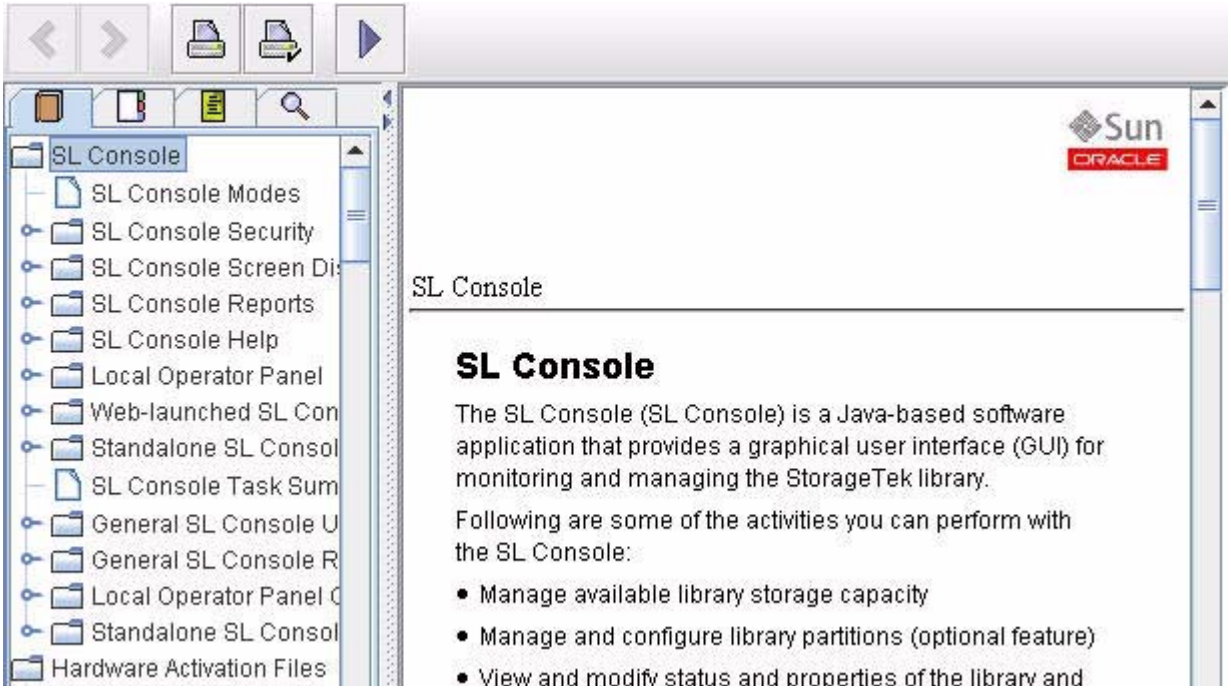
SL Console Help

The SL Console Help displays information for library operators, system programmers, system administrators, and service representatives.

> **Note –** The information relates only to the SL Console. For information about library hardware, tape drives, or host software, see the appropriate product publication.

FIGURE 2-2 shows a sample SL Console Help screen.

FIGURE 2-2 SL Console Help, Sample Screen



To display the SL Console Help from any SL Console screen, use either of the following methods:

- To display context-sensitive help for the current SL Console screen, click the **?** button in the Options bar.
- To display general help information, click **Help > Contents** in the Menu bar.

Navigating Help

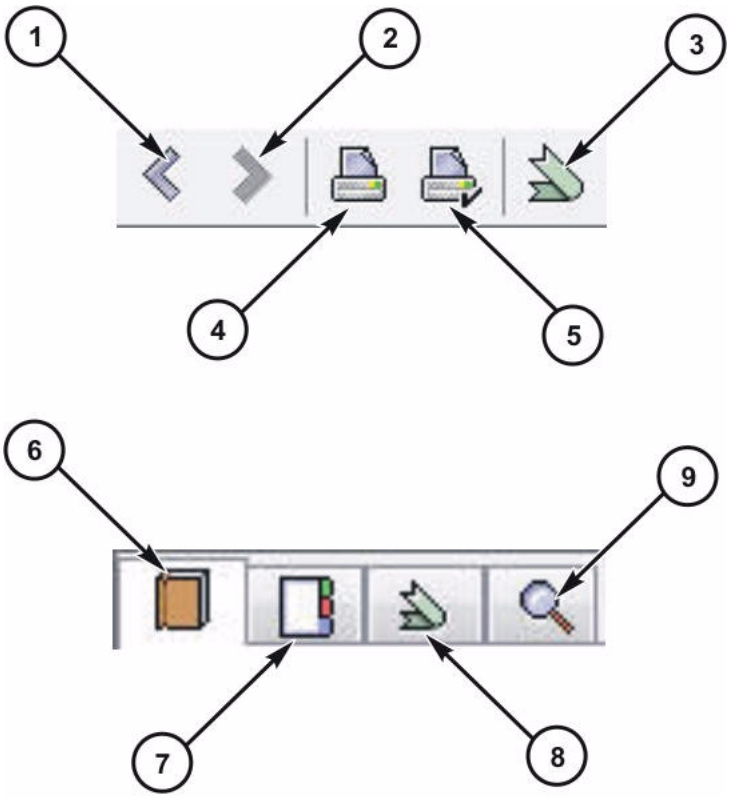
The left panel of the SL Console Help sc reen displays either of the following:

- Table of contents (TOC): An outline of topics and subtopics
- Index: A list of terms and topics, in alphabetical order

The right panel displays the Help topic itself.

The top of the SL Console Help window includes the nav igation buttons shown in FIGURE 2-3 and described in TABLE 2-3 on page 66.

FIGURE 2-3 SL Console Help Navigation Buttons



See TABLE 2-3 for details.

TABLE 2-3 SL Console Help, Navigation Buttons

Button	Meaning	Action
1	Back	Retraces your steps, going backward one topic at a time
2	Forward	Retraces your steps, going forward one topic at a time
3	Print	Displays the **Print** dialog box, which allows you to print one or more topics: • To print the current topic, click the **Print** button. • To print a different topic, click the topic title in the SL Console Help table of contents, and click the **Print** button. • To print more than one topic, highlight the topics in the SL Console Help table of contents by pressing **Shift-Click** or **Ctrl-Click**, and then click the **Print** button.

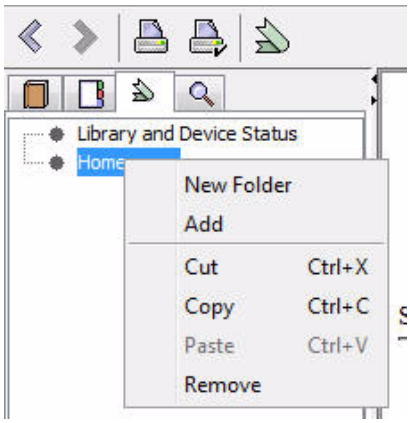
TABLE 2-3 SL Console Help, Navigation Buttons

Button	Meaning	Action
4	Print Setup	Displays the **Page Setup** dialog box, which allows you to modify your print page layout
5	Add Favorite	Saves the currently displayed topic as a favorite topic. See the following "Managing Favorite Topics" on page 67 for more information.
6	TOC	Displays the SL Console Help table of contents
7	Index	Displays the SL Console Help index
8	Favorites List	Displays list of favorite topics
9	Search	Allows you to enter a term and search the contents for that term

Managing Favorite Topics

To save favorite topics, navigate to the topic you want to save. Click the **Add to Favorites** button shown in FIGURE 2-4. The topic will then display in the left-hand column as a topic. To delete a topic, select it. Then right-click to display the menu, and click **Remove**.

FIGURE 2-4 Management Menu for Favorite Help Topics



Tips for Using the SL Console Help

You can minimize, maximize, or resize the Help screen to accommodate your needs.

You can resize the left and right panels of the Help screen by clicking the border between them and dragging it left or right.

Most topics include a **Related Topics** button at the bottom of the page. Click on this button to display and navigate to help topics containing related information.

Local Operator Panel

The local operator panel is an optional feature of the library, which is built in to the base module and Drive Expansion Module (DEM). It enables you to run most of the SL Console application directly at the library from a flat-screen display with a touch screen interface.

The local operator panel has the following features:

- Flat-panel display (12.1-inch), resident within the library
- Touch screen interface, allowing alphanumeric data entry. Stylus available. See "Virtual Keypad" on page 68 for details.
- No keyboard or mouse option

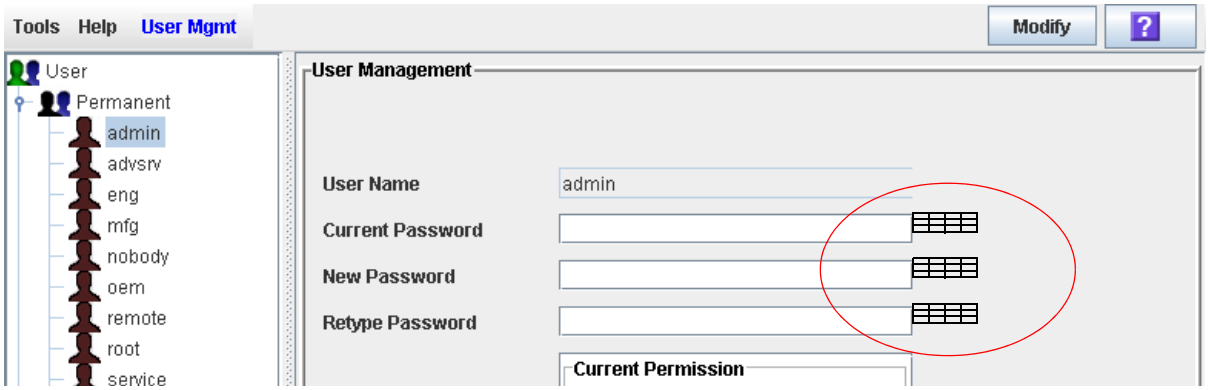
LEDs located directly below the local operator panel provide the following status information:

- Library Active: Library processor is working.
- Wait: Library firmware is loading.
- Service Required: Library is rebooting.

Virtual Keypad

Some screen fields require you to make a text entry. The local operator panel displays a keyboard icon next to these fields. By clicking on the keyboard icon, you can display a virtual keypad, which allows you to enter valid alphanumeric characters into the field. FIGURE 2-5 shows the keyboard icons on a sample screen.

FIGURE 2-5 Virtual Keypad



The virtual keypad provides the standard alphanumeric and symbol characters. It enables you to enter only characters that are valid for the current field. Characters that are not valid are grayed out.

The virtual keypad also provides the following cursor movement buttons listed in the following TABLE 2-4.

TABLE 2-4 Virtual Keypad, Cursor Movement Buttons

Button	Function
Insert	If highlighted, inserts text at the cursor position. If not highlighted, replaces text to the right of the cursor.
Home	Places cursor at the beginning of the field.
Del	Deletes character to the right of the cursor.
End	Places cursor at the end of the field.
Back	Deletes character to the left of the cursor
Clear	Clears the entire field
Left	Moves cursor one character to the left
Right	Moves cursor one character to the right
OK	Submits the text entry in the field
Cancel	Cancels the text entry in the field and dismisses the virtual keypad

Touch Screen Calibration

Alignment of the local operator panel touch screen is calibrated at the factory. The factory settings are appropriate for most situations, and it is usually not necessary for you to make any adjustments. On rare occasions, however, the touch screen may come out of alignment or need adjustment.

To re-calibrate the touch screen, proceed as follows:

- If you have a Linux-based local operator panel, you can re-calibrate it yourself. See "Re-calibrate the Local Operator Panel" on page 97 for detailed instructions.
- If you have a Windows-based local operator panel, contact your Oracle support representative. Windows-based local operator panels can be re-calibrated only by an authorized service representative.

If you have a Linux-based local operator panel, you can re-set the touch screen to its factory settings at any time. See "Reset the Local Operator Panel Calibration" on page 100 for detailed instructions.

Web-launched SL Console

The Web-launched SL Console is a standard feature of the library. It enables the SL Console to be installed on a centralized Web server. Individual clients can then use a supported Web browser to download the Web-launched SL Console. Using the Web-launched SL Console you can connect to any library for which you have a valid user ID.

The Web-launched SL Console is delivered to clients as a Java Web Start process, which executes outside the browser.

Security Considerations

The Web-launched SL Console software is digitally signed, which guarantees that it has been issued by Oracle Corporation and has not been altered or corrupted since it was created. As a Java Web Start process, the Web-launched SL Console includes the security features provided by the Java 2 platform.

You are responsible for implementing all appropriate additional security systems, including firewalls, user access, etc.

Client Requirements

You can download the Web-launched SL Console to clients meeting the requirements listed in the following TABLE 2-5.

TABLE 2-5 Web-launched SL Console Requirements

Platform	Solaris 9: SPARC (Firefox 2.x) Solaris 10: SPARC (Firefox 2.x) Windows 2000: 32 bit (IE 5, IE 5.5, Firefox 2.x) Windows XP: 32 bit (IE 6, IE 7, Firefox 2.x) Windows Vista: 32 bit (IE 7, Firefox 2.x)
Other	• Java 1.5 Plug-in (the browser will install this automatically if it is not present already) • Ethernet connection to the library • Ethernet connection to the Web-launched SL Console server

Web-launched SL Console Updates

Updates to the Web-launched SL Console only need to be installed on the centralized Web server. After the updates are installed on the server, they are downloaded automatically to all clients whenever the application is started on the client.

Starting the Web-launched SL Console on a Client

You can use either of the following methods to start and log in to the Web-launched SL Console on a client:

- From a command line (Solaris only) or supported browser. See "Log in to the Web-launched SL Console Using a Browser or Command Line" on page 75.
- By double-clicking the `slc.jnlp` icon on your client. To use this method from a client, you must use the browser method at least once and save the `slc.jnlp` file locally. See "Log in to the Web-launched SL Console Using an Icon" on page 80.

Standalone SL Console

The standalone SL Console is a standard feature of the StorageTek SL3000 library. It enables you to run the SL Console application remotely from a PC or workstation that has a network connection to the library. Using the standalone SL Console, you can connect to any library for which you have a valid user ID.

Security Considerations

The SL Console application interfaces with the primary library interface (PLI) over a secure sockets layer (SSL). SSL provides a secure communication path between the library and the customer's SL Console session. This security prevents an unauthorized network user from monitoring library activity.

Installation Requirements

You can install the standalone SL Console on a computer meeting the requirements listed in the following TABLE 2-6:

TABLE 2-6 Standalone SL Console Requirements

Platform	Solaris 9: SPARC
	Solaris 10: SPARC
	Windows 2000 Server: 32 bit
	Windows XP Client: 32 bit
	Windows Vista: 32 bit
Other	Ethernet connection to the library

The standalone SL Console software is available for download at the Oracle Software Delivery Cloud, available at:

http://edelivery.oracle.com/

Standalone SL Console Updates

Note – Before you can install a new version of the standalone SL Console, you must uninstall the previous version. See your PC or workstation documentation for detailed instructions. Running multiple versions of the SL Console on the same PC or workstation can cause problems such as inconsistent data on reports.

After you have uninstalled the previous version of the SL Console, see the following procedures for detailed instructions on upgrading the software.

- "Download the Standalone SL Console Media Pack" on page 102
- "Install the Standalone SL Console" on page 106

SL Console Task Summary

SL Console tasks are divided into the following categories:

General SL Console Usage Tasks

▼ Log in to the Local Operator Panel

Task Tool

This procedure can be performed at the local operator panel.

Task Purpose

Use this procedure to log in to the local library .

Note – Only one user at a time can log in to the local operator panel.

Task Steps

1. **If the touch screen panel is blank, touch the screen anywhere to activate the Login screen.**
2. **Use the virtual keypad to enter your login information (see "Virtual Keypad" on page 68 for details).**

   `User ID:` *SLC_login*
   `Password:` *password*

   where:

   - *SLC_login* is the SL Console user ID .
   - *password* is the password assigned to this user ID.

     Note – Beginning with SL Console FRS 4.50, your password must be limited from 5 - 8 characters. Enter the first 8 characters of the initially assigned password. After initial login, you can change the password.

     Note – The user ID you use determines the screens you can access. See "SL Console Security" on page 60.

3. **Click Log on.**

▼ Log in to the Web-launched SL Console Using a Browser or Command Line

Task Tool

This procedure can be performed at either of the following:

- Web browser
- Command line

Task Purpose

Log in to the SL Console.

On Windows 2000, you may need to install a Java plugin for your Web browser before performing this procedure. You can download the plugin from the following location: http://java.sun.com/products/archive/j2se/5.0_04/index.html

On Solaris platforms, it is easier to log in to the Web-launched SL Console using the command line. If you prefer to log in using a Web browser, however, you need to download a recent version of the Firefox Web browser from the following location: www.mozilla.com

> **Note –** Before you perform this activity, you must obtain the DNS alias or IP address of the SL Console server. Depending on how your Web-launched SL Console server has been set up, it may be accessible only by IP address. See your library administrator for assistance.
>
> **Note –** The command line option is available on Solaris platforms only.

Task Steps

1. **Choose your login method:**
   - Command line: Available on Solaris only. Proceed to Step 2.
   - Web browser: Available on either Windows or Solaris. Proceed to Step 3.
2. **Open a terminal window, and type the following command:**

   `javaws http://`*server_ID*`:`*port_ID*`/opel/slc.jnlp`

   where:
   - *server_ID*: Either of the following:
     - IP address of the SL Console server
     - DNS alias of the SL Console server
   - *port_ID*: Port ID of the SL Console application, typically `8080`
   - `opel`: The name (context root) of the Web-launched SL Console application on the server.

   Proceed to Step 4.

3. **Start a supported Web browser on your client PC or workstation (see "Client Requirements" on page 70 for a list of supported browsers), and in the Location Bar or Address field, enter the URL of the SL Console Web Start application:**

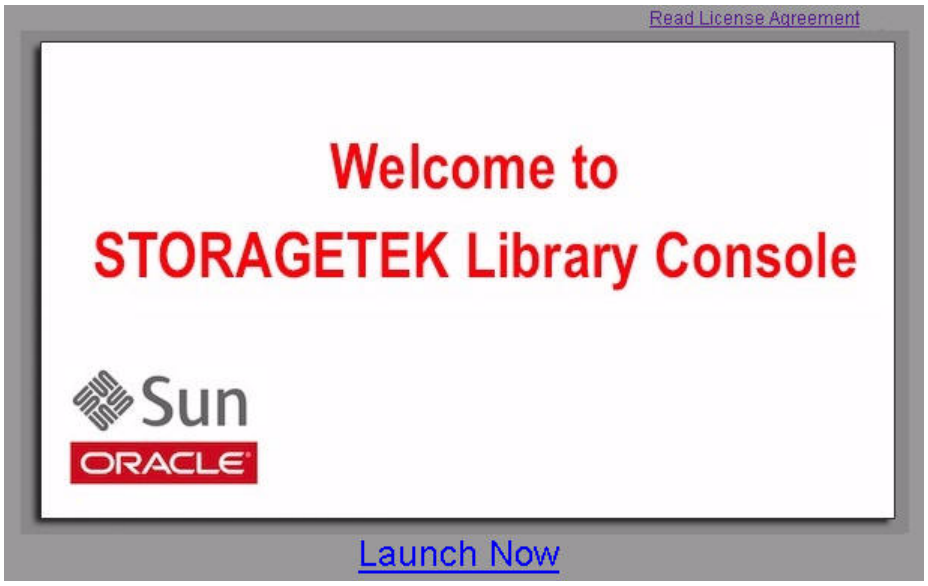
   `http://`*server_ID*`:`*port_ID*`/opel`

   where:

   - *server_ID*: Either of the following:
     - IP address of the SL Console server
     - DNS alias of the SL Console server
   - *port_ID*: Port ID of the SL Console app lication, typically `8080`
   - `opel`: The name (context root) of the W eb-launched SL Console application on the server.

     Note – You can bookmark this URL for future logins.

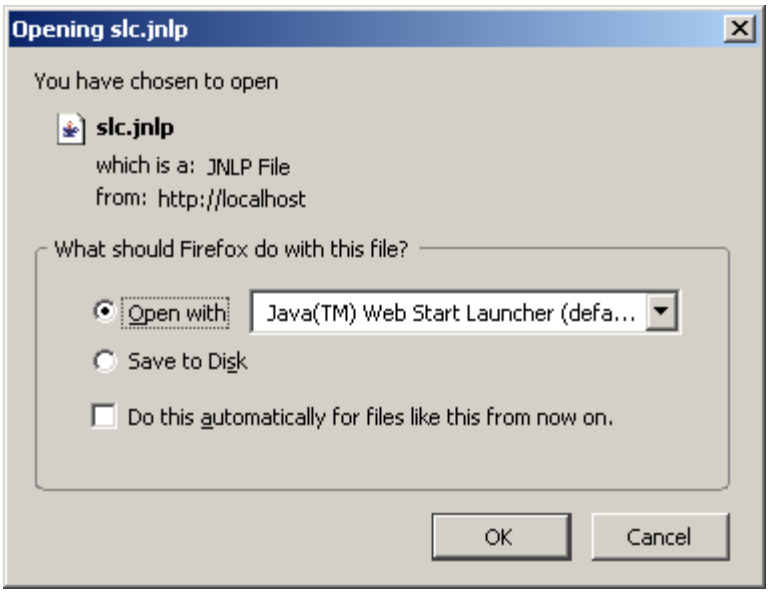
   The **SL Console Launch** screen appears.



4. **Click Launch Now.**

   The Web Start process retrieves the Web-launched SL Console application from the server. Any updates download automatically.

   The **Opening slc.jnlp** dialog box appears.



5. **Complete the dialog box as follows:**

   a. **Specify the action you want to take with the `slc.jnlp` file:**

      - Click the **Open with Java(TM) Web Start Launcher** radio button if you want to start the SL Console directly.
      - Click the **Save to Disk** radio button if you want to save the `slc.jnlp` file to your client and log in to the SL Console later. See "Log in to the Web-launched SL Console Using an Icon" on page 80 for login instructions.

   b. **Optionally click the "Do this automatically for files like this from now on" check box. If you make this selection, this message will not appear during future logins.**

   c. **Click OK.**

If this is the first time you are running the Web-launched SL Console, a digital signature warning dialog box appears.

6. **Complete the dialog box as follows:**

   a. **Verify the Publisher.**

   b. **Optionally click the "Always trust content from the publisher" check box. If you make this selection, this dialog box will not appear during future logins.**

   c. **Click Run.**

   The SL Console Login screen app ears.

7. **Enter your login information, and click Log on.**

   `User ID:` *SLC_login*
   `Password:` *password*
   `Library:` *library_ID*

   where:

   - *SLC_login*: SL Console user ID.

- *password*: Password assigned to this user ID. (Password must be between 5-8 characters.)
- *library_ID*: Library to which you want to connect, expressed in either of the following ways:
  - IP address of the library
  - DNS alias of the library

    Note – Beginning with SL Console FRS 4.50, your password must be limited from 5 - 8 characters. Enter the first 8 characters of the initially assigned password. After initial login, you can change the password.

    Note – The user ID you use determines the screens you can access. See "SL Console Security" on page 60.

▼ Log in to the Web-launched SL Console Using an Icon

Task Tool

This procedure can be performed at your client.

Task Purpose

Log in to the SL Console.

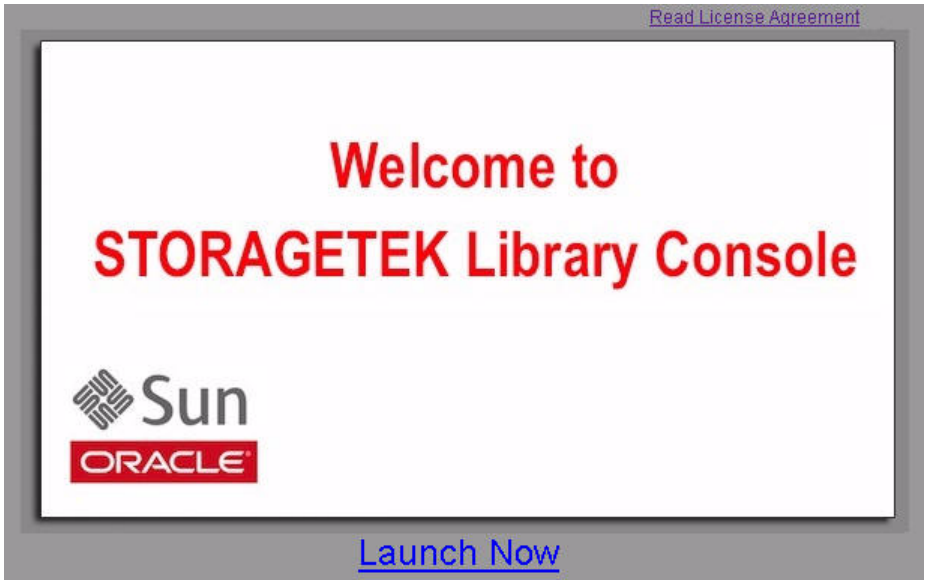
> **Note –** To perform this activity, you must first save the Web-launched SL Console `slc.jnlp` file to your client. See "Log in to the Web-launched SL Console Using a Browser or Command Line" on page 75 for details.

Task Steps

1. **Double-click the `slc.jnlp` desktop icon on your client.**

   The Web Start process retrieves the Web-launched SL Console application from the server. Any updates are downloaded automatically.

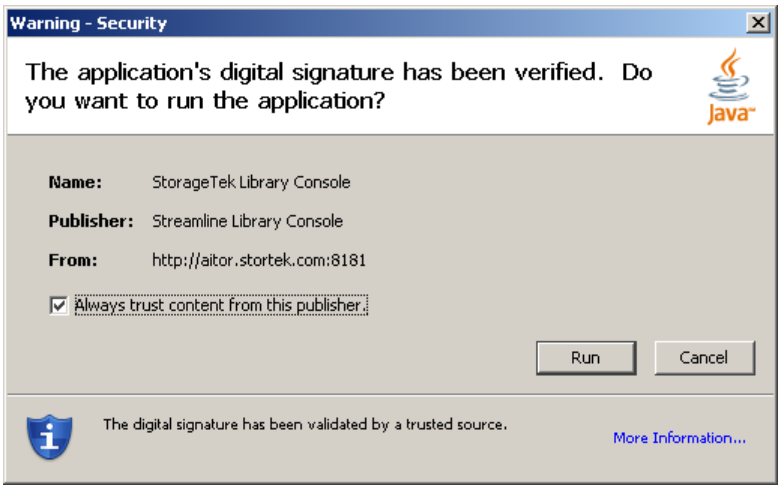
   The **SL Console Launch** screen appears.



2. **Click Launch Now.**

   The Web Start process retrieves the Web-launched SL Console application from the server. Any updates download automatically.

   If this is the first time you are running the Web-launched SL Console, a security warning dialog box appears.



3. **Complete the dialog box as follows:**

   a. **Verify the Publisher is Oracle Corporation.**

   b. **Optionally click the "Always trust content from the publisher" check box. If you make this selection, this dialog box will not appear during future logins.**

   c. **Click Run.**

   The SL Console Login screen app ears.

4. **Enter your login information, and click Log on.**

   `User ID:` *SLC_login*
   `Password:` *password*
   `Library:` *library_ID*

   where:

   - *SLC_login*: SL Console user ID.
   - *password*: Password assigned to this user ID. (Password must be between 5-8 characters.)
   - *library_ID*: Library to which you want to connect, expressed in either of the following ways:
     - IP address of the library
     - DNS alias of the library

     Note – Beginning with SL Console FRS 4.50, your password must be limited from 5 - 8 characters.

     Note – The user ID you use determines the screens you can access. See "SL Console Security" on page 60.

▼ Log in to the Standalone SL Console

Task Tool

This procedure can be performed at your client.

Task Purpose

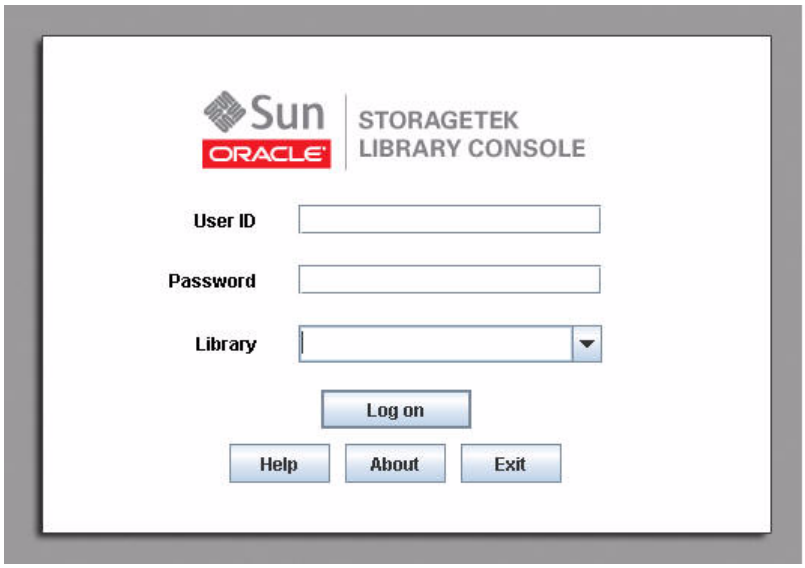
Log in to the SL Console.

Task Steps

1. **Start the SL Console application on your PC or workstation by doing either of the following:**

   - Double-click the **SL Console** icon on the desktop.
   - Select **Start > RunSLConsole** or **Launch > RunSLConsole.**

   The SL Console starts, and the **Login** screen appears.



2. **Enter your login information.**

   `User ID:` *SLC_login*
   `Password:` *password*
   `Library:` *library_ID*

   where:

   - *SLC_login*: SL Console user ID.
   - *password*: Password assigned to this user ID. (Password must be between 5-8 characters.)
   - *library_ID*: Library to which you want to connect, expressed in either of the following ways:
     - IP address of the library
     - DNS alias of the library

Note – Beginning with SL Console FRS 4.50, your password must be limited from 5 - 8 characters.

Note – The user ID you use determines the screens you can access. See "SL Console Security" on page 60.

3. **Click Log on.**

▼ Log Off the SL Console

Task Tool

This procedure can be performed at either of the following:

- Standalone SL Console
- Web-launched SL Console

Task Purpose

Log off the SL Console.

Note – Before you log off, make sure all operations for the current SL Console session have completed (for example, code loads, audits, diagnostic moves).

Task Steps

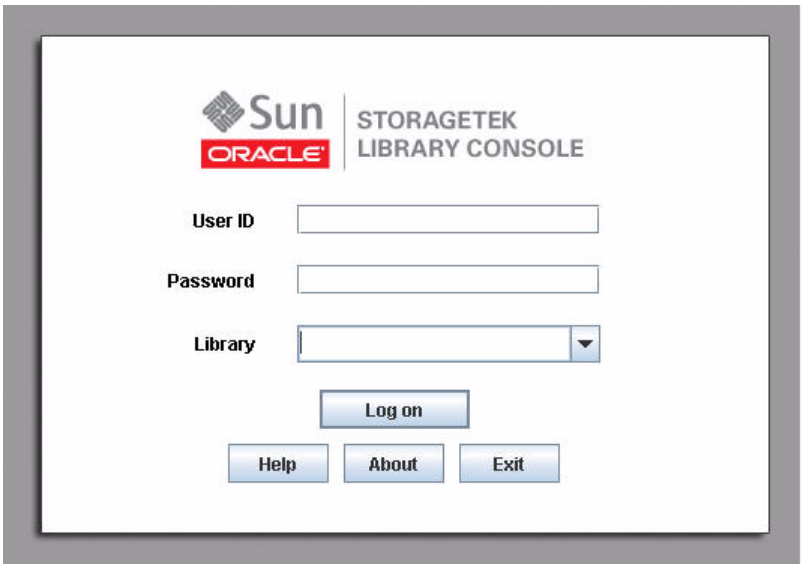
1. **From any SL Console screen, select Tools > Log Off.**

   The **Confirm** message appears.

   Note – To remain logged in to the SL Console, click **Cancel.** You are returned to the originating screen without logging off.

2. **Click OK.**

   You are logged off the SL Console, and the **Login** screen appears.



3. **Click Exit to close the SL Console.**

▼ Change a User Password

Task Tool

This procedure can be performed at either of the following:

- Standalone SL Console
- Web-launched SL Console

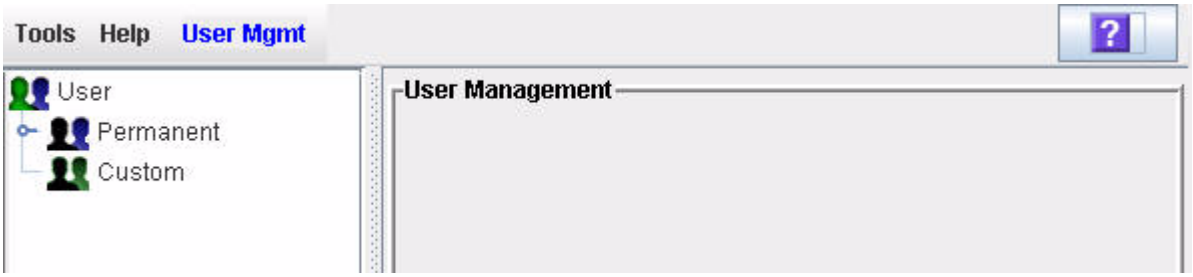
Task Purpose

Use this procedure to change the password for a user account.

Task Steps

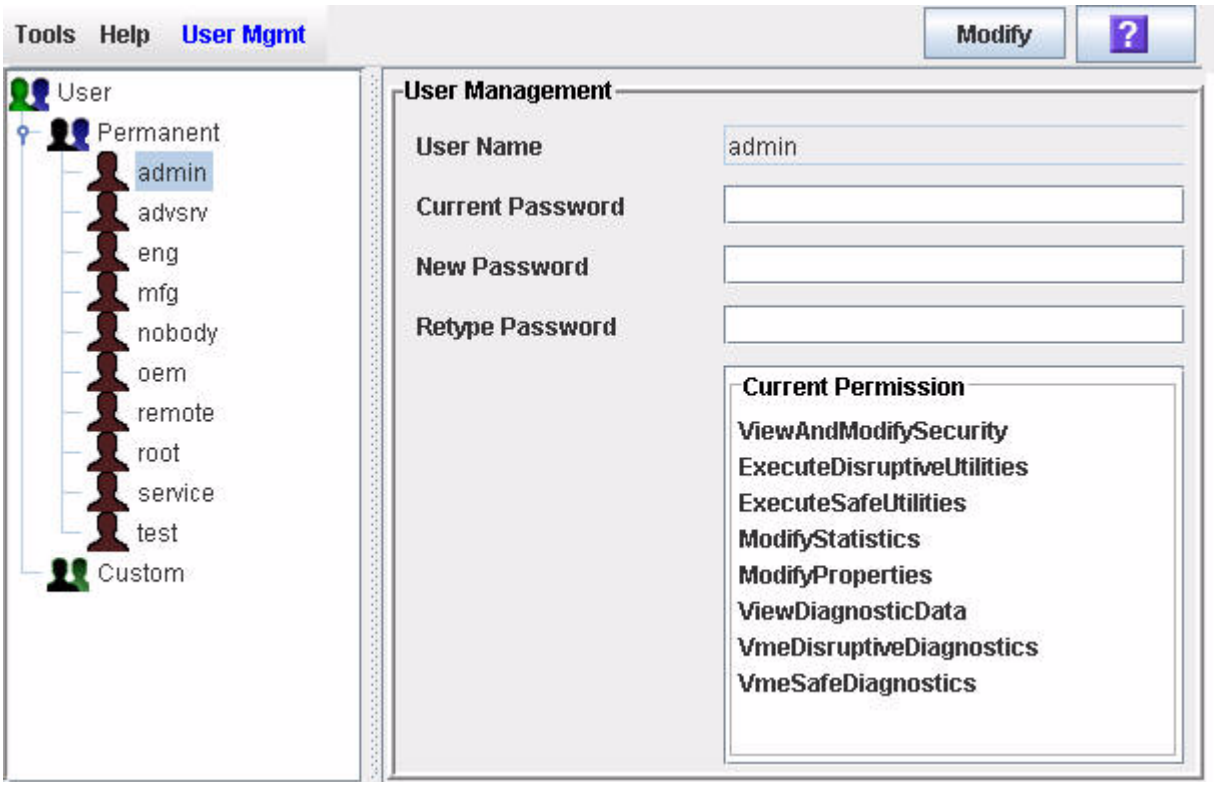
1. **Log in to the SL Console using any of the modes available to you (local operator panel, Web-launched SL Console, or standalone SL Console). You must log in using the user account you want to modify.**
2. **Select Tools > User Mgmt.**

   The **User Management** screen appears.



3. **On the navigation tree, expand the Permanent folder, and select the user account you want to modify (the user account you are logged in as).**

   Detailed information for the user account is displayed.



4. **Complete the following fields: Current Password, New Password, and Retype Password.**

5. **Click Modify.**

   The password for the account updates.

General SL Console Report Tasks

▼ Display a Library Report

Task Tool

This procedure can be performed at any of the following:

- Local operator panel
- Standalone SL Console
- Web-launched SL Console

Task Purpose

Use this procedure to display library reports available from the **Tools** > **Reports** menu.

> **Note –** All report output is a static display of information sent from the library controller at the time the report is generated. The SL Console does not update the information dynamically unless you explicitly select the **Update** button in the upper right corner.

If you want to search the report data or save it to a file, see the following procedures:

- "Search a Library Report" on page 92
- "Save Library Report Data to a File" on page 94

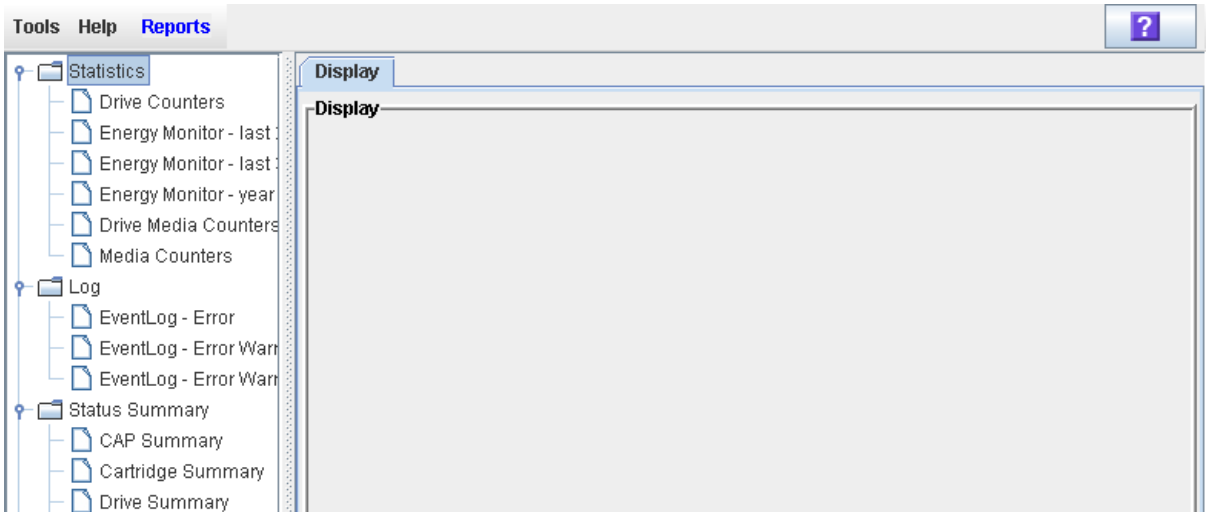
Additional reports are available from the following menus:

- **Tools** > **Partitions**
- **Tools** > **Select Active Cells**

Task Steps

1. **Select Tools** > **Reports.**

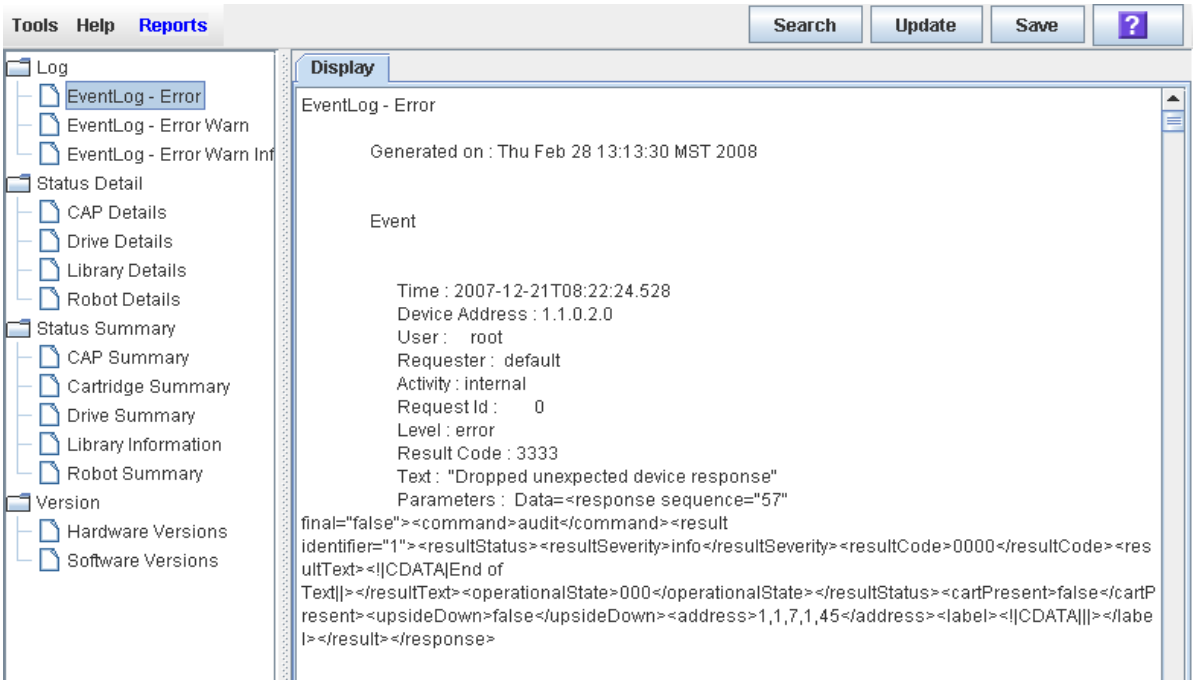
   The reports **Display** page appears. All library report options are listed in the navigation bar.



2. **In the navigation tree, expand a report category to see the report options.**

3. **Click the report you want to display.**

   The selected report displays.



▼ Search a Library Report

Task Tool

This procedure can be performed at any of the following:

- Local operator panel
- Standalone SL Console
- Web-launched SL Console

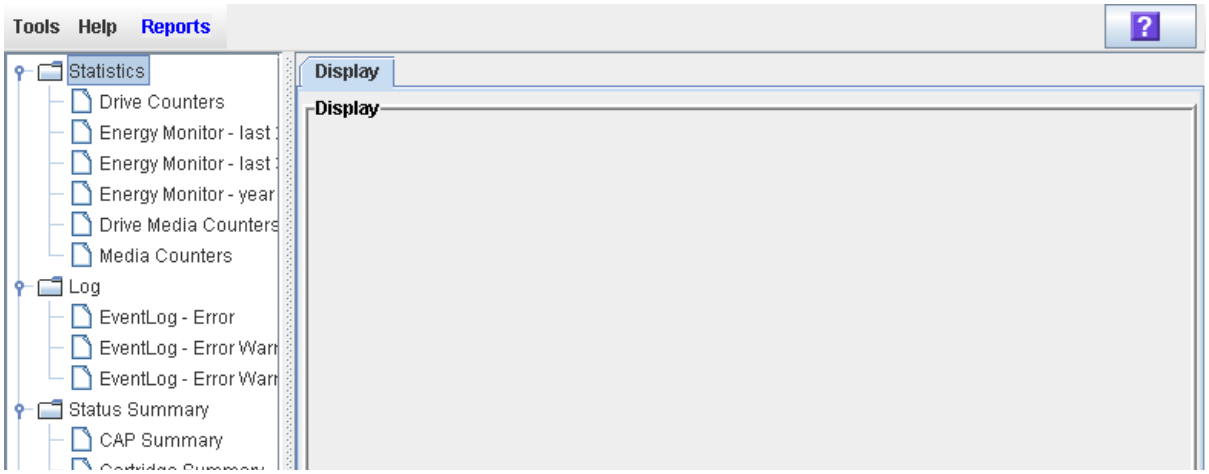
Task Purpose

Use this procedure to search a library report for a specified text string. This procedure can be performed on any of the library report screens.

Task Steps

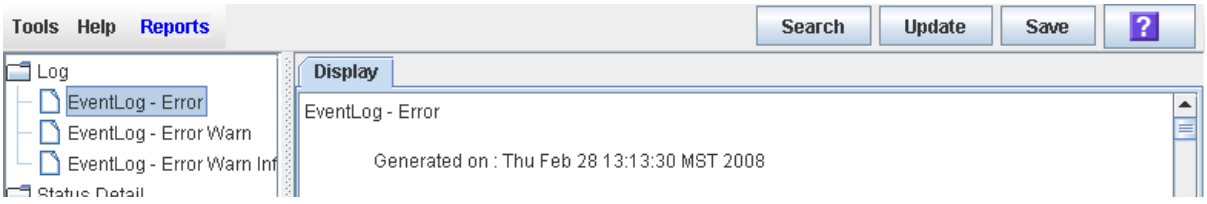
1. **Select Tools > Reports.**

   The reports **Display** page appears. All library report options are listed in the navigation bar.



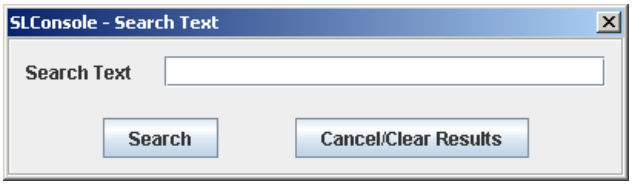
2. **In the navigation tree, expand a report category to see the report options.**
3. **Click the report you want to display.**

   The specified report displays. All report screens include the **Search** button.



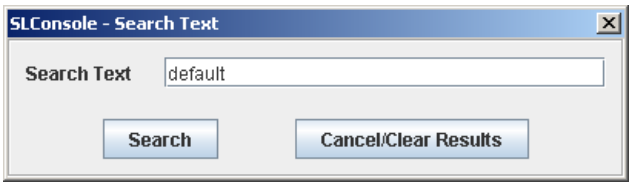
4. **Click Search.**

   The **Search Text** dialog box appears.

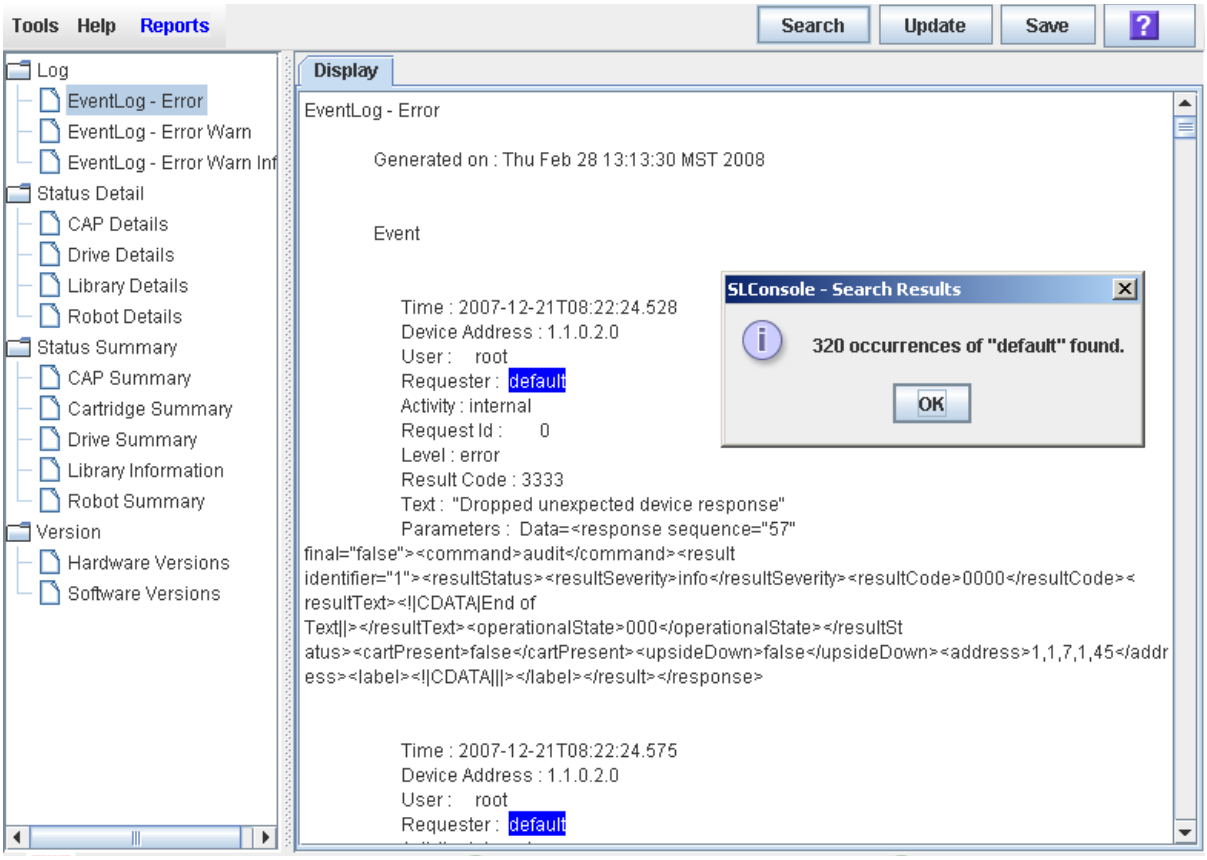


5. **Enter the text string you want to search for, and click Search.**

   Note – The search is case-sensitive, and wildcards are not supported.



6. **The Search Results message appears, displaying the number of occurrences of the text string. All instances of the text string in the report are highlighted.**



7. **Click OK to dismiss the message.**

▼ Save Library Report Data to a File

Task Tool

This procedure can be performed at any of the following:

- Local operator panel
- Standalone SL Console
- Web-launched SL Console

Task Purpose

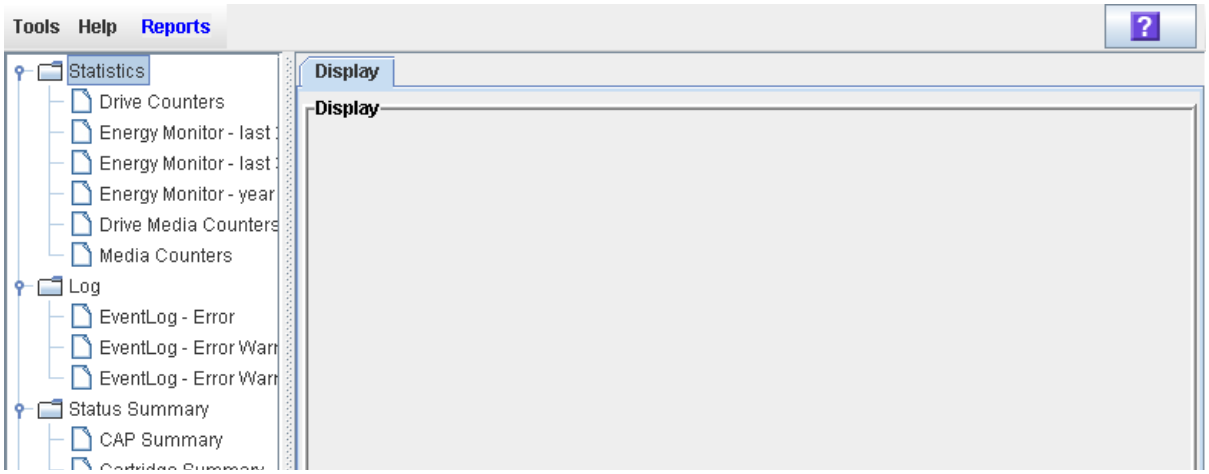
Use this procedure to display a library report and save the data to a file. Depending on the report, you can save to in text (`.txt`), HTML, XML, or comma-separated values (`.csv`) format. This procedure can be performed from any of the library report screens.

After the file is saved, you can print it or include it in e-mail. This may be useful for communicating about library issues with your Oracle support representative. Also, you can import a `.csv` file into a spreadsheet or charting application to better understand and interpret the data.

Task Steps

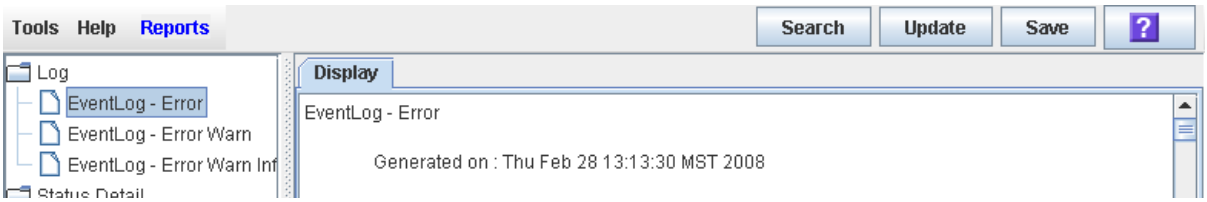
1. **Select Tools > Reports.**

   The reports **Display** page appears. All library report options are listed in the navigation bar.



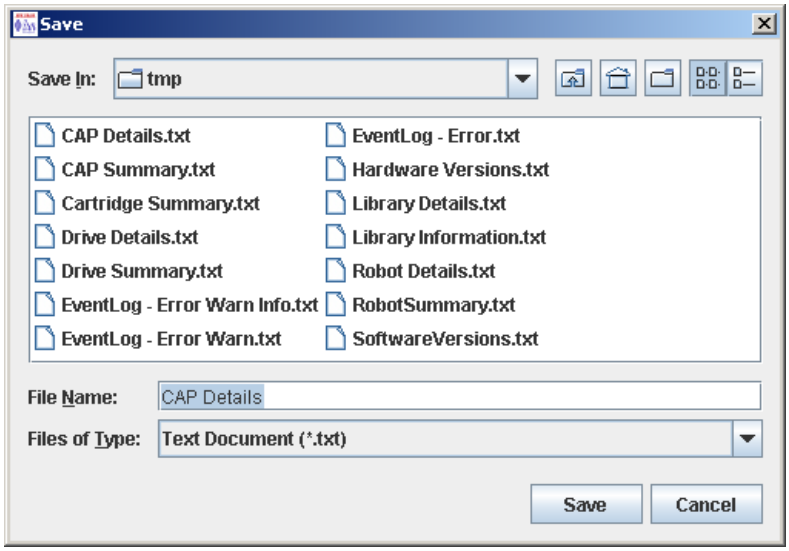
2. **In the navigation tree, expand a report category to see the report options.**
3. **Click the report you want to display.**

   The specified report displays. All report screens include the **Save** button.



4. **Click Save.**

   The **Save** dialog box appears.



5. **Browse to the directory where you want to save the file. In the File Name field, you can accept the default entry or enter a different file name.**
6. **In the Files of Type list, select the format in which you want to save the data (HTML, Text, XML, .csv).**
7. **Click Save.**

   The data is saved to the specified file.

   Note – If the file exists already, a message appears to prompt you whether you want to replace the file.

Local Operator Panel Calibration Tasks

▼ Re-calibrate the Local Operator Panel

Task Tool

This procedure can be performed at a Linux-based local operator panel.

> **Note –** This procedure can be performed only at a Linux-based local operator panel. To re-calibrate a Windows-based local operator panel, contact your Oracle support representative.

Task Purpose

Use this procedure to change the alignment of the local operator panel touch screen. The touch screen comes pre-calibrated from the factory, and in most cases no adjustment is necessary. Typically, use this procedure only if the touch screen has come out of alignment.

> **Note –** Before beginning this procedure, make sure there is no debris on the touch screen, as this can interfere with an accurate calibration.

> **Note –** You can re-set the touch screen to its factory settings at any time. See "Reset the Local Operator Panel Calibration" on page 100 for detailed instructions.

Task Steps

1. **Log in to the local operator panel.**

   See "Log in to the Local Operator Panel" on page 74 for detailed instructions.

2. **Select Tools > Calibrate.**

   The **Select Calibration Option** message appears.

3. **Click Calibrate.**

   The alignment sequence begins. Ten targets are presented sequentially on the screen.

4. **Gently tap in the center of each target with your finger or a pointing stylus.**

   This aligns the screen according to your touch. Be sure to touch the center of each target so you can get an accurate calibration.

   > **Note –** If you tap outside of a target, you can potentially mis-align your touch screen. Depending on the severity of the mis-alignment, you may have trouble logging back into the local operator panel if you save these new settings. See Step 7 for instructions on discarding settings.

   After you touch the last target of the alignment sequence, the first of two **Accept Calibration** messages appears, with a **Click Me** button on the left side of the message.

5. **Proceed as follows with the agility test, depending on whether the new alignment settings are good:**

   - To save the new alignment settings, proceed to Step 6.
   - To discard the new settings, proceed to Step 7.

6. **Use the following steps to save the new settings.**

   a. **On the Accept Calibration message, touch the Click Me button within the indicated time period.**

- If the button depresses when you touch it directly, the touch screen is properly aligned. The second **Accept Calibration** message appears, this time with a **Click Me** button on the right side of the message.

- If the button does not depress when you touch it directly, the touch screen is not properly aligned and you should discard the new settings. Proceed to Step 7.

b. On the second Accept Calibration screen, touch the Click Me button within the indicated time period.

If you depress the button successfully, the alignment settings are saved and the **Calibration Accepted** message appears.

c. Click OK to dismiss the message and save the new settings.

The new settings are effective immediately, and the display returns to the SL Console screen. The local operator panel is not rebooted.

7. Use the following steps to discard the new settings.

a. On either Accept Calibration message, let the timer run out without touching the Click Me button.

The **Retry Calibration** countdown message appears.

b. The calibration sequence screen is presented again. Return to Step 4 to try the calibration a second time.

If you are not able to successfully calibrate the screen on the second try, the local operator panel is rebooted automatically, and the alignment is restored to the previously saved settings.

▼ Reset the Local Operator Panel Calibration

Task Tool

This procedure can be performed at a Linux-based local operator panel.

> **Note –** This procedure is available only for a Linux-based local operator panel. To re-set the calibration of a Windows-based local operator panel, contact your Oracle support representative.

Task Purpose

Use this procedure to restore the alignment of the local operator panel touch screen to the factory settings. This procedure forces a reboot of the local operator panel, which takes several minutes.

Task Steps

1. **Log in to the local operator panel.**

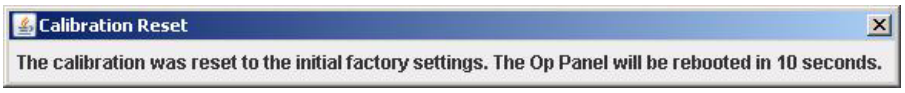
   See "Log in to the Local Operator Panel" on page 74 for detailed instructions.

2. **Select Tools > Calibrate.**

   The **Select Calibration Option** message appears.

3. **Click Reset Calibration.**

   The current touch screen calibration settings are discarded, and the alignment is restored to the factory settings. The **Calibration Reset** countdown message is displayed.



   The local operator panel reboots automatically, and the display returns to the SL Console screen.

   > **Note –** The reboot takes several minutes.

Standalone SL Console Installation Tasks

▼ Download the Standalone SL Console Media Pack

Task Tool

This procedure can be performed at the Web browser.

Task Purpose

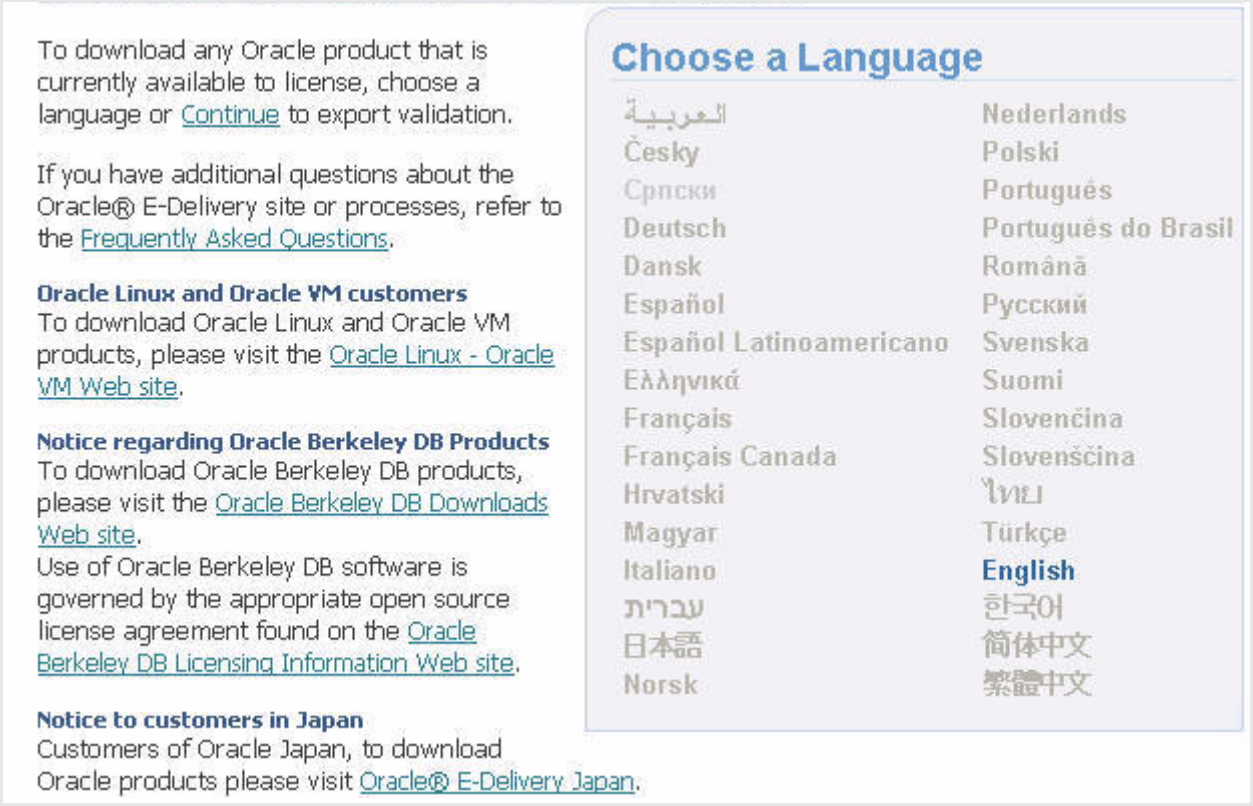
Use this procedure to download and extract the current SL Console Media Pack from the Oracle Software Delivery Cloud. The Media Pack includes the Web-launched SL Console server, as well as the Web-launched SL Console client and the standalone SL Console.

> **Note –** Your Oracle support representative may have performed this procedure for you during library installation.

Task Steps

1. **Launch a Web browser on your PC or workstation and navigate to the Oracle Software Delivery Cloud at the following URL:**

   http://edelivery.oracle.com/

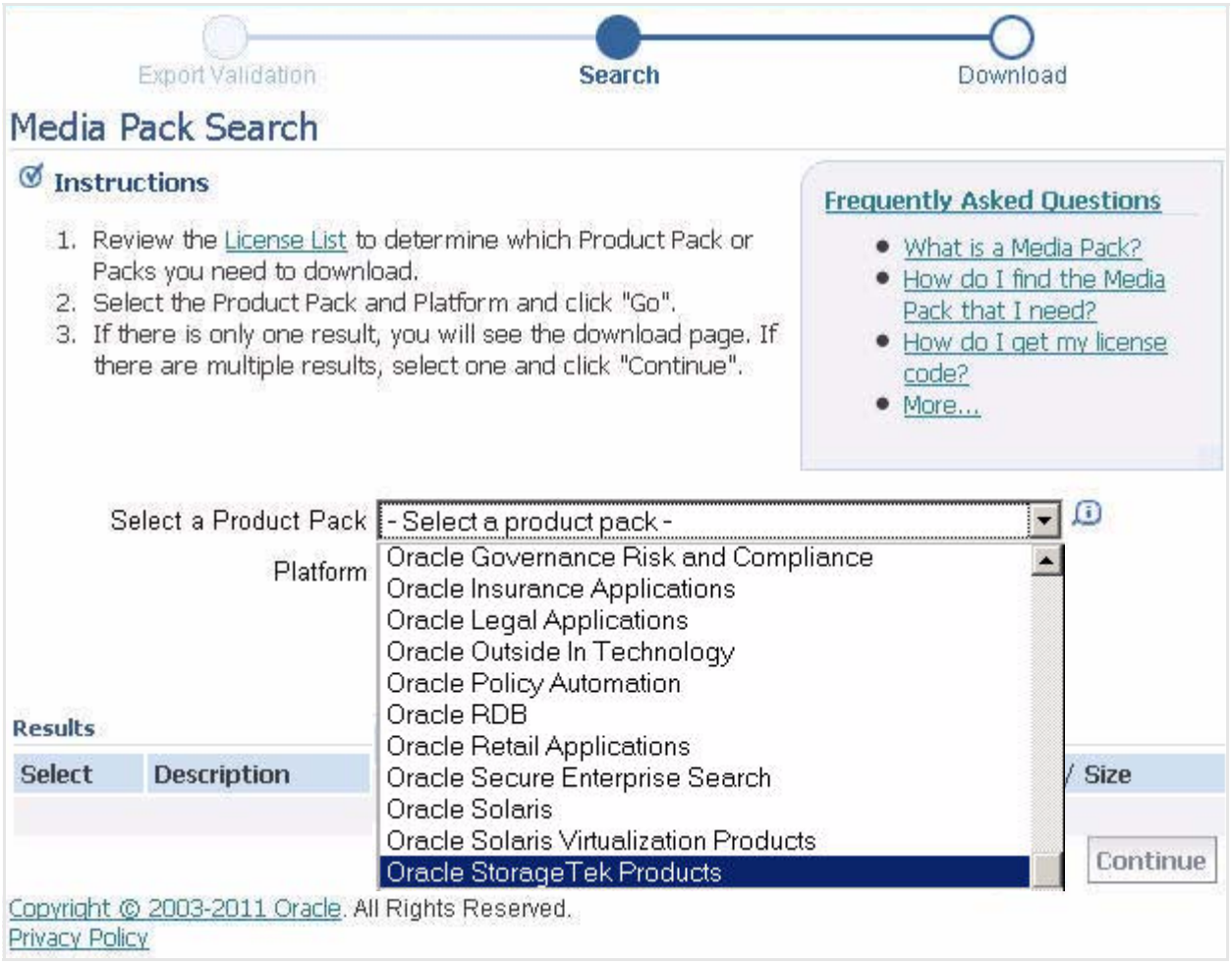


2. **Click Continue.**
3. **On the Export Validation screen, make the following entries:**
   - Enter your contact information.
   - Read the License Agreement and Export Restrictions, and click the check boxes to indicate your acceptance.

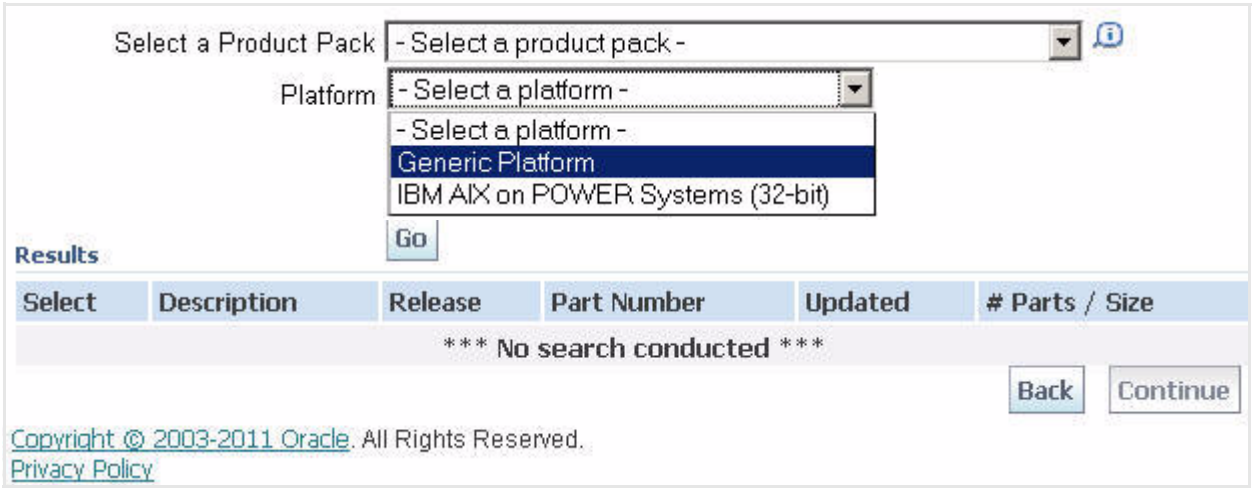
- Click **Continue**.

4. **On the Media Pack Search screen, make the following selections:**

   - In the **Select a Product Pack** list, select **Oracle StorageTek Products**.

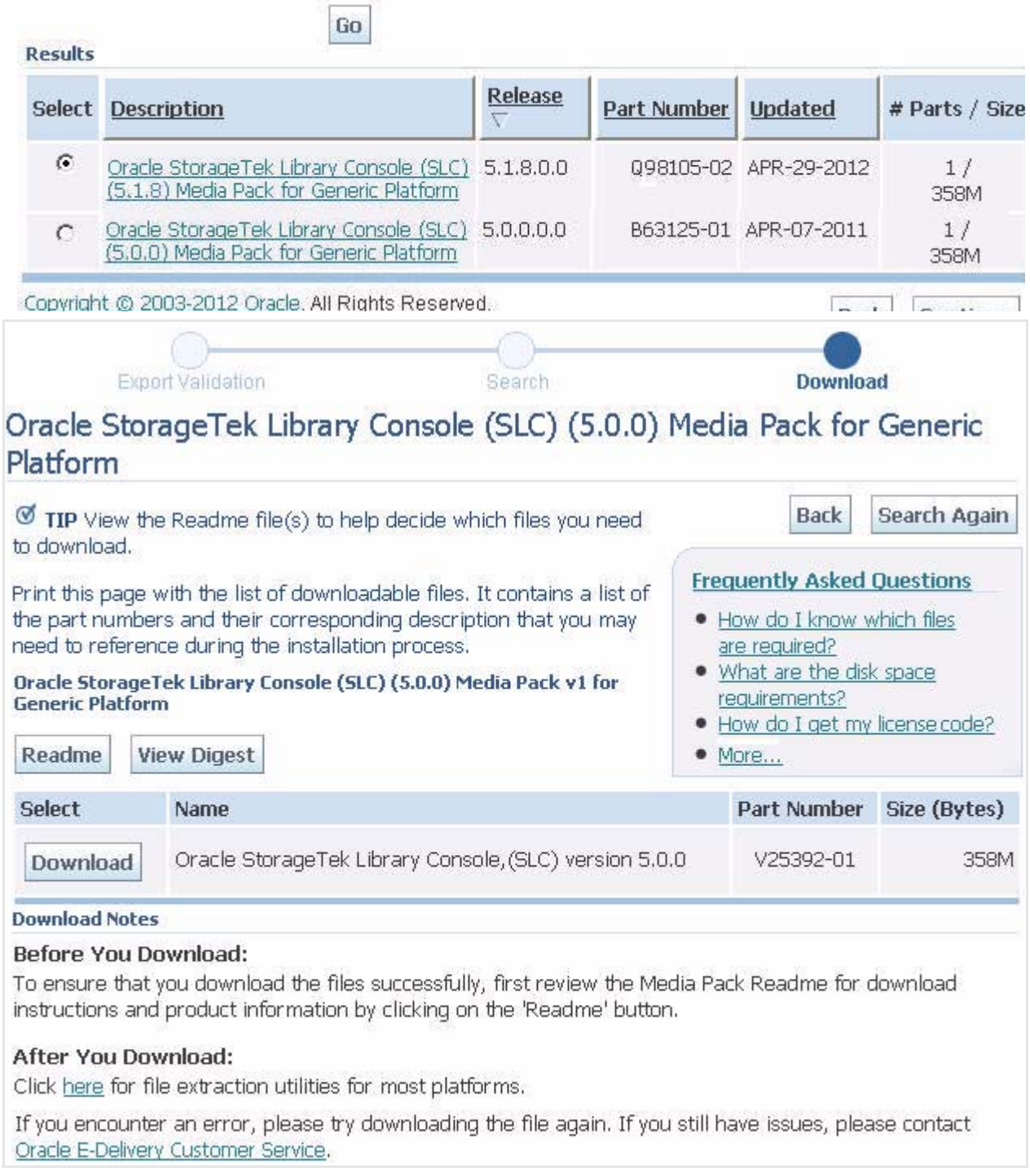


   - In the **Platform** list, select **Generic Platform**.



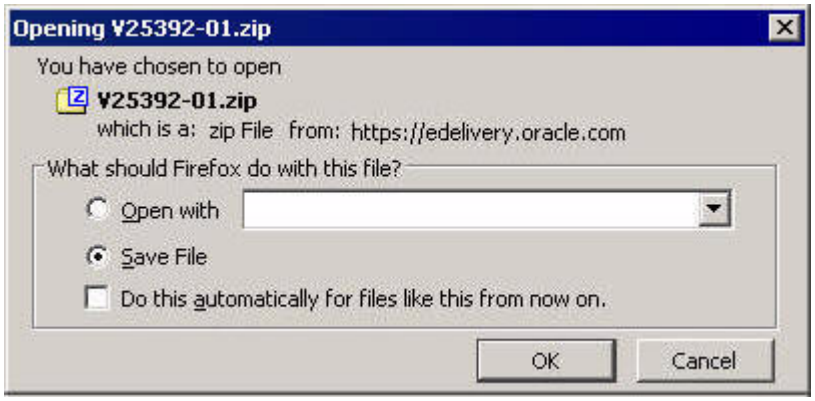
   - Click **Go**.

5. **All media packs meeting your selection criteria are displayed in the Results section of the screen. Select the SL Console version you want to download. Click Continue.**
6. **On the specific media pack screen, review the information to verify that you have selected the correct media pack. Click Download.**



7. **In the dialog box, click Save File to save the media pack to your PC or workstation. Click OK.**

Note – This process may take several minutes.



8. **To complete the installation, see "Install the Standalone SL Console" on page 106.**

▼ Install the Standalone SL Console

Task Tool

This procedure can be performed at the client.

Task Purpose

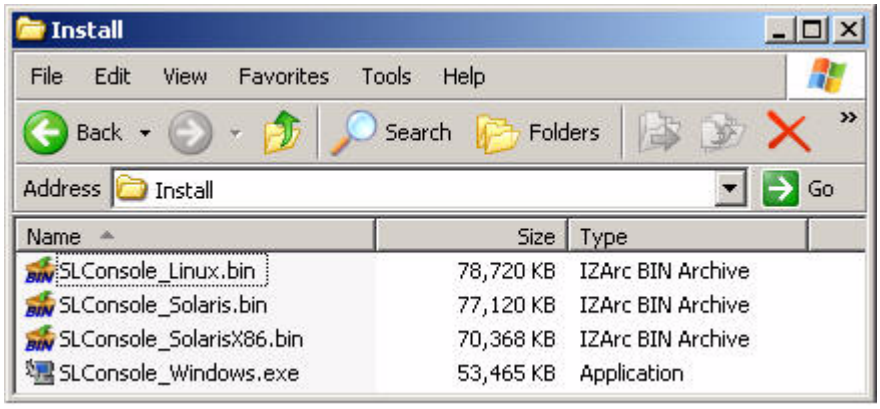
Use this procedure to install the standalone SL Console on your PC or workstation.

Note – Your Oracle support representative may have performed this procedure for you during library installation.

Note – Prior to using this procedure, you must have downloaded and extracted the standalone SL Console media pack to your PC or workstation. See "Download the Standalone SL Console Media Pack" on page 102.

Task Steps

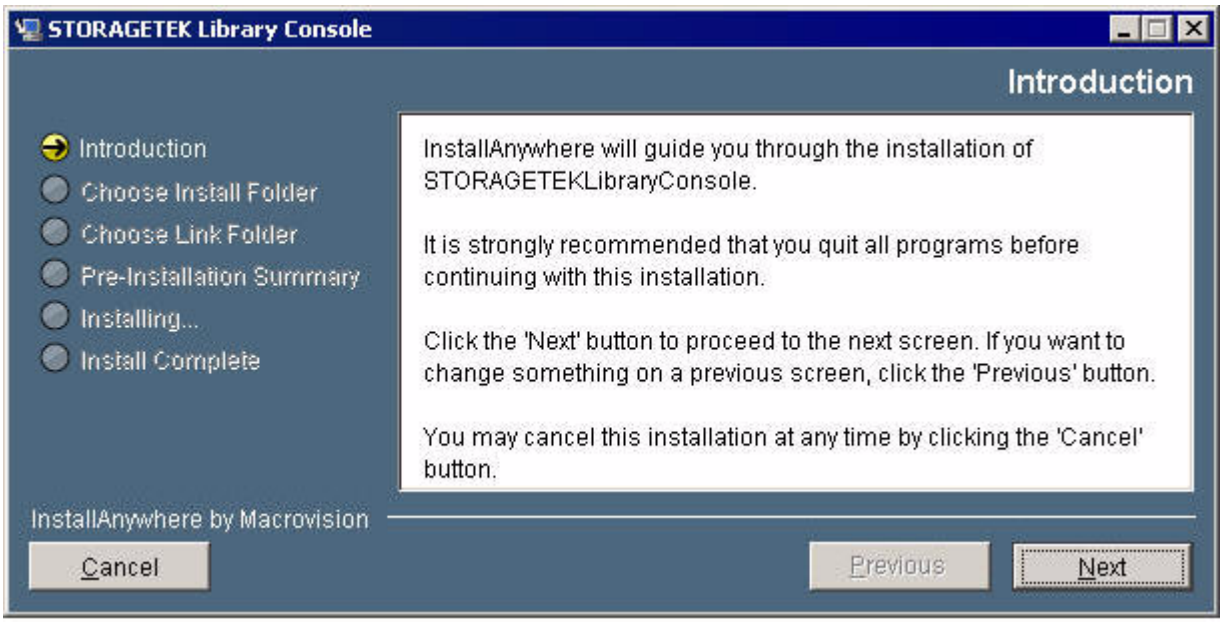
1. **On your PC or workstation, change to the directory where you saved the standalone SL Console media pack and expand the archive file.**
2. **Open the Install folder.**



3. **Open the SL Console installer file that is appropriate for your operating system.**

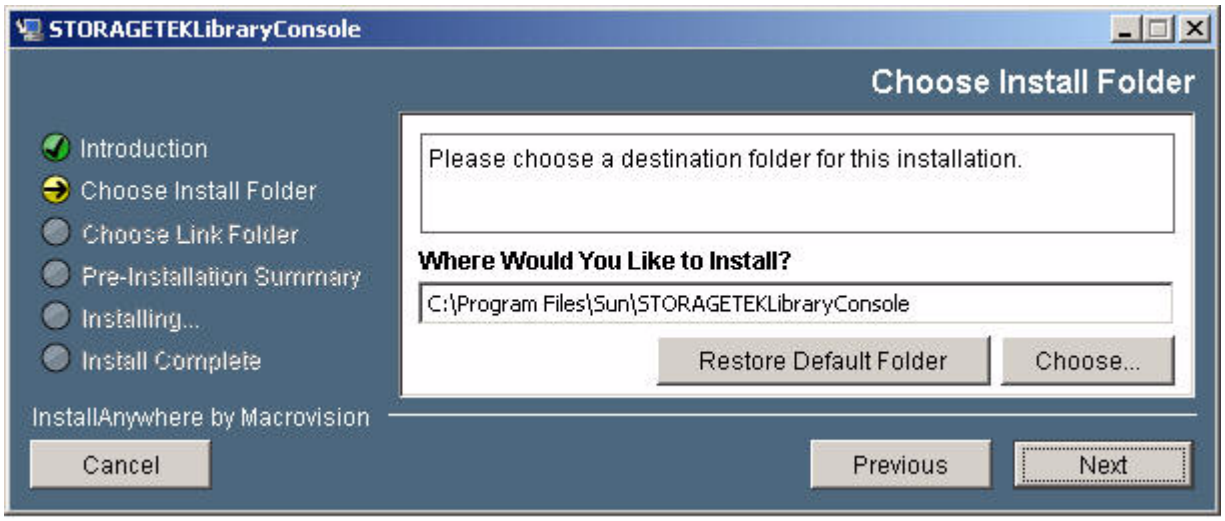
   The installation wizard begins and the **Introduction** screen appears.

Note – At any time during the installation wizard, you can click **Cancel** to cancel the installation or **Previous** to return to the previous screen and re-enter information.



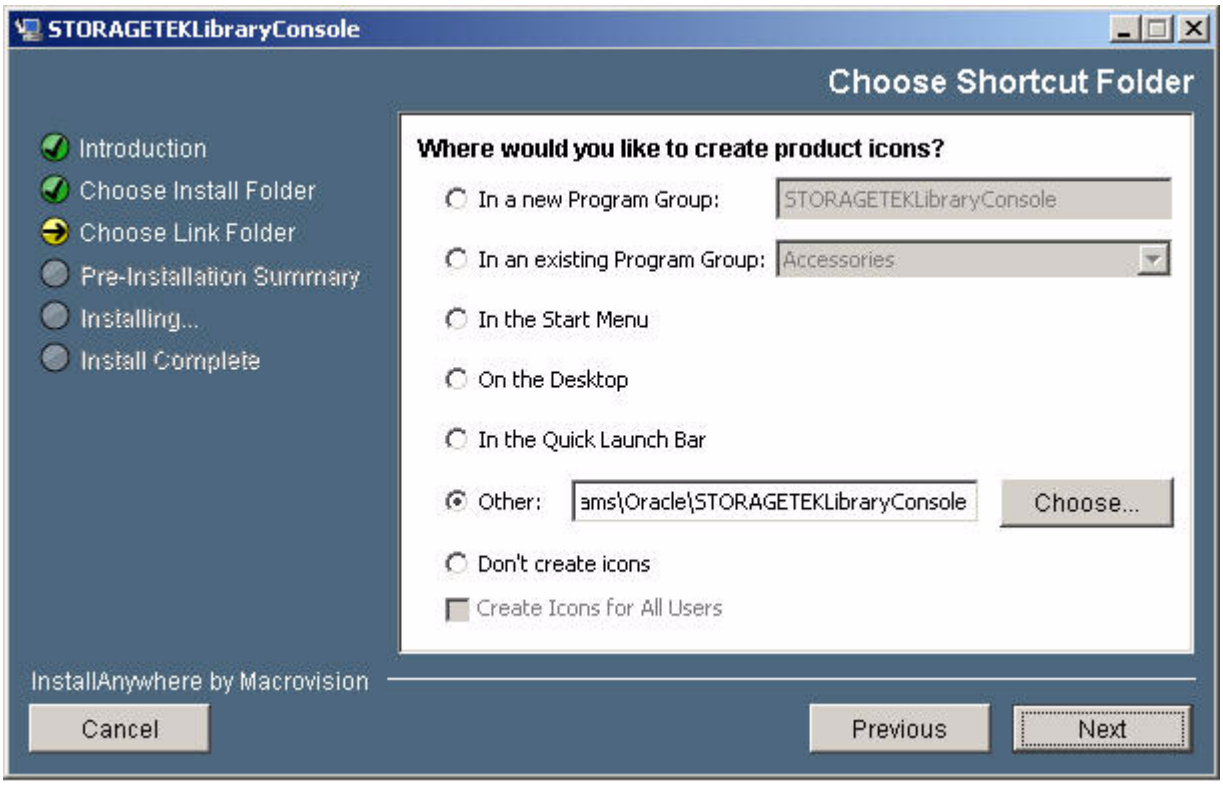
4. **Review the information, and click Next.**

   The **Choose Install Folder** screen appears.



5. **Specify where you want to install the SL Console program. You can accept the default location displayed, or you can click Choose to browse to a different directory. Click Next to continue.**

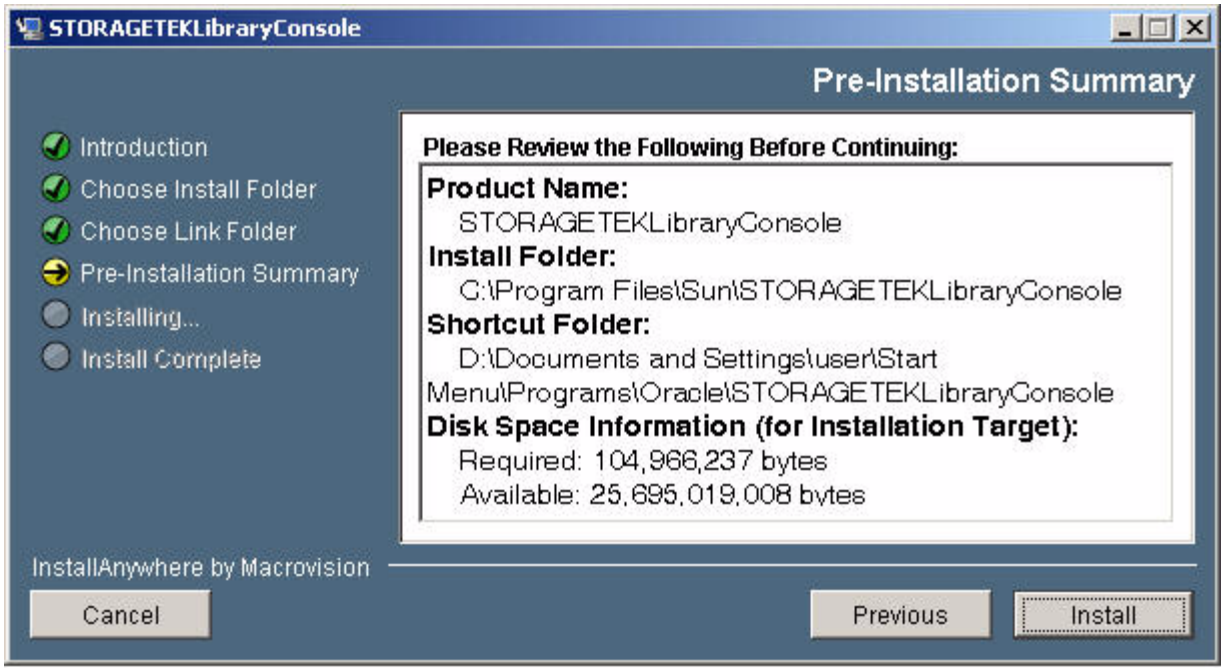
   The **Choose Shortcut Folder** screen appears.



6. **Enter the location where you want to create the SL Console shortcut icons. You can accept the default location displayed, or you can click one of the other choices listed and specify a different location. Click Next to continue.**

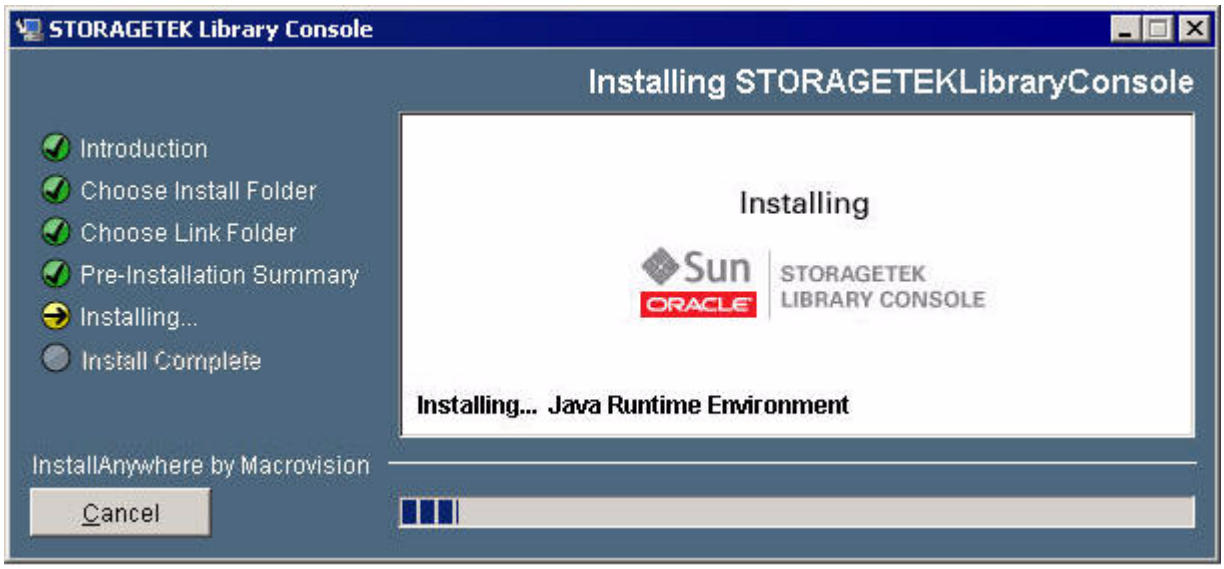
   On Solaris, the default location for shortcut s is the user's home directory. However, shortcuts cannot be created in the root directory (`/`), which is the `root` user's home, so if you are installing on a Solaris platform as `root` you must choose something other than the default location. In this case, we recommend that you choose `/usr/bin` or a similar location.

   When you click **Next**, the **Pre-Installation Summary** screen appears.

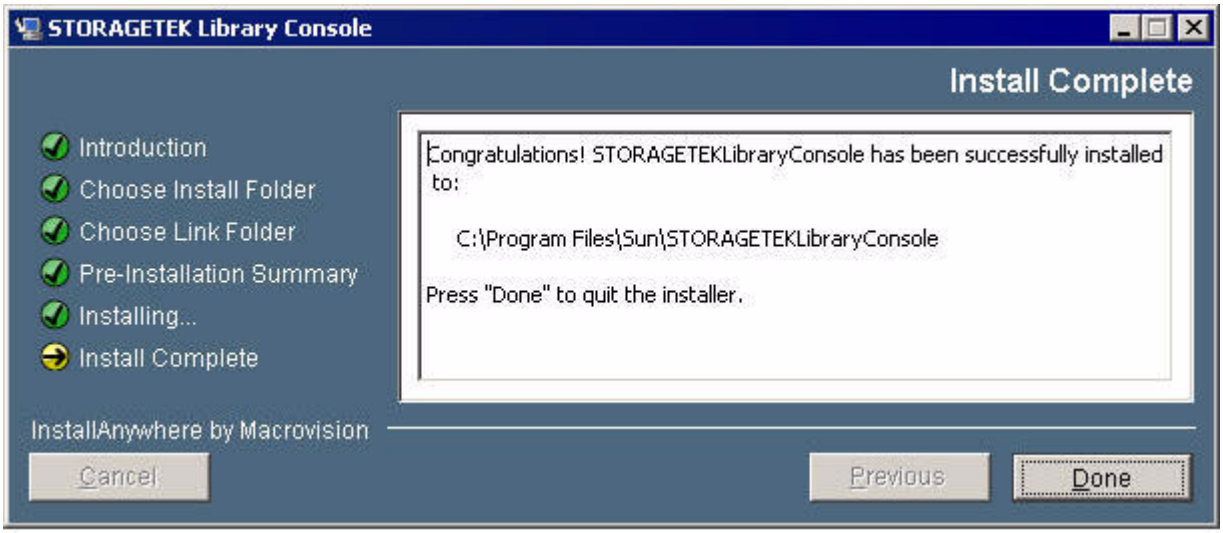


7. **Review the information and verify that it is all correct. Click Install to continue.**

   The installation begins, and the **Installing SL Console** screen appears.



8. **When the installation finishes, the Install Complete screen appears.**



9. **Review the information and click Done to exit the installation program.**

3

Hardware Activation Files

Note – This feature is available starting with SL3000 firmware version FRS_3.0 and SL Console version FRS_5.00.

This chapter explains how to activate optional fe atures on the SL3000 tape library. It begins with a brief list of the "Customer-Activated Features" on page 111 and an overview of "Oracle Hardware Activation Files" on page 111. It then provides:

- An overview of the "Hardware Activation File Installation Process" on page 113
- Detailed instructions for carrying out SL3000
- A "Hardware Activation Screen Reference" on page 134

Customer-Activated Features

The hardware activation utility enables you to activate and monitor selected optional features on the SL3000 library. Some library features are activated by the customer, while other must be installed and enabled by an Oracle support representative. Features you can activate include:

- Capacity Upgrades (Full Base, Full DEM, Third DEM, Full CEM)
- Dual TCP/IP
- Multi Port Fibre Channel (MultiPortFibre)
- Partitioning

The functions described in this chapter can be performed from the standalone SL Console or Web-launched SL Console only. These functions are not available at the local operator panel.

Oracle Hardware Activation Files

Selected SL3000 features are activated through an Oracle hardware activation file. This activation file is a digitally signed Java Archive (`.jar`) file containing a feature activation key. You install one hardware activation file for each feature you have purchased. When you install a new hardware activation file, the included feature is added to the ones already activated on the library.

Downloading Oracle Hardware Activation Files

Download Oracle hardware activation files from the Oracle Software Delivery Cloud at:

http://edelivery.oracle.com

Legacy Hardware Activation Files

For SL3000 libraries prior to firmware version FRS_3.0, hardware activation files were delivered by e-mail from Oracle Corporation. In addition, all features you purchased for an SL3000 library were included in a single hardware activation file. When you installed a new hardware activation file on the library, it would overlay any previously installed activation files.

This distribution system has been replaced by the Oracle hardware activation files described in this chapter. When you upgrade to SL3000 firmware version FRS_3.0, all features that have already been activated on the library are retained.

After the library is upgraded to SL3000 firmware version FRS_3.0, use the processes described in this chapter to activate any new features. See "Hardware Activation File Installation Process" on page 113 for a summary of the process.

> **Note –** If your SL3000 library is running firmware prior to FRS_3.0, features are still delivered to you by e-mail from Oracle Corporation.

Hardware Activation File Installation Process

To activate library features, perform the following tasks.

1. Purchase a feature for an Oracle StorageTek library from Oracle Corporation.
2. Locate the hardware activation file for the feature on the Oracle Software Delivery Cloud and download it to a system accessible to your StorageTek Library Console (SL Console) session.
3. Use the SL Console to verify and install the hardware activation file on the target library.

   Note – You can activate features from either the standalone SL Console or the Web-launched SL Console. But you cannot use the local operator panel.

4. Use the SL Console to display and verify the features on the target library.
   - To configure newly activated capacity or partitioning, see the following:
     - "Library Partitioning" on page 195
     - "Capacity on Demand" on page 149
   - To configure the Dual-Path TCP/IP feature, see "Redundant Electronics and Firmware Upgrades" on page 372.

     Note – The functions described in this chapter can be performed from the standalone SL Console or Web-launched SL Console only. These functions are not available at the local operator panel.

Hardware Activation Tasks

▼ Download a New Hardware Activation File

Task Tool

This procedure can be performed at a Web browser.

Task Purpose

Use this procedure to download a new hardware activation file for the library.

Task Steps

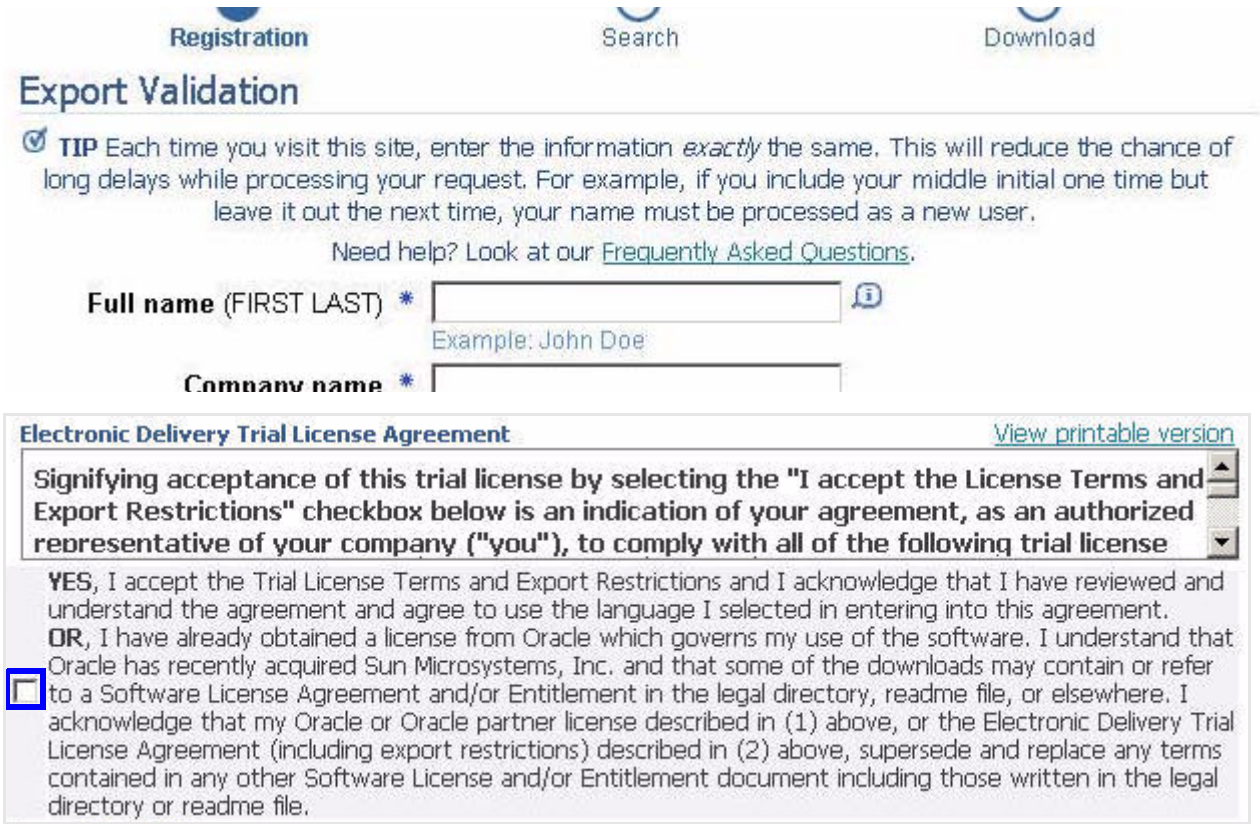
1. **Start a Web browser on your PC or workstation, and navigate to the Oracle Software Delivery Cloud at the following URL:**

   http://edelivery.oracle.com/

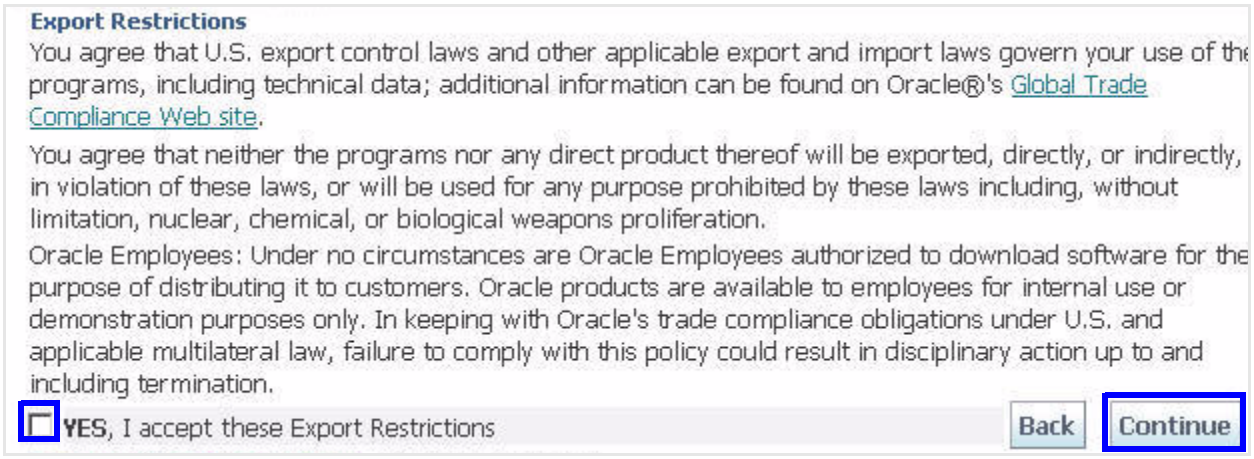
2. **Click Sign In / Register.**

3. **When the Export Validation screen appears, read the instructions.**
4. **On the Export Validation screen, enter your full name, company name, and e-mail address in the text fields. Select a country from the list.**
5. **While still on the Export Validation screen, read the Notice.**

In the Electronic Delivery Trial License Agreement section, read the agreement and terms. Then check the YES check box to agree to the terms of your license.

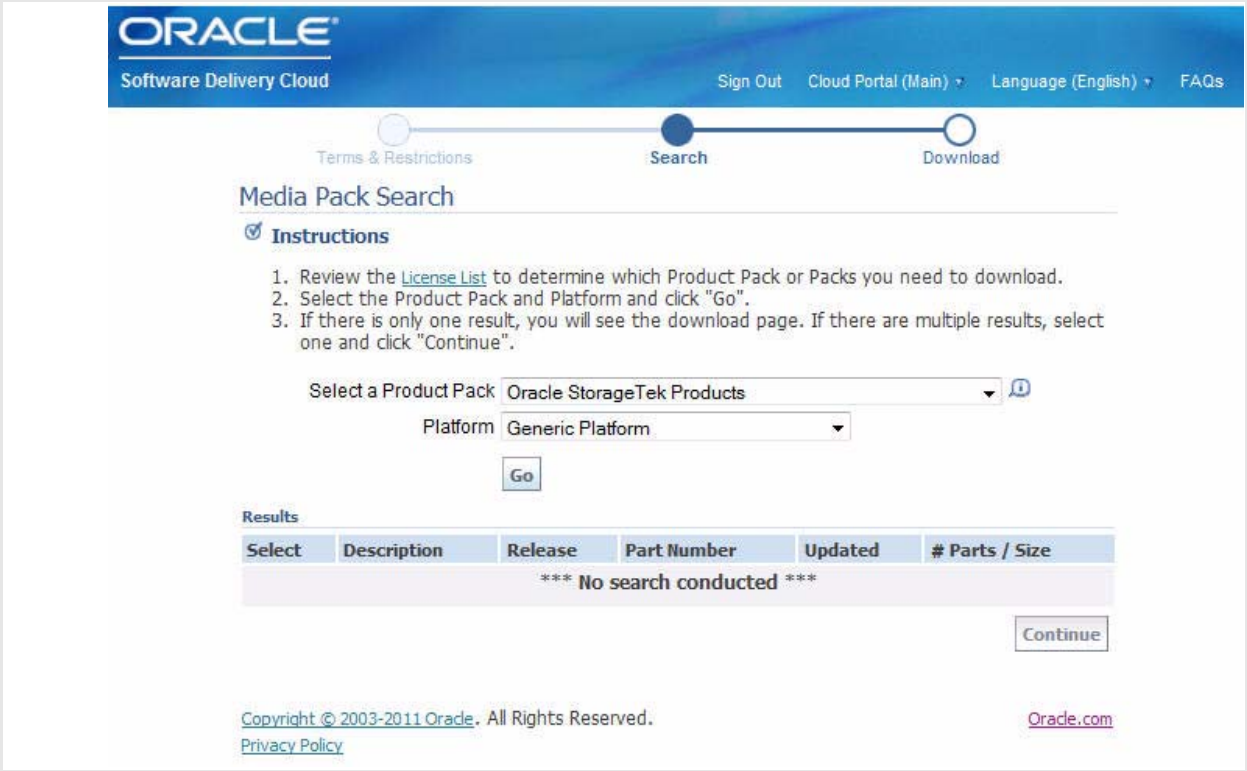


6. **While still on the Export Validation screen, read the Export Restrictions. Check the corresponding YES check box to accept the restrictions.**



7. **Click the Continue button to move from the Export Validation screen to the Media Pack Search screen.**

8. **In the Select a Product Pack list of the Media Pack Search screen, select Oracle StorageTek Products.**



9. **Click Go.**

   The **Media Pack Search** screen refreshes. In the **Results** section of the screen, a list of media packs meeting your selection criteria replaces the ***** No search conducted ***** notice.

10. **In the Select a Product Pack list of the Media Pack Search screen, use the Platform list, and select Generic Platform.**

11. **Click the Select radio button that corresponds to the SL3000 media pack that you want to download, and click the Continue button.**

12. **When download screen for the selected media pack appears, review the information to verify that you have selected the correct media pack. Click the Readme button to review the readme file.**

Oracle StorageTek SL3000 Hardware Activation Files Media Pack v1 for Generic Platform

Readme | View Digest

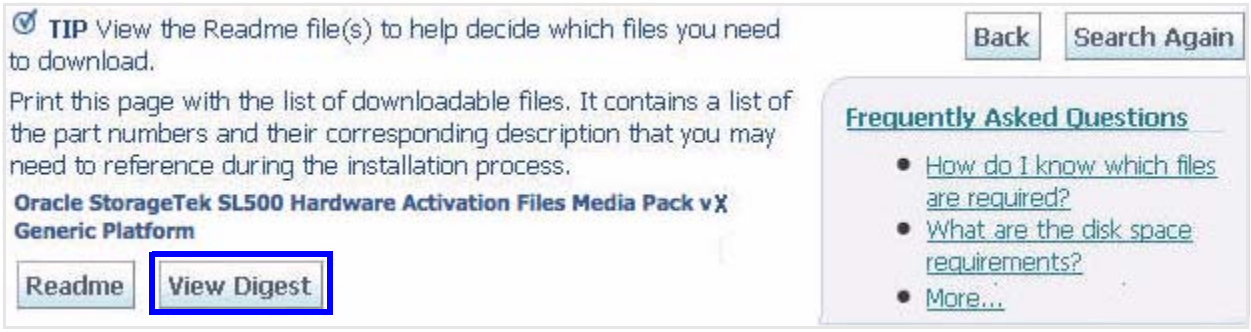
Select	Name	Part Number	Size (Bytes)
Download	Oracle StorageTek SL3000 Hardware Activation File for 25 Slot Capacity	V24976-01	2.2K
Download	Oracle StorageTek SL3000 Hardware Activation File for 100 Slot Capacity	V24977-01	2.2K
Download	Oracle StorageTek SL3000 Hardware Activation File for 200 Slot Capacity	V24978-01	2.2K
Download	Oracle StorageTek SL3000 Hardware Activation File for 500 Slot Capacity	V24979-01	2.2K
Download	Oracle StorageTek SL3000 Hardware Activation File for 700 Slot Capacity	V24980-01	2.2K
Download	Oracle StorageTek SL3000 Hardware Activation File for 1000 Slot Capacity	V24981-01	2.2K
Download	Oracle StorageTek SL3000 Hardware Activation File for Dual TCP/IP	V24982-01	2.2K
Download	Oracle StorageTek SL3000 Hardware Activation File for Partitioning	V24983-01	2.2K
Download	Oracle StorageTek SL3000 Hardware Activation File for Multiport Fibre	V24984-01	2.2K
Download	Oracle StorageTek SL3000 Hardware Activation File for OEM Base 200 Slot Capacity	V25032-01	2.2K
Download	Oracle StorageTek SL3000 Hardware Activation File for DEM 200 Slot Capacity	V25034-01	2.2K

Total: 11

13. **After verifying you have chosen the correct software, click the Download button beside each desired feature.**
14. **When the download dialog appears, select the Save File radio button, and click OK.**
15. **When the Enter name of file to save to dialog appears, browse to the local directory that will hold the download file, and press Save.**

    The file is large and may take some time to download, depending on your connection speed.

16. **On the download screen for the media pack, press View Digest to view the MD5 and/or SHA-1 digests of the download files.**



17. **Compute your own digest of the downloaded media pack using the appropriate commandline utility.**

18. **To verify the integrity of your download, compare your computed digest with the digest displayed by the View Digest button on the download page. They should be identical.**

19. **If the digests match, use the extraction utility appropriate for your operating system (`gunzip`, `pkunzip`, etc.) to extract the media pack to a location that you can reach from a StorageTek Library Console (SL Console) session.**

▼ Display and Verify New Hardware Activation File Contents

Task Tool

This procedure can be performed at either of the following:

- Standalone SL Console
- Web-launched SL Console

Task Purpose

Use this procedure to display a new hardware activation file before installing it on a target library.

Prior to performing this procedure, you must download a new hardware activation file to a system accessible to the SL Console session. See "Download a New Hardware Activation File" on page 115.

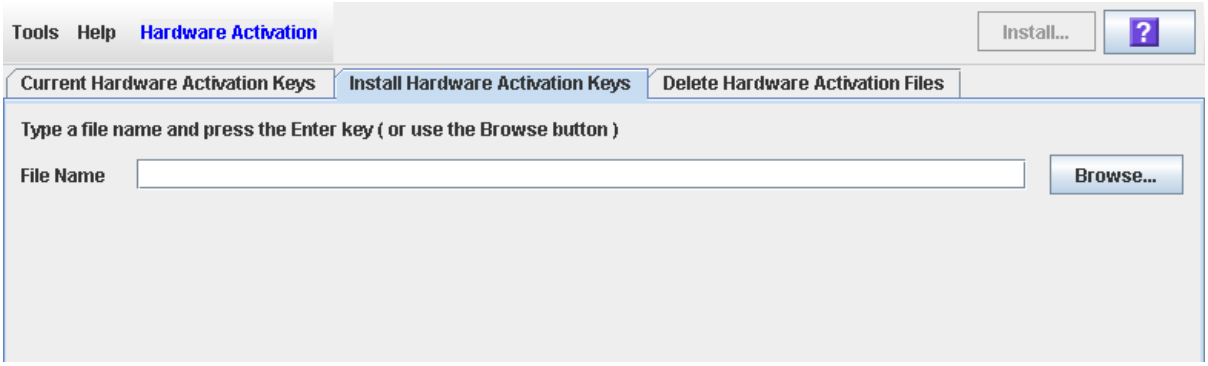
Task Steps

1. **Use the SL Console to log in to the target library.**

   See "General SL Console Usage Tasks" on page 73 for details.

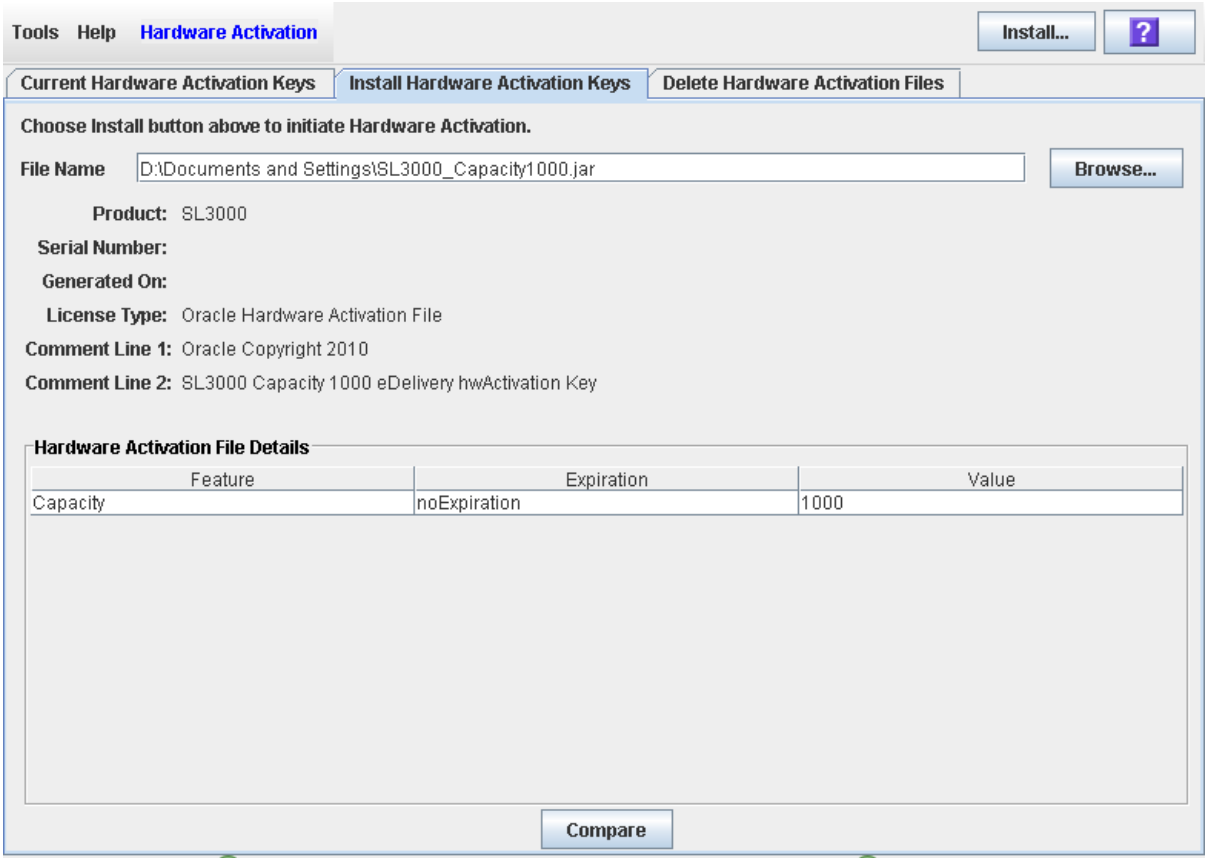
2. **Select Tools > Hardware Activation Management, and click the Install Activation Keys tab.**

   The **Install Activation Keys** screen appears.



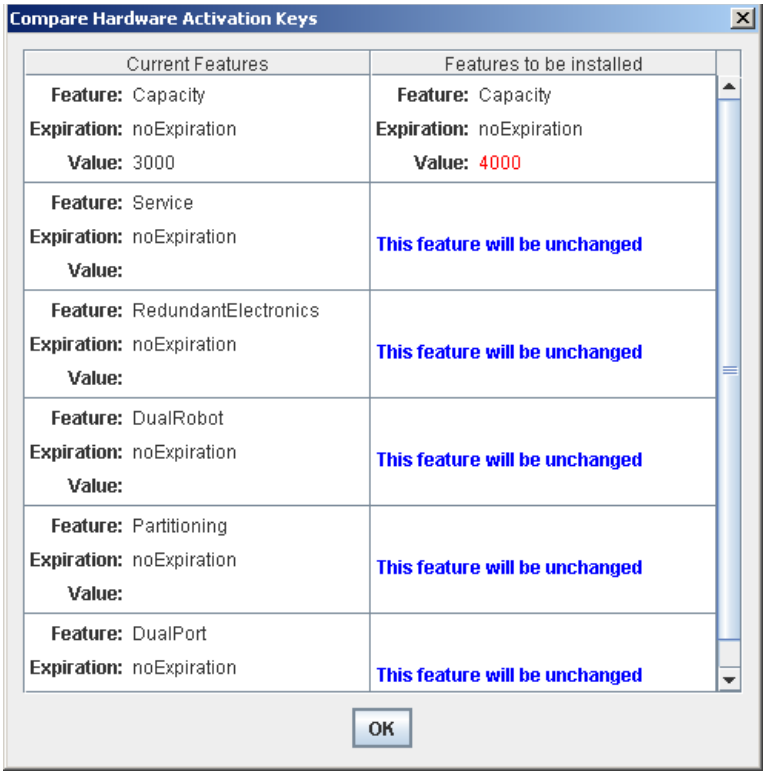
3. **In the File Name field, enter the full path of the hardware activation file you want to display, and press Enter. Optionally, you can click Browse and navigate to the file location.**

The **Hardware Activation File Details** displays on the screen.



4. **Review the hardware activation file details, and then click Compare.**

The **Compare Hardware Activation Keys** message appears.



5. **Review the activation file information.**

   Note – Changes that will be implemented by the new hardware activation file, such as additional capacity or expiration date changes, are highlighted in red.

6. **Click OK to dismiss the message.**

▼ Install a New Hardware Activation File on the Target Library

Task Tool

This procedure can be performed at either of the following:

- Standalone SL Console
- Web-launched SL Console

Task Purpose

To install a new hardware activation file on a target library, follow this procedure using the StorageTek Library Console (SL Console). You cannot use the local operator panel for this task.

Before performing this procedure, download a new hardware activation file to a system accessible to the SL Console session. See "Download a New Hardware Activation File" on page 115.

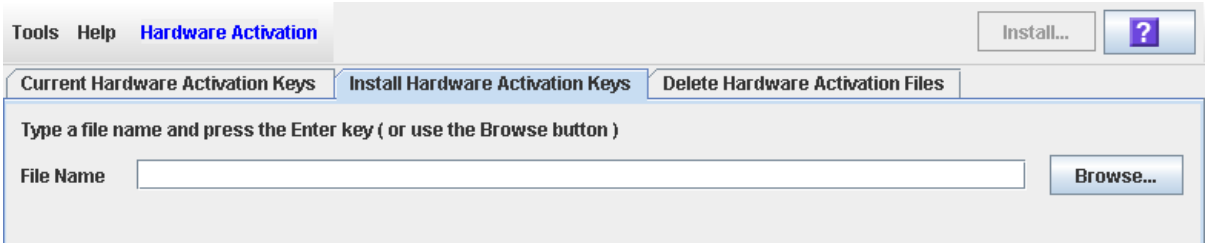
Task Steps

1. **Use the SL Console to log in to the target library.**

   See "General SL Console Usage Tasks" on page 73 for details.

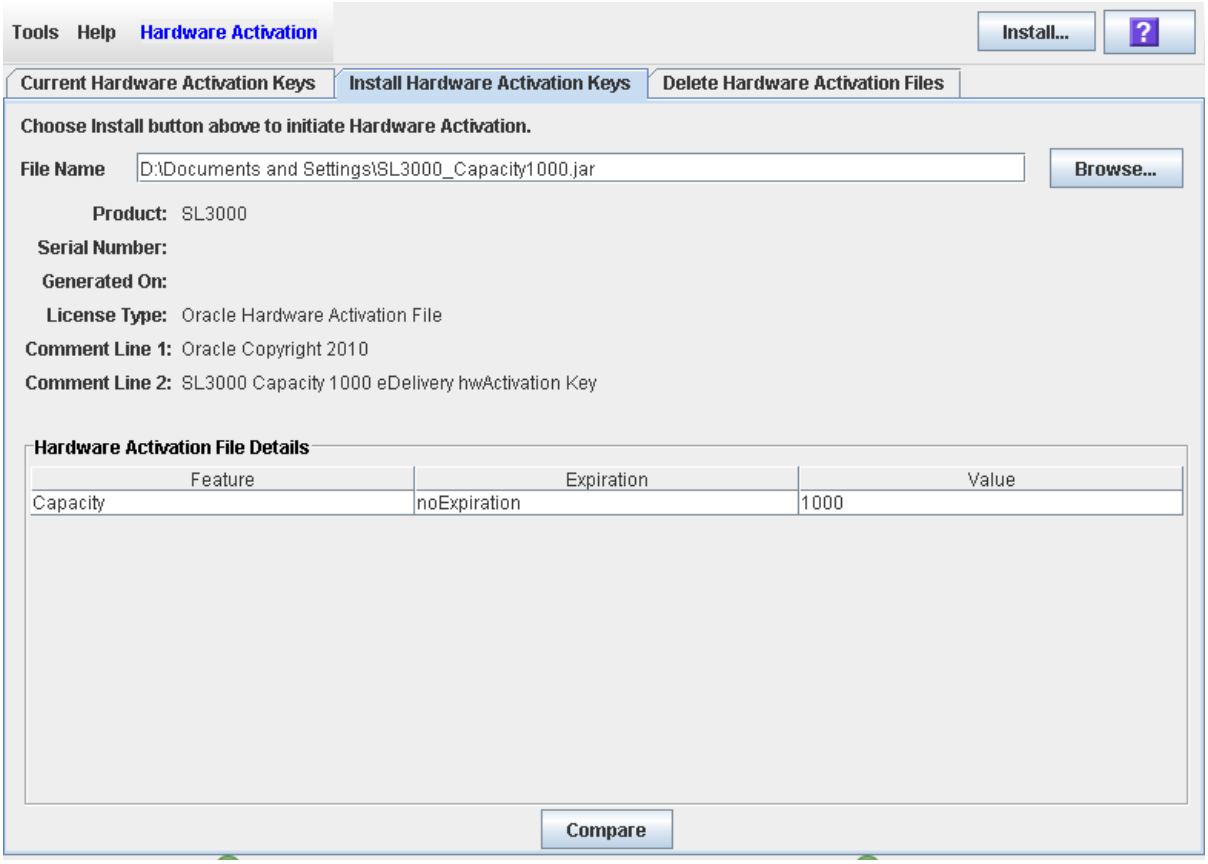
2. **Select Tools > Hardware Activation, and select the Install Hardware Activation Keys tab.**

   The **Install Hardware Activation Keys** page appears.



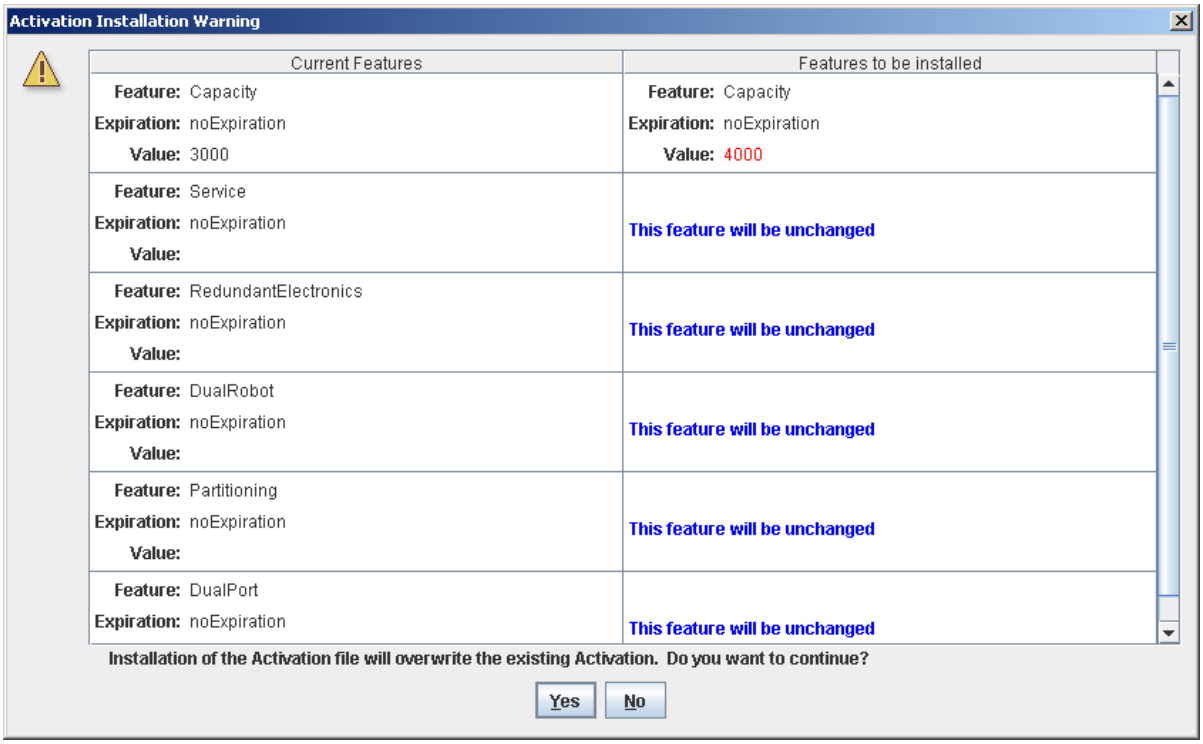
3. **In the File Name field, enter the full path of the hardware activation file you want to install, and press Enter. Optionally, click Browse and navigate to the file location.**

The **Hardware Activation File Details** display in the lower part of the page.



4. **Review the hardware activation file details, and then click Install in the upper right corner.**

The **Activation File Installation Warning** message appears.



5. **Review the Features to be Installed and verify that the new hardware activation file is accurate.**

   Note – Changes that will be implemented by the new hardware activation file, such as additional capacity or expiration date changes, are highlighted in red.

6. **If the new hardware activation file is accurate, click Yes to begin installing the activation file on the target library.**

7. **The library controller installs the hardware activation file, and a confirmation message appears.**

8. **Click OK to dismiss the message.**

9. **You can verify that the activation file has been installed successfully by displaying the current activation files. See “Display Current Hardware Activation Files” on page 127 for details.**

10. **Depending on the features included in the hardware activation file, you may need to perform additional tasks to use the new features.**

    - See “Increasing Activated Capacity” on page 153 and “Decreasing Activated Capacity” on page 154 for special considerations that apply when you install a hardware activation file that changes the activated capacity of the library.

- See “Allocated Storage Capacity” on page 206 for special considerations that apply when you install a hardware activation file with the Partitioning feature.

▼ Display Current Hardware Activation Files

Task Tool

This procedure can be performed at either of the following:

- Standalone SL Console
- Web-launched SL Console

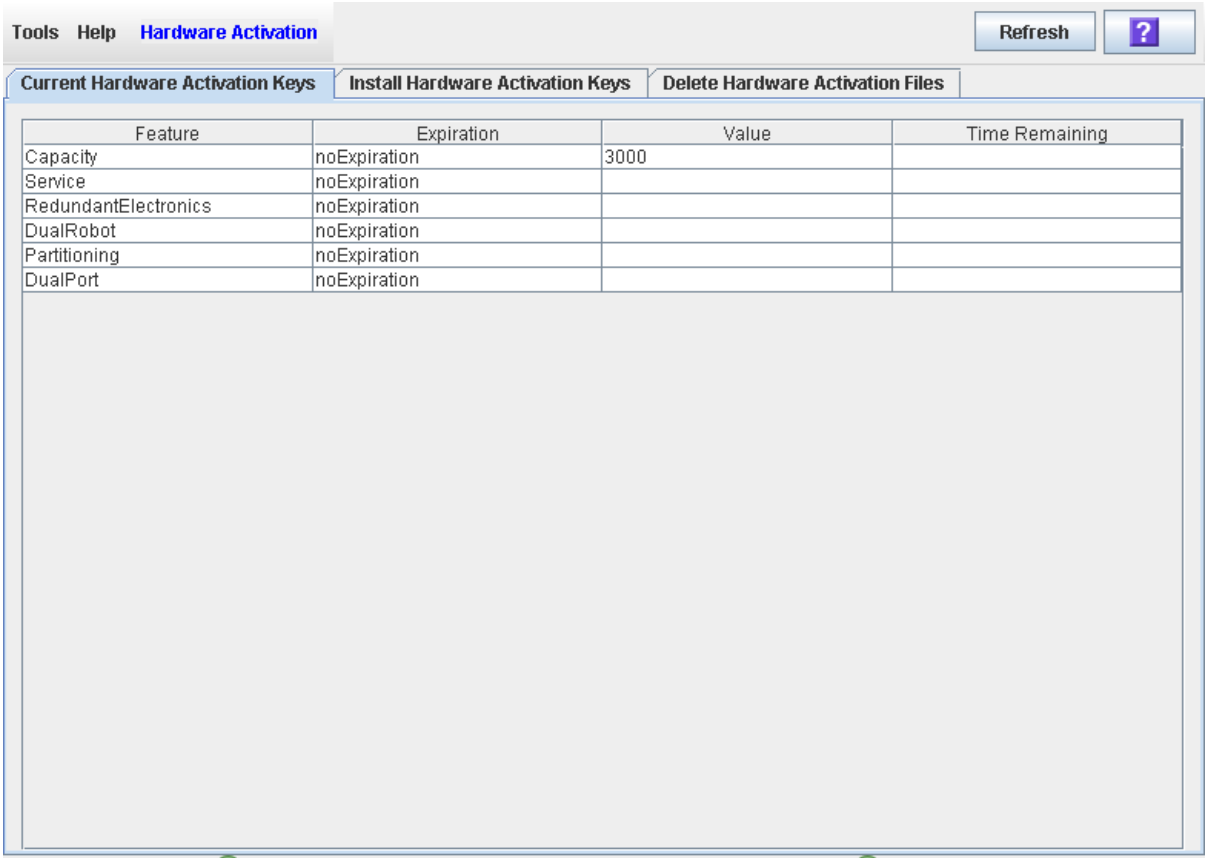
Task Purpose

To display the features currently activated on a target library, perform this procedure using the StorageTek Library Console (SL Console). You cannot use the local operator panel for this task.

Task Steps

1. **Select Tools > Hardware Activation, and click the Current Hardware Activation Keys tab.**

   The **Current Activation Keys** page appears, listing the currently activated features.



See "Hardware Activation > Current Hardware Activation Keys" on page 135 for detailed information about the fields.

▼ Delete a Hardware Activation File

Task Tool

This procedure can be performed at either of the following:

- Standalone SL Console
- Web-launched SL Console

Task Purpose

To delete a hardware activation file from a target library, complete this procedure using the StorageTek Library Console (SL Console). You cannot use the local operator panel for this task.

> **Caution –** Deleting a hardware activation file is an exceptional situation. Be sure you want to do this before you begin this procedure. Having extra hardware activation files installed on a library does not present any problems (for example, capacity activation files that exceed the physical capacity of the library). The extra activation files are simply not used.
>
> **Caution –** *Capacity reduction.* Deleting a capacity hardware activation file reduces the activated capacity of the affected library module. This can result in orphaned cartridges. See "Decreasing Activated Capacity" on page 154 and "Orphaned Cartridges in Non-Partitioned Libraries" on page 151.
>
> **Caution –** *Partitioning feature removal.* Deleting a partitioning hardware activation file deletes the partitioning feature from the library. See "Deleting the Partitioning Feature" on page 208 for details about the effects on the library configuration.

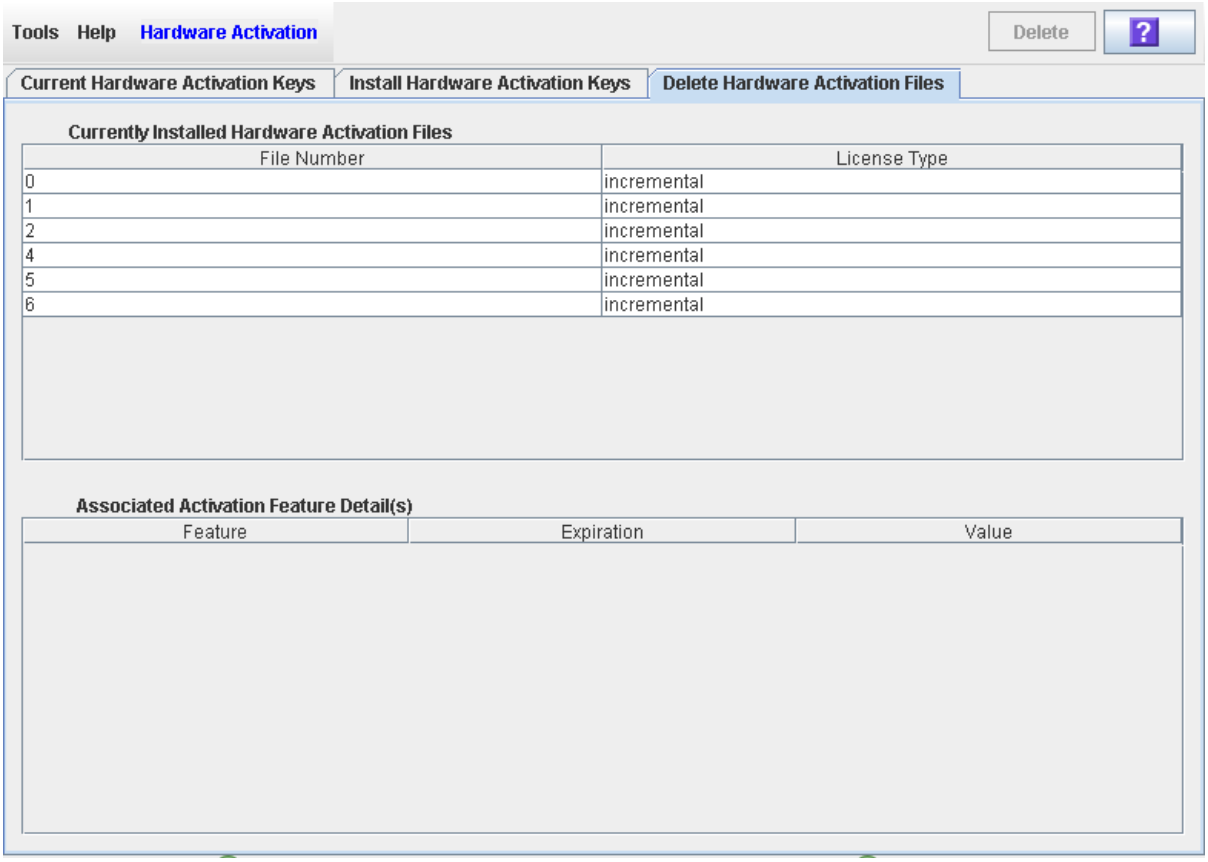
Task Steps

1. **Use the SL Console to log in to the target library.**

   See "General SL Console Usage Tasks" on page 73 for details.

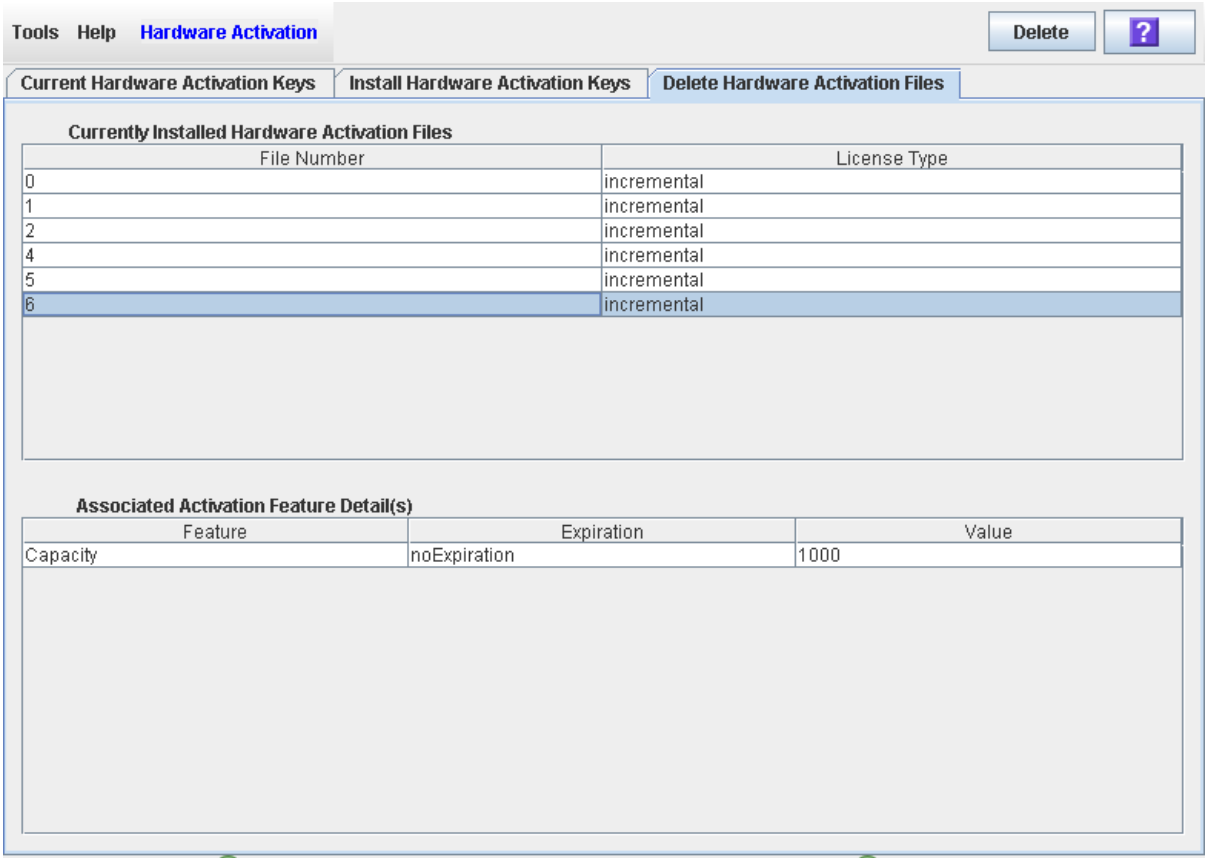
2. **Select Tools > Hardware Activation, and click the Delete Hardware Activation Files tab.**

The **Delete Hardware Activation Files** screen appears.



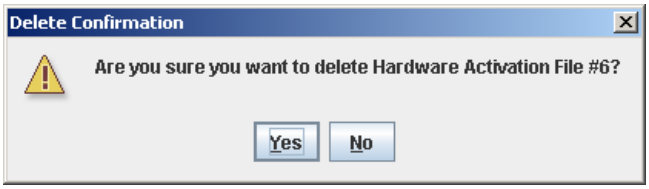
3. **Click the activation file you want to delete.**

The **Delete...** button activates, and detail for the file is displayed in the **Associated Activation Feature Detail(s)** section of the screen.



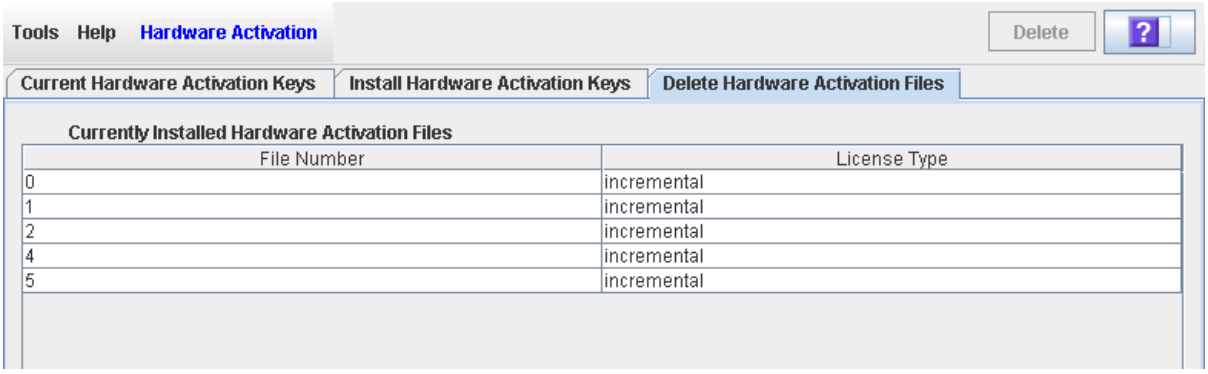
4. **Verify you have selected the correct activation file, and click the Delete button.**

   A **Delete Confirmation** message appears.



5. **Click Yes to begin the deletion.**

The hardware activation file is deleted from the library, and the **Currently Installed Hardware Activation Files** section updates.



6. **Depending on the feature included in the hardware activation file, you may need to perform additional tasks after deleting the key.**

   - See "Decreasing Activated Capacity" on page 154 for special considerations that apply when you delete a capacity hardware activation file.
   - See "Deleting the Partitioning Feature" on page 208 for special considerations that apply when you delete a Partitioning hardware activation file.

▼ Display the Feature Audit Log

Task Tool

This procedure can be performed at either of the following:

- Standalone SL Console
- Web-launched SL Console

Task Purpose

Use this procedure to display a list of all feature activation activity that has occurred over the life of the library. You can use this log to verify the validity of all features installed on the library.

> **Note –** This feature is available starting with SL3000 firmware version FRS_3.0 and SL Console version FRS_5.00.

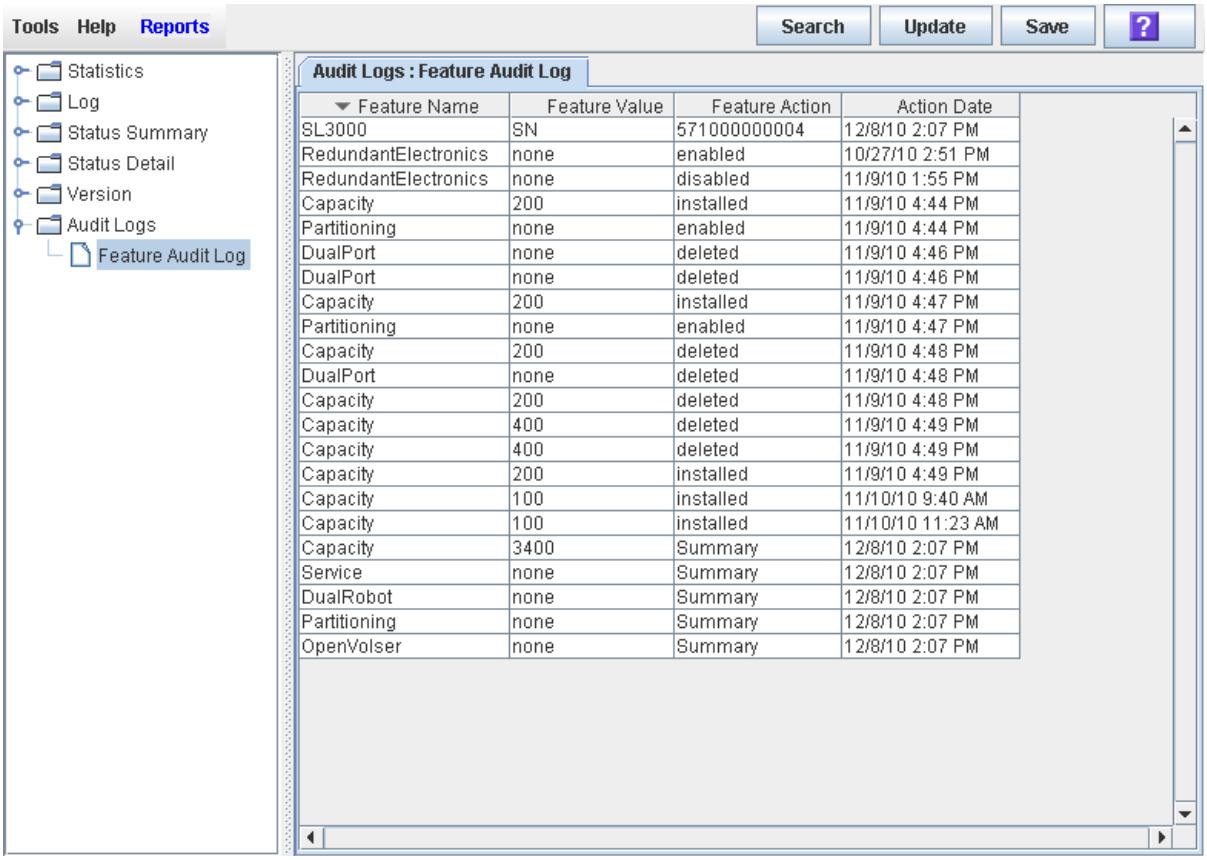
By default, the report is sorted in chronological order. Optionally, you can change the sort order, and rearrange and resize the columns. See "Modifying the Screen Layout" on page 62.To create a chart from this report, save the data to a comma-separated (`.csv`) file, then import the `.csv` file into a charting application. For details, see "Save Library Report Data to a File" on page 94.

Task Steps

1. **Select Tools > Reports.**
2. **Expand the Audit Logs folder, and click the Feature Audit Log tab.**

   The **Feature Audit Log** appears.

See “Reports > Feature Audit Log” on page 147 for detailed information about the fiel ds.



Feature Name	Feature Value	Feature Action	Action Date
SL3000	SN	571000000004	12/8/10 2:07 PM
RedundantElectronics	none	enabled	10/27/10 2:51 PM
RedundantElectronics	none	disabled	11/9/10 1:55 PM
Capacity	200	installed	11/9/10 4:44 PM
Partitioning	none	enabled	11/9/10 4:44 PM
DualPort	none	deleted	11/9/10 4:46 PM
DualPort	none	deleted	11/9/10 4:46 PM
Capacity	200	installed	11/9/10 4:47 PM
Partitioning	none	enabled	11/9/10 4:47 PM
Capacity	200	deleted	11/9/10 4:48 PM
DualPort	none	deleted	11/9/10 4:48 PM
Capacity	200	deleted	11/9/10 4:48 PM
Capacity	400	deleted	11/9/10 4:49 PM
Capacity	400	deleted	11/9/10 4:49 PM
Capacity	200	installed	11/9/10 4:49 PM
Capacity	100	installed	11/10/10 9:40 AM
Capacity	100	installed	11/10/10 11:23 AM
Capacity	3400	Summary	12/8/10 2:07 PM
Service	none	Summary	12/8/10 2:07 PM
DualRobot	none	Summary	12/8/10 2:07 PM
Partitioning	none	Summary	12/8/10 2:07 PM
OpenVolser	none	Summary	12/8/10 2:07 PM

Hardware Activation Screen Reference

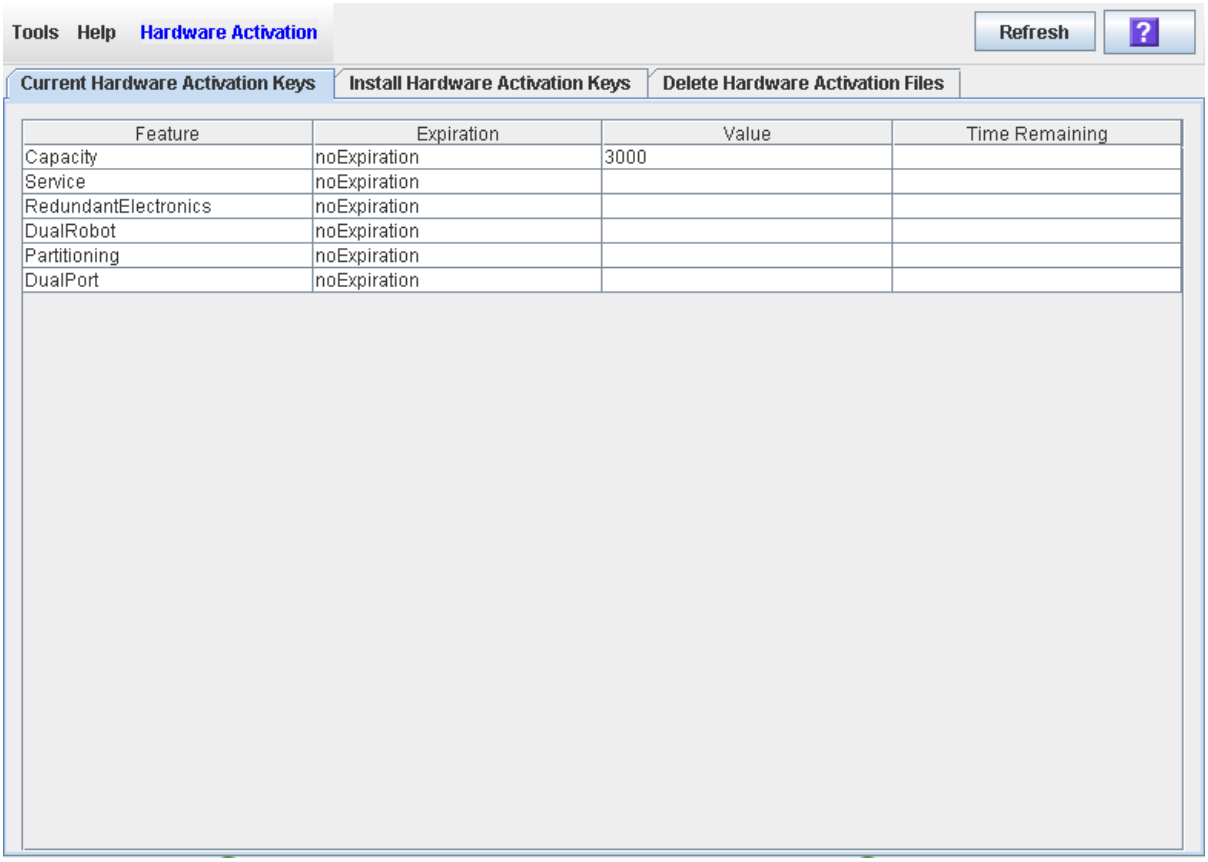
This section includes detailed descriptions of all SL Console hardware activation file screens, arranged by screen navigation path. For example, **Hardware Activation > Install Hardware Activation Keys: Compare** indicates the screen accessed by clicking:

1. **Tools**
2. **Hardware Activation** tab
3. **Install Hardware Activation Keys** tab
4. **Compare** button

> **Note –** You can access the hardware activation file screens only from the standalone SL Console or the Web-launched SL Console. They are not accessible from the local operator panel.

Hardware Activation > Current Hardware Activation Keys

Sample Screen



Description

Displays the contents of the hardware activation file currently installed on the library you are logged in to.

You can modify the layout and display of this screen. See "Modifying the Screen Layout" on page 62 for details.

Screen Access

This screen can be accessed at either of the following:

- Standalone SL Console
- Web-launched SL Console

Screen Fields

Feature

Name of the feature activated on the library.

Expiration

Number of days until the feature is due to expire or has expired. If there is no expiration date, the field displays “noExpiration.”

Value

Qualification for the feature, if applicable. For example, for the Capacity feature, this field displays the capacity the activation file provides. Depending on the feature, the field may be blank or indicate “None.”

Time Remaining

Amount of time remaining until the expiration of the feature. If there is no expiration date, the field is blank.

Buttons

Click to reboot the library.

Refresh

Click to refresh the display with current data from the library controller database.

? (Help)

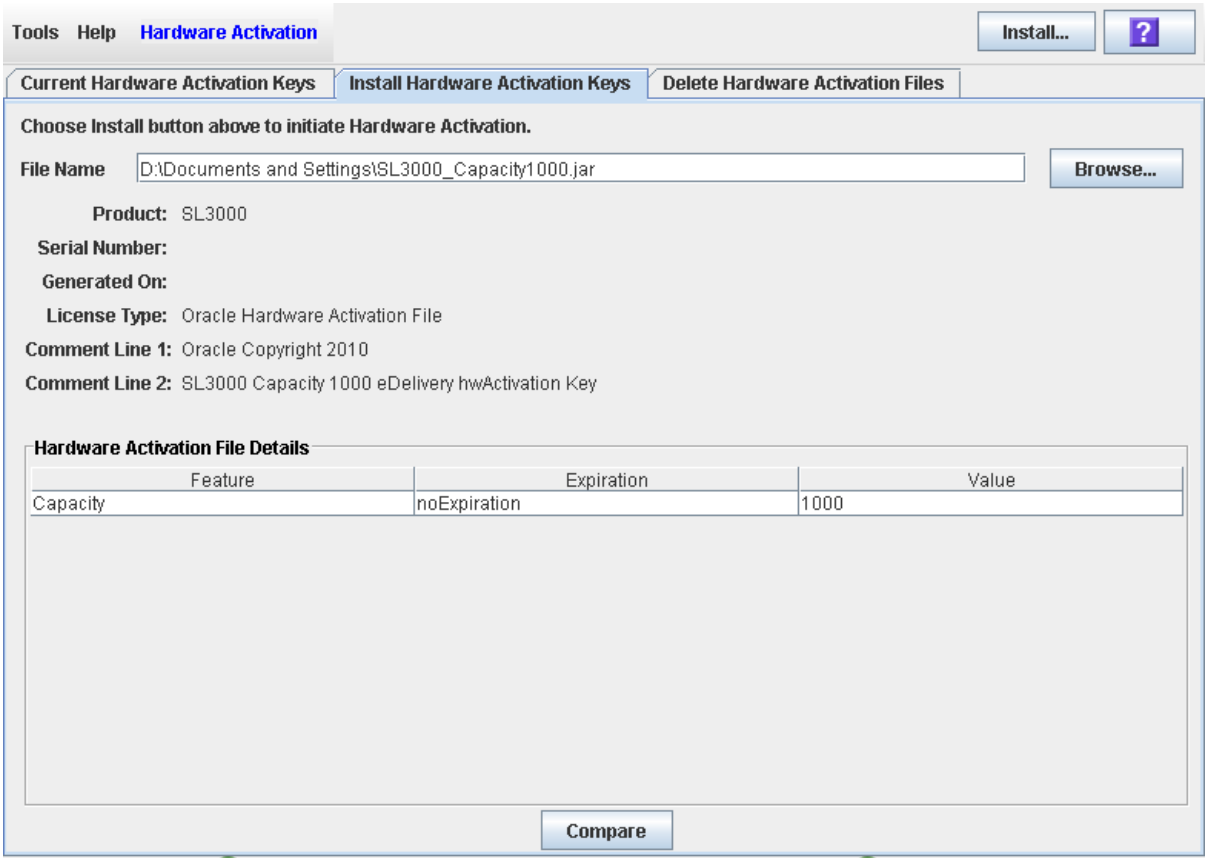
Click to display online help for the screen.

See Also

“Hardware Activation > Install Hardware Activation Keys” on page 137

Hardware Activation > Install Hardware Activation Keys

Sample Screen



Description

Enables you to display the contents of a new hardware activation file and install it on the library.

Also includes buttons that enable you to initiate any of the following activities:

- Compare the new hardware activation file with the one currently installed on the library.
- Install the new hardware activation file on the library.

You can modify the layout and display of this screen. See "Modifying the Screen Layout" on page 62 for details.

Screen Access

This screen can be accessed at either of the following:

- Standalone SL Console
- Web-launched SL Console

Screen Fields

File Name

Required.

Enter the full path of the hardware activation file you want to install on the library. Optionally, you can click **Browse** and navigate to the file location. The file must be located on a system accessible to the SL Console session.

Product

Display only.

Type of library. For example, SL8500, SL3000 or SL500.

Serial Number

Display only.

Serial number of the library the hardware activation file is for. This entry applies only to legacy hardware activation files. See "Legacy Hardware Activation Files" on page 112 for details.

Generated On

Display only.

Date when the hardware activation file was created.

Key Type

Display only.

Type of hardware. Options are:

- Oracle Hardware Activation File: File downloaded from the Oracle Software Delivery Cloud.
- Sun Hardware Activation File: Legacy file. See "Legacy Hardware Activation Files" on page 112 for details.

Comment Line 1

Display only.

Optional comment concerning the hardware activation file, from Oracle Corporation

Comment Line 2

Display only.

Optional comment concerning the hardware activation file, from Oracle Corporation

Hardware Activation File Details

Feature

Display only.

Name of a feature included in the hardware activation file.

Expiration

Display only.

Number of days until the feature is due to expire. If there is no expiration date, the field displays “noExpiration.”

Value

Display only.

Qualification for the feature, if applicable. For example, for the Capacity feature, this field displays the amount of storage capacity the activation file provides. Depending on the feature, the field may be blank.

Buttons

Install

Click to install the displayed hardware activation file on the library you are logged in to. The “Hardware Activation >Install Activation File— Install” on page 142 dialog box appears.

Browse

Click to navigate to the hardware activation file you want to display and install.

Compare

Click to compare the new hardware activation file with the ones currently installed on the library. The “Hardware Activation > Install Activation File— Compare” on page 140 dialog box appears.

? (Help)

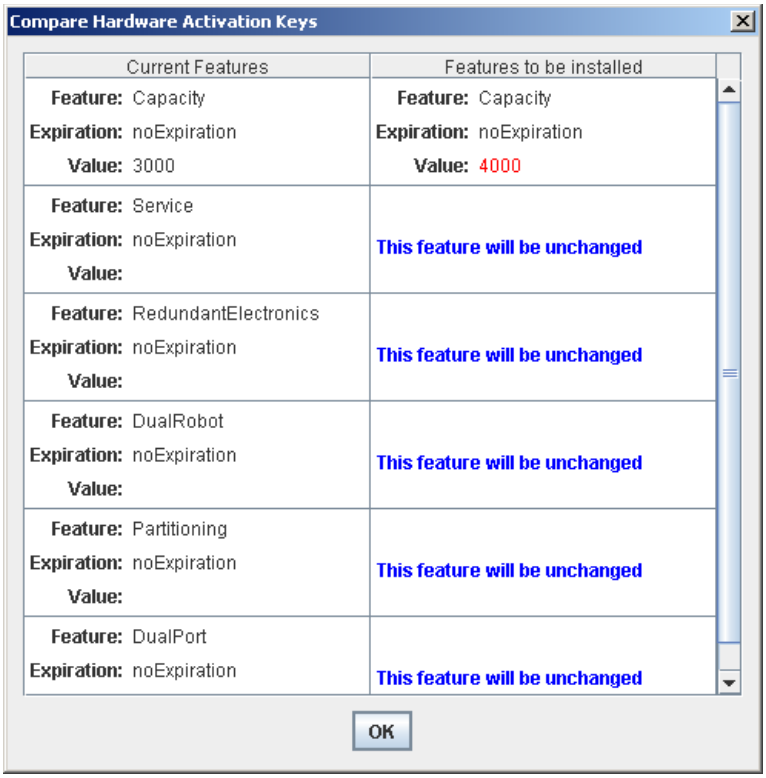
Click to display online help for the screen.

See Also

- “Hardware Activation > Current Hardware Activation Keys” on page 135
- “Hardware Activation > Install Activation File— Compare” on page 140
- “Hardware Activation >Install Activation File— Install” on page 142

Hardware Activation > Install Activation File— Compare

Sample Screen



Description

Enables you to compare the following sets of activat ion file information:

- Features currently activated on the library you are lo gged in to
- Feature included in the new hardware activation file you have specif ied in the “Hardware Activation > Install Hardware Activation Keys” on page 137 screen

  Note – Changes that will be im plemented by the new hardware activation file, such as additional capacity or expiration date changes, are highlighted in red.

This screen is a message that appears when you click **Compare** on the “Hardware Activation > Install Hardware Activation Keys” on page 137 screen.

Screen Access

This screen can be accessed at either of the following:

- Standalone SL Console
- Web-launched SL Console

Screen Fields

Current Features

Display only.

List of features, expiration dates, and values for all features currently activated on the library you are logged in to.

Features to be Installed

Display only.

Name, expiration date, and values for the feature included in the specified new hardware activation file. Changes that will be implemented by the new hardware activation file, such as additional capacity or expiration date changes, are highlighted in red.

Buttons

OK

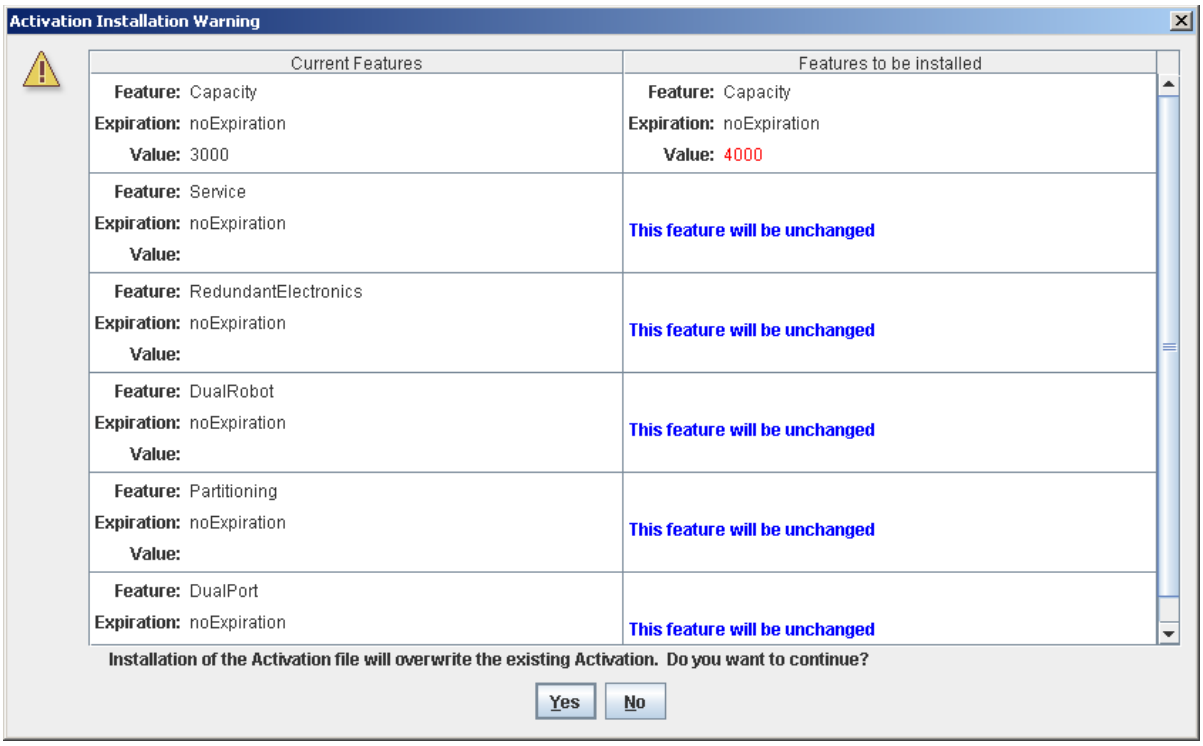
Click to dismiss the popup and return to the previous screen.

See Also

- “Hardware Activation > Install Hardware Activation Keys” on page 137
- “Hardware Activation >Install Activation File— Install” on page 142

Hardware Activation >Install Activation File— Install

Sample Screen



Description

Enables you to compare the following sets of activat ion file information:

- Features currently activated on the library you are lo gged in to.
- Feature included in the new hardware activation file you have specified in the “Hardware Activation > Install Hardware Activation Keys” on page 137 screen.

Warning messages display if installation of the new hardware activation file will result in features being removed from the library .

After comparing the activation file information, you can install the new hardwar e activation file on the library by clicking the **Yes** button.

This screen is a message that appears when you click **Install** on the “Hardware Activation > Install Hardware Activation Keys” on page 137 screen.

Depending on the features included in the hardware activation file, you may need to perform additional tasks to use the new features.

- See “Decreasing Activated Capacity” on page 154 for special considerations that apply when you delete a Capacity hardware activation file.
- See “Deleting the Partitioning Feature” on page 208 for special considerations that apply when you delete a Partitioning hardware activation file.

Screen Access

This screen can be accessed at either of the following:

- Standalone SL Console
- Web-launched SL Console

Screen Fields

Current Features

Display only.

List of features, expiration dates, and values for all features currently activated on the library you are logged in to.

Features to be Installed

Display only.

Name, expiration date, and values for the feature included in the specified new hardware activation file. Warning messages are displayed if installation of the hardware activation file will result in features being removed from the library.

Buttons

Yes

Click to install the specified hardware activation file on the library. The library controller verifies the validity of the hardware activation file and installs it.

No

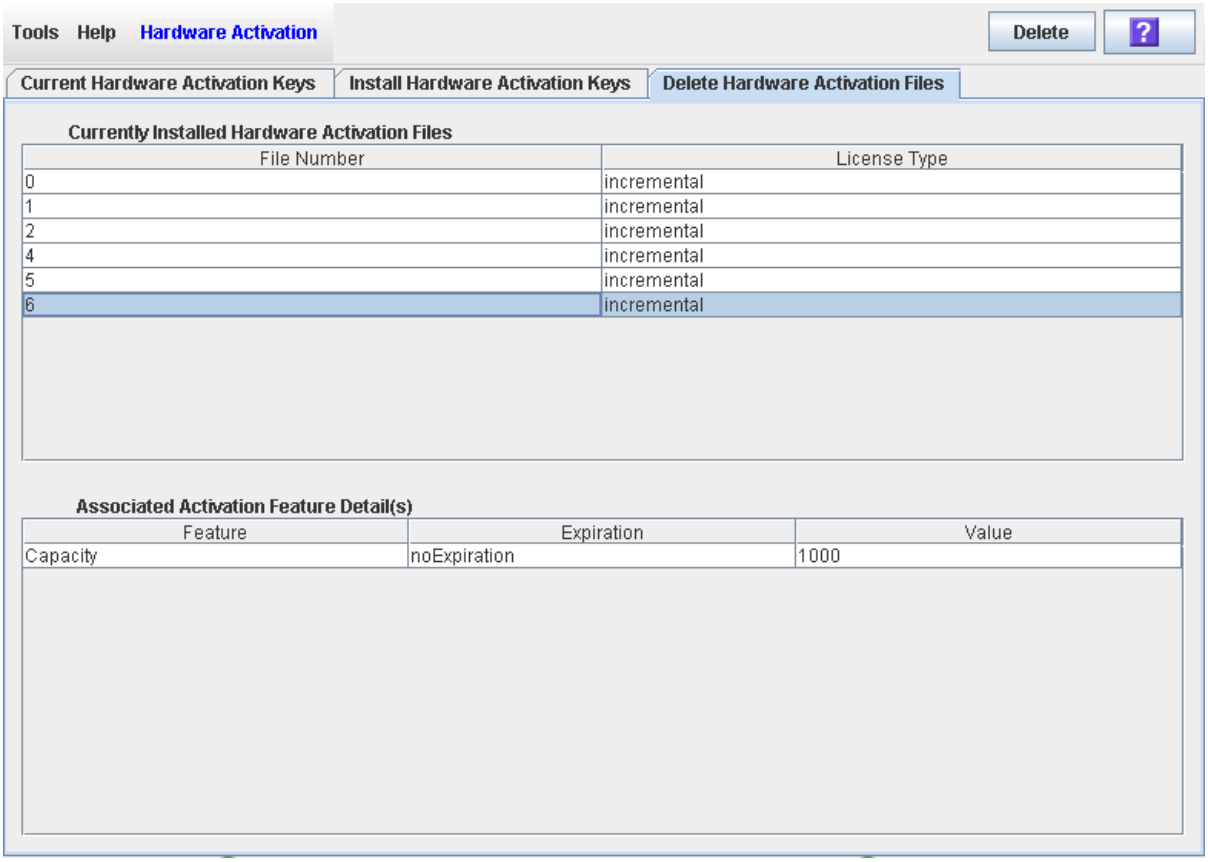
Click to cancel the update and return to the previous screen.

See Also

- "Hardware Activation > Install Hardware Activation Keys" on page 137
- "Hardware Activation > Install Activation File— Compare" on page 140
- "Hardware Activation >Delete Hardware Activation Files" on page 144

Hardware Activation >Delete Hardware Activation Files

Sample Screen



Description

Enables you to review and delete selected hardware activation files from the library. Only customer-installed hardware activation files appear on this screen for deletion.

> **Caution –** *Significant impact on operations.* Deleting a hardware activation file is an exceptional situation and can have significant effects on library operations. See "Delete a Hardware Activation File" on page 128 for considerations.

Screen Access

This screen can be accessed at either of the following:

- Standalone SL Console
- Web-launched SL Console

Screen Fields

Currently Installed Hardware Activation Files

File Number

Display only.

ID number assigned to the hardware activation file. The numbers indicate the sequence in which the features were installed on the library. There may be gaps in the sequence, which may result from one of the following reasons:

- A feature was deleted.
- A feature was installed and enabled by an Oracle support representative, and therefore does not appear on this list.

Key Type

Display only.

Type of hardware activation file. Options are:

- incremental: Oracle hardware activation file downloaded from the Oracle Software Delivery Cloud.
- absolute: Legacy Sun hardware Activation file. See "Legacy Hardware Activation Files" on page 112 for details.

Associated Activation Feature Detail(s)

Feature

Name of the feature activated on the library.

Expiration

Number of days until the feature is due to expire or has expired. If there is no expiration date, the field displays "noExpiration."

Value

Display only.

Qualification for the feature, if applicable. For example, for the Capacity feature, this field displays the capacity the activation file provides. Depending on the feature, the field may be blank or may indicate "`None`."

Buttons

Delete

Click to delete the currently selected hardware activation file.

? (Help)

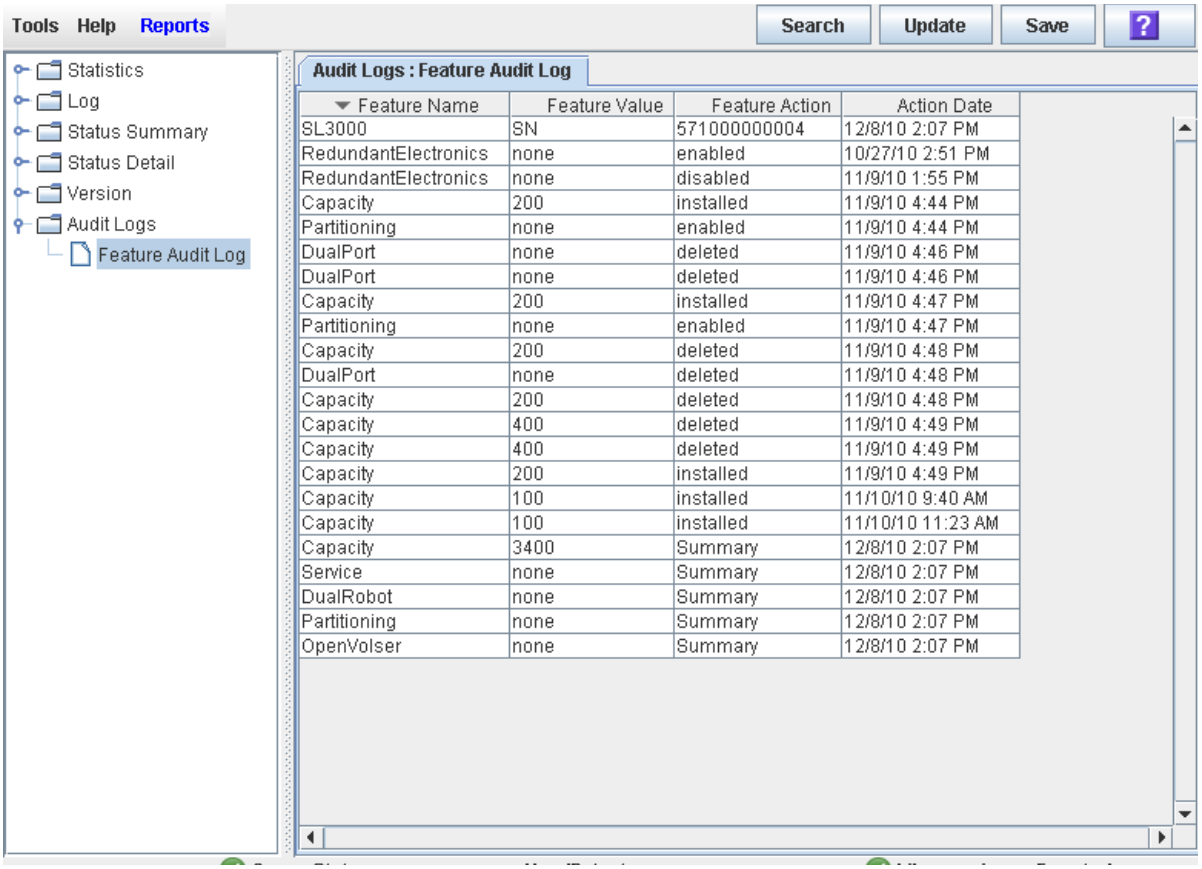
Click to display online help for the screen.

See Also

- “Hardware Activation > Install Hardware Activation Keys” on page 137
- “Hardware Activation >Install Activation File— Install” on page 142

Reports > Feature Audit Log

Sample Screen



Feature Name	Feature Value	Feature Action	Action Date
SL3000	SN	571000000004	12/8/10 2:07 PM
RedundantElectronics	none	enabled	10/27/10 2:51 PM
RedundantElectronics	none	disabled	11/9/10 1:55 PM
Capacity	200	installed	11/9/10 4:44 PM
Partitioning	none	enabled	11/9/10 4:44 PM
DualPort	none	deleted	11/9/10 4:46 PM
DualPort	none	deleted	11/9/10 4:46 PM
Capacity	200	installed	11/9/10 4:47 PM
Partitioning	none	enabled	11/9/10 4:47 PM
Capacity	200	deleted	11/9/10 4:48 PM
DualPort	none	deleted	11/9/10 4:48 PM
Capacity	200	deleted	11/9/10 4:48 PM
Capacity	400	deleted	11/9/10 4:49 PM
Capacity	400	deleted	11/9/10 4:49 PM
Capacity	200	installed	11/9/10 4:49 PM
Capacity	100	installed	11/10/10 9:40 AM
Capacity	100	installed	11/10/10 11:23 AM
Capacity	3400	Summary	12/8/10 2:07 PM
Service	none	Summary	12/8/10 2:07 PM
DualRobot	none	Summary	12/8/10 2:07 PM
Partitioning	none	Summary	12/8/10 2:07 PM
OpenVolser	none	Summary	12/8/10 2:07 PM

Description

Displays a list of all feature activation activity that has occurred over the life of the li brary. You can use this log to verify the validity of all features installed on the library .

Screen Access

This screen can be accessed at either of the following:

- Standalone SL Console
- Web-launched SL Console

Screen Fields

Feature Name

Name of the feature.

The first line of the display is the type of library.

Feature Value

Special attributes of the feature. Options are:

- SN: Indicates that the serial number of the library is displayed in the Feature Action field. Appears on the first line of the display.
- *nnnn*: For capacity hardware activation files, the number of cells added or removed.
- none: Appears for all other features.

Feature Action

Action that was performed. Options are:

- *nnnnnnnn*: Serial number of the library. Appears on the first line of the display.
- deleted: The hardware activation file for the feature was deleted.
- disabled: The feature was disabled by an Oracle support representative.
- enabled: The feature was enabled by an Oracle support representative.
- installed: The hardware activation file for the feature was installed.
- Summary: The feature is active on the library.

Action Date

Date and time when the action was performed.

Buttons

Search

Click to search a library report for a specified text string.

Update

Click to update the report with current data.

Save

Click to save the report to a designated comma-separated text file (.csv extension). Comma-separated files can be opened by a variety of spreadsheet and database programs.

? (Help)

Click to display online help for the screen.

See Also

- "Hardware Activation > Current Hardware Activation Keys" on page 135
- "Hardware Activation > Install Hardware Activation Keys" on page 137
- "Hardware Activation > Install Activation File— Compare" on page 140

4

Capacity on Demand

The SL3000 library includes RealTimeGrowth and Capacity on Demand features. With RealTimeGrowth, you can install physical storage capacity beyond your current needs. Capacity on Demand separates physical from activated capacity, which means you pay only for the capacity you need. As your needs grow, you can expand storage capacity with minimal disruption to library operations.

To activate additional capacity, you need only purchase and install a hardware activation file for the new capacity. Library storage capacity must be installed through the SL3000 hardware activation utility. See "Hardware Activation Files" for details.

> **Note –** This feature controls cartridge storage cells only. All installed CAPs and tape drives are active by default.

Capacity on Demand Features and Restrictions

This section describes important features and restrictions of Capacity on Demand that will help you to plan for and use the feature in your SL3000 library.

- The minimum activated capacity is 200 storage cells.
- You can purchase additional activated capacity in increments of 25, 100, 200, 500, or 1000 cells.
- Installation of additional activated capacity results in minimal disruption to library operations. Once verified by the library controller, the additional storage cells are available immediately. You do not need to reboot the library. Depending on the host interface (HLI or FC-SCSI), there may be a brief interruption in host operations as the hosts update the new resource information. See "Non-disruptive Capacity Changes" on page 152 for details.
- A library's current activated storage capacity is equal to the capacity specified in the most recently installed hardware activation key file.

Terminology

The following terms are used to describe library capacity management:

- Physical or installed capacity: The number of storage cells physically present in the library.

- Activated capacity: The number of storage cells specified in the installed hardware activation file.
- Active cell: A storage cell that can be used for cartridge storage. By default, the total active cells this is the same as the activated capacity specified in the installed hardware activation file. You can optionally deactivate selected storage cells, making this less than the activated capacity.
- Active storage region: A rectangular area of storage cells that can be used for cartridge storage. An active storage region can be as small as a single storage cell or as large as the total activated capacity for the library.
- Inactive cell: A storage cell that is explicitly deactivated and therefore cannot be used for cartridge storage.
- Selected cell: A storage cell that cannot currently be used for cartridge storage, but will be made active automatically by the library controller when activated capacity is increased.

Active Storage Region Configuration

The library contoller can automatically assign active storage regions or you can manually assign them. Automatic assignment by the library controller provides balanced growth of library modules.

Individual storage cells can be in either of the following states:

- Active: The cell can be used for cartridge storage.
- Inactive: The cell has been deactivated, and therefore cannot be used for cartridge storage. You can monitor the cell on library displays and reports, but requests to move cartridges to the cell are rejected by the library controller.
- Selected: The cell is not currently active, but will be activated automatically by the library controller when capacity is increased by the installation of a new hardware activation file. This state applies to non-partitioned libraries only.

Only active storage cells can be used for tape cartridge storage. Inactive storage cells cannot be used for cartridge storage, nor can they be accessed by any hosts.

Cell Activation Rules

The library controller uses the following rules when adding cells to active storage regions:

- Cell activation starts in the left upper rear of the active storage region and moves to the right lower front.
- All cells within a column are activated from top to bottom before moving to the next column.
- Columns within a panel are activated from left to right.

Non-Partitioned Libraries

Within a non-partitioned library, the library controller automatically selects all physical cells, but only activates a number of cells up to the total activated capacity of the library. Selected cells that cannot be activated due to activated capacity limits remain selected and will be activated automatically whenever additional activated capacity is installed.

When activating cells, the library controller begins at the back of the library, starting with the left-most module and working to the right. Then it moves to the front of the library, starting with the left-most module and working to the right.

To optimize cartridge placement, you can optionally designate active storage regions in the library, within which the library controller applies the rules above.

Partitioned Libraries

In partitioned libraries, the total number of storage cells allocated to all library partitions cannot exceed the activated capacity of the library.

In partitioned libraries, there is no default active storage region. You must explicitly assign storage cells to partitions, thereby configuring the active storage regions for each partition. See "Partition Process Overview" on page 213 for details.

When placing cartridges in storage cells, the library controller applies the predefined cell activation rules separately to each partition. See "Cell Activation Rules" on page 151 for details.

De-activating Storage Capacity

You can optionally reduce the size of an active storage region by de-activating designated storage cells. A warning message is displayed if cartridges will be orphaned due to the capacity reduction.

Orphaned Cartridges in Non-Partitioned Libraries

> **Note –** For a discussion of orphaned cartridges in partitioned libraries, see "Planning for Partitioning" on page 206.

In non-partitioned libraries, an orphaned cartridge is a cartridge located in an inactive storage cells. Orphaned cartridges are inaccessible to all hosts.

A cartridge can become orphaned for a variety of reasons. Following are some possible causes:

- Active storage capacity has been reduced.
- The cartridge has been moved to an inac tive or inaccessible cell through manual intervention.

If the SL Console identifies an orphaned cartridge, it displays a warning message. You can then use the following tools to help you resolve and disposition the orphaned cartridge:

- Generate a report of orphaned cartridges
- Perform an audit of the library
- Perform a recovery move on a cartridge

For detailed instructions on checking for and resolving orphaned cartridges, see the following procedures:

- "Display an Active Storage Region Report" on page 164
- "Commit Active Storage Region Changes" on page 161

Non-disruptive Capacity Changes

Changes to active capacity result in m inimal disruptions to library operations. The specific library behavior depends on the type of host connection, as described in the following sections:

- "Active Capacity Changes and HLI Connections" on page 152
- "Active Capacity Changes and FC-SCSI Connections" on page 153

> **Caution –** *Possible configuration conflicts.* Although changes to active capacity are not disruptive to library hosts, it is recommended that you make the library unavailable to other users before committing your active storage region changes. Because the SL Console does not validate storage region boundaries against the library co ntroller database in real-time, configuration conflicts may arise if you change active storage region boundaries while other users are pe rforming cartridge movements or library configuration changes. See "Synchronizing the Display W ith the Controller Database" for details.

Active Capacity Changes and HLI Connections

With HLI libraries, you can increase active capacity without stopping host jobs or having host connections go offline. When you decrease capacity, the library goes offline only momentarily and then comes back online automatically.

Adding Active Capacity

Whenever you add active storage cells, the library stays online. The library c ontroller sends an asynchronous message to all hosts notifyi ng them that the library configuration has changed. ACSLS and ELS must perform an audit of the library to account for the new library configuration information. Hosts can continue processing jobs while the audit takes place.

Removing Active Capacity

The library goes offline temporarily whenever you make any of the following types of capacity changes:

- Deactivate a storage cell
- Remove an empty drive slot

After the configuration change is updated in the library controller database, the library comes back online and the library controller sends an asynchronous message to all hosts notifying them that the library configuration has changed. ACSLS and ELS must perform an audit of the library to account for the new library configuration information. Hosts can continue processing jobs while the audit takes place.

Active Capacity Changes and FC-SCSI Connections

With FC-SCSI libraries, the library goes offline temporarily with a Unit Attention condition whenever you make any of the following changes:

- Activate or deactivate a storage cell
- Activate or deactivate a drive
- Activate or deactivate CAP cells
- Add, change, or remove a host LUN connection

Multiple error messages may be generated, and all hosts must issue the appropriate commands to update their library configuration information. See the appropriate tape management software documentation for detailed procedures and commands. In the case of adding or removing drives, the device SCSI numbering is updated as well.

Increasing Activated Capacity

The following special considerations apply after you successfully install a capacity activation key providing additional capacity. See "Hardware Activation File Installation Process" on page 113 for details on installing hardware activation key files.

- The new library capacity is equal to the capacity specified in the most recently installed hardware activation file.
- You do not need to reboot the library to begin using the new capacity, but you must configure all affected library host applications to recognize the new capacity. See "Non-disruptive Capacity Changes" on page 152 for details.
- ACSLS and ELS must perform an audit of the library to account for the new capacity. Hosts can continue processing jobs while the audit takes place.
- If the new activated capacity exceeds the physical capacity, a warning displays. No corrective action is necessary.
- If the library is not partitioned, the library controller automatically activates cells that have not been explicitly deactivated by the user previously. In this case, no user intervention is required to make the new activated capacity available. If cells have been deactivated, however, you may need to manually select cells to start using the additional capacity.

- If the library is partitioned, all new capacity is added as unallocated cells. You must allocate new storage cells to partitions manually to start using the cells; see "Design a Partition: AEM Module" on page 224 for details.

Decreasing Activated Capacity

The following special considerations apply after you successfully install a capacity hardware activation file resulting in reduced capacity. See "Hardware Activation File Installation Process" on page 113 for details on installing hardware activation key files.

> **Note –** Installing reduced capacity is an exceptional situation. Be sure this is what you really want to do before installing the hardware activation key file.

- A warning appears if cartridges will be orphaned as a result of the reduced capacity. See "Orphaned Cartridges in Non-Partitioned Libraries" on page 151 for details.
- For non-partitioned libraries:
  - The new, reduced capacity takes effect immediately.
  - The library controller deactivates cells in reverse order of their activation, meaning it deactivates the cells activated most recently.

For partitioned libraries:

- If the total number of cells allocated to all partitions exceeds the new activated capacity, the library is automatically taken offline. You must manually de-allocate cells from partitions so the total allocation does not exceed the new activated capacity.
- If the total number of cells allocated to all partitions is still less than the new activated capacity, the new reduced capacity takes effect immediately with no change to the existing partition allocations. The library continues operations without interruption.

Capacity Management Tasks

This section provides detailed instructions for all tasks involved in implementing and managing active storage capacity in the library.

Storage Capacity Installation Process

The following is a summary of the process used to install new library storage capacity.

1. You purchase and install a capacity hardware activation file for the library. See "Hardware Activation File Installation Process" on page 113 for details.
2. The newly activated capacity is available immediately. You do not need to re-boot the library.
3. In non-partitioned libraries, all newly activated cells are immediately available for use by default. Proceed as follows:
   - If you want to use the default storage region configuration assigned by the library controller, you must configure all affected library host applications to recognize the new storage regions. See "Non-disruptive Capacity Changes" on page 152 for details.
   - If you want to modify the storage region configuration from the default, see "Define Active Storage Regions" on page 158.
4. In partitioned libraries, all newly activated cells are added as "unallocated," and are therefore not available for use. You must manually allocate the new cells to partitions. See "Partition Process Overview" on page 213 for detailed instructions.

SL Console Active Storage Region Workspace

The **Select Active Cells** screens, and all associated dialog boxes, give you a dynamic workspace to customize your activated capacity configuration. All activated capacity configuration information is automatically saved to the active storage region workspace in SL Console memory and retained for the duration of your SL Console session. This workspace enables you to switch among active storage region views, and leave and return to the **Select Active Cells** screens any number of times without losing your configuration changes.

Information in the SL Console active storage region workspace is committed to the library controller database only through the **Apply** button on the Select Active Cells > Select Active Cells screen. The information is lost if any one of the following occurs before you have committed your updates:

- You actively log off the SL Console session.
- The SL Console session times out or the connection to the library is lost.
- You actively refresh the active storage region workspace from the current library controller database. This occurs when you click the **Refresh** button on the **Select Active Cells** screens.

> **Caution –** *Possible configuration conflicts.* Although changes to active capacity are not disruptive to library hosts, it is recommended that you make the library unavailable to other users before committing your active storage region changes. Because the SL Console does not validate storage region boundaries against the library controller database in real-time,

configuration conflicts may arise if you change active storage region boundaries while other users are performing cartridge movements or library configuration changes. See “Synchronizing the Display With the Controller Database” for details.

Capacity Management Tasks

Note – The following tasks apply to non-partitioned libraries only . For detailed instructions on configuring storage regions for partitioned libraries, see "Partition Process Overview" on page 213.

Task Tool

Capacity management tasks be performed at either of the following:

- Standalone SL Console
- Web-launched SL Console

Note – You cannot perform them at the local operator panel.

▼ Define Active Storage Regions

Task Tool

This procedure can be performed at either of the following:

- Standalone SL Console
- Web-launched SL Console

Task Purpose

When you install additional activated capacity, the library controller automatically activates the number of storage cells equal to the activated capacity. The library controller uses a set of internal rules when choosing the actual cells to activate. See "Active Storage Region Configuration" on page 150 for details.

> **Note –** See "Hardware Activation File Installation Process" on page 113 for information about installing activated capacity.

Use this procedure only if you want to do one of the following:

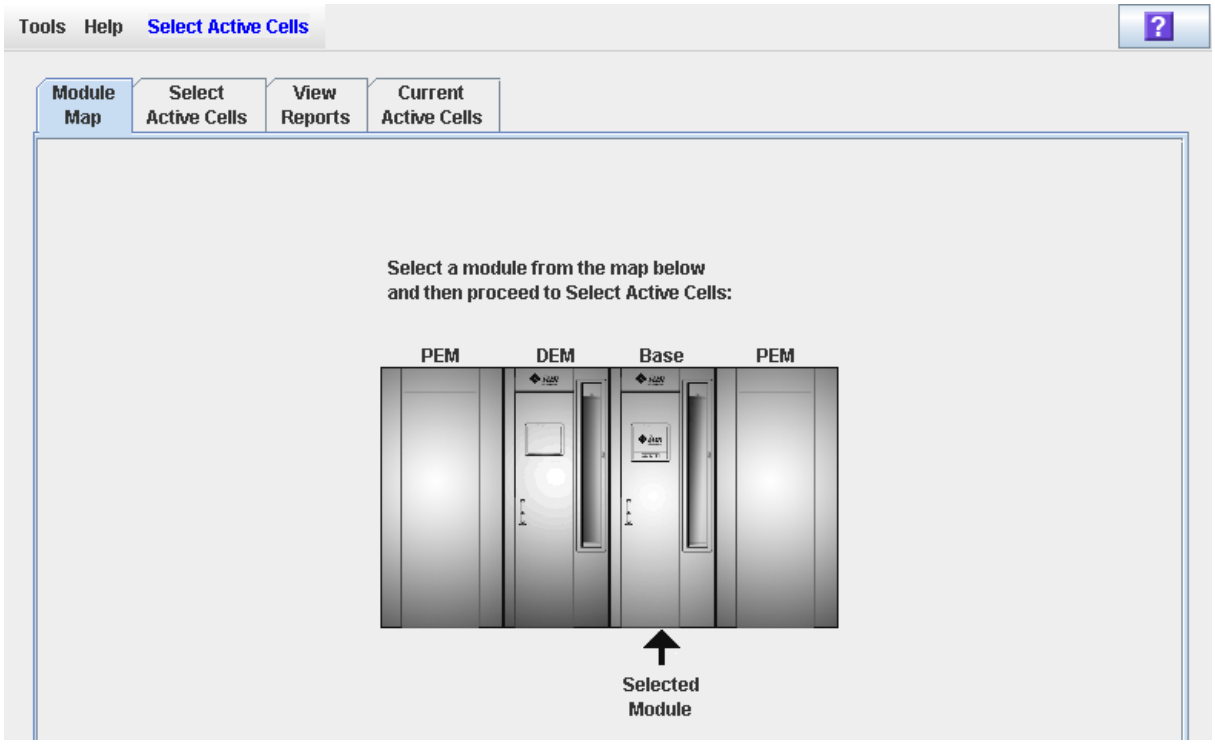
- Customize the active storage regions to make them different from the default configuration assigned by the library controller. For example, you can configure active storage cells so that cartridges are concentrated around the drives and the ends of the library are left for future growth.
- Deactivate storage cells to make the total number of active storage cells less than the activated capacity.
- Deselect storage cells to ensure the cells will not be automatically activated when the library's activated capacity is increased.

> **Note –** If you want to use the default storage region configuration defined by the library controller, you do not need to use this procedure.

Task Steps

1. **Select Tools > Select Active Cells.**

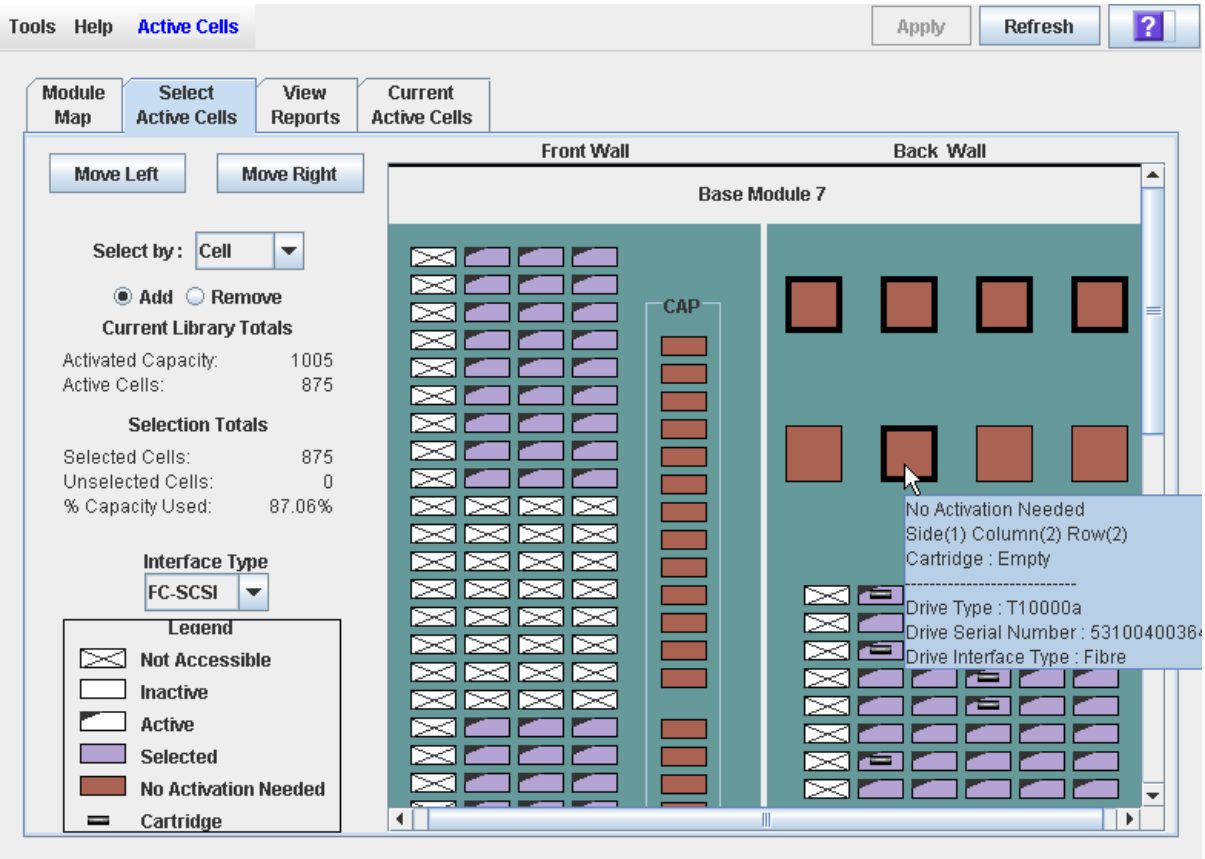
The **Module Map** page appears.



2. **Click the module for which you want to define the active storage regions.**
3. **Click the Select Active Cells tab.**

   The **Select Active Cells** page appears, displaying the current configuration of the module you have selected.

Note – The first time this page displays, the number of selected cells is equal to the physical capacity of the library , and the number of active cells is equal to the library's total activated capacity.



Note – Click the **Move Left** or **Move Right** buttons to display a module directly adjacent to the one currently displayed.

4. **Choose the Select by method, and click either the Add or Remove radio button.**
5. **Use the library map to select the storage cells you want to activate or deactivate.**

   Note – See "Select Active Cells > Select Active Cells" on page 175 for detailed instructions on using the library m ap.

   The system saves your capacity configuration changes to the SL Console active storage region workspace for the dur ation of this login session. You can make additional modifications and leave and return to the **Select Active Cells** screens any number of times without losing your changes.

6. **When you are done making changes, proceed to "Commit Active Storage Region Changes" on page 161 to verify and commit your changes.**

▼ Commit Active Storage Region Changes

Task Tool

This procedure can be performed at either of the following:

- Standalone SL Console
- Web-launched SL Console

Task Purpose

Use this procedure to verify and commit active storage region configuration changes you have made on the **Select Active Cells** page. This procedure warns you of the following possible errors:

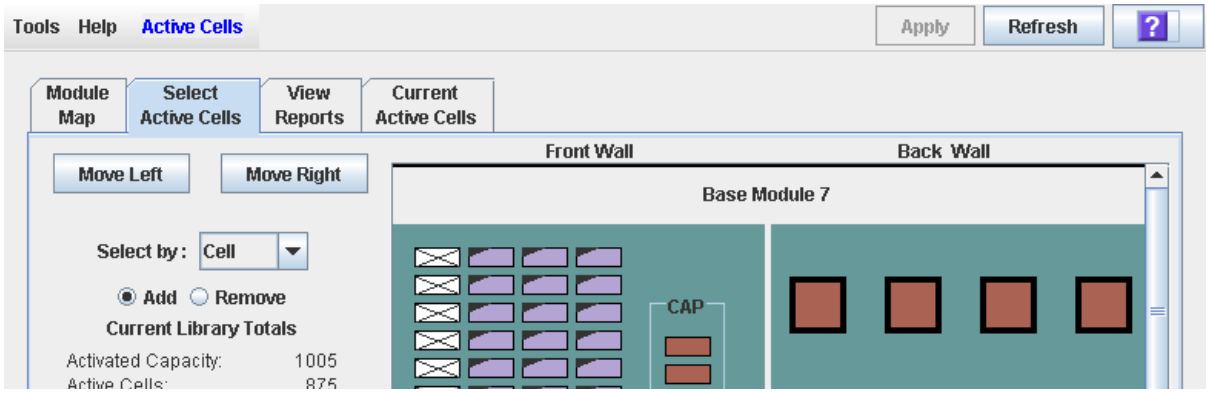
- The library has orphaned cartridges. See "Orphaned Cartridges in Non-Partitioned Libraries" on page 151 for details.
- Cells will be made inaccessible to library hosts.

> **Caution –** *Possible configuration conflicts.* Although changes to active capacity are not disruptive to library hosts, it is recommended that you make the library unavailable to other users before committing your active storage region changes. Because the SL Console does not validate storage region boundaries against the library controller database in real-time, configuration conflicts may arise if you change active storage region boundaries while other users are performing cartridge movements or library configuration changes. See "Synchronizing the Display With the Controller Database" for details.

Task Steps

1. **Perform the steps in "Define Active Storage Regions" on page 158.**

   The changes you have made are displayed on the **Select Active Cells** page.

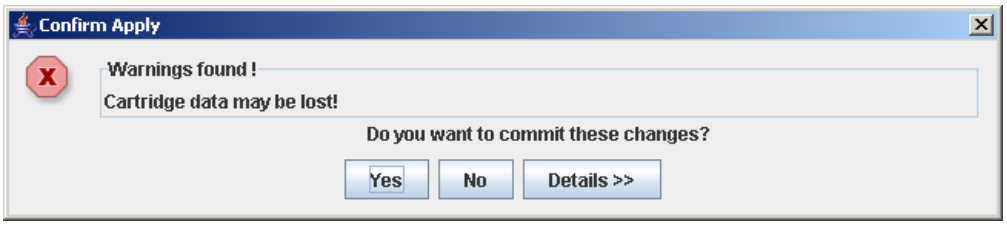


2. **In the upper right corner, click Apply.**

   The boundaries of the active storage regions are verified, including the locations of all tape cartridges.

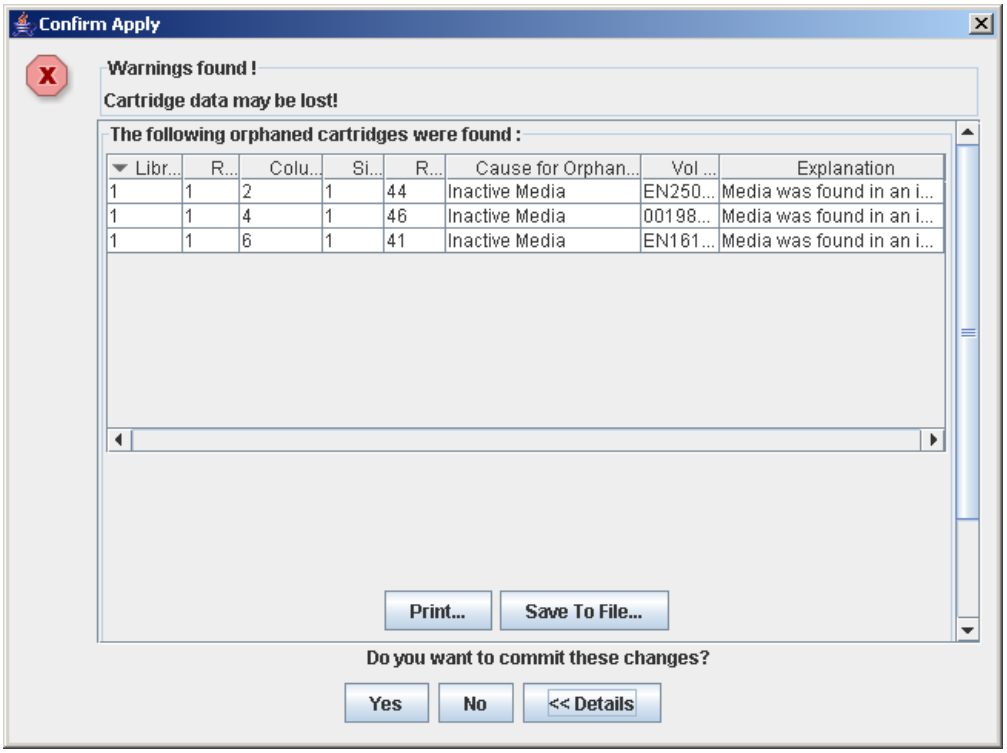
Note – The system performs this verification only on the active storage region configuration defined in the **Select Active Cells** screens. It does not verify active storage regions against the library controller database. Therefore, it cannot identify configuration conflicts that may arise due to other users performing cartridge movements or library configuration changes (through the command line interface, other SL Console sessions, or host applications) at the same time you have made changes to active storage regions.

The **Confirm Apply** message appears, indicating whether there are any orphaned cartridges or other problems in the active storage region configuration.



3. **To display detailed warning messages explaining the reasons for any orphaned cartridges, click Details.**

   You can use the **Details** button to toggle between the expanded and collapsed views of the warning messages.



4. **Optionally, in the expanded view of the warning messages you can do the following:**
   - Click **Print** to print the detailed message data.
   - Click **Save to File** to save the detailed message data to a comma-separated file.
5. **Proceed as follows:**

- Click **No** to cancel the update.

  The library controller database is not updated, but all changes you have made are retained on the **Select Active Cells** page.

- Click **Yes** to make the following updates to the library controller database and proceed to Step 6.

- White cells with a turned over ("dog-eared") left corner are made inactive.

- Purple cells without a turned over ("dog-eared") left corner are made active, up to the total activated capacity of the library. Purple cells that cannot be made active due to library activated capacity limits will remain purple and will automatically become active whenever additional activated capacity is installed.

- All other cells are left unchanged.

- **The Commit Success** message appears.

6. **Click OK to return to the Select Active Cells page.**

   All newly activated cells are immediately available for use. The library does not need to be rebooted.

7. **All affected library host applications must now be configured to recognize these updates. See the appropriate tape management software documentation for the procedures and commands.**

▼ Display an Active Storage Region Report

Task Tool

This procedure can be performed at either of the following:

- Standalone SL Console
- Web-launched SL Console

Task Purpose

Use this procedure to display the following active storage region reports:

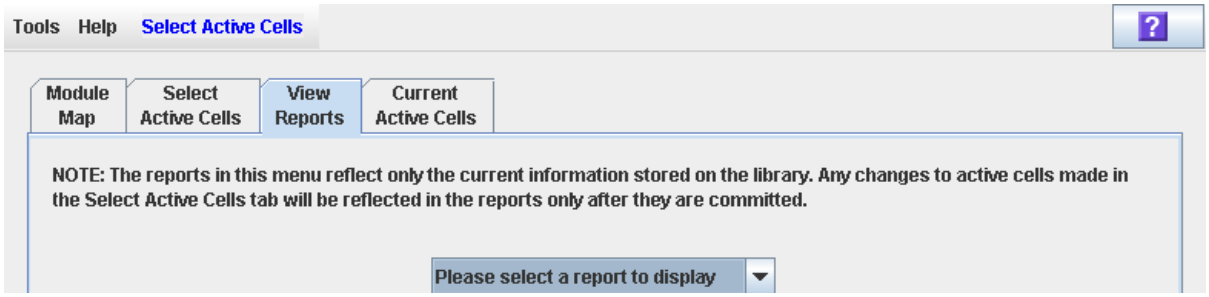
- Cartridge Cell and Media Summary: Displays a detailed list of all library resources and their status (active or inactive).
- Orphaned Cartridge Report: Displays a detailed list of all orphaned cartridges.

> **Note –** The active storage region reports display data saved to the library controller database. If you have made changes to the active storage region configuration without commiting the changes to the library controller, the data in these reports will differ from data shown on **Select Active Cells** screen.

Task Steps

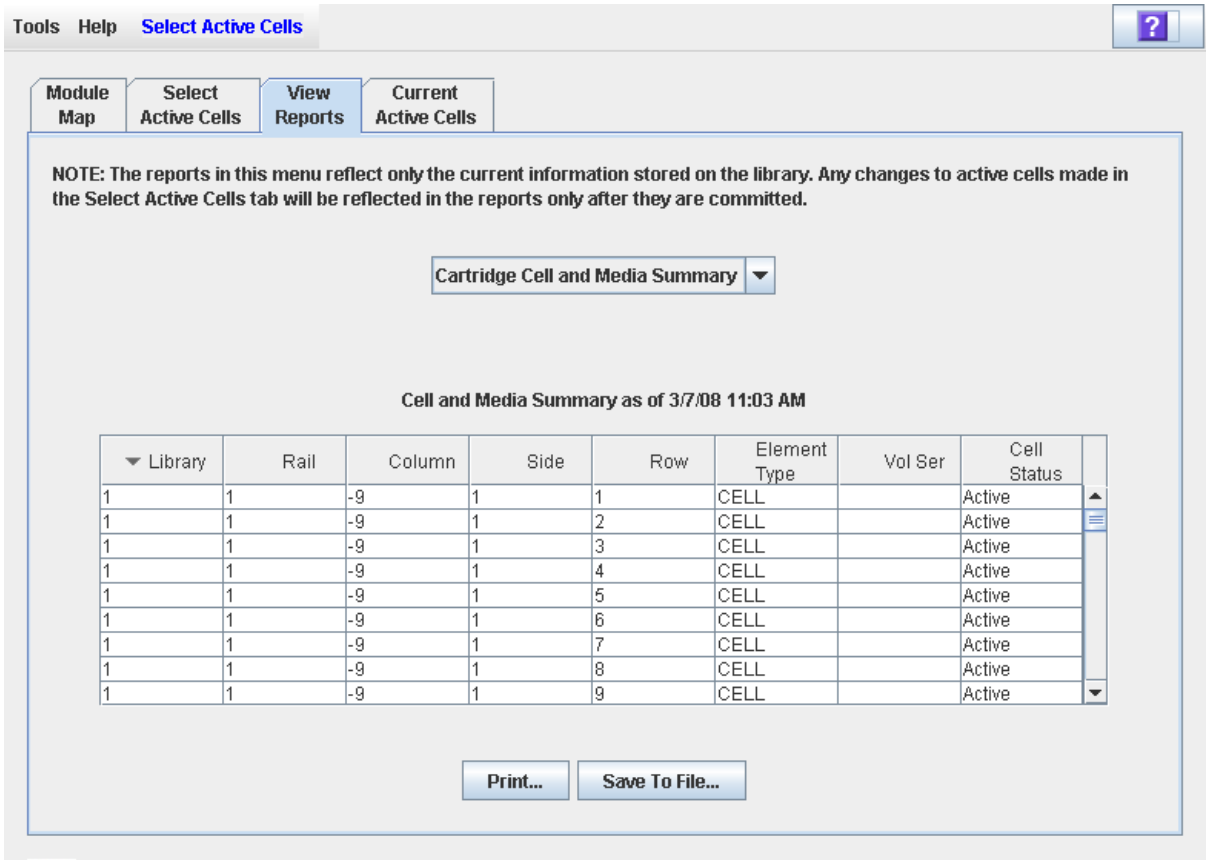
1. **Select Tools > Select Active Cells, and click the View Reports tab.**

   The **View** Reports page appears.



2. **In the list, select the report you want to display.**

The page updates with current data from the library controller database.



3. **If you want to print the report data or save it to a file, see the following procedures:**
   - "Print Active Storage Region Report Data" on page 166
   - "Save Active Storage Region Report Data" on page 168

▼ Print Active Storage Region Report Data

Task Tool

This procedure can be perform ed at either of the followin g:

- Standalone SL Console
- Web-launched SL Console

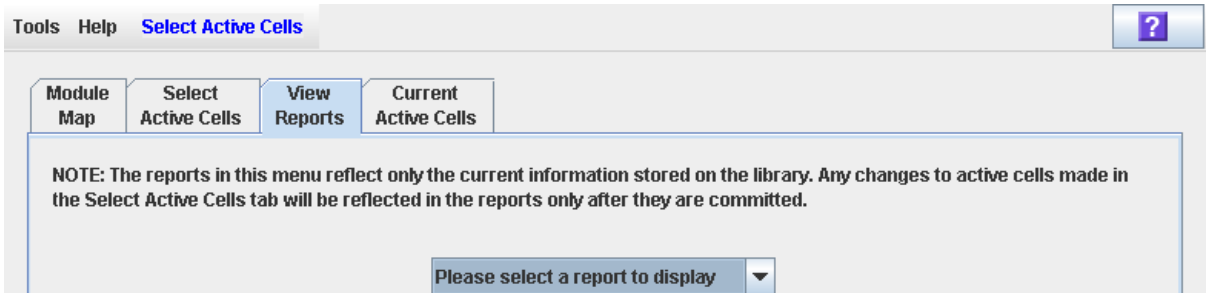
Task Purpose

Use this procedure to print an active storag e region report. You can perform this procedure from any of the active storage region report pages.

Task Steps

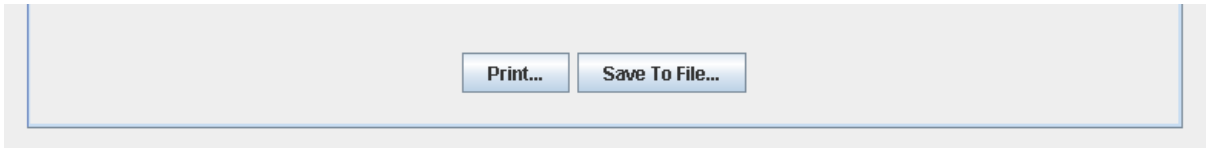
1. **Select Tools > Select Active Cells, and click the View Reports tab.**

   The **View Reports** page appears.



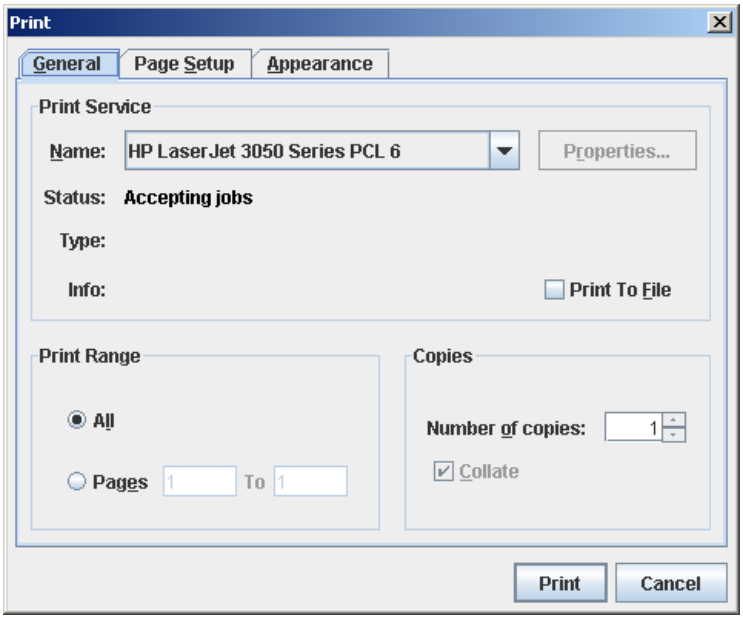
2. **In the list, select any report.**

   The specified report is displayed. All report pages include the **Print** and **Save to File** buttons.



3. **Click Print.**

The **Print** dialog box appears.



4. **Complete the print dialog box, and click Print.**

   The report prints to the selected printer .

▼ Save Active Storage Region Report Data

Task Tool

This procedure can be performed at either of the following:

- Standalone SL Console
- Web-launched SL Console

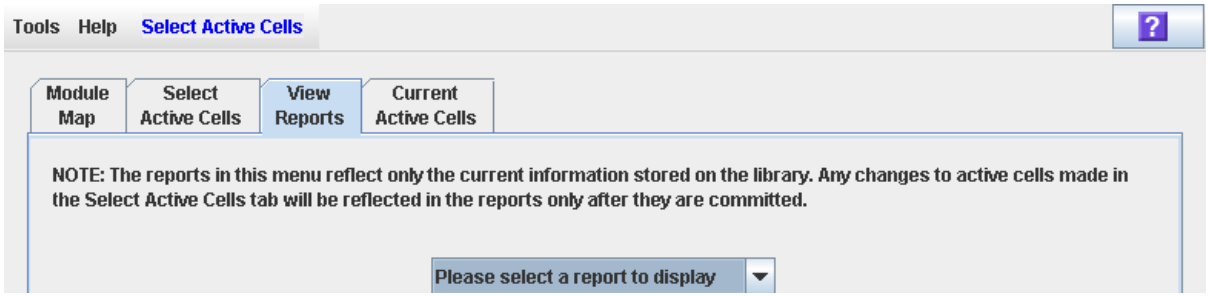
Task Purpose

Use this procedure to save active storage region report data to a comma-separated file (`.csv` format). You can use a variety of spreadsheet applications to view the file. You can perform this procedure from any of the active storage region report pages.

Task Steps

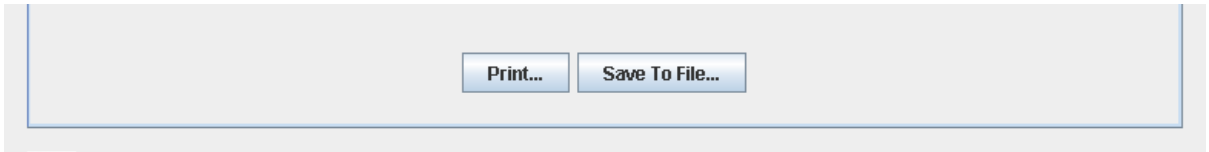
1. **Select Tools > Select Active Cells, and click the View Reports tab.**

   The **View Reports** page appears.



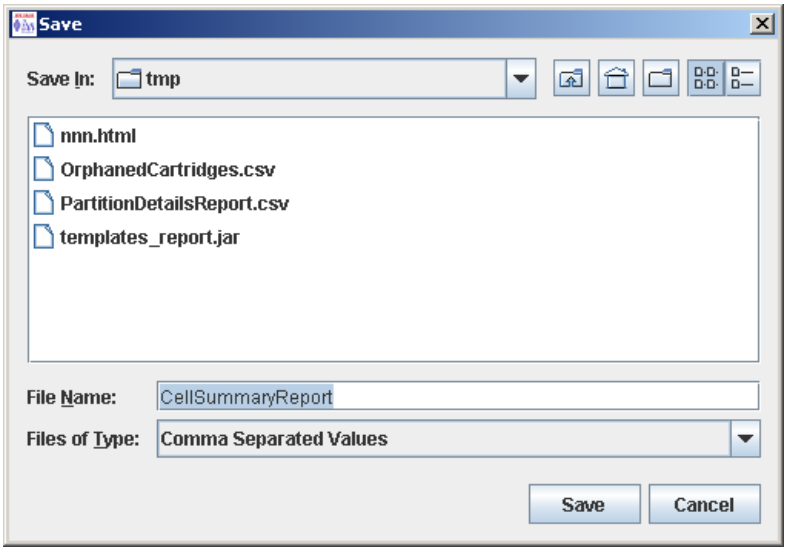
2. **In the list, select any report.**

   The specified report displays. All report pages include the **Print** and **Save to File** buttons.



3. **Click Save to File.**

The **Save** dialog box appears.



4. **Browse to the directory where you want to save the file, and enter the file name.**
5. **Click Save.**

   The data is saved to the specified file.

▼ Display Active Cell Detail

Task Tool

This procedure can be performed at any of the following:

- Local operator panel
- Standalone SL Console
- Web-launched SL Console

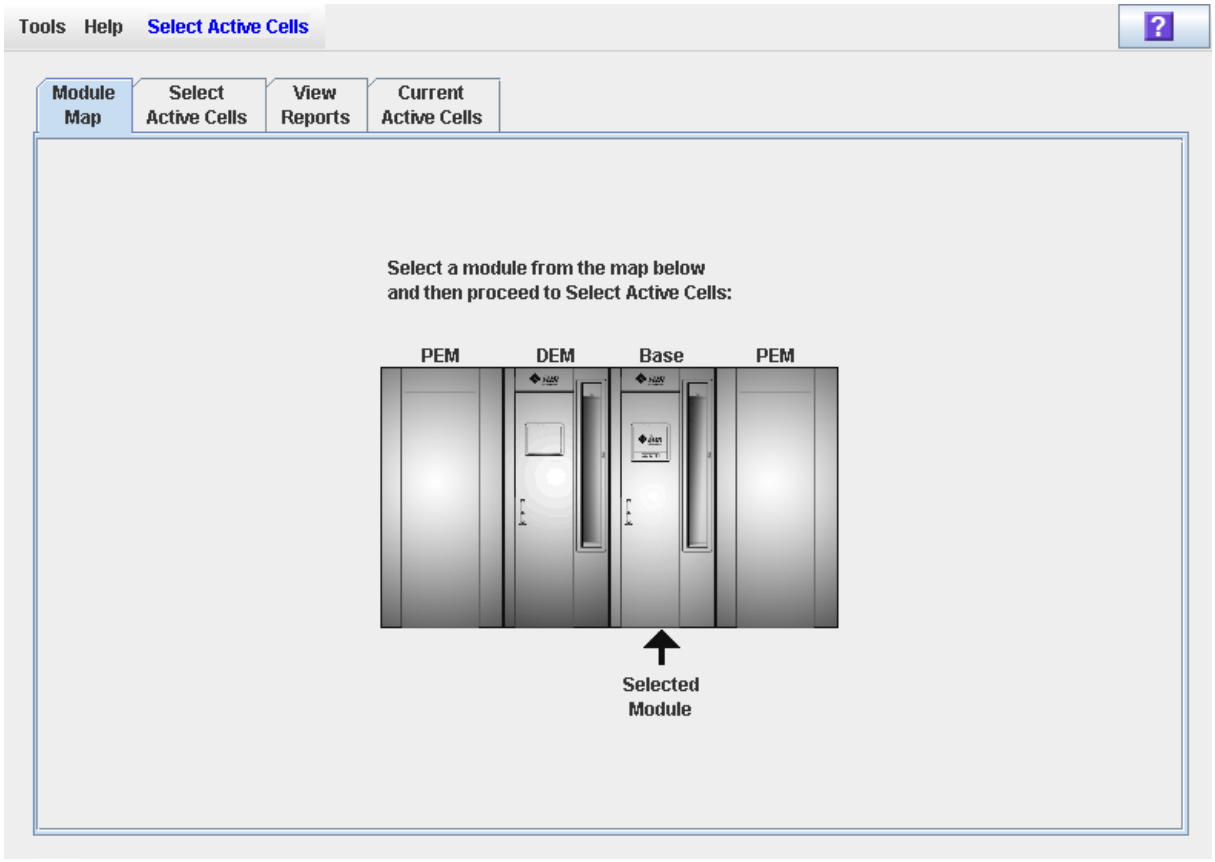
Task Purpose

Use this procedure to display which storage cells are currently active, inactive, or selected for activation. You can also display detailed information about cartridge, drive, and storage cell locations.

Task Steps

1. **Select Tools > Select Active Cells.**

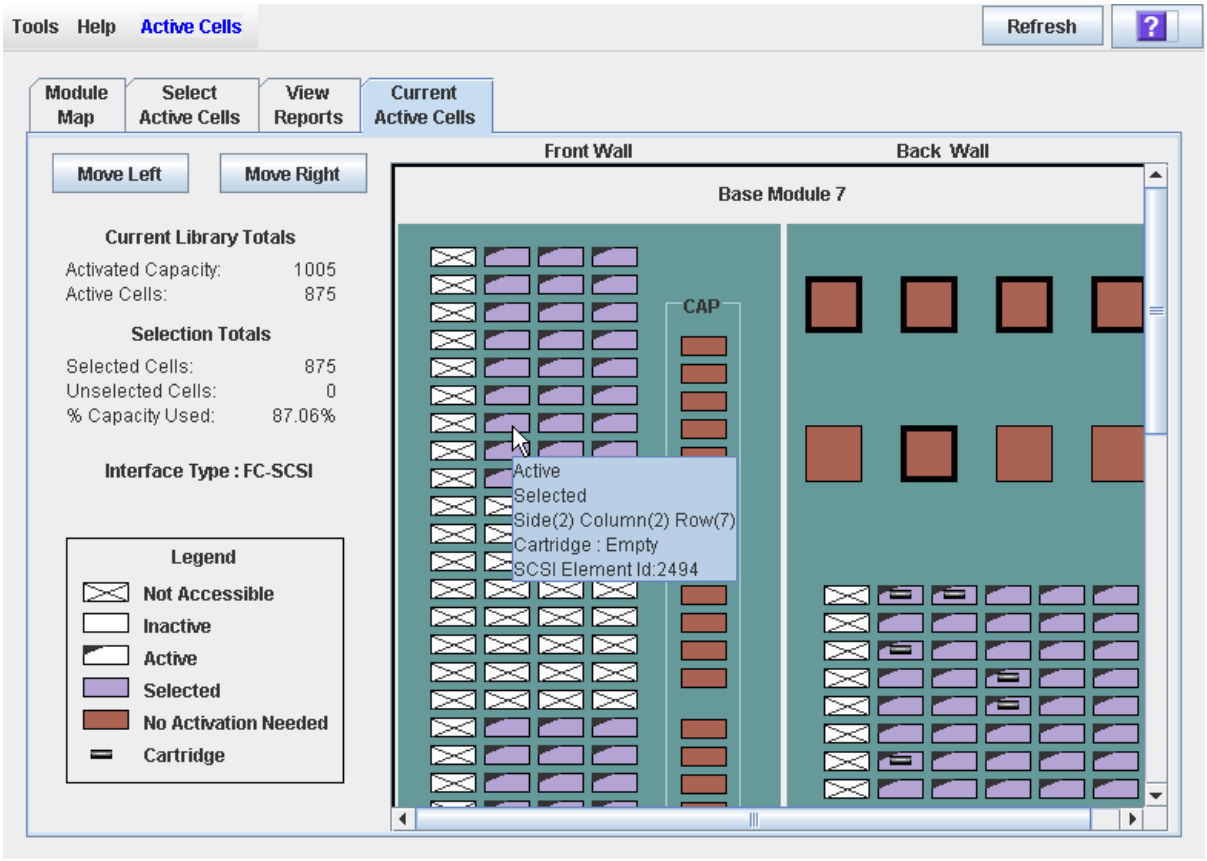
   The **Module Map** page appears.



2. **Click the module you want to display.**
3. **Click the Current Active Cells tab.**

The **Active Cells** page appears, displaying the current configuration of the m odule you have selected.

You can mouse-over a cell or drive to disp lay a tooltip of detailed information.



Active Storage Region Screen Reference

This section includes detailed descriptions of all SL Console active storage region screens, arranged by screen navigation path. For example, **Select Active Cells—Select Active Cells—Confirm Apply** indicates the screen accessed by:

1. Clicking **Tools**
2. Clicking **Select Active Cells**
3. Clicking the **Select Active Cells** tab
4. Clicking the **Confirm Apply** button

Note – These screens are available for non-partitioned libraries only. See "Deleting the Partitioning Feature" on page 208 for the screens used in managing capacity in partitioned libraries.

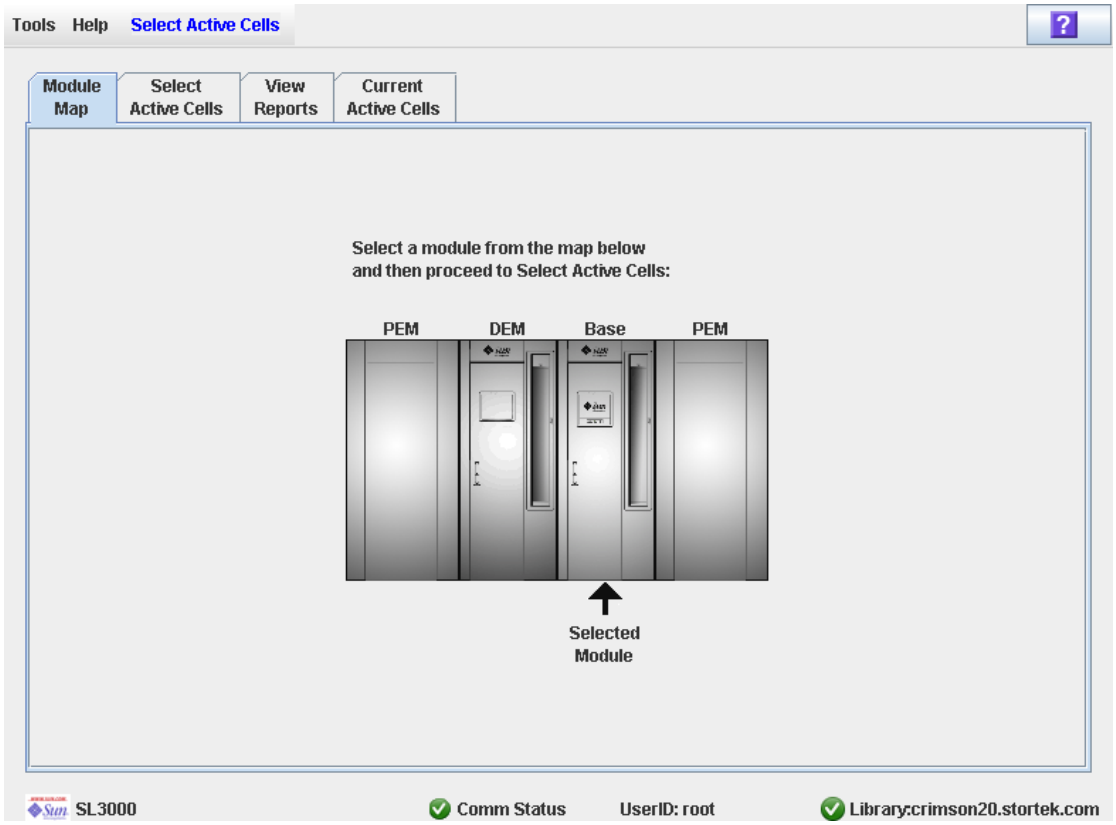
Note – Only the Select Active Cells—Current Active Cells screen is available on the local operator panel. The remaining screens can be accessed only from the standalone SL Console or the Web-launched SL Console.

Note – The **Select Active Cells** screen, and all associated popups, give you a dynamic workspace to design active storage regions. All active cell information is automatically saved to the storage region workspace in SL Console memory and retained for the duration of your SL Console session. This allows you to make modifications and leave and return to the **Select Active Cells** screens any number of times without losing your changes.

Caution – Information in the SL Console active storage region workspace is saved to the library controller database only through the **Apply** button. If your SL Console session ends or you refresh the workspace data before you have committed your updates through the **Apply** button, you will lose any active storage region changes you have made through the **Select Active Cells** screens and all associated popups.

Select Active Cells > Module Map

Sample Screen



Description

Enables you to select the library module for which you want to activate or deactivate cells for cartridge storage.

Screen Access

This screen can be accessed by either of the following:

- Standalone SL Console
- Web-launched SL Console

Screen Fields

Select a module from the map below

The screen displays an illustration of the lib rary's actual module configuration. This information is taken directly fro m the library controller database.

Click the module for which you want to se lect storage cells, and then click the **Select Active Cells** tab.

Buttons

? (Help)

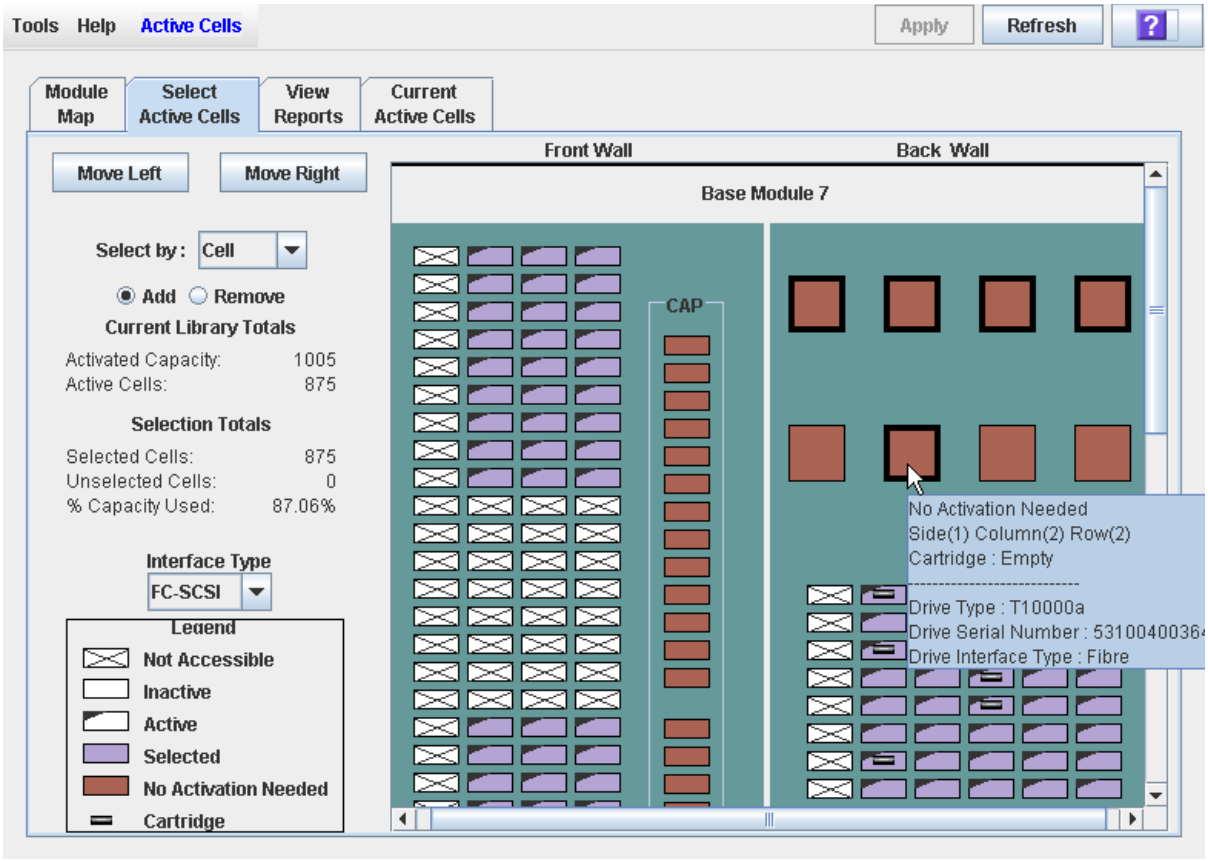
Click to display online help for the screen.

See Also

“Select Active Cells > Select Active Cells” on page 175

Select Active Cells > Select Active Cells

Sample Screen



Description

Note – If you want to use the default active storage region configuration defined by the library controller, you do not need to use this screen.

Enables you to define active library storage regions by selecting the storage cells you want to activate or deactivate for use. You can configure active storage cells so that cartridges are concentrated around the drives, and the ends of the library are left for future growth.

You can make any number of cells active, up to the total activated capacity of the library. Selected cells that cannot become active due to activated capacity limits will remain selected and will automatically become active whenever additional activated capacity is installed.

You can use any of the following methods to select storage cells (see "Library Map" on page 179 for detailed instructions):

- Select individual cells or groups of cells
- Select an entire column within a library module
- Select a side within a library module (front or back)
- Select an entire library module
- Select all cells within the library

Caution – Deactivating storage cells can result in orphaned cartridges and inaccessible data. See "Orphaned Cartridges in Non-Partitioned Libraries" on page 151 for details.

Note – You can select storage cells only. Installed CAPs and tape drives are always active.

Note – The **Select Active Cells** screen, and all associated popups, give you a dynamic workspace to design active storage regions. All active cell information is automatically saved to the storage r egion workspace in SL Console memory and retained for the duration of your SL Console session. This allows you to make modificati ons and leave and return to the **Select Active Cells** screens any number of times without losing your changes.

Caution – Information in the SL Console active storage region workspace is saved to the library controller database o nly through the **Apply** button. If your SL Console session ends or you refresh the workspace data before you have com mitted your updates through the **Apply** button, you will lose any active storage region changes you have made through the **Select Active Cells** screens and all associated popups.

Screen Access

This screen can be accessed by either of the following:

- Standalone SL Console
- Web-launched SL Console

Screen Fields

Select by

Required.

Indicates the method you want to use for selec ting storage cells to activate or deactivate. Options are:

- Cell: Select individual or rectangular groups of cells.
- Column: Select all cells within a column.
- Side: Select all cells within one side of a library module.
- Module: Select all cells within a library module.
- Library: Select all cells within the library.

Note – You must select either **Add** or **Remove**.

Add

Required.

Indicates you want to add cells to the active storage region. You can click only inactive cells on the library map.

Remove

Required.

Indicates you want to remove cells from the active storage region. You can only click active or selected cells on the library map.

Current Library Totals

Capacity

Display only.

Total activated storage capacity of the library.

Active Cells

Display only.

Total number of storage cells that have been made active. The number of active storage cells cannot be greater than the activated **Capacity** of the library.

Selection Totals

Selected Cells

Display only.

Total number of selected and active cells, which can be greater than the activated **Capacity** of the library.

Unselected Cells

Display only.

Total number of de-selected and inactive cells.

Note – Selected Cells + **Unselected Cells** = library physical capacity

% Capacity Used

Display only.

Percentage of total activated capacity that has been selected for use (cannot be greater than 100%). Calculated as:

Selected Cells / (activated) **Capacity**

Interface Type

Required.

Type of interface to be used for the library host connection. Options are:

- HLI
- FC-SCSI

The screen displays the value assigned previously. You can leave it as is or make changes.

Note – For additional details about modifying this field, see "Change the Library Interface Type (Non-Partitioned Libraries)" on page 371.

Legend

Legend for the library map. The state of each library resource (storage cell, tape drive, or CAP cell) is indicated as follows:

- Not Accessible (white and x-ed out): Resource is not accessible to any host. Possible reasons include:
  - Storage cells have been configured for diagnostic cartridges.
  - Drive bay has no installed drive.
  - CAP has been configured for storage, not CAP operations.
- Inactive (white): Storage cell is not selected.
  - If the cell also has a left corner turned over or "dog-eared," it is currently activated for use in the library controller database and you have selected this cell to be removed from the active storage region. The cell will be made inactive in the library controller database when you click the **Apply** button.
  - If the cell does not have a left corner turned over or "dog-eared," it is currently inactive in the library controller database. There will be no change to the cell's status in the library controller database when you click the **Apply** button.
- Active (turned over or "dog-eared" left corner): Indicates the status of the storage cell in the library controller database:
  - Cells with a turned over ("dog-eared") left corner are currently active.
  - Cells with turned over ("dog-eared") left corner are currently inactive.
- Selected (purple): Storage cell is selected. Cells can be selected automatically by the library controller or manually by the user.
  - If the cell also has a turned over ("dog-eared") left corner, it is currently activated for use in the library controller database. There will be no change to the cell's status in the library controller database when you click the **Apply** button.
  - If the cell does not have a turned over ("dog-eared") left corner, it is currently inactive in the library controller database and you have selected this cell to be added to the active storage region. When you click the **Apply** button, the cell will be made active in the library controller database, up to the total activated capacity of the library. Purple cells that cannot be activated due to activated capacity limits will remain purple and will be activated automatically whenever additional activated capacity is installed.
- No Activation Needed (brown). Resource cannot be selected on this screen because it is active by default; applies to all CAP cells and tape drives.
- Cartridge (cartridge icon). Resource contains a tape cartridge.
- Drive slots with installed drives are outlined with a thick border. Empty drive slots have a narrow border.

Library Map

Graphical representation of the current library configuration. Initial display for the current SL Console login session is from the library controller database. Then the display reflects your modifications. The display includes the following information:

- Type of module currently displayed (base module, drive expansion module, access expansion module, parking expansion module.)
- Numeric module ID (1–12)
- Location of all resources (storage cells, tape drives, CAP cells) within the library

  Note – Move the cursor over any resource to display a tooltip of detailed information about the cell or drive. The tooltip displays whether it is active in the library controller database, whether it is currently selected on the screen, and the identity of any resident cartridge.

Use the library map to modify the boundaries of the active storage capacity areas. Depending on whether you have clicked the **Add** or **Remove** radio button, cells you click will be selected or de-selected.

Depending on your choice in the **Select by** field, you can perform any of the following actions.

- Select by cell: Select individual or groups of resources. Active storage cells do not need to be adjacent to one another.
  - To select an individual storage cell, double-click it.
  - To select a rectangular group of storage cells, click the cell at one corner of the rectangle, and then click the cell diagonally opposite.
- Select by column: Select an entire column within the module. Columns of active cells do not need to be adjacent to one another. Click any storage cell within the column you want to select.
- Select by side: Select all storage cells within an entire module side. Active sides do not need to be adjacent to one another. Click any storage cell within the side you want to select.
- Select by module: Select all storage cells within a module. Active modules do not need to be adjacent to one another. Click any storage cell within the module you want to select.
- Select the library: Select all storage cells in the library. Click any storage cell in the library.

Buttons

Move Left

Click to display the library module directly to the left of the one currently displayed. This button is grayed out if there is no module to the left.

Move Right

Click to display the library module directly to the right of the one currently displayed. This button is grayed out if there is no module to the right.

Apply

Click to update the library controller database with the current settings from the screen. The **Confirm Apply** popup appears, indicating whether there are any orphaned cartridges or other errors in the active storage region configuration.

> **Note –** This button is grayed out if you have not made any changes to the **Select Active Cells** screen since the last update.

The status of the cells will be updated in the library controller database, as follows:

- White cells with a turned over ("dog-eared") left corner are made inactive.
- Purple cells without a turned over ("dog-eared") left corner are made active, up to the total activated capacity of the library. Purple cells that cannot be made active due to library activated capacity limits will remain purple and will automatically become active whenever additional activated capacity is installed.
- All other cells are left unchanged.

Refresh

Click to refresh the screen with current data from the library controller database. All unapplied active storage region changes you have made during this SL Console login session will be discarded. The **Cell Selection Refresh** popup appears, prompting you to confirm the refresh.

? (Help)

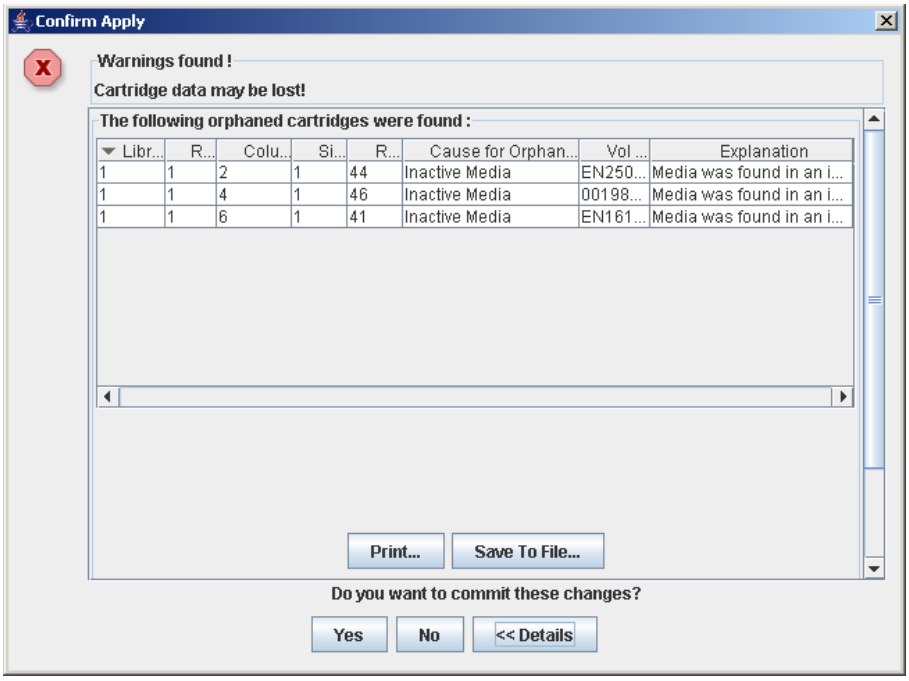
Click to display online help for the screen.

See Also

- "Select Active Cells > Module Map" on page 173
- "Select Active Cells > Select Active Cells—Confirm Apply" on page 181
- "Select Active Cells—Current Active Cells" on page 193

Select Active Cells > Select Active Cells—Confirm Apply

Sample Screen



Description

Displays a list of configuration errors in the defined active storage regions. This screen is a dialog box which appears when you click **Apply** on the Select Active Cells > Select Active Cells screen.

After viewing the error messages, you can commit all data from the **Select Active Cells** screen to the library controller database by clicking the **Yes** button.

> **Caution –** *Possible configuration conflicts.* Although changes to active capacity are not disruptive to library hosts, it is recommended that you make the library unavailable to other users before committing your active storage region changes. Because the SL Console does not validate storage region boundaries against the library controller database in real-time, configuration conflicts may arise if you change active storage region boundaries while other users are performing cartridge movements or library configuration changes. See "Synchronizing the Display With the Controller Database" for details.

Possible errors include:

- The library has orphaned cartridges. See "Planning for Partitioning" on page 206 for details.
- Storage cells have been removed from the library.

If any of these error conditions are present, the screen initially displays summary warning messages. You can view detailed messages by clicking the **Details** button.

It is recommended that you resolve all errors before committing the data to the library controller database.

Optionally, you can print the screen data or save it to a comma-separated file.

Screen Access

This screen can be accessed by either of the following:

- Standalone SL Console
- Web-launched SL Console

Screen Fields

Warnings found

Display only.

Summary error messages regarding the storage region configuration.

Module

Display only.

Module number where the orphaned cartridge is located.

Row

Display only.

Row number where the orphaned cartridge is located. Rows are numbered consecutively from the top down, with row 1 at the top.

Column

Display only.

Column number where the orphaned cartridge is located. Column location is referenced from the center of the drive bays. +1 is to the right of the drive bays; -1 is to the left.

Column

Display only.

Column number where the orphaned cartridge is located. Column location is referenced from the left edge of the Base Module. “+1” is to the right; “-1” is to the left.

Side

Display only.

Module side where the orphaned cartridge is located. “1” is the back wall; “2” is the front wall.

Row

Display only.

Row number where the orphaned cartridge is located. Rows are numbered consecutively from the top down, with row “1” at the top.

Cause for Orphaned State

Display only.

Reason why the cartridge has been identified as orphaned. Options include:

- Just Activated
- Inactive Media

Vol Ser

Display only.

Volume serial number (VOLID) of the orphaned cartridge.

Explanation

Display only.

Explanation of why the cartridge is orphaned.

Some possible options are:

- Media was found in an inactive cell.
- Inactive cell with media was just activated.

Buttons

> **Note –** To display the **Print** and **Save to File** buttons, you may need to scroll down within the inner window.

Print

Click to print the report on a selected printer.

Save to File

Click to save the report to a designated comma-separated text file (.csv extension). Comma-separated files can be opened by a variety of spreadsheet and database programs.

Yes

Click to confirm that you want to update the library controller database with the current settings from the **Select Active Cells**. The status of the cells are updated in the library controller database, as follows:

- White cells with a turned over (“dog-eared”) left corner are made inactive.
- Purple cells without a turned over (“dog-eared”) left corner are made active, up to the total activated capacity of the library. Purple cells that cannot be made active due to library activated capacity limits will remain purple and will automatically become active whenever additional activated capacity is installed.
- All other cells are left unchanged.

No

Click to cancel the update. The library controller database is not updated, but the current settings on the **Select Active Cells** are retained.

Details

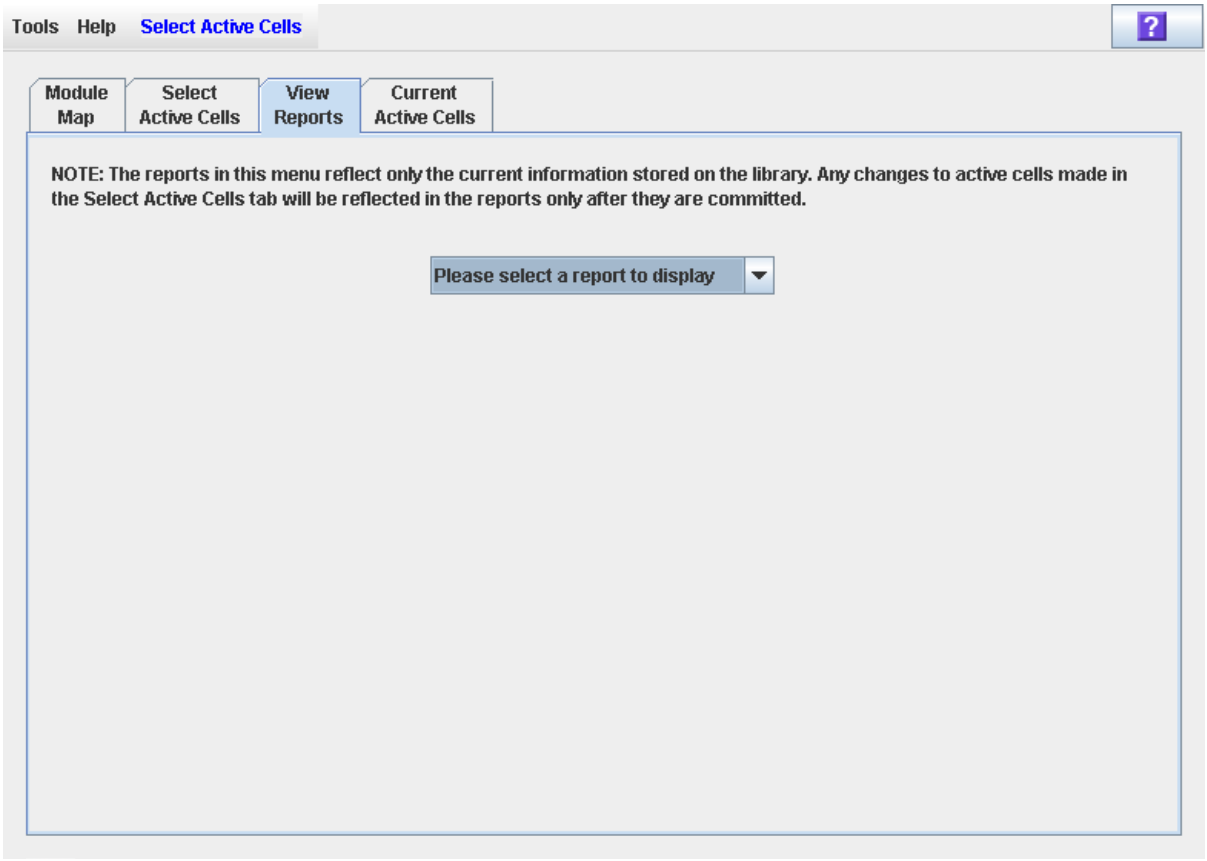
Click to toggle between the expanded and collapsed views of the warning message display.

See Also

- "Select Active Cells > Select Active Cells" on page 175

Select Active Cells—View Reports

Sample Screen



Description

Enables you to select one of the following active storage region reports:

- Cartridge Cell and Media Summary
- Orphaned Cartridge Report

> **Note –** The active storage region reports display data saved to the library controller database. If you have made changes to the active storage region configuration without commiting the changes through the **Apply** button, the data in these reports will differ from data shown on the **Select Active Cells** screen.

Screen Access

This screen can be accessed by either of the following:

- Standalone SL Console
- Web-launched SL Console

Screen Fields

Please select a report to display

Required.

Click the report you want to display. The list contains all available active storage region reports.

Buttons

Apply

Click to update the library controller database with the current settings from the screen. The **Confirm Apply** popup appears, indicating whether there are any orphaned cartridges or other errors in the active storage region configuration.

> **Note –** This button is grayed out if you have not made any changes to the **Select Active Cells** screen since the last update.

Refresh

Click to refresh the screen with current data from the library controller database. All unapplied active storage region changes you have made during this SL Console login session will be discarded. The **Cell Selection Refresh** popup appears, prompting you to confirm the refresh.

? (Help)

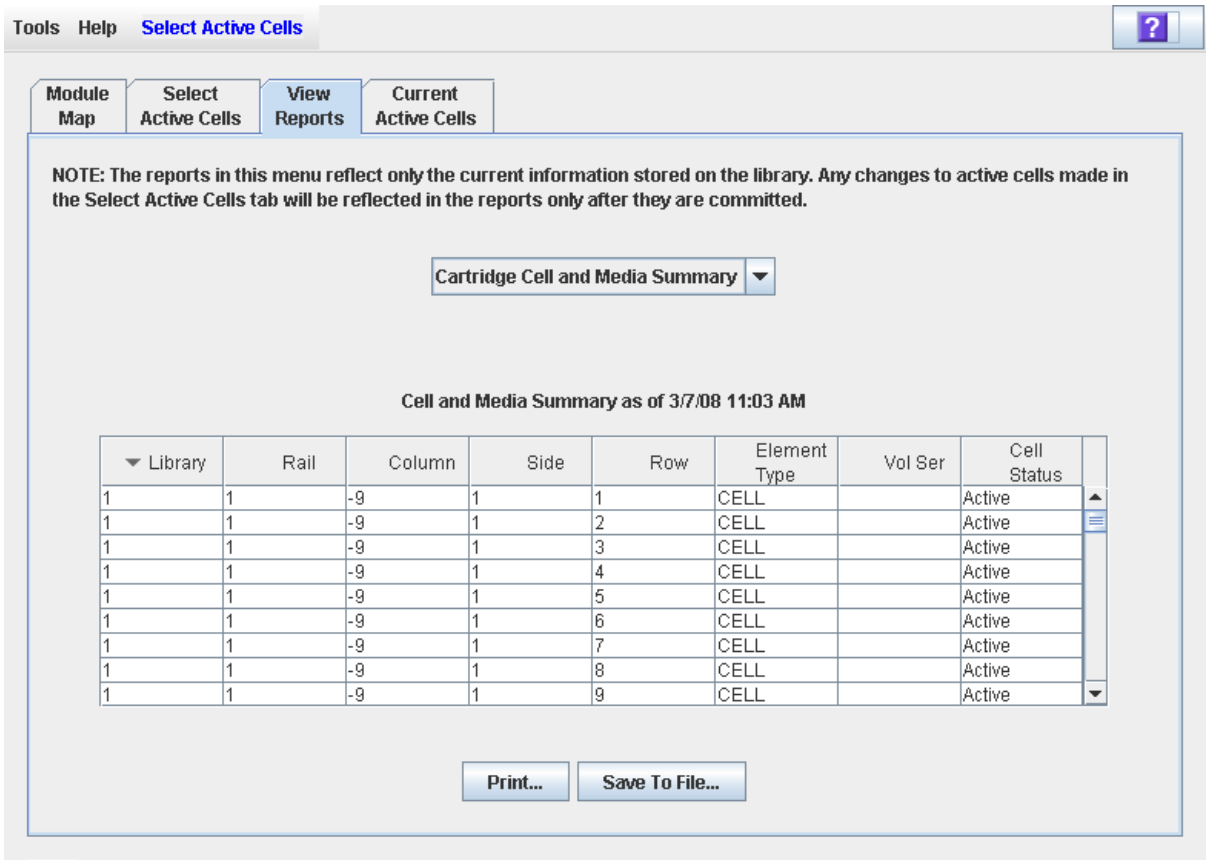
Click to display online help for the screen.

See Also

- “Select Active Cells > Select Active Cells” on page 175
- “Select Active Cells—View Reports—Cartridge Cell and Media Summary” on page 187
- “Select Active Cells—View Reports—Orphaned Cartridge Report” on page 190

Select Active Cells—View Reports—Cartridge Cell and Media Summary

Sample Screen



Description

Displays detailed information about all library resources (storage cells, tape drives, and CAP cells) and any stored cartridges.

> **Note –** The active storage region reports display data saved to the library controller database. If you have made changes to the active storage region configuration without commiting the changes to the library controller, the data in these reports will differ from data shown on **Select Active Cells** screen.

You can modify the layout and display of this screen. See "Modifying the Screen Layout" on page 62 for details.

Optionally, you can print the screen data or save it to a comma-separated file.

Screen Access

This screen can be accessed by either of the following:

- Standalone SL Console

- Web-launched SL Console

Screen Fields

Library

Display only.

Library number where the library resource is located. This is always “1.”

Rail

Display only.

Rail number where the library resource is located. This is always “1.”

Column

Display only.

Column number where the library resource is located. Column location is referenced from the left edge of the Base Module. “+1” is to the right; “-1” is to the left.

Side

Display only.

Module side where the library resource is lo cated. “1” is the back wall. “2” is the front wall.

Row

Display only.

Row number where the library resource is located. Rows are numbered consecutively from the top down, with row “1” at the top.

Element Type

Display only.

Type of library resource. Options are:

- CAP
- CELL
- DRIVE

Vol Ser

Display only.

Volume serial number (VOLID) of the cartridge resident in the library resource, if applicable.

Cell Status

Display only.

Capacity status of the library resource. Applies to storage cells only. Options are:

- Active: Cell is activated for use and can be used for cartridge storage.
- Inactive: Cell is not activated for use and cannot be used for cartridge storage.

Buttons

Print

Click to print the report on a selected printer .

Save to File

Click to save the report to a d esignated comma-separated text file (.csv extension). Comma-separated files can be opened by a variety of spreadsheet and database programs.

? (Help)

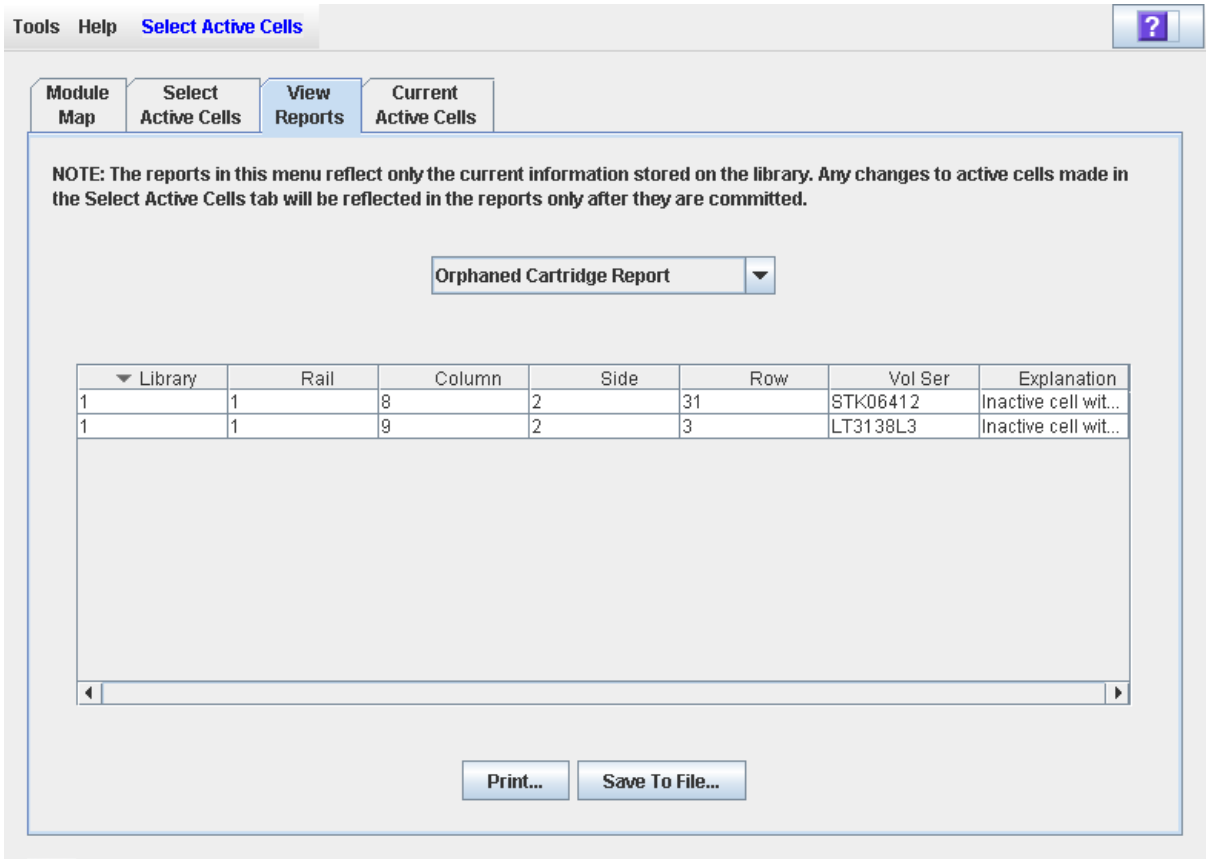
Click to display online help for the screen.

See Also

- “Select Active Cells—View Reports” on page 185
- “Select Active Cells—View Reports—Orphaned Cartridge Report” on page 190

Select Active Cells—View Reports—Orphaned Cartridge Report

Sample Screen



Description

Displays the locations and volume serial numbers (VOLIDs) of all orphaned cartridges in the library. Also identifies why the cartridge is orphaned.

> **Note –** The active storage region reports display data saved to the library controller database. If you have made changes to the active storage region configuration without commiting the changes to the library controller, the data in these reports will differ from data shown on **Select Active Cells** screen.

You can modify the layout and display of this screen. See "Modifying the Screen Layout" on page 62 for details.

Optionally, you can print the screen data or save it to a comma-separated file.

Screen Access

This screen can be accessed by either of the following:

- Standalone SL Console
- Web-launched SL Console

Screen Fields

Module

Display only.

Module number where the orphaned cartridge is located.

Row

Display only.

Row number where the orphaned cartridge is located. Rows are numbered consecutively from the top down, with row 1 at the top.

Column

Display only.

Column number where the orphaned cartridge is located. Column location is referenced from the center of the drive bays. +1 is to the right of the drive bays; -1 is to the left.

Column

Display only.

Column number where the orphaned cartridge is located. Column location is referenced from the left edge of the Base Module. “+1” is to the right; “-1” is to the left.

Side

Display only.

Module side where the orphaned cartridge is located. “1” is the back wall; “2” is the front wall.

Row

Display only.

Row number where the orphaned cartridge is located. Rows are numbered consecutively from the top down, with row “1” at the top.

Vol Ser

Display only.

Volume serial number (VOLID) of the orphaned cartridge.

Explanation

Display only.

Explanation of why the cartridge is orphaned.

Some possible options are:

- Media was found in an inactive cell.
- Inactive cell with media was just activated.

Buttons

Print

Click to print the report on a selected printer .

Save

Click to save the report to a d esignated comma-separated text file (.csv extension). Comma-separated files can be opened by a variety of spreadsheet and database programs.

? (Help)

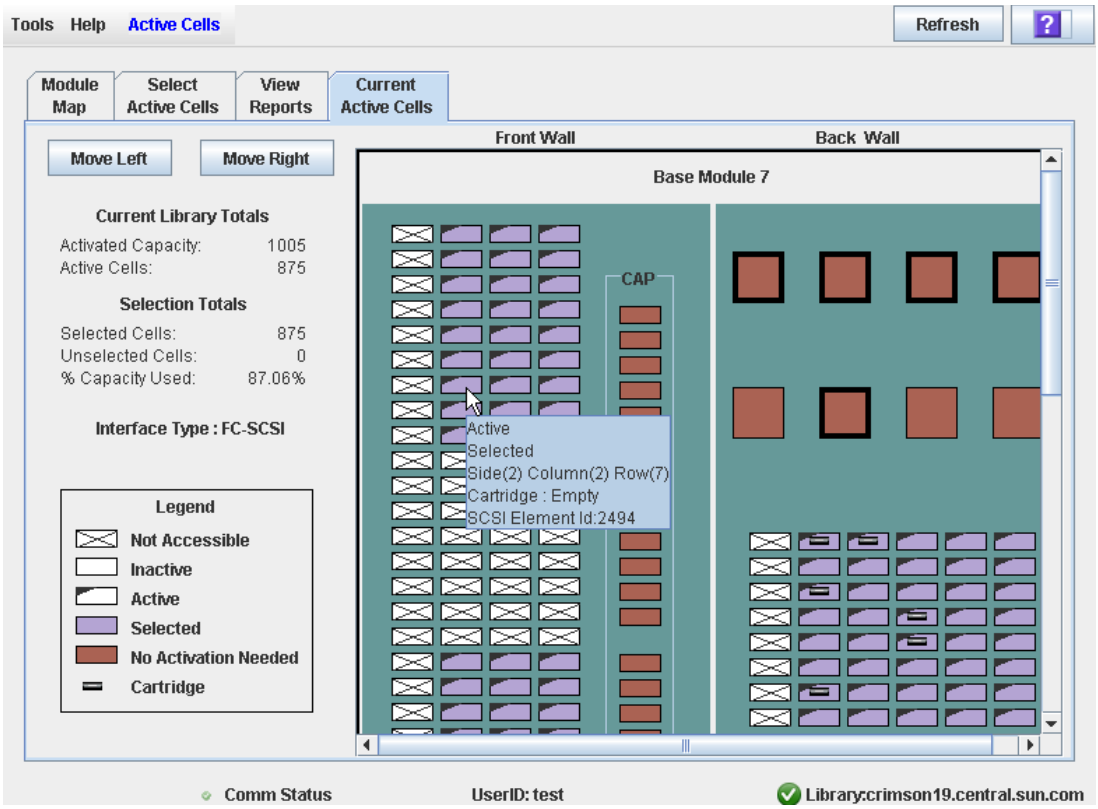
Click to display online help for the screen.

See Also

- “Select Active Cells—View Reports” on page 185
- “Select Active Cells—View Reports—Orphaned Cartridge Report” on page 190

Select Active Cells—Current Active Cells

Sample Screen



Description

Display-only screen. Displays current active library storage regions. Shows which storage cells are currently active, inactive, or selected for activation.

This is the only **Select Active Cells** screen that is available on the local operator panel.

Screen Access

This screen can be accessed by any of the following:

- Local operator panel
- Standalone SL Console
- Web-launched SL Console

Screen Fields

For detailed descriptions of the screen fields, see "Select Active Cells > Select Active Cells" on page 175.

Buttons

Refresh

Click to refresh the display with current data from the library controller database.

? (Help)

Click to display online help for the screen.

See Also

- “Select Active Cells > Select Active Cells” on page 175

5

Library Partitioning

> **Note –** Library partitioning must be installed through the SL3000 hardware activation utility. See "Hardware Activation Files" on page 111 for details.

By using library partitioning, you can assign logical groups of storage cells and tape drives of the SL3000 library for exclusive use by specified hosts. For example, you can configure one group of storage cells and drives to be used only for Symantec operations, and another group only for Tivoli operations. This enables you to configure an SL3000 library for applications running on multiple hosts and operating systems.

You can use the standalone SL Console or Web-launched SL Console to configure library partitions. The local operator panel cannot be used for partitioning. For host-partition connections, you configure partitions with the appropriate host software.

This chapter covers the following:

Benefits of Partitioning

By partitioning the SL3000 library, you can have:

- More than one operating system and application manage the library
- An improvement in the protection or isolation of files
- An increase in system and library performance
- A higher level of data organization
- An increase in user efficiency

Partitions can be customized to fit different requirements, for example:

- Allowing for special partitions to protect or archive data
- Enabling multiple organizations, companies, or departments access
- Isolating clients (such as for service centers)
- Separating different encryption key groups
- Dedicating partitions as test systems for new technologies or data migration to new tape drives

Partitioning Concepts and Features

This section applies to partitioning an SL3000 library and covers:

Allocation

Library resources (cells, drives, and CAPs) are allocated to a partition for exclusive use by that partition. Storage cells, CAPs, and tape drives allocated to a partition can be used only by the hosts assigned to that partition. See "Allocating Storage Cells and Drives to a Partition" on page 199 and "Rotational and AEM CAPs and Partitions" on page 199 for details.

Storage cells, CAPs, and drives not allocated to, reserved for or associated with any partition cannot be accessed by any hosts. For example, you might leave an area of cells unallocated, in preparation for future partitioning.

Partitions Available

You can configure up to eight partitions within an SL3000 library.

Smallest Partition Unit

A partition can be as small as a single storage cell or tape drive, or a whole rotational or AEM CAP. Cells and drives within a partition do not need to be adjacent.

Host Control of Partitions

Host-partition connections identify the hosts that are able to access a partition. Host-partition connections can use either the FC-SCSI or HLI (TCP/IP) interface.

Each partition appears to the host as a separate library. A host can control one or more partitions. In addition, it is possible for more than one host to control a single FC-SCSI partition, but it is recommended that you exercise caution in implementing this configuration, as some host applications may not allow for resource sharing.

Sharing the Entire Library

Up to eight hosts can share a single SL3000 library.

Control by HLI Hosts

An HLI (Host Library Interface) partition can have up to 16 assigned hosts. You define the HLI host-partition connection configuration through the library management software (ACSLS or ELS). Therefore there are no SL Console screens to display or maintain this information. See the appropriate tape management software documentation for details.

A single ACSLS server can manage multiple partitions in the same library. Each partition is configured as a separate ACS.

ELS hosts using a common control data set (CDS) database (called a “host group”) can share one partition. A single ELS CDS database can manage more than one partition within the same SL3000 library. Individual HSC hosts and groups of up to 16 ELS hosts that share a common control dataset can control a single partition.

Control by FC-SCSI Hosts

An FC-SCSI partition can have one or more host-partition connections. The host-partition connection configuration is user-defined and consists of the following information:

- World Wide Port Name of the FC-SCSI host bus adapter
- Logical unit number (LUN) of the host

See **“Add a Host Connection (FC-SCSI partitions only)” on page 220** for detailed instructions on defining this information.

Host Accessiblity to Resources

The host assigned to SL3000 library’s partition has full-time, exclusive access to all available storage resources allocated to that partition. The host “owns” all tape drives, storage slots, and cartridges in the partition, just as it would if these resources were located in a freestanding, unpartitioned library. A host has no access to the resources of partitions not assigned to it.

Sharing CAPs Between Hosts/Partitions

TallBots in the library are shared resources which you cannot assign exclusively to one partition. However, CAPs can be "owned" by a partition.

A host/partition can take ownership of a CAP in any of the following ways:

- The CAP is dedicated to one partition. In this case the partition always has exclusive ownership of the CAP. See "Dedicating a CAP" on page 198.
- A host application reserves the CAP prior to an enter or eject operation. This typically applies to HLI host applications only. See "CAP Reservations" on page 201 for details.
- The user explicitly associates the partition to the CAP. This applies to FC-SCSI CAPs only. See "FC-SCSI CAP Associations" on page 203 for details.

While a partition has ownership of a CAP, the CAP is reserved exclusively to that partition and unavailable to all others. The library sends "CAP opened" and "CAP closed" messages only to the host holding the reservation.

For HLI CAPs only, when a host attempts to reserve a CAP already reserved by another partition, the library sends a message to the requesting host identifying the partition ID and host ID holding the reservation.

Sharing a CAP

Partitions of the same interface type (FC-SCSI or HLI) can share CAPs. See "Sharing CAPs Between Hosts/Partitions" on page 198. FC-SCSI and HLI partitions cannot both share the same CAP. See "Allocating CAPs" on page 200.

Reserving a Shared CAP (HLI)

A CAP shared by HLI partitions must be reserved for use for enter or eject operations. The reservation gives the HLI partition exclusive use of a shared CAP for the duration of an enter or eject operation. See "Reserving CAPs" on page 200.

Manually Associating a CAP (FC-SCSI)

A CAP shared by FC-SCSI partitions must be manually associated for enter or eject operations. The association gives the FC-SCSI partition exclusive ownership of a shared CAP for the duration of an enter or eject operation. See "FC-SCSI CAP Associations" on page 203.

Dedicating a CAP

A CAP can be allocated for exclusive use by (or dedicated to) only one partition. See "Allocating CAPs" on page 200 for details.

Non-Disruptive Partitioning

With the non-disruptive partitioning (NDP) feature, there is minimal host disruption whenever resources are allocated to a partition, and changes made to one partition do not impact other partitions or their host connections. See "Non-Disruptive Partitioning" on page 203 for details.

Allocating Storage Cells and Drives to a Partition

After resources (storage cells, tape drives, and cartridges) are allocated to a partition, only host connections that are also assigned to the partition can access the partition's resources. For example, if a group of tape drives is allocated to a partition, only the hosts assigned to that partition can use those drives.

Storage cells and drives that are not allocated to any partition cannot be accessed at all. For example, you can leave an area of cells unallocated in preparation for a planned future partition.

On the SL Console screens and reports, storage cells and drives appear in one of the following states:

- Allocated: Assigned to the current partition.
- Unallocated (or Unassigned): Not assigned to any partition, therefore, available to be assigned to a partition.
- Unavailable: Assigned to another partition.
- Not accessible: Not available for host operations. For example, cells reserved for diagnostic cartridges, cells that are physically blocked, and cells that are inactive. No host can access storage cells, cartridges, and drives not allocated to any partition.

  Note – TallBots are shared resources and cannot be allocated exclusively to a partition.

To display partition assignments for storage cells and drives, see "Partitions—Reports—Cartridge Cell and Media Summary" on page 319.

Rotational and AEM CAPs and Partitions

Note – AEM CAPs are subject to the same partitioning rules and restrictions as rotational CAPs. Throughout this section, the term "CAP" refers to both types of CAPs.

Note – The SL3000 does not support common CAPs, split CAPs, or the allocation of individual CAP cells to a partition.

When configuring CAPs, you must plan carefully for anticipated CAP usage. A partition can only use the CAPs explicitly allocated to it. There is no "common" CAP (a feature of the SL500 library) in the SL3000.

When you allocate a CAP to a partition, all cells in the CAP are allocated as a whole. It is not possible to allocate or de-allocate individual cells within a CAP. There is no "split" CAP (a feature of the SL500 library) in the SL3000.

Shared CAPs

Because a library can have more partitions than CAPs, it may be necessary to share CAPs among partitions. Only partitions with the same host interface type can share a CAP. For example, any number of FC-SCSI partitions can share a group of one or more CAPs, and any number of HLI partitions can share a different group of CAPs, but HLI and FC-SCSI partitions cannot both share any of the same CAPs.

A partition can have only dedicated CAPs or shared CAPs. For example, it is not possible for a partition to have a dedicated CAP while sharing another CAP. Both CAPs must be either dedicated or shared.

> **Note –** You must carefully manage shared CAP usage among FC-SCSI hosts to avoid contention. See "FC-SCSI CAP Associations" on page 203 for details.

Allocating CAPs

All CAPs in a partitioned library are unallocated by default. You allocate CAPs to partitions through the following screens:

- "Partitions—Design (Step 3b)" on page 294 for Base, Drive, and CEM modules
- "Partitions—Design (Step 3b) – AEMs Only" on page 300 for AEM modules

CAP allocations can take either of the following forms:

- Dedicated: The CAP is allocated for the exclusive use of one partition.
- Shared: The CAP is allocated for the use of more than one specified partition. See "Reserving CAPs" on page 200 for details.

Once a CAP is allocated, it becomes either an FC-SCSI CAP or an HLI CAP, depending on the host interface type of the first partition to which it is allocated. For example, if you allocate a previously unallocated CAP to a partition with an FC-SCSI interface, the CAP becomes an FC-SCSI CAP. Subsequent allocations of the CAP can be to other FC-SCSI partitions only. To change the CAP from FC-SCSI to HLI, you must first de-allocate the CAP from all FC-SCSI partitions, and then allocate the CAP to an HLI partition.

> **Note –** CAP allocations are not required. It is possible to have partitions with no allocated CAP.

> **Note –** Because FC-SCSI host applications typically do not use CAP reservations, it is recommended that you dedicate at least one CAP to each FC-SCSI partition whenever possible. This enables each partition to operate independently from the others and enables you to avoid the resource contention issues that can arise through shared CAPs. See "FC-SCSI CAP Associations" on page 203 for details.

Reserving CAPs

A rotational or AEM CAP is a shared library resource, meaning it can be used by all partitions in the library. A CAP can be used by only one partition at a time, however. While a partition is using a CAP for enters or ejects, the CAP is reserved to that partition and unavailable to all others.

In order for a partition to reserve a rotational CAP, all of the following conditions must be met:

- The CAP must be available, that is, not reserved by any other partition.
- The CAP must be empty.
- The CAP must be closed and locked.

CAP Auto Enter Mode

CAP auto enter mode enables a library operator to open a CAP and initiate an enter operation without issuing an explicit enter request and without an explicit reservation from a host application. Auto enter mode is available for CAPs that have been dedicated to a partition. CAPs in auto enter mode are left unlocked.

Auto enter mode is managed by the host applications. See the appropriate tape management software documentation for details.

CAP States

A CAP must be unlocked in order for you to open it to insert or remove cartridges. When a CAP is unlocked, the light on the CAP button is turned on.

When you close a CAP, the TallBot performs an audit to determine whether there are cartridges present. During the audit the CAP is locked and the light on the CAP button is turned off. Once the audit is completed, the CAP is returned to its default state.

The following TABLE 5-1 describes the default states of the various types of CAPs within a partitioned library.

TABLE 5-1 Default States of CAPs Within a Partitioned Library

Type of CAP	Default State	Default CAP Button Light Condition	Comment
HLI: Dedicated or shared	Locked	Off	Host reservation unlocks the CAP and turns the light on. See "CAP Reservations" on page 201 for details.
HLI: Auto enter mode	Unlocked	On	
FC-SCSI: Dedicated	Unlocked	On	
FC-SCSI: Shared	Locked	Off	Partition-CAP association unlocks the CAP and turns the light on. See "FC-SCSI CAP Associations" on page 203 for details.

CAP Reservations

Both FC-SCSI and HLI hosts can make use of CAP reservations. CAP reservations give a partition exclusive ownership of a shared CAP for the duration of an enter or eject operation. When the operation is finished, the host application must release the reservation to make the CAP available to other partitions sharing the CAP. No other partitions can access the CAP until the first one has terminated the operation and released the reservation.

For a partition to reserve a CAP, the CAP must be unreserved (applies to shared CAPs only), empty, and closed.

HLI CAP Reservations

HLI host applications use a strict reservation scheme to manage CAP usage among host clients, and therefore always reserve a CAP before unlocking it or moving a cartridge to it. When an HLI host application attempts to reserve a CAP already reserved by another partition, the library controller sends a message to the requesting host identifying the partition ID and host ID holding the reservation.

Releasing CAP Reservations

In normal operations, a CAP reservation for an ACSLS or ELS host is released in the following ways:

- Enter operations: After all cartridges have been successfully entered into the library, the host explicitly terminates the enter command. The library controller releases the CAP after verifying that the CAP is closed and empty.
- Eject operations: After all cartridges have been successfully ejected, the host automatically terminates the eject operation. The library controller releases the CAP after verifying that the CAP is closed and empty.

If for some reason a CAP reservation is not released as described above, the CAP will be unavailable to all other partitions, and cartridges belonging to the first partition may remain in the CAP. In this case, it is recommended that you terminate the enter or eject from the host holding the reservation. This ensures a normal release of the CAP reservation.

> **Note –** See the ACSLS or ELS documentation for details about terminating enters and ejects.

Overriding CAP Reservations

In some cases, you may not be able to access the host holding a reservation and therefore cannot perform a normal release of the CAP. This may be because the host has terminated or because you lack physical access or security authorization to issue commands to the host. In these cases, you can override (unreserve) the CAP reservation manually. See "Override a CAP Reservation" on page 265 for the detailed procedure.

> **Note –** Use extreme care when using the SL Console to override a CAP reservation. If you do not complete the procedure, the CAP could be left unavailable to all partitions, and/or cartridges assigned to one partition could be entered into another partition.

> **Note –** You can use the SL Console to override a CAP reservation only in a partitioned library. If a library is not partitioned, CAP reservations must always be released through ACSLS or ELS.

FC-SCSI CAP Reservations

Most FC-SCSI host applications do not use CAP reservations. FC-SCSI host applications typically assume sole ownership of a CAP and therefore do not coordinate CAP sharing well. To avoid contention among partitions for a shared CAP, you must manually associate a partition to a CAP. See "FC-SCSI CAP Associations" on page 203 for details.

FC-SCSI CAP Associations

If a FC-SCSI partition shares CAPs with other partitions, you must manually associate the partition to its CAPs prior to initiating an enter or eject operation. See "Associate an FC-SCSI Partition to Its Shared CAPs" on page 258 for the detailed procedure.

A partition-CAP association gives a partition exclusive ownership of its shared CAPs, similar to a CAP reservation. This ensures that cartridges are always entered into the correct partition and prevents other partitions from taking ownership of a shared CAP that is already in use.

The following rules apply when making partition-CAP associations:

- You can associate only one partition at a time to a CAP.
- Selecting a partition causes all its allocated CAPs to be associated to it at once. You cannot select individual CAPs to be associated to the partition.
- Partition-CAP associations remain active until you explicitly remove them. The associations are not automatically removed when the enter or eject operation completes.
- Partition-CAP associations are removed during library reboots, power cycles, library door open/close operations, or CAP initializations
- Partition-CAP associations are removed if the CAP becomes allocated to a different partition through the **Design (Step 3b)** screen.

If a partition-CAP association is removed while the CAP is open or has cartridges in it, the CAP ownership will be changed to the "default" requester (the library controller), and the CAP will be unavailable to all partitions. You must empty and close the CAP before it can be associated to any partitions.

Non-Disruptive Partitioning

The non-disruptive partitioning (NDP) feature minimizes the number of host interruptions that occur when partitions are modified. The library does not need to be taken offline for every partition change, and hosts are insulated from partition changes that do not affect them directly.

Prior to this feature, whenever a partition was changed in any way, all partitions would go offline while the library controller database was updated. As a result, library outages needed to be coordinated across all hosts connected to a partitioned library.

The specific functions of the NDP feature vary, depending on the type of host-partition connection. For details, see the following sections:

- "NDP and HLI Partitions" on page 204
- "NDP and FC-SCSI Partitions" on page 204

> **Caution –** Although partition changes are not disruptive to library hosts, it is recommended that you make the library unavailable to other users before committing your partition workspace changes. Because the SL Console does not validate partition boundaries against the library controller database in real-time, configuration conflicts may arise if you change partition boundaries while other users are performing cartridge movements or library configuration changes. See "Synchronizing the Display With the Controller Database" on page 63 for details.

NDP and HLI Partitions

With HLI partitions, you can allocate additional resources to a partition without stopping host jobs or having the partition go offline. In general, a partition goes offline only when resources are de-allocated. In all cases, neighboring partitions are always left undisturbed.

Allocating Additional Resources to a Partition

Whenever you make any of the following types of partition changes, the affected partition stays online:

- Allocate a storage cell
- Allocate a drive
- Allocate a CAP

The library controller sends an asynchronous message to all hosts connected to the partition that the library configuration has changed. The hosts experience a brief interruption as they update their library configuration information, and then they automatically continue processing jobs.

Removing Allocations from a Partition

Whenever you make any of the following types of partition changes, the affected partition goes offline briefly:

- De-allocate a storage cell
- De-allocate a drive
- Remove an empty drive slot

After the configuration change updates in the library controller database, the partition automatically comes back online and the library controller notifies all hosts connected to the partition that a configuration change has occurred. The hosts experience a brief interruption as they update their library configuration information, and then they automatically continue processing jobs.

NDP and FC-SCSI Partitions

All changes to an FC-SCSI partition cause the affected partition to go offline with a Unit Attention condition. Neighboring partitions and their connected hosts are not disturbed.

Host Connection Changes

Host connection changes include the following activities:

- Add a host-partition connection
- Change the LUN for a host-partition connection
- Delete a host-partition connection

Whenever you change a host LUN or add a LUN connection mapping for a host, the affected partition goes offline with a LUNS Data Has Changed Unit Attention condition. The hosts connected to the partition must issue the appropriate commands to update their library configuration information. See the appropriate tape management software documentation for detailed procedures and commands.

If a host has unique ITL nexus connection mappings for each partition connection, then only the partition experiencing the connection change is affected.

Partition Configuration Changes

Partition configuration changes include the following activities:

- Allocate a storage cell
- Allocate a drive
- De-allocate a storage cell
- De-allocate a drive
- De-allocate a CAP

Whenever you make any of these changes, the affected partition goes offline with a Mode Parameters Have Changed Unit Attention condition. The hosts connected to the partition must issue the appropriate commands to update their library configuration information. See the appropriate tape management software documentation for detailed procedures and commands. In the case of adding or removing drives, the device SCSI numbering updates as well.

Orphaned Cartridges in Partitioned Libraries

Note – For a discussion of orphaned cartridges in non-partitioned libraries, see "Planning for Partitioning" on page 206.

In partitioned libraries, an orphaned cartridge is a cartridge located in an unallocated cell or drive (that is, a cell or drive not allocated to any defined partition).

Caution – If a host encounters an orphaned cartridge it might treat the cartridge as scratch and overwrite the data. Therefore, it is very important to disposition orphaned cartridges properly.

A cartridge can become orphaned for a variety of reasons, including:

- Partition boundaries have changed.
- A partition has been deleted.
- The cartridge has been moved to an unallocated or inaccessible cell through manual intervention.

If the SL Console identifies an orphaned cartridge, it displays a warning message. You can then place the cartridge in the correct partition with a recovery move. For detailed instructions on checking for and resolving orphaned cartridges, see the following:

- "Verify Partition Configurations" on page 226
- "Resolve Orphaned Cartridges" on page 230
- "Commit Partition Configuration Changes" on page 231

Planning for Partitioning

Library partitioning requires:

- A thorough knowledge of library wall and slot mapping
- Expertise in configuring and administering host software applications
- Clear communication among all parties involved, including system programmers and administrators, library operators, and your Oracle service representative
- Verification that all tape drives and cartridges have been moved to the proper locations, according to the planned assignments

Plan the storage area needed for resident tape cartridges, and anticipate the number of required free cells. Understand the boundaries of each partition you want to create and the host assignments to those partitions.

Allocated Storage Capacity

In partitioned libraries:

- The total number of storage cells allocated to all library partitions cannot exceed the activated capacity of the library.

Note that the total number of storage cells allocated to all library partitions cannot exceed the acapacity of the library.

When assigning cartridges to storage cells, the library controller applies the predefined cell selection rules separately to each partition. See “Cell Activation Rules” on page 151 for details.

Partition Configurations

You must use the standalone SL Console or Web-launched SL Console to configure library partitions. The partitioning screens are not available on the local operator panel.

To configure a partition, you must define the following:

- “Partition Summary Information” on page 206
- “Host-Partition Connections” on page 207
- “Partition Boundaries” on page 207

For detailed instructions on defining library partitions, see “Partition Process Overview” on page 213.

Partition Summary Information

Partition summary information includes the partition ID, optional name, and host-partition connection type (HLI or FC-SCSI). Partition IDs must be unique and can range from 1–8.

Host-Partition Connections

Host-partition connections identify the hosts that are able to access a partition. Each partition appears to the host as a separate library. A host can control one or more partitions. In addition, it is possible for more than one host to control a single FC-SCSI partition, but it is recommended that you exercise caution in implementing this configuration, as some host applications may not allow for resource sharing.

HLI Host-Partition Connections

An HLI (Host Library Interface) partition can have up to 16 assigned hosts. You define the HLI host-partition connection configuration through the library management software (ACSLS or ELS). Therefore there are no SL Console screens to display or maintain this information. See the appropriate tape management software documentation for details.

FC-SCSI Host-Partition Connections

An FC-SCSI partition can have one or more host-partition connections. The host-partition connection configuration is user-defined and consists of the following information:

- World Wide Port Name of the FC-SCSI host bus adapter
- Logical unit number (LUN) of the partition as seen from the host.

See "Add a Host Connection (FC-SCSI partitions only)" on page 220 for detailed instructions on defining this information.

Partition Boundaries

Partition boundaries identify the storage cells, drives, and rotational and AEM CAPs that are part of each partition. Only unallocated cells can be added to a partition, and only allocated cells can be removed.

You can define partition boundaries in any of the following ways:

- Select individual cells or rectangular groups of cells to add or remove from a partition. Cells or cell groups do not have to be contiguous.
- Select a module column to add or remove from a partition. Columns do not have to be contiguous.
- Select an entire module side (front or back) to add or remove from a partition. Sides do not have to be contiguous.
- Select an entire module to add or remove from a partition. Modules do not have to be contiguous.

Note – It is possible to have partitions with no allocated resources.

Preparing the Library for Partitioning

Before you can partition a library, you must install, activate, and enable the partitioning feature.

The following special considerations apply after you successfully install the partitioning feature on a previously non-partitioned library.

- You can begin creating partitions immediately, without rebooting the library first.
- Until you create at least one partition, the library remains in a non-partitioned state. That is, all activated storage cells, drives, and rotational and AEM CAPs are accessible to all hosts.

Enabling and Disabling the Partitioning Feature

The partition feature can be installed and enabled through the "Hardware Activation File Installation Process" on page 113.

A library with partitioning enabled can be in either of the following states:

- Partitioned: The library has at least one user-defined partition with a valid partition ID.
- Non-partitioned: The library has no user-defined partitions. A non-partitioned library behaves in the same manner as a library that does not have partitioning enabled. That is all active storage cells, drives, and rotational and AEM CAPs are accessible to all hosts.

To disable partitioning on a library, you must first delete all partitions. The library state will then change to "non-partitioned."

Deleting the Partitioning Feature

You can delete the partitioning feature by deleting the partitioning hardware activation file from the library. See "Delete a Hardware Activation File" on page 128 for detailed instructions. You must reboot the library after deleting the partitioning activation file for the deletion to take effect.

> **Note –** Deleting the partitioning feature is an exceptional situation. Be sure this is what you want to do. The partitioning feature cannot be deleted if it was activated by a legacy hardware activation file prior to SL3000 firmware version FRS_3.0.

Deleting the partitioning feature has the following effects on the library configuration:

- Changes the library state to "non-partitioned."
- Makes all activated storage cells, drives, and CAPs accessible to hosts.
- All existing partition summary information and resource allocations are retained, but not usable. If the partitioning activation file is later re-installed, the partition allocations are restored.

Library Resource Addresses

Resource addresses uniquely identify each resource (storage cells, drives, and rotational and AEM CAPs) within the library. The SL3000 library and attached hosts use the following addressing schemes:

- "Library Internal Address" on page 209
- "Host SCSI Element Address" on page 209
- "HLI-PRC Address" on page 211

Each partition appears to a host as a separate library. This is reflected in the partition address. For additional details about library resource addressing, see "Library Resource Addresses" on page 601.

Library Internal Address

The library internal address is used by the SL3000 library controller and the SL Console device tree to identify the physical location of each resource. The addressing scheme used by the SL3000 is a five-digit, comma-separated value, specifying the library, rail, column, side, and row, as viewed from the front of the library, facing the drive bays.

The format of the SL3000 library internal address is *l*,*r*,*c*,*s*,*w* where:

- *l* = library or partition number. This value is always "1."
- *r* = rail number. This value is always "1."
- *c* = column number. Column numbering is referenced from the left edge of the bass module, as you face the inside back wall, as follows:
  - Numbering is static, enableing modules to be added without renumbering existing columns.
  - Columns within and to the right of the bass module are numbered positively (+), in ascending sequence from left to right.
  - Columns to the left of the bass module are numbered negatively (-), in descending sequence from right to left.
  - Base module panels are always "1" to "6."
  - DEM panels (if present) are always "-1" to "-6."
  - If there is no DEM and a CEM is to the left of the bass module, then columns "-1" to "-6" are skipped and the CEM is assigned columns "-7" to "-12."
  - CEM columns to the right of the bass module start with "7."
  - Left AEM columns are always numbered "–33" to "–31." Right AEM columns are always "31" to "33." In other words, AEM columns are numbered as if a DEM and four CEMS are installed to the left, and four CEMs are installed to the right, of the bass module.
- *s* = side. Back wall = "1," front wall = "2."
- *w* = row number. Numbered consecutively from the top, down. Valid values are "1" to "52," with row "1" at the top.

Host SCSI Element Address

SCSI element addresses are used by hosts with a FC-SCSI connection to the SL3000 library. Each library resource available to a host is identified by a unique SCSI element address.

Following are rules for SCSI element numbering within partitioned libraries:

- Each SCSI element address is a single integer, up to four digits in length.
- SCSI element addresses for each library resource type fall within a distinctive range: 10-999 for CAPs, 1000-1999 for drives, and 2000+ for storage cells.
- SCSI element numbering restarts for each partition. For example, storage cell numbering starts with 2000 for each partition within a given library.
- Numbering starts at the upper-left back of the library, as viewed from the front of the library. Numbering continues to the lower-right front by frame module.
- SCSI element addresses for a partition start at the lowest module, row, and column within the partition, then proceed by row until the end of the column, then increment by column until the end of the module.
- SCSI element numbering is continuous within each partition, even if cell locations for the partition are not adjacent.
- When additional resources are allocated to an existing FC-SCSI partition, the original resources are not renumbered. This helps to minimize disruption to the FC-SCSI host.
- Drive element numbering includes occupied drive slots only. Empty drive slots are not assigned a SCSI element address.

For example, if a library's base and storage expansion modules are allocated to Partition 1 and the Drive Module is allocated to Partition 2, then SCSI element numbering is as follows:

- For Partition 1, the first available storage cell in the base module is assigned element address "2000." Numbering continues sequentially through the last available cell in the storage module, running from top-left through bottom-right. Installed drives in the base module are assigned sequential element addresses, starting with "1000" for the top left drive.
- For Partition 2, the first available storage cell in the Drive Module is assigned element address "2000." Numbering continues sequentially through the last available cell in the Drive Module, running from top-left through bottom-right. Installed drives in the Drives Module are assigned sequential element addresses, starting with "1000" for the top left drive.

SCSI Element Address Examples

A library's Base and storage expansion modules are allocated to Partition 1, and the Drive Module is allocated to Partition 2. SCSI element numbering is as follows:

- For Partition 1, the first available storage cell in the base module is assigned element address "2000." Numbering continues sequentially through the last available cell in the storage module, running from top-left through bottom-right. Installed drives in the Base Module are assigned sequential element addresses, starting with "1000" for the top left drive.
- For Partition 2, the first available storage cell in the drive module is assigned element address "2000." Numbering continues sequentially through the last available cell in the Drive Module, running from top-left through bottom-right. Installed drives in the Drives Module are assigned sequential element addresses, starting with "1000" for the top left drive.

HLI-PRC Address

The HLI-PRC (Host Library Interface-Panel, Row, Column) address is used by hosts with an HLI connection to the SL3000 library, including ACSLS and ELS. The HLI-PRC address uniquely identifies each library resource accessible to the host and is assigned by the host software.

The HLI-PRC address is an eight-digit value specifying the library, panel, row, and column where the resource is located. The format is *ll*:*pp*:*rr*:*cc*, where:

- *ll* = Library number. This value is always "00."
- *pp* = Panel number. Numbering is relative to the Base Module, as follows:
  - Base Module panels are always "12" and "13."
  - Modules to the left of the Base Module are numbered in descending sequence, starting with "11." Modules to the right are numbered in ascending sequence, starting with "14."
  - Rear walls are assigned even numbers. Front walls are assigned odd numbers.
  - DEM panels (if present) are always "10" and "11."
  - If there is no DEM and a CEM is to the left of the Base Module, then panels "10" and "11" are skipped and the CEM is assigned panels "8" and "9." This enables you to add a DEM to the left of the Base Module at a later date without renumbering modules.
  - For AEM panel numbering, see "HLI CAP Numbering: Rotational and AEM CAPs" on page 211.
- *rr* = Row number within the panel. Numbered consecutively from the top, down. Valid values are 0–51, with row 0 at the top.
- *cc* = Column number within the panel. Numbered consecutively from left to right, starting at the front of the module. Each panel has a maximum of six columns. Therefore, valid column values are 0–5.

HLI CAP Numbering: Rotational and AEM CAPs

> **Note –** ELS displays HLI-PRC addresses in hexadecimal notation. Therefore, panels 10, 11, and 12 are displayed as "0A," "0B," and "0C" respectively. ACSLS and the SL Console display HLI-PRC addresses in decimal notation.

Library CAP numbers are assigned by module, from left to right:

- Base Module CAP = 6
- DEM CAP = 5
- Rotational CAPs in CEMs to the left of the Base Module = 1–4
- Rotational CAPs in CEMs to the right of the Base Module = 7–10
- AEM CAP to the left of the Base Module = 0
- AEM CAP to the right of the Base Module = 11

Rotational CAPs contain a single column of cells with 26 rows. Cells are numbered 0–25.

The AEM contains a bulk load CAP with 234 cells arranged in six colu mns. Column numbering starts at the rear wall and runs left to right (columns 0–2). Then proceeds to the front wall and runs left to right (columns 3–5).

Partition Process Overview

> **Note –** Library partitioning must be installed through the SL3000 hardware activation utility. See "Oracle Hardware Activation Files" on page 111 for details.

The high level process for creating a partition for the first time is explained below.

1. Review summary instructions for the partition configuration process at the **Instructions (Step 1)** tab. See "Review Partitioning Instructions" on page 217.
2. At the **Summary (Step 2)** tab, add a partition by:
   - Assigning the partition a partition ID
   - Giving the partition a name (optional)
   - Designating the type of interface the host will have to the partition

   See "Add a Partition" on page 218 and "Add a Host Connection (FC-SCSI partitions only)" on page 220.
3. Design the partition:
   - At the **Module Map (Step 3a)** tab, choose the module where you want the partition.
   - At the **Design (Step 3b)** tab, allocate library resources to the partition and verify the partition assignments.

     > **Note –** The partition you have just designed is not applied to the library until you commit the configuration in Step 4.

   See "Design a Partition: Base, DEM, or CEM Module" on page 222 or "Design a Partition: AEM Module" on page 224 and "Verify Partition Configurations" on page 226.
4. At the **Commit (Step 4) tab**, commit the partition to the library.

   See "Commit Partition Configuration Changes" on page 231.
5. At the **Current Partition Definitions** tab, review the changes you have made.

SL Console Partition Workspace

The partition **Summary (Step 2)** and **Design (Step 3b)** screens, and all associated dialog boxes, give you a dynamic workspace to design your library partitions. All partition configuration information is automatically saved to the partition workspace in SL Console memory and retained for the duration of your SL Console session. This enables you to switch among partition views and leave and return to the partition screens any number of times without losing your configuration changes.

Information in the SL Console partition workspace is committed to the library controller database only through the **Commit (Step 4)** screen. The information is lost if any one of the following occurs before you have committed your updates:

- You actively log off the SL Console session.
- The SL Console session times out or the connection to the library is lost.
- You actively refresh the SL Console work space from the current library controller database. This is done through the **Refresh** button on the **Summary (Step 2)** and **Design (Step 3b)** screens.

Caution – Although partition changes are not disruptive to library hosts, it is recommended that you make the library unavailable to other users before committing your partition workspace changes. Because the SL Console does not validate partition boundaries against the library controller database in real-time, configuration conflicts may arise if you change partition boundaries while other users are performing cartridge movements or library configuration changes. See "Synchronizing the Display With the Controller Database" on page 63 for details.

▼ Partitioning Task Categories

Partitioning tasks are divided into the following categories:

Partition Configuration Tasks

▼ Review Partitioning Instructions

Task Tool

This procedure can be performed at either of the following:

- Standalone SL Console
- Web-launched SL Console

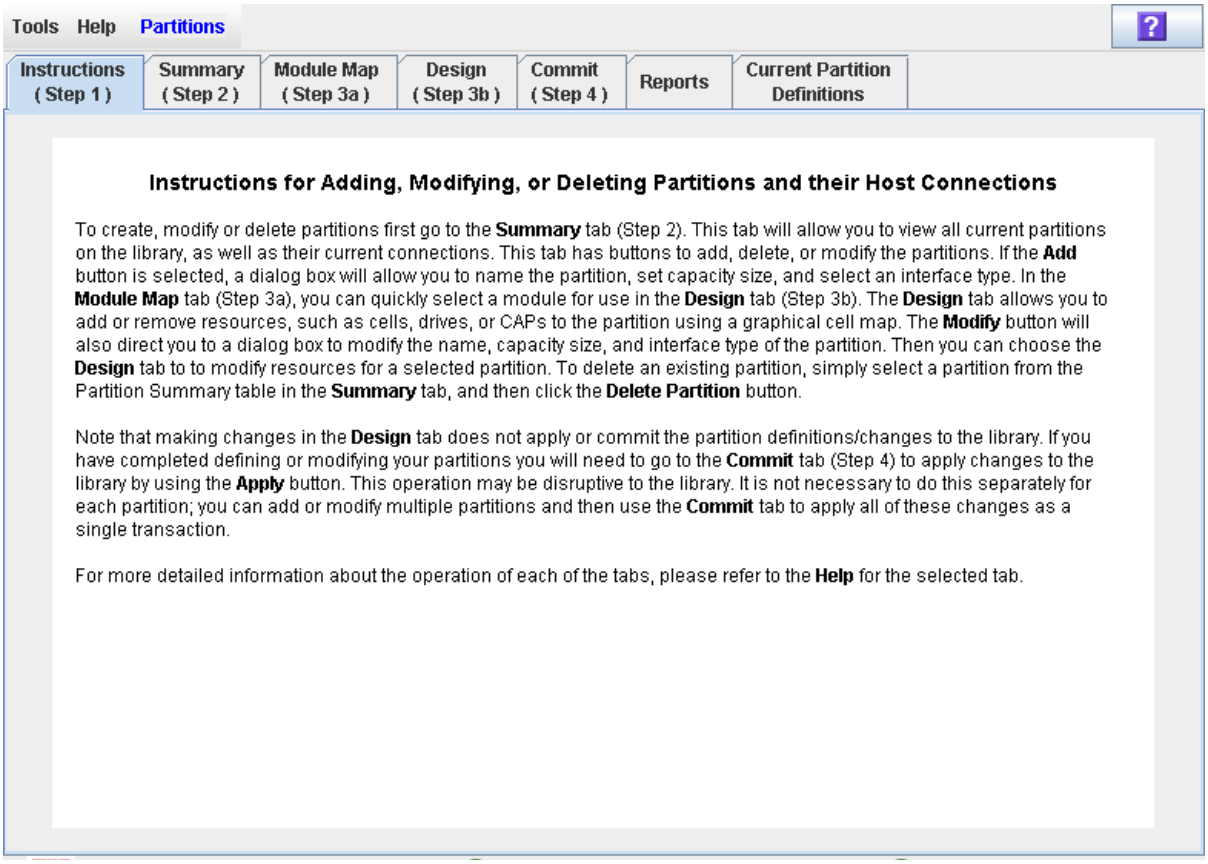
Task Purpose

Use this procedure to review the partitioning process prior to any other partitioning tasks.

Task Steps

1. **Select Tools > Partitions.**

   The first time you make this selection during an SL Console login session, the **Instructions (Step 1)** page appears automatically.



2. **Review the instructions on the page before proceeding with other partitioning tasks.**

▼ Add a Partition

Task Tool

This procedure can be performed at either of the following:

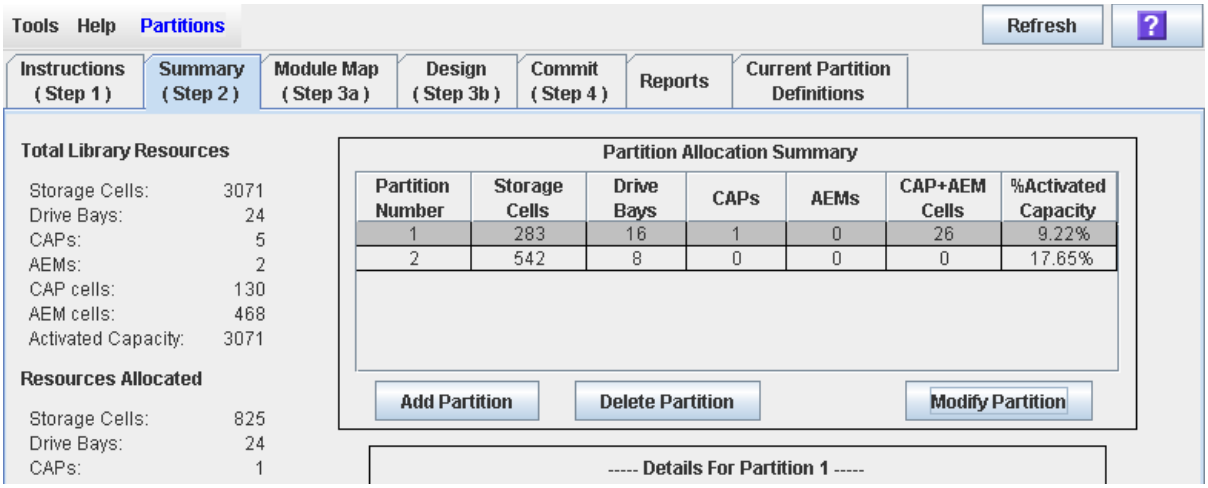
- Standalone SL Console
- Web-launched SL Console

Task Purpose

Use this procedure to create a new library partition and assign its storage capacity. You can create up to eight partitions, with IDs from 1–8.

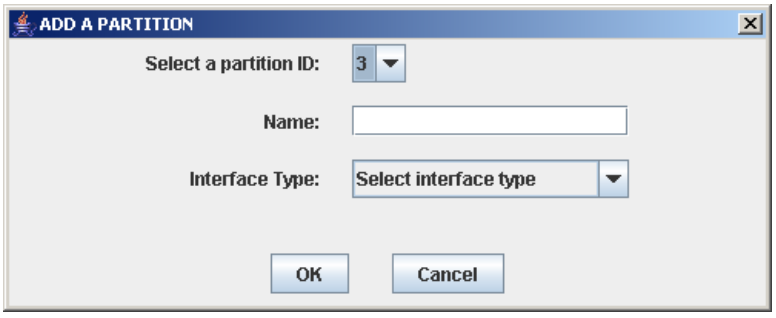
Task Steps

1. **Select Tools > Partitions, and click the Summary (Step 2) tab. The Summary (Step 2) page appears.**



2. **Click Add Partition.**

   The **Add Partition** dialog box appears.



3. **Select the Partition ID you want to add, and enter the Name and Interface Type.**

   Note – Partition IDs do not need to be contiguous. For example, you can create partition 2 and partition 4, with no partitions 1 or 3.

4. **Click OK.**

   Your partition configuration changes are saved to the SL Console partition workspace for the duration of this login session.

   To update the library controller database with all changes from this SL Console login session, see "Verify Partition Configurations" on page 226 and "Commit Partition Configuration Changes" on page 231.

▼ Add a Host Connection (FC-SCSI partitions only)

Task Tool

This procedure can be performed at either of the following:

- Standalone SL Console
- Web-launched SL Console

Task Purpose

Use this procedure to set up the connection between a host and a selected partition. You must perform this procedure in order for the partition to be accessible by the host.

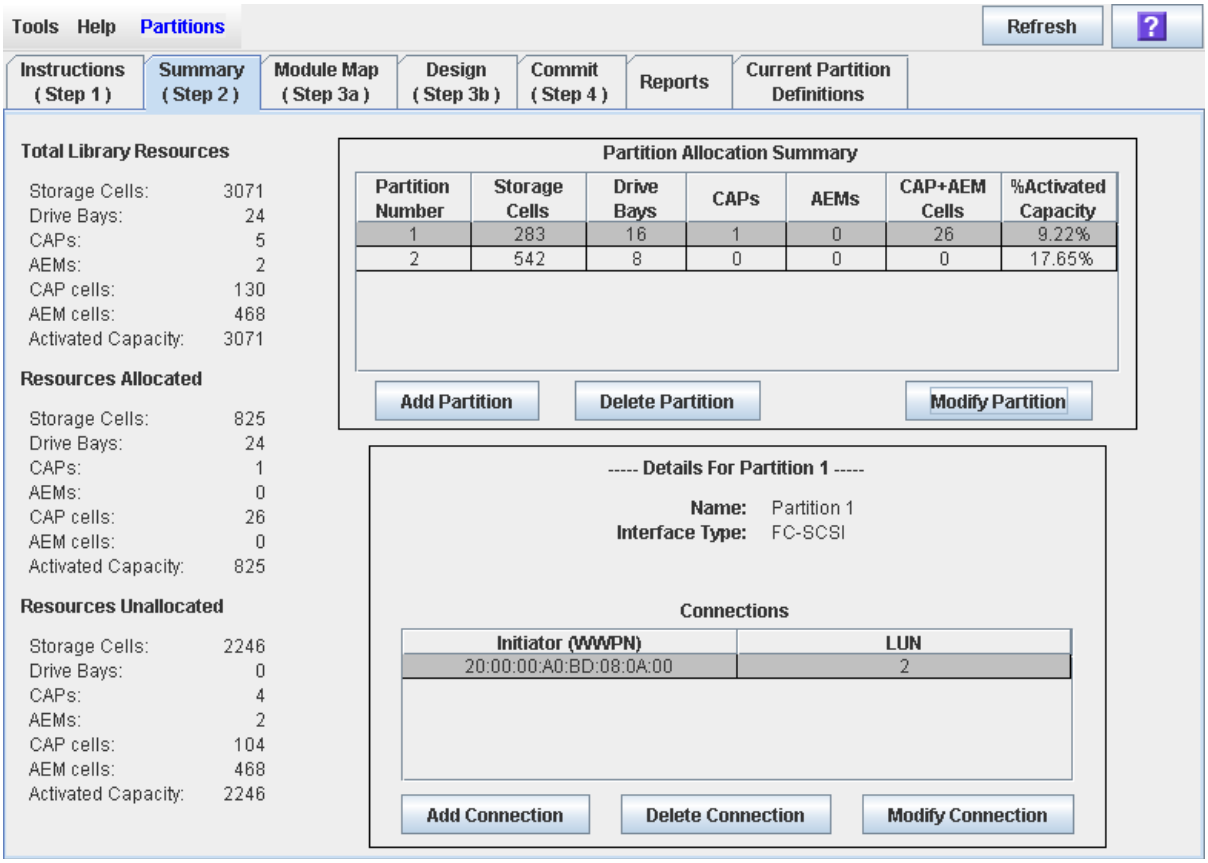
Each partition can have up to nine host connections. Also, each host can connect to multiple partitions.

> **Note –** This procedure applies to FC-SCSI host-partition connections only. HLI host-partition connections are configured through the host library management software (ELS or ACSLS), not through the SL Console. See the ELS or ACSLS documentation for details.

Task Steps

1. **Select Tools > Partitions, and click the Summary (Step 2) tab.**

   The **Summary (Step 2)** page appears.

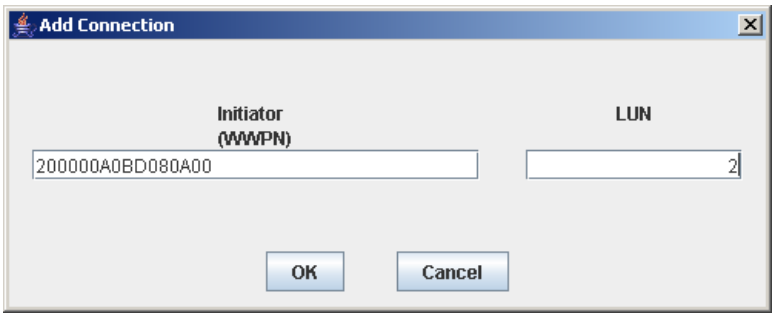


2. **Click the partition to which you want to add a host connection**

   Note – If you select an HLI partition, all the buttons in the Details section of the page are grayed out.

3. **Click Add Connection.**

   The **Add Connection** dialog box appears.



4. **Enter the Initiator (WWPN) and LUN.**

   Note – Each initiator connected to the library must have one library partition assigned to LUN 0. When you verify or commit partition configuration changes, the SL Console will notify you if an initiator does not meet this requirement.

5. **Click OK.**

▼ Design a Partition: Base, DEM, or CEM Module

Task Tool

This procedure can be performed at either of the following:

- Standalone SL Console
- Web-launched SL Console

Task Purpose

Use this procedure to allocate library resources (storage cells, tape drives, and rotational CAPs) to a partition.

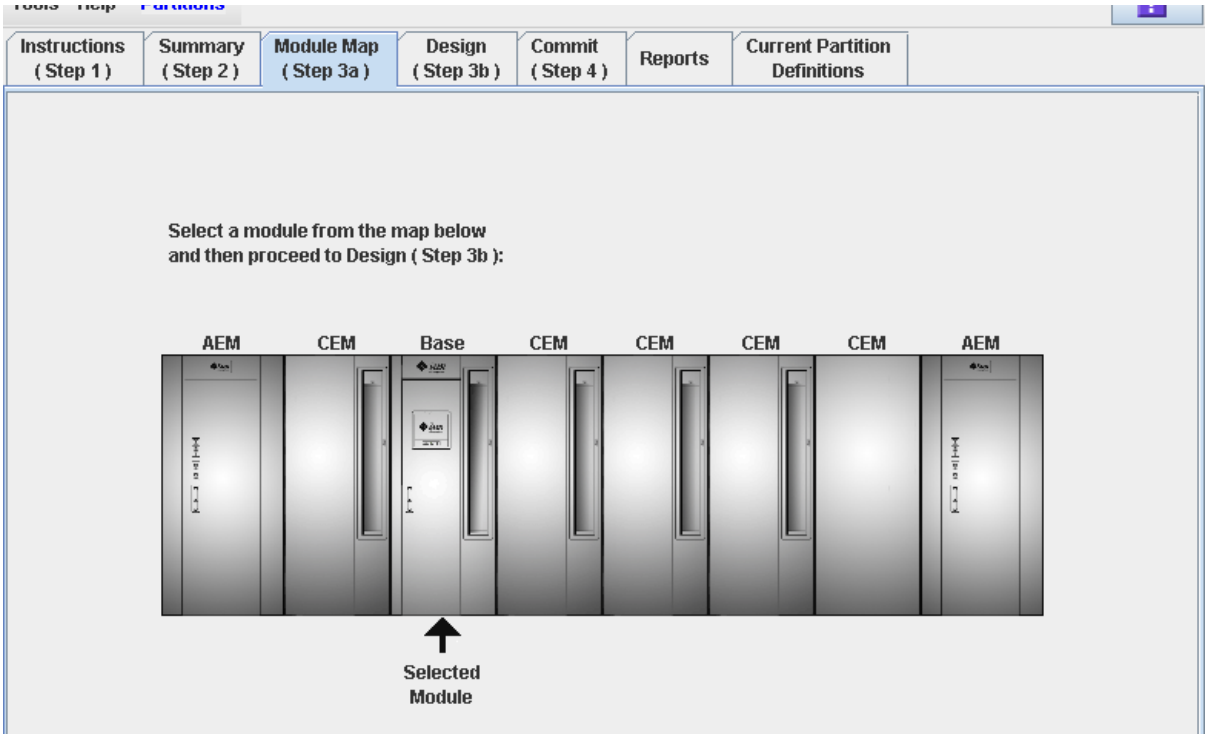
> **Note –** This procedure applies to Base, DEM, or CEM modules only. See "Design a Partition: AEM Module" on page 224 for detailed instructions on allocating or de-allocating an AEM CAP to or from a partition.

Note that library resources can be allocated to only one partition at a time. If you want to add resources to a partition but the resources are already allocated to another partition, you must first remove the resources from the assigned partition, and then add them to the new partition.

Task Steps

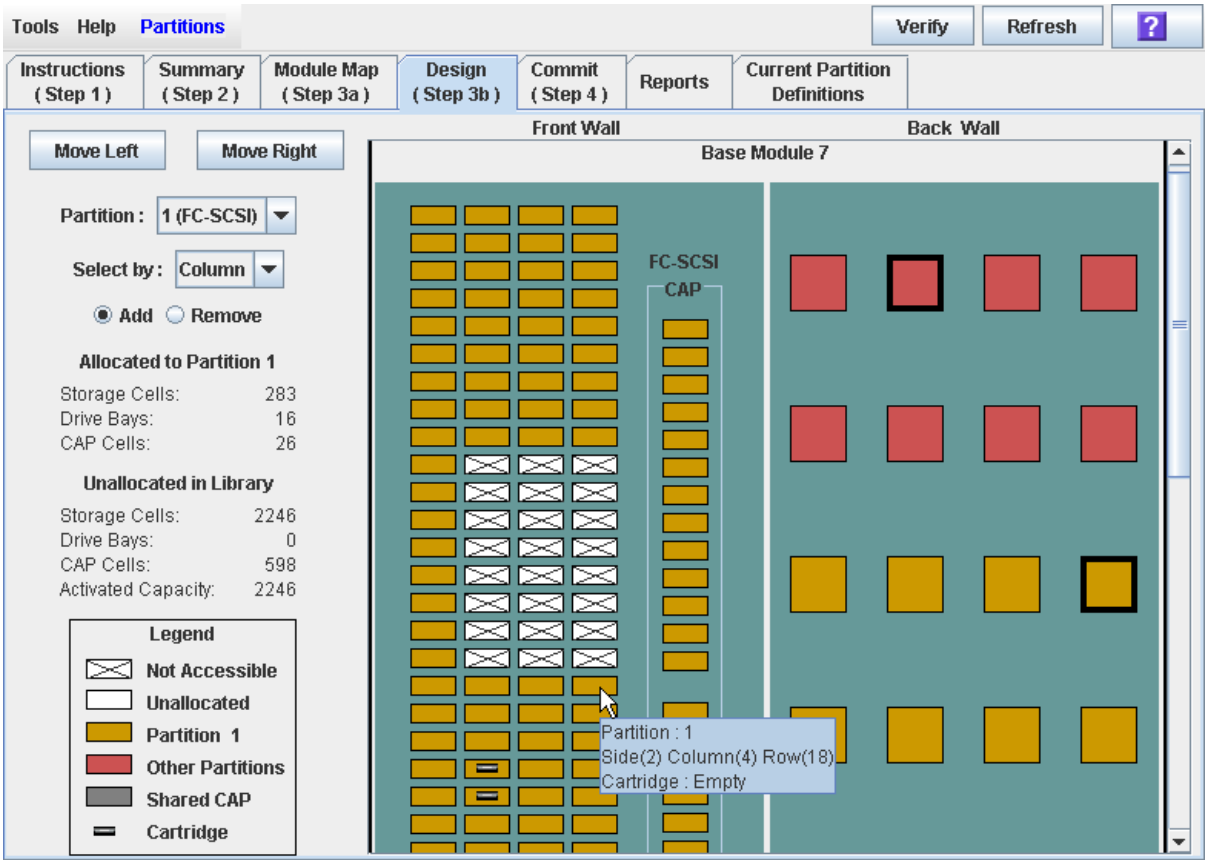
1. **Select Tools > Partitions.**
2. **Click the Module Map (Step 3a) tab.**

   The **Module Map (Step 3a)** page appears.



3. **Click the module for which you want to design a partition.**

4. **Click the Design (Step 3b) tab.**



5. The **Design (Step 3b)** page appears, displaying the current configuration of the module you have selected.

6. **In the Partition list, select the partition that you want to configure.**

   All fields update to reflect the current configuration for the selected partition.

   > **Note –** Click the **Move Left** or **Move Right** buttons to display a module directly adjacent to the one currently displayed.

7. **Choose the Select by method, and select either the Add or Remove radio button.**

8. **Use the library map to select the resources you want to add or remove.**

   > **Note –** See "Partitions—Design (Step 3b)" on page 294 for detailed instructions on using the library map.

   Your partition configuration changes are saved to the SL Console partition workspace for the duration of this login session.

   To update the library controller database with all changes from this SL Console partition login session, see "Verify Partition Configurations" on page 226 and "Commit Partition Configuration Changes" on page 231.

▼ Design a Partition: AEM Module

Task Tool

This procedure can be performed at either of the following:

- Standalone SL Console
- Web-launched SL Console

Task Purpose

Use this procedure to add or remove an AEM CAP to or from a partition.

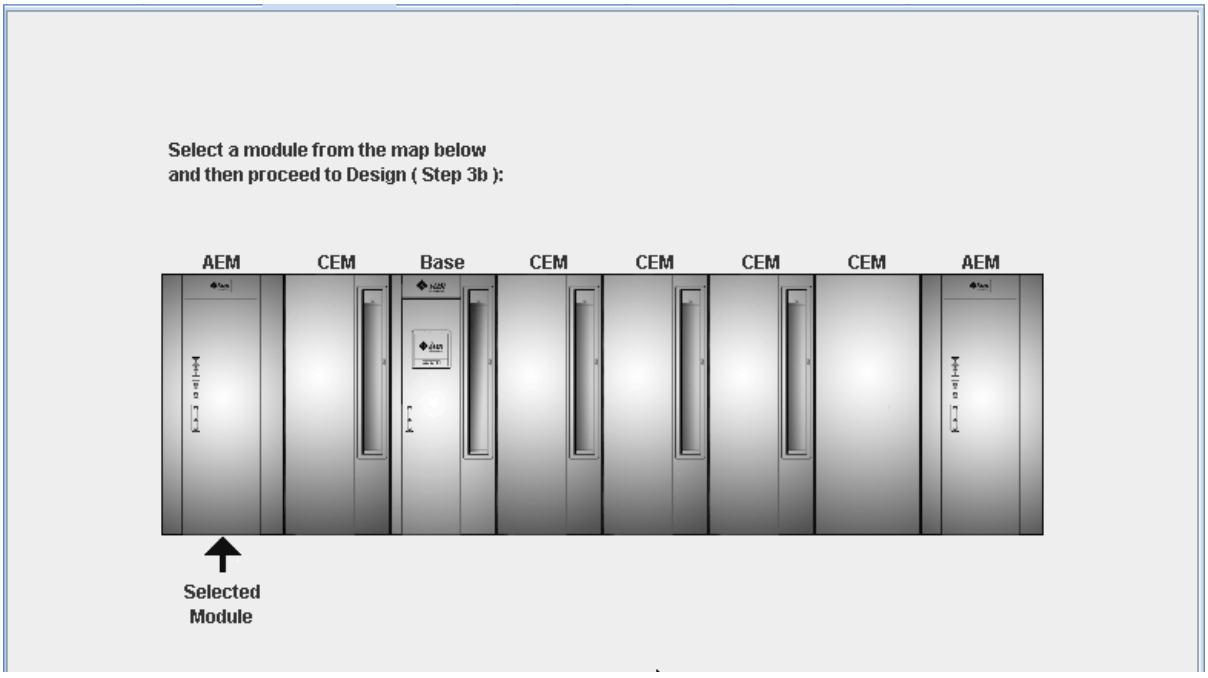
You can allocate or de-allocate the entire AEM at one time. It is not possible to allocate just part of an AEM to a partition. AEMs can be shared by multiple partitions that share the same host-partition interface (HLI or FC-SCSI).

> **Note –** This procedure applies only to AEM modules. See "Design a Partition: Base, DEM, or CEM Module" on page 222 for detailed instructions on adding or removing library resources in Base, DEM, or CEM modules to or from a partition.

Task Steps

1. **Select Tools > Partitions.**
2. **Click the Module Map (Step 3a) tab.**

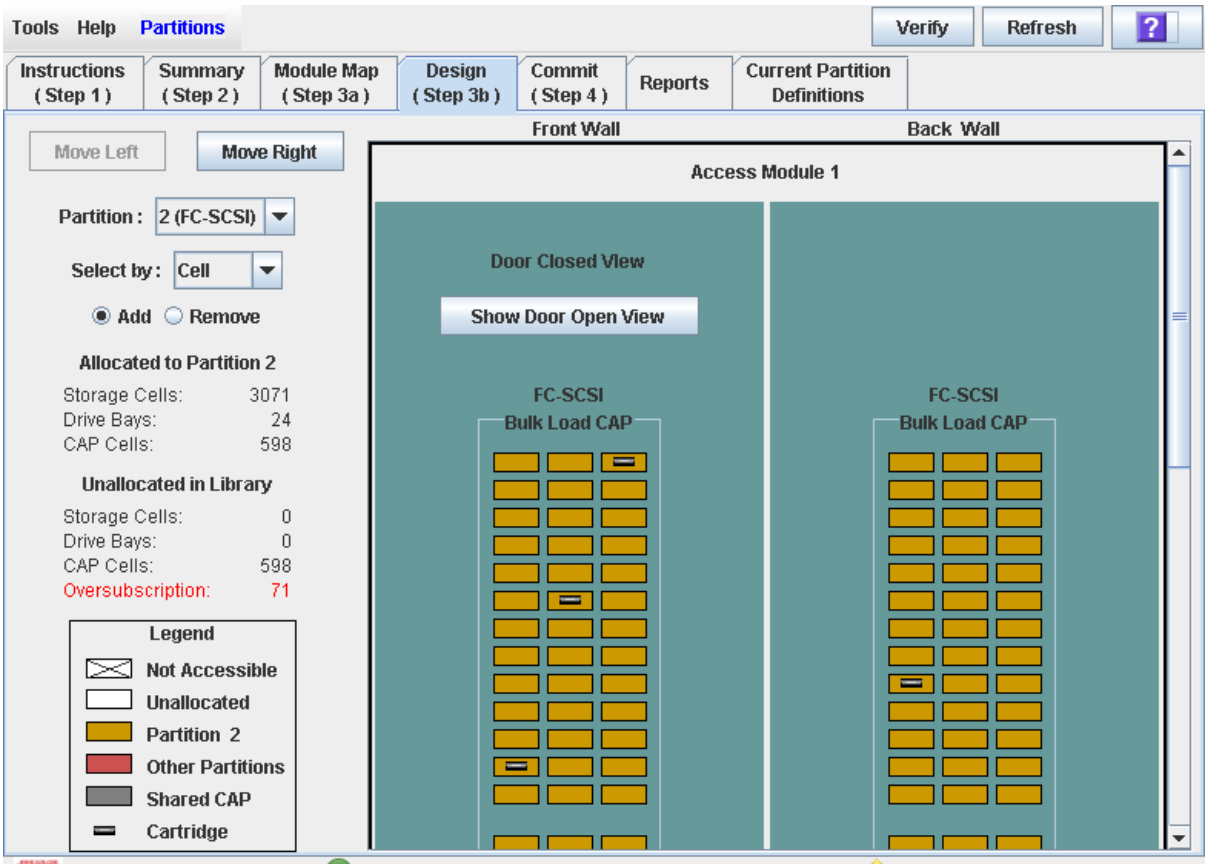
   The **Module Map (Step 3a)** page appears.



3. **Click the AEM you want to allocate to a partition.**

4. **Click the Design (Step 3b) tab.**

   The **Design (Step 3b)** page appears, displaying the current configuration of the AEM you have selected.



5. **In the Partition list, select the partition you want to configure.**

   All fields are updated to reflect the current configuration for the selected partition.

   Note – Click the **Move Left** or **Move Right** buttons to display a module directly adjacent to the one currently displayed.

6. **Select either the Add or Remove radio button.**

7. **Click anywhere on the library map to select the AEM and indicate that you want to allocate or de-allocate it to or from the partition.**

   Your partition configuration changes are saved to the SL Console partition workspace for the duration of this login session.

   For additional information on the design tools and library map, see "Partitions—Design (Step 3b)" on page 294.

▼ Verify Partition Configurations

Task Tool

This procedure can be performed at either of the following:

- Standalone SL Console
- Web-launched SL Console

Task Purpose

Use this procedure to verify partition configuration changes you have made during this SL Console login session. This procedure warns you of the following possible errors:

- A partition has orphaned cartridges. See "Planning for Partitioning" on page 206 for details.
- Library resources have been removed from a partition.
- A host connected to the library does not have a partition assigned to LUN 0.
- The library's capacity is oversubscribed. That is, total partition allocations exceed activated capacity.

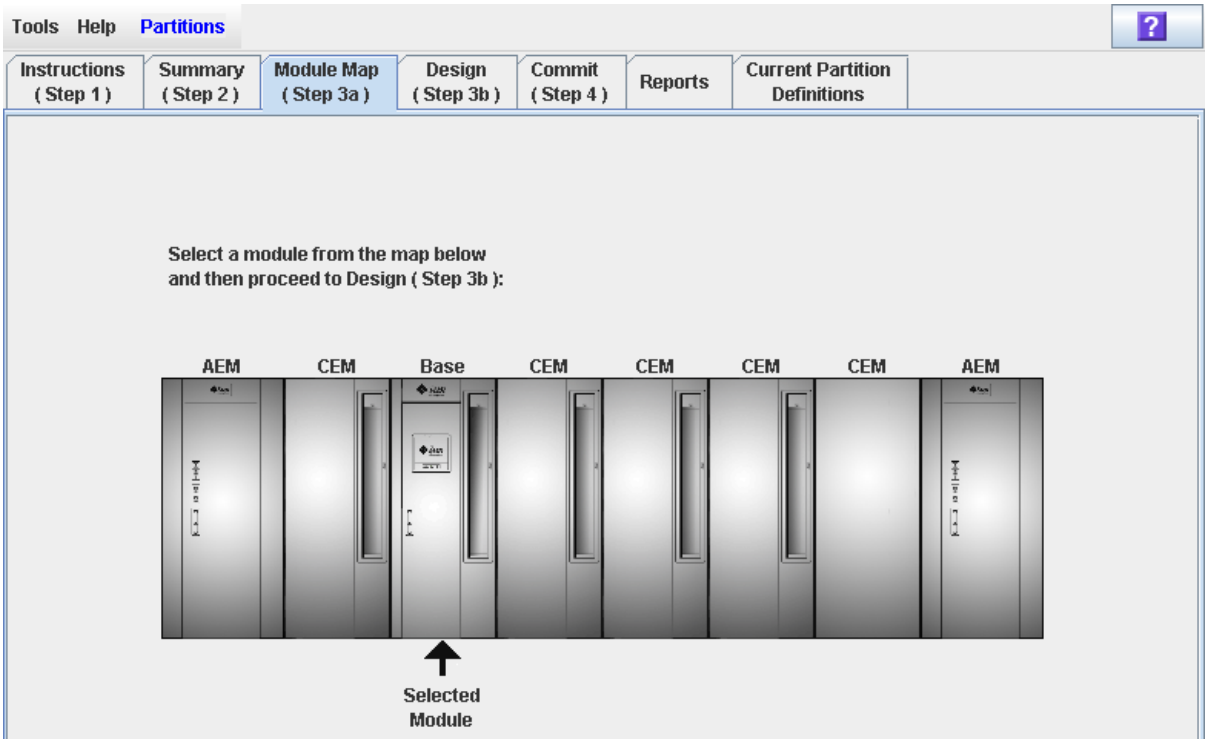
Note – This procedure verifies only one partition at a time. If you need to verify multiple partitions, you must repeat this procedure separately for each partition.

Task Steps

1. **Select Tools > Partitions.**

2. **Click the Module Map (Step 3a) tab.**

   The **Module Map (Step 3a)** page appears.

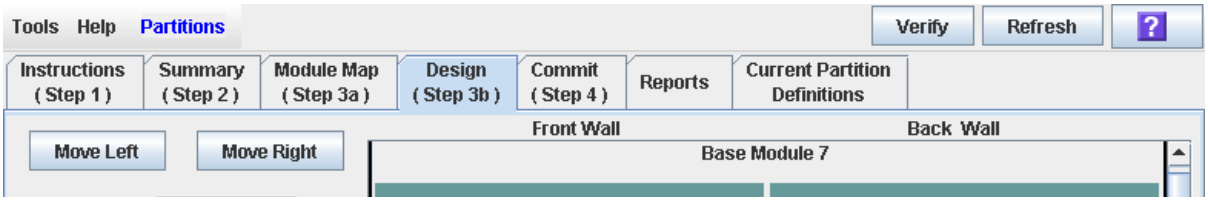


3. **Click the module for which you want to verify a partition.**

   The module is highlighted on the page.

4. **Click the Design (Step 3b) tab.**

   The **Design (Step 3b)** page appears, displaying the current configuration of the module you have selected.



5. **In the Partition list, select the partition you want to configure.**

   All fields update to reflect the current configuration for the selected partition.

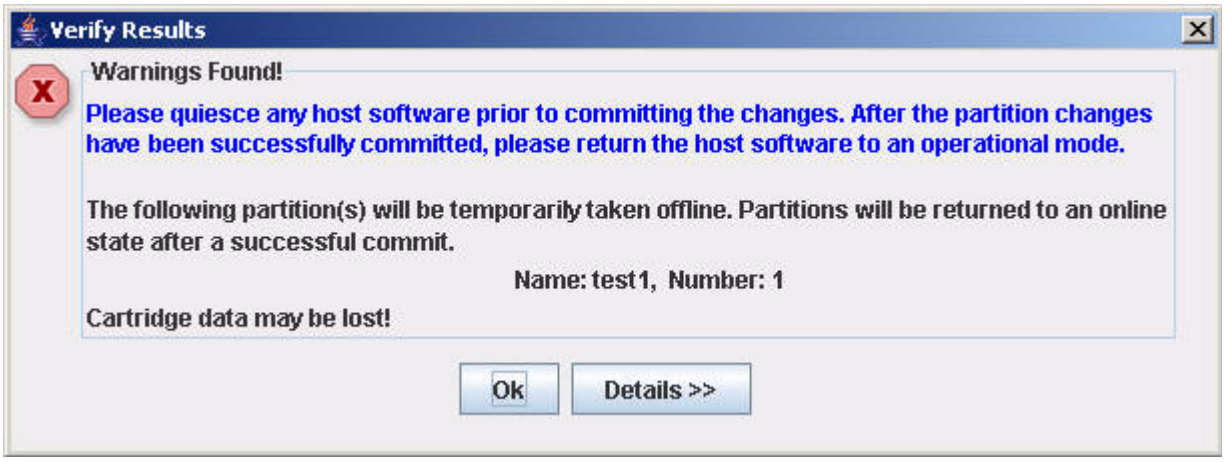
6. **In the upper right corner, click Verify.**

   The boundaries of the selected partition are verified, including the locations of all tape cartridges.

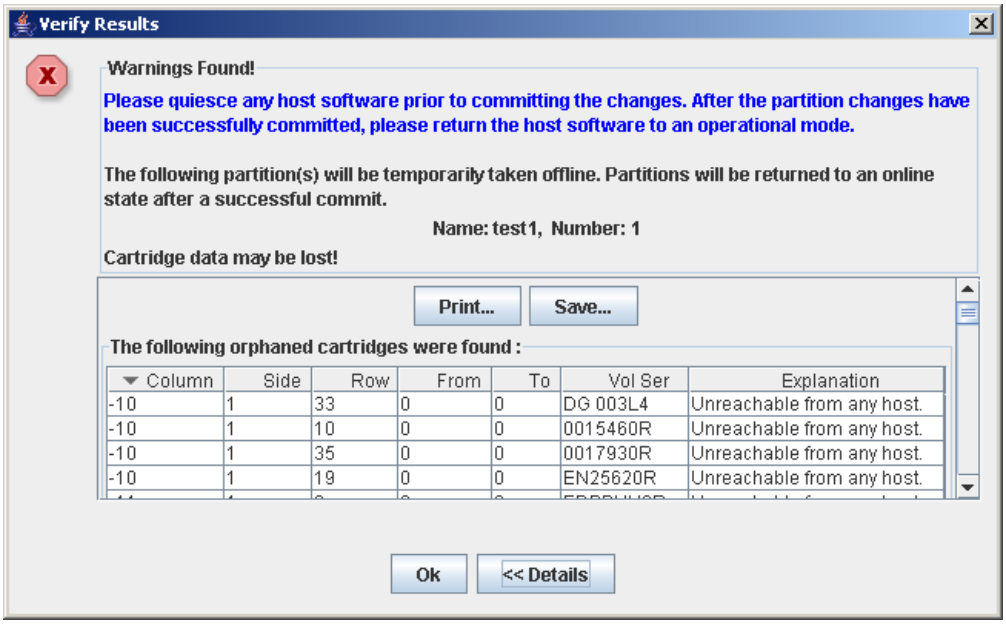
Note – This verification is performed on the current partition configuration in the SL Console partition workspace only. It does not verify current partition boundaries against the library controller database. Therefore, it cannot identify configuration conflicts that may arise due to other users performing cartridge movements or library configuration changes (through the command line interface, other SL Console sessions, or host applications) at the same time you have made partition changes.

7. **When the Verify Results message appears, check for warnings (such as orphaned cartridge messages, oversubscribed storage capacity, etc.) for the current partition configuration.**

   Note – If library capacity is oversubscribed (that is, total partition allocations exceed activated capacity), before you can proceed to "Commit Partition Configuration Changes" on page 231, you must remove storage cells from partition allocations to bring the total allocated cells within the library's activated capacity.



8. **To toggle between detailed warning messages and the summary, click Details.**



9. **To print the warning messages, click Print in the expanded view of the warning messages.**
10. **To save the warning messages in a comma-delimited text file, click Save.**
11. **If the warnings messages indicate that cartridges have been orphaned, see "Resolve Orphaned Cartridges" on page 230 before committing your changes to the library controller database.**
12. **To dismiss the Verify Results message and return to the Design (Step 3b) page, click OK.**

▼ Resolve Orphaned Cartridges

Task Tool

This procedure can be performed at either of the following:

- Standalone SL Console
- Web-launched SL Console

Task Purpose

Use this procedure to resolve any orphaned cartridges that are displayed on the SL Console.

Task Steps

1. **If the SL Console identifies an orphaned cartridge, it displays a warning message. Perform recovery moves on all cartridges listed in the warnings (see "Recovery Moves" on page 415) before proceeding to "Commit Partition Configuration Changes" on page 231.**

   Caution – *Potential data loss.* If you do not perform recovery moves, host applications may find the orphans and treat them as scratch volumes. Valid data could be overwritten.

▼ Commit Partition Configuration Changes

Task Tool

This procedure can be performed at either of the following:

- Standalone SL Console
- Web-launched SL Console

Task Purpose

This procedure updates the library controller database with all partition configuration changes that have made during this SL Console session. If you log out of SL Console without committing your changes, all changes are discarded.

> **Caution –** Although partition changes are not disruptive to library hosts, it is recommended that you make the library unavailable to other users before committing your partition workspace changes. Because the SL Console does not validate partition boundaries against the library controller database in real-time, configuration conflicts may arise if you change partition boundaries while other users are performing cartridge movements or library configuration changes. See "Synchronizing the Display With the Controller Database" on page 63 for details.

> **Note –** Be sure to "Resolve Orphaned Cartridges" on page 230 before proceeding.

> **Note –** You cannot perform this procedure if current library capacity is oversubscribed (that is, total partition allocations exceed activated capacity). The **Apply** button is grayed out, and before you can proceed, you must remove storage cells from partition allocations to bring the total allocated cells within the library's activated capacity.

Task Steps

1. **Take the library offline to ACSLS and ELS tape management software.**

   See the appropriate tape management software documentation for the procedures and commands.

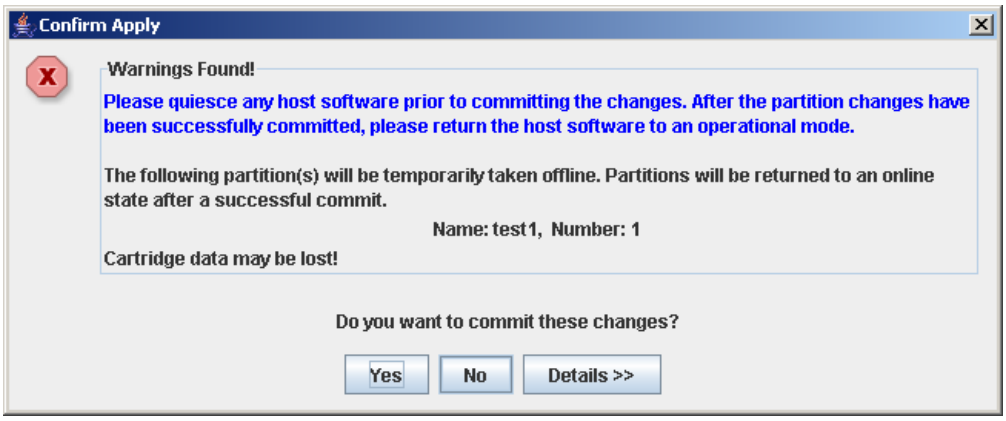
2. **Select Tools > Partitions, and click the Commit (Step 4) tab.**

   The **Commit (Step 4)** page appears.

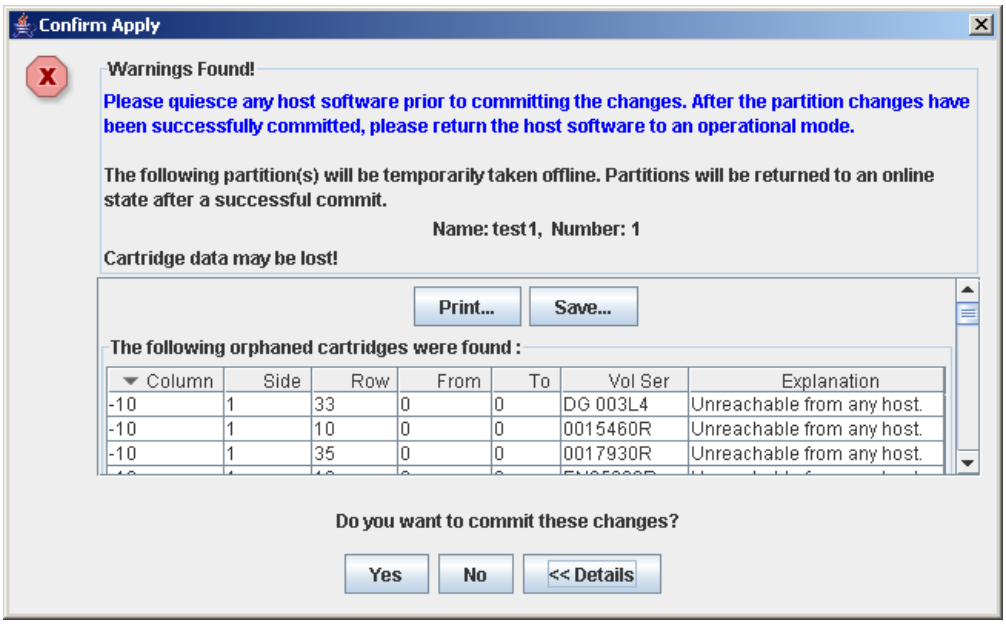
3. **Click the Apply button.**

   The boundaries of the selected partition are verified, including the locations of all tape cartridges.

   The **Confirm Apply** message appears, indicating whether there are any orphaned cartridges or other problems in the current partition configuration.



4. **To toggle between detailed warning messages and the summary, click Details.**



5. **To print the warning messages, click Print in the expanded view of the warning messages.**

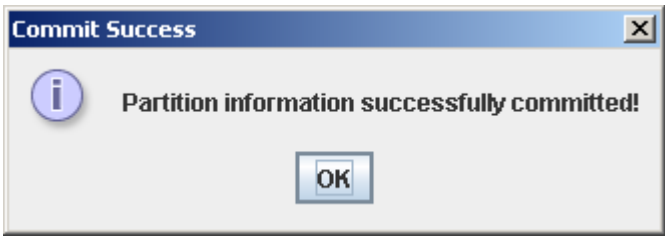
6. **To save the warning messages in a comma-delimited text file, click Save.**

7. **If the warnings messages indicate that cartridges have been orphaned, see** "Resolve Orphaned Cartridges" on page 230 **before committing your changes to the library controller database.**

8. **If you want to cancel the update without applying your changes, click No.**

   The library controller database is not updated, but all partition changes from this login session are retained in the SL Console partition workspace.

9. **Otherwise, if you want to update the library controller database and apply your changes, click Yes. When the Commit Success message appears, click OK to return to the Commit (Step 4) page.**



10. **You must now configure all affected library host applications to recognize your changes. See the appropriate tape management software documentation for the procedures and commands.**

Partition Management Tasks

▼ Modify Partition Summary Information

Task Tool

This procedure can be performed at either of the following:

- Standalone SL Console
- Web-launched SL Console

Task Purpose

Use this procedure to change the name or allocated storage capacity of an existing partition.

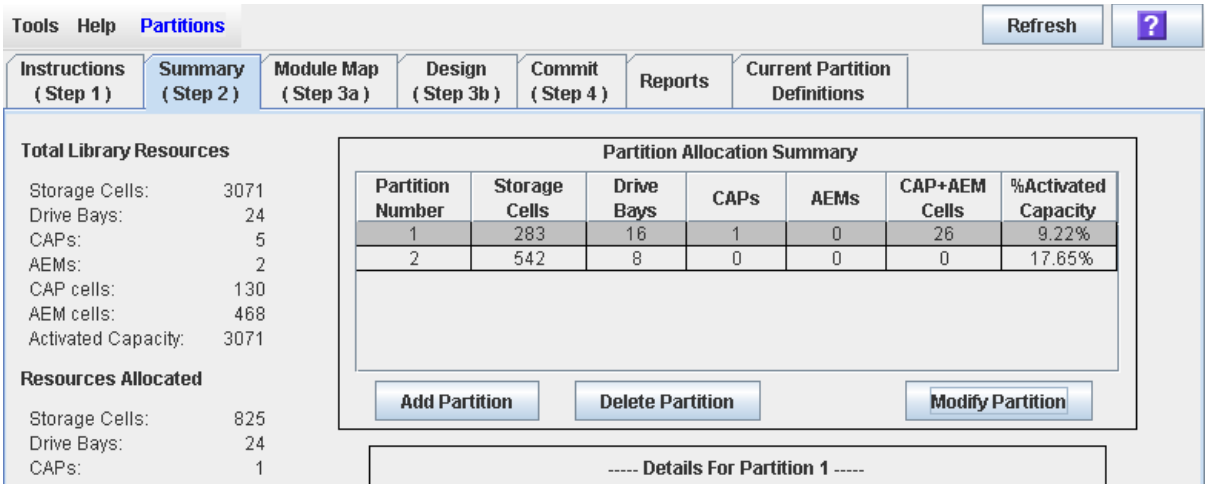
Note – To change the host-partition connection type (HLI or FC-SCSI), see "Modify the Interface Type of a Host-Partition Connection" on page 239.

Note – You cannot change the partition ID. To assign a different Partition ID, you must delete the old partition and create a new one with the new ID.

Task Steps

1. **Select Tools > Partitions, and click the Summary (Step 2) tab.**

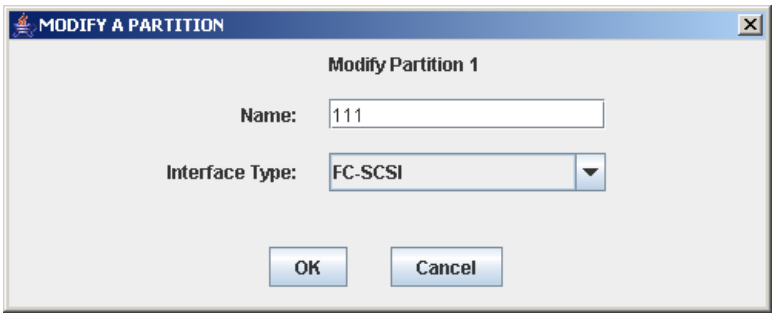
   The **Summary (Step 2)** page appears.



2. **In the Partition Summary section, select the partition you want to modify.**

3. **Click Modify Partition.**

   The **Modify a Partition** dialog box appears.



4. **Enter the changes you want to make.**
5. **Click OK to confirm the changes.**

▼ Delete a Partition

Task Tool

This procedure can be performed at either of the following:

- Standalone SL Console
- Web-launched SL Console

Task Purpose

Use this procedure to delete a partition from the library. The following changes are made to the library partition configuration:

- All resources allocated to the partition are marked available.
- All host connections for the partition are deleted.
- The partition ID is deleted.

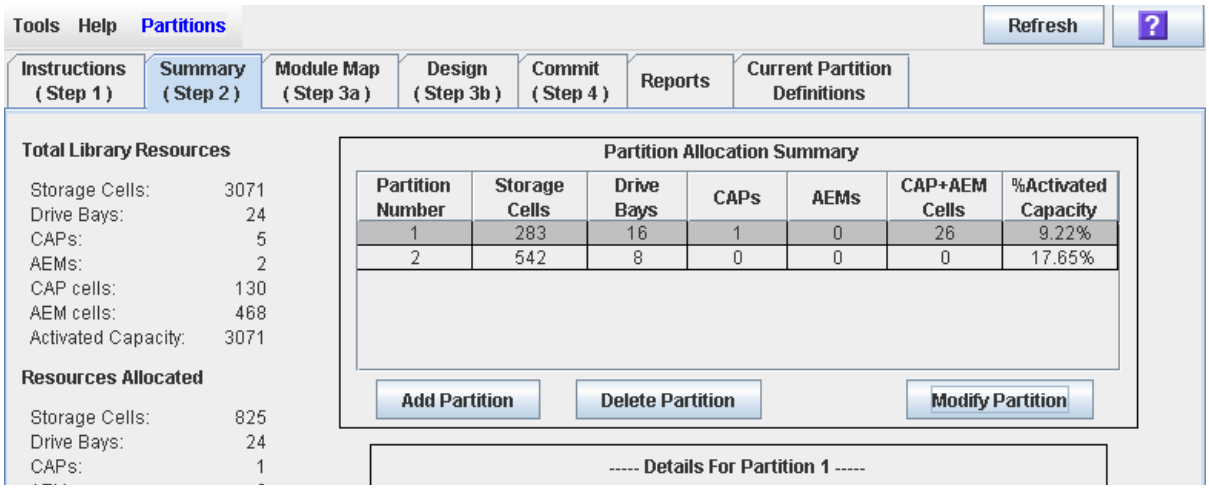
Caution – Deleting partitions can result in orphaned cartridges and data that could be lost. See "Planning for Partitioning" on page 206 for details.

Note – Deleting all partitions from the library causes the library state to change to "non-partitioned." All active storage cells, drives, and rotational or AEM CAPs will be accessible to all hosts.

Task Steps

1. **Select Tools > Partitions, and click the Summary (Step 2) tab.**

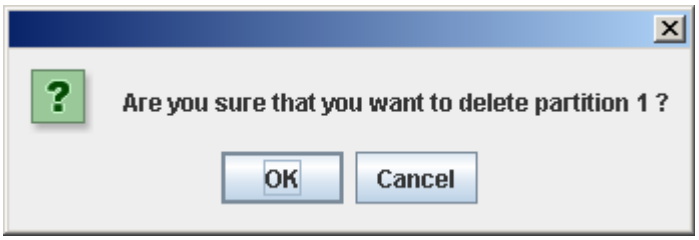
   The **Summary (Step 2)** page appears.



2. **In the Partition Summary section, click the partition you want to remove.**

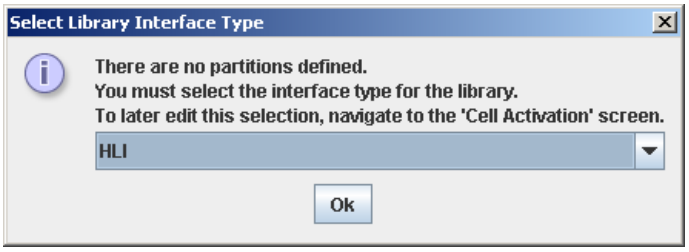
3. **Click Delete Partition.**

   A confirmation message appears.



4. **Click OK to confirm the deletion.**

   - If partitions still remain in the library, proceed to Step 6.
   - If no partitions remain, the **Select Library Interface Type** dialog box appears.



5. **Select the library interface type you want to assign for all host connections to the library. Options are:**

   - HLI
   - FC-SCSI

6. **Click OK to confirm the change.**

   The updates are made. Your partition configuration changes are saved to the SL Console partition workspace for the duration of this login session.

7. **To update the library controller database with all changes from this SL Console login session, see “Verify Partition Configurations” on page 226.**

   If there are no partitions remaining in the library, when you commit the updates the library state will change to “non-partitioned.”

▼ Modify the Interface Type of a Host-Partition Connection

Task Tool

This procedure can be performed at either of the following:

- Standalone SL Console
- Web-launched SL Console

Task Purpose

Use this procedure to change the host-partition connection type of an existing partition. You should use this procedure with caution, due to the following possible effects:

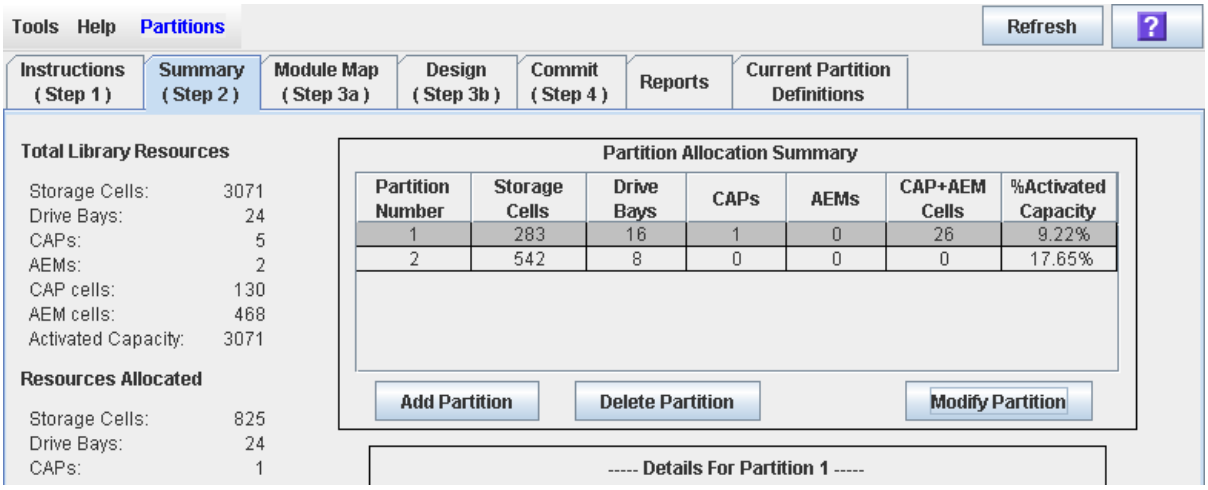
- Changing the interface type can result in the loss of active host connections.
- Changing the interface type from FC-SCSI to HLI can result in the loss of FC-SCSI connection detail.
- Because rotational and AEM CAPs cannot be shared across partition types, changing the interface type can result in the loss of existing shared CAP assignments. Dedicated CAP assignments are not affected.

> **Note –** To change the name or allocated storage capacity of an existing partition, see "Modify Partition Summary Information" on page 235.

Task Steps

1. **Select Tools > Partitions, and click the Summary (Step 2) tab.**

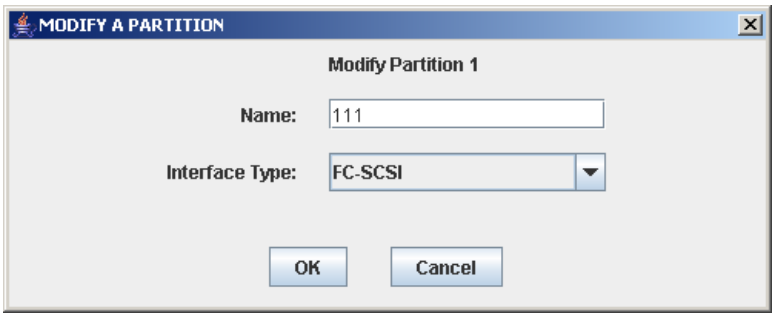
   The **Summary (Step 2)** page appears.



2. **In the Partition Summary section, click the partition you want to modify.**

3. **Click Modify Partition.**

   The **Modify a Partition** dialog box appears.

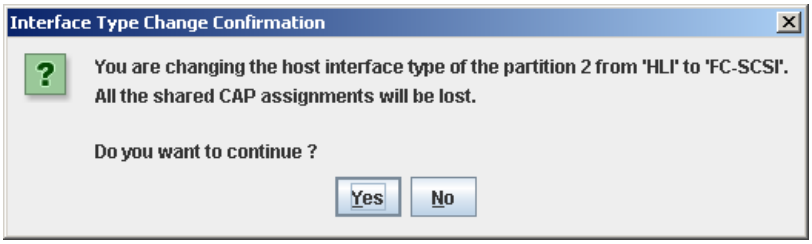


4. **In the Interface Type list, select the interface type you want to assign. Click OK.**

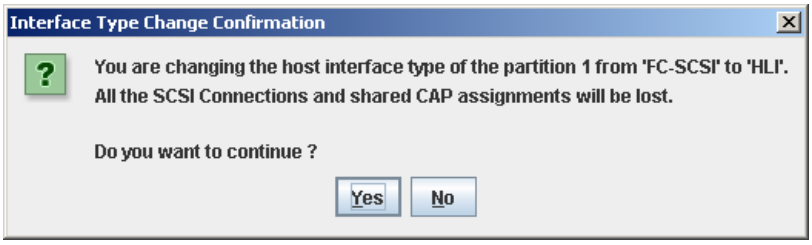
   The SL Console checks the current partition configuration in the SL Console workspace. If the partition has shared CAP allocations or, in the case of FC-SCSI partitions, host-partition connection detail, warning messages will appear.

   The following are sample messages that may appear.

   - Changing from HLI to FC-SCSI:



   - Changing from FC-SCSI to HLI:



5. **Click the message's Yes button to confirm the change.**

   Your partition configuration changes are saved to the SL Console partition workspace for the duration of this login session.

▼ Modify FC-SCSI Host-Partition Connection Detail

Task Tool

This procedure can be performed at either of the following:

- Standalone SL Console
- Web-launched SL Console

Task Purpose

Use this procedure to modify the host World Wide Port Name or LUN number of the library for a host-partition connection.

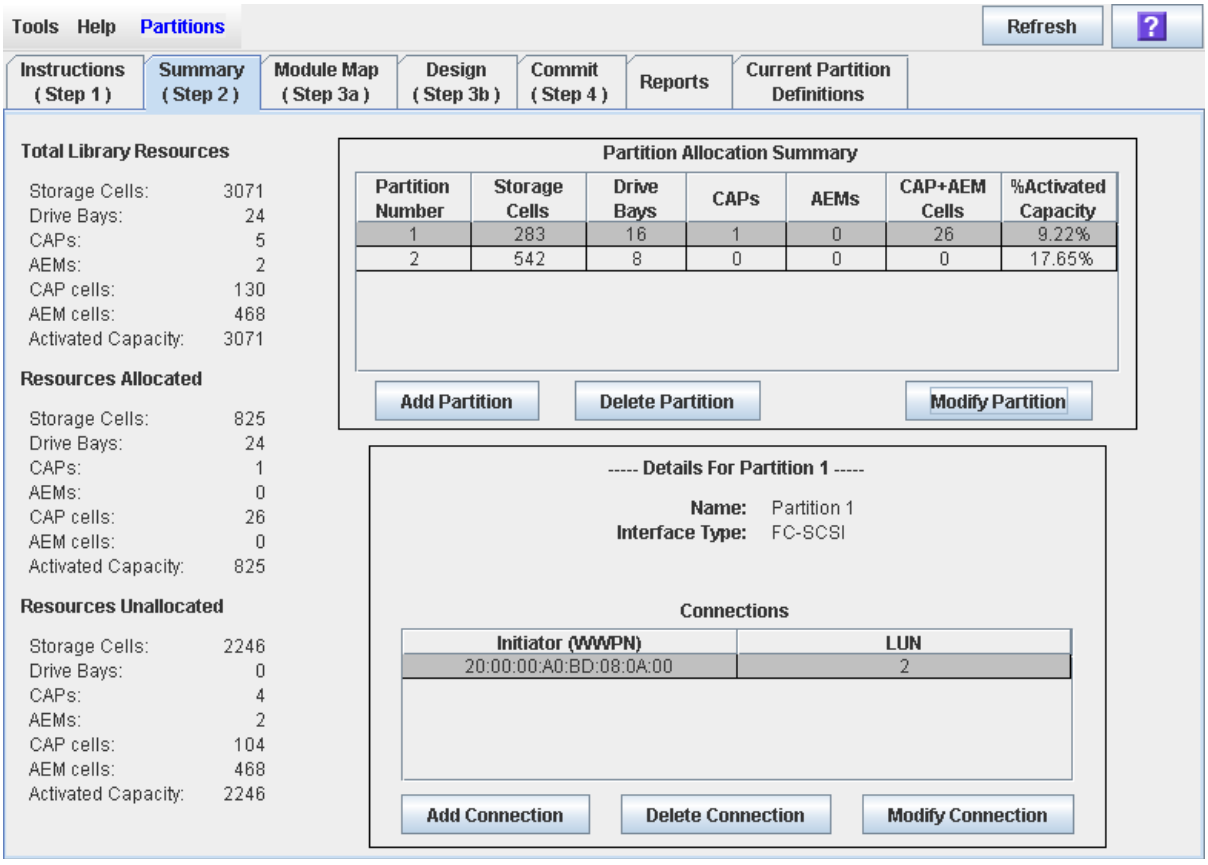
Note – This procedure applies to FC-SCSI host-partition connections only. HLI host-partition connections are configured through the host library management software (ELS or ACSLS), not through the SL Console. See the ELS or ACSLS documentation for details.

Note – You cannot modify the target port number for the library. It is always "0."

Task Steps

1. **Select Tools > Partitions, and click the Summary (Step 2) tab.**

   The **Summary (Step 2)** screen appears.

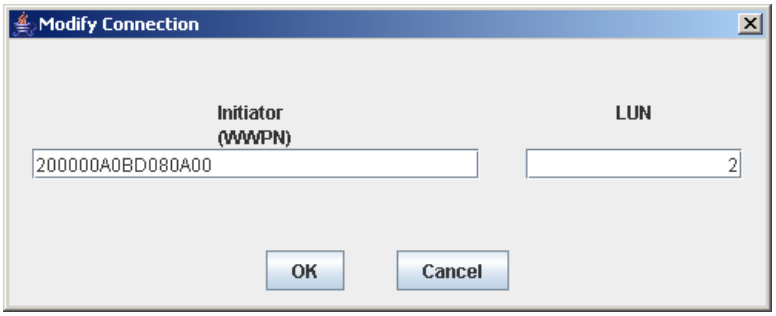


2. **In the Summary section of the screen, select the partition for which you want to modify a connection.**
3. **In the Connections section, select the host-partition connection you want to modify.**

   Note – If you select an HLI partition, all the buttons in the Details section of the screen are grayed out.

4. **Click Modify Connection.**

   The **Modify a Connection** message appears.



5. **Enter the changes you want to make.**
6. **Click OK to confirm the changes.**

   Your partition configuration changes are saved to the SL Console partition workspace for the duration of this login session.

   To update the library controller database with all changes from this SL Console login session, see "Verify Partition Configurations" on page 226 and "Commit Partition Configuration Changes" on page 231.

▼ Delete a FC-SCSI Host Connection

Task Tool

This procedure can be performed at either of the following:

- Standalone SL Console
- Web-launched SL Console

Task Purpose

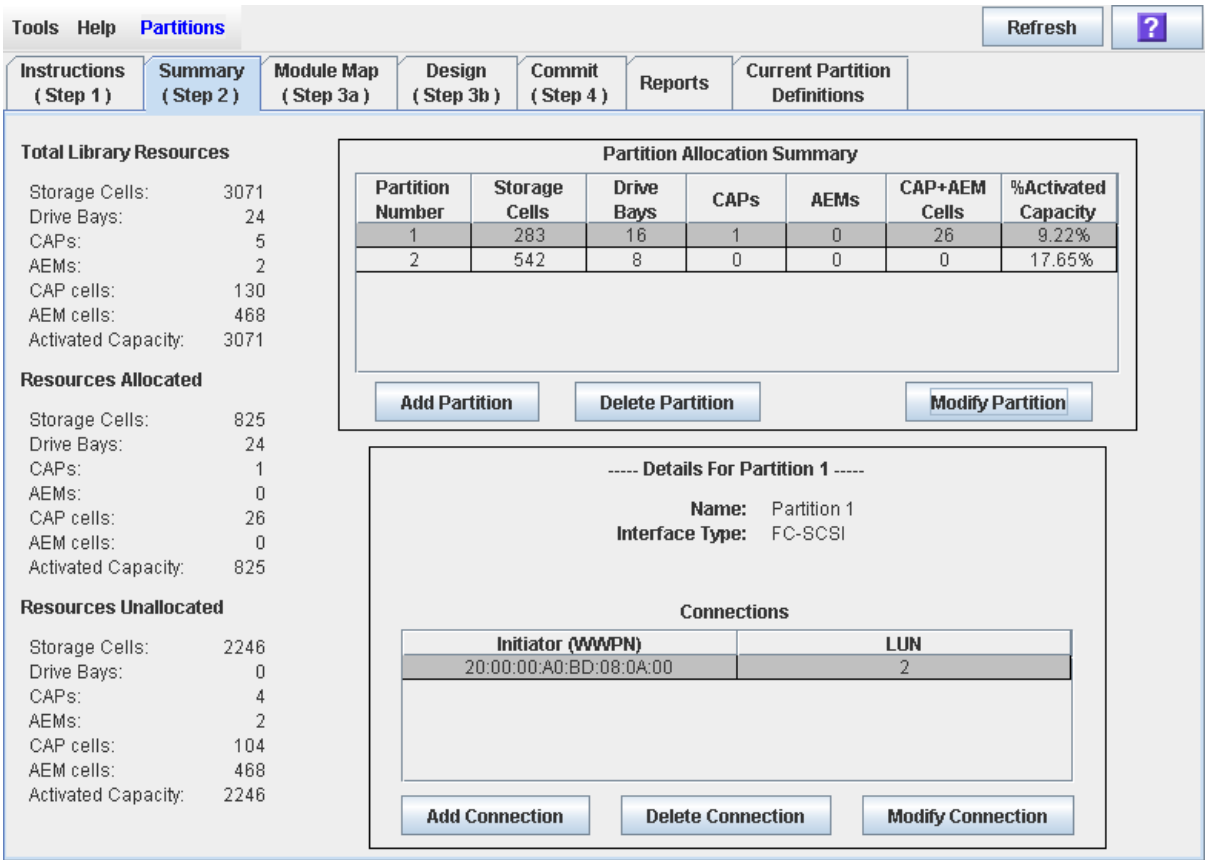
Use this procedure to delete a host-partition connection. After you perform this procedure, the host will no longer be able to access the partition.

> **Note –** This procedure applies to FC-SCSI host-partition connections only. HLI host-partition connections are configured through the host library management software (ELS or ACSLS), not through the SL Console. See the ELS or ACSLS documentation for details.

Task Steps

1. **Select Tools > Partitions, and click the Summary (Step 2) tab.**

   The **Summary (Step 2)** page appears.

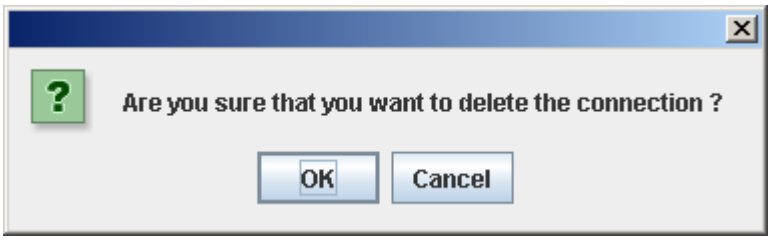


2. **In the Summary section of the page, click the partition for which you want to Delete a connection.**

Note – If you select an HLI partition, all the buttons in the Details section of the page are grayed out.

3. **In the Connections section, click the host-partition connection you want to delete.**
4. **Press the Delete Connection button.**

   A confirmation message appears.



5. **Click OK to confirm the deletion.**

   Your partition configuration changes are saved to the SL Console partition workspace for the duration of this login session.

   To update the library controller database with all changes from this SL Console login session, see “Verify Partition Configurations” on page 226 and “Commit Partition Configuration Changes” on page 231.

▼ Refresh the SL Console Partition Workspace

Task Tool

This procedure can be performed at either of the following:

- Standalone SL Console
- Web-launched SL Console

Task Purpose

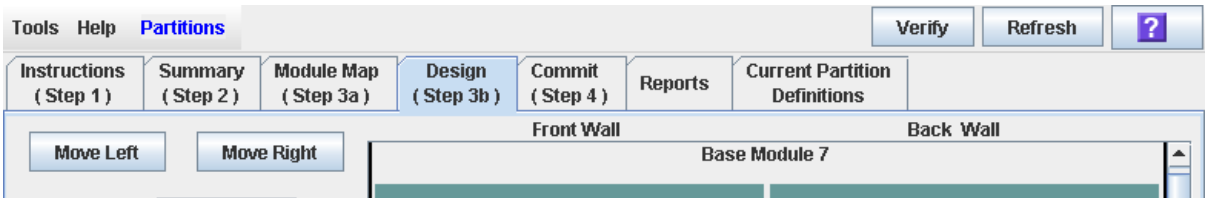
Use this procedure to refresh the SL Console partition workspace with current data from the library controller database. The current data includes all updates that other users have made to the library controller database during your login session, through the command line interface, other SL Console sessions, or host applications.

> **Note –** When you complete this procedure, all uncommitted partition changes you have made during this SL Console login session are discarded.

Task Steps

1. **Select Tools > Partitions.**
2. **Click one of the following tabs:**
   - **Summary (Step 2)**
   - **Design (Step 3b)**

   The selected page appears.



3. **In the upper right corner, click Refresh.**

   The **Partition Refresh** message appears.

4. **Click Yes to confirm the refresh.**

All partition data updates with current data from the library controller database.

▼ Reallocate Library Resources

Task Tool

This procedure can be performed at either of the following:

- Standalone SL Console
- Web-launched SL Console

Task Purpose

Reallocate library resources (storage cells, tape drives, rotational or AEM CAPs, or cartridges) from one partition to another.

Reallocation is done through one of the following:

- "Partitions—Design (Step 3b)" on page 294
- "Partitions—Design (Step 3b) – AEMs Only" on page 300 for AEM modules

Task Steps

You must use the following two-step process:

1. **Remove the resource from the partition it is currently allocated to.**
2. **Allocate the resource to a different partition.**

   See "Design a Partition: Base, DEM, or CEM Module" on page 222 for detailed instructions.

   Caution – Reallocating resources can result in orphaned cartridges and data that could be lost. See "Planning for Partitioning" on page 206 for details.

▼ Make a Hardware Change to a Partitioned Library

Task Tool

This procedure can be performed at either of the following:

- Standalone SL Console
- Web-launched SL Console

Task Purpose

Some library hardware changes, such as adding expansion modules, adding a second robot, or adding rotational CAP cells, may require the removal of all or part of an existing partitioned module. Use the following process to make such hardware changes without losing partitioning information for the sections of the library that are unchanged.

> **Caution –** Failure to follow this procedure could result in the loss of library partition configuration information after a hardware change.

Task Steps

1. **De-allocate all library resources (storage cells,** rotational and AEM **CAPs, and drives) that will be removed as part of the hardware change from the partitions they are currently allocated to.**

   See "Design a Partition: Base, DEM, or CEM Module" on page 222 for detailed instructions.

2. **Power down the library.**

   See "Power Down the Library" on page 594 "Power Off the Library" on page 410 for detailed instructions.

3. **Install the hardware change.**

4. **Power up the library.**

   See "Power Up the Library" on page 595 for detailed instructions.

   All partition allocations for the unchanged parts of the library remain in effect.

5. **Allocate the library resources that have been added due to the hardware change.**

   See "Design a Partition: Base, DEM, or CEM Module" on page 222 for detailed instructions.

   > **Caution –** Reallocating resources can result in orphaned cartridges and data that could be lost. See "Planning for Partitioning" on page 206 for details.

Partition Report Tasks

▼ Display a Partition Report

Task Tool

This procedure can be performed at either of the following:

- Standalone SL Console
- Web-launched SL Console

Task Purpose

Use this procedure to display any of the following partition reports:

- Cartridge Cell and Media Summary: Displays a detailed list of all resource partition assignments.
- Host Connections Summary: Displays detailed host-partition connection information for all partitions.
- Orphaned Cartridge Report: Displays a detailed list of all orphaned cartridges.
- Partition Details: Displays detailed information for a selected partition.
- Partition Summary: Displays summary information for all partitions.

> **Note –** The partition reports display data saved to the library controller database. If you have made partition configuration changes without commiting the changes to the library controller through the **Commit (Step 4)** screen, the data in these reports will differ from data shown on the partition **Summary (Step 2)** and **Design (Step 3b**) screens.

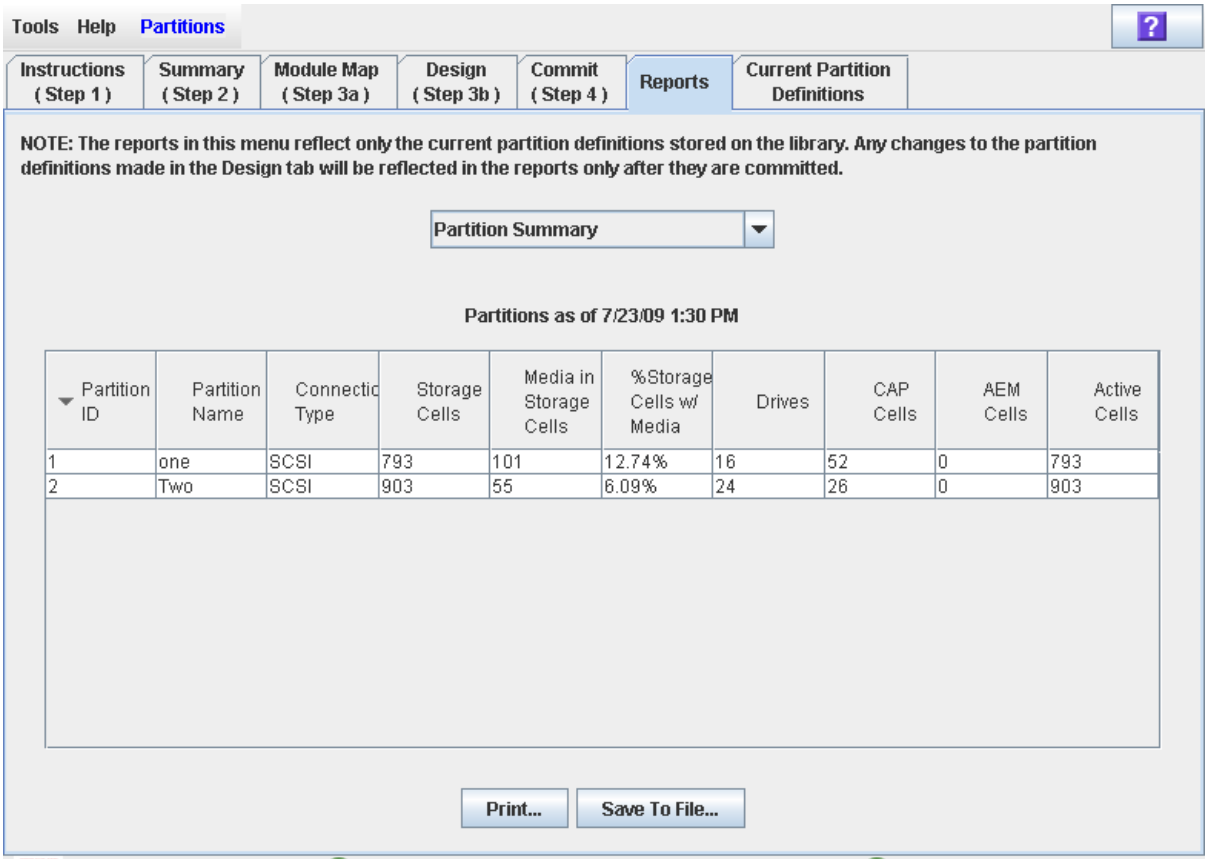
Task Steps

1. **Select Tools > Partitions, and click the Reports tab.**

   The **Reports** page appears.

2. **In the list, select the report you want to display.**

   The page updates with current data from the library controller database.



3. **If you want to print the report data or save it to a file, see the following procedures:**

   - "Print Partition Report Data" on page 251
   - "Save Partition Report Data" on page 253

▼ Print Partition Report Data

Task Tool

This procedure can be performed at either of the following:

- Standalone SL Console
- Web-launched SL Console

Task Purpose

Use this procedure to print a partition report. This procedure can be performed from any of the partition report pages.

Task Steps

1. **Select Tools > Partitions, and click the Reports tab.**

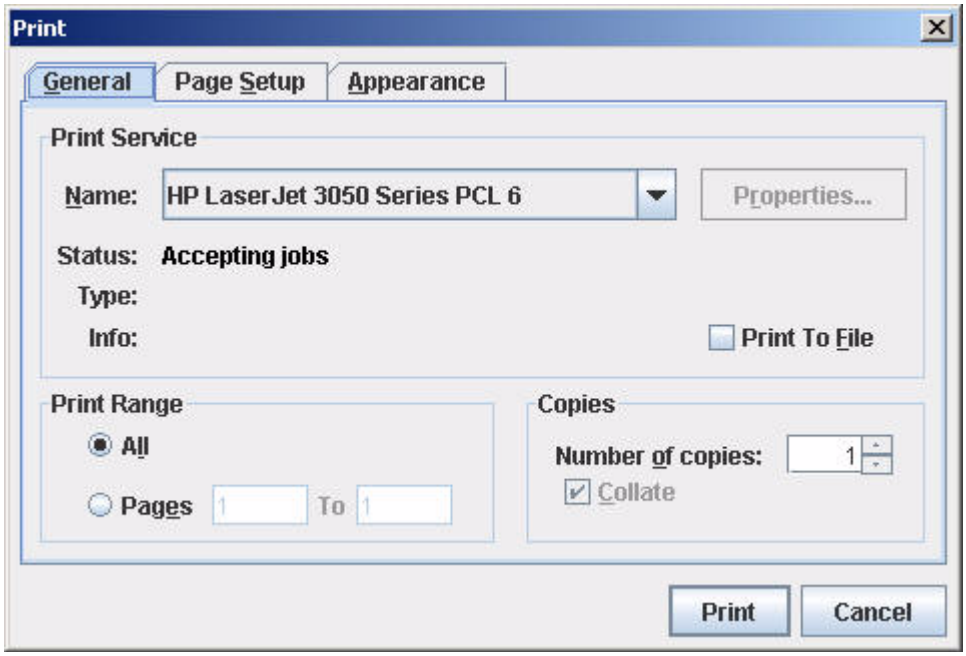
   The **Reports** page appears.

2. **In the list, select any report.**

   The specified report is displayed. All report pages include the **Print** and **Save to File** buttons.

3. **Click Print.**

   The **Print** dialog box appears.



4. **Complete the print dialog box, and click Print.**

   The report is printed to the selected printer.

▼ Save Partition Report Data

Task Tool

This procedure can be perform ed at either of the followin g:

- Standalone SL Console
- Web-launched SL Console

Task Purpose

Use this procedure to save partition report data to a comma-separated file (.csv format) that is compatible with most spreadsheet applications. This procedure can be performed from any of the partition report pages.

Task Steps

1. **Select Tools > Partitions, and click the Reports tab.**

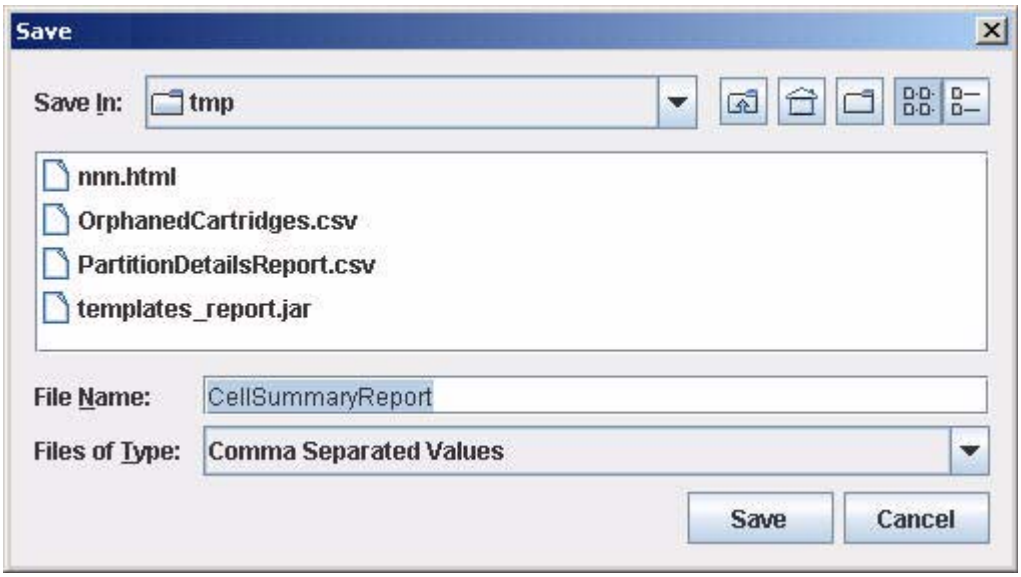
   The **Reports** page appears.

2. **In the list, select any report.**

   The specified report is displayed. All report pages include the **Print** and **Save to File** buttons.

3. **Click Save to File.**

   The **Save** dialog box appears.



4. **Browse to the directory where you want to save the file, and enter the file name.**
5. **Click Save.**

   The data is saved to the specified file.

▼ Display Partition Detail

Task Tool

This procedure can be performed at either of the following:

- Standalone SL Console
- Web-launched SL Console

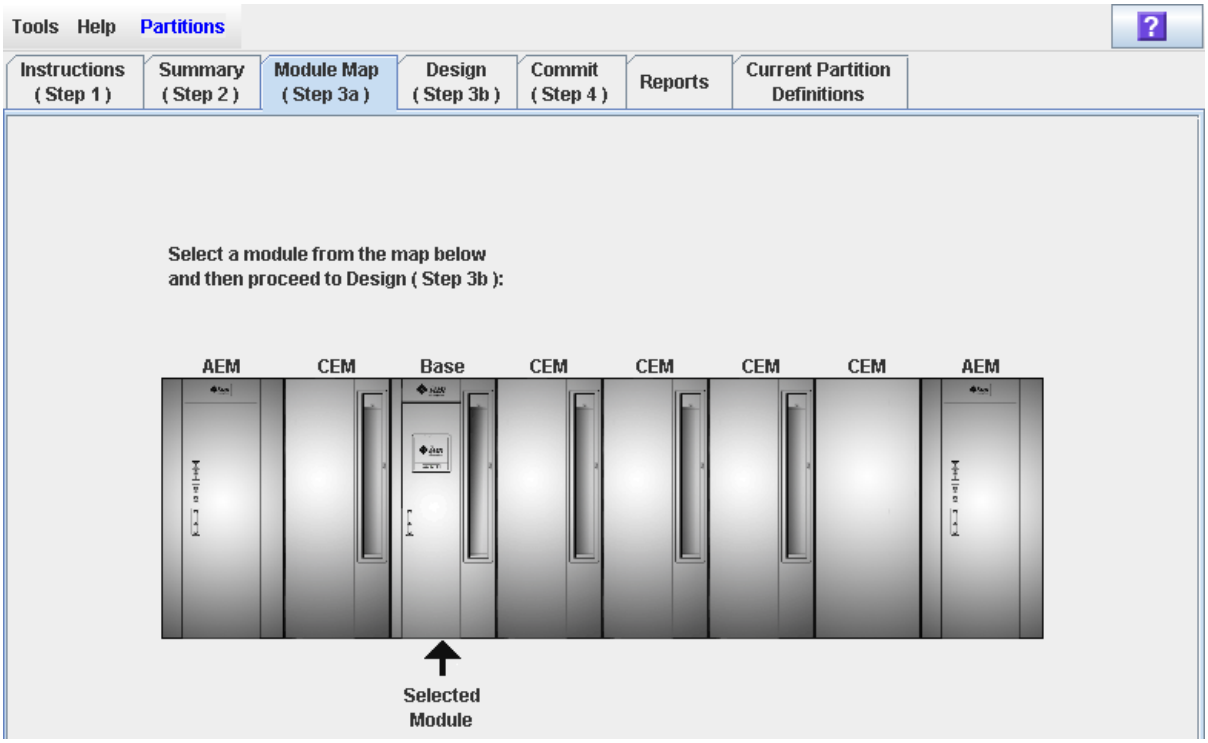
Task Purpose

Use this procedure to display current partition boundaries and allocations. You can also display detailed information about cartridge, drive, and storage cell locations.

Task Steps

1. **Select Tools > Partitions.**
2. **Click the Module Map (Step 3a) tab.**

   The **Module Map (Step 3a)** page appears.



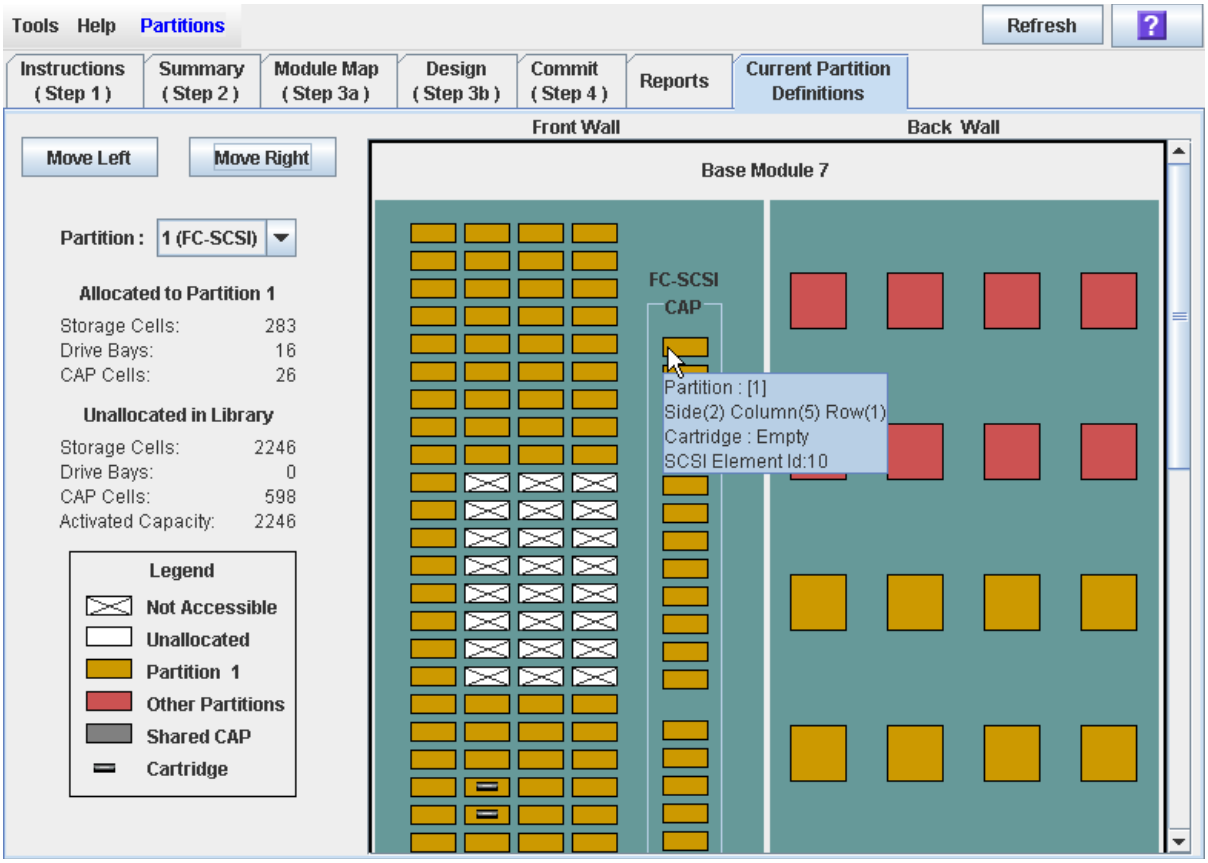
3. **Click the module you want to display.**

   The module is highlighted on the page.

4. **Click the Current Partition Definitions tab.**

   The **Partition Definitions** page appears, displaying the current configuration of the module you have selected.

   You can hover over a cell to display a tooltip of detailed information about the cell.



CAP Operation Tasks

▼ Associate an FC-SCSI Partition to Its Shared CAPs

Task Tool

This procedure can be performed at either of the following:

- Standalone SL Console
- Web-launched SL Console

Task Purpose

Use this procedure to associate an FC-SCSI partition to its shared rotational or AEM CAPs. This procedure gives the partition exclusive ownership of its shared CAPs until you explicitly remove the association. See "Remove a Partition-CAP Association" on page 263 for details.

Note – This procedure cannot be used for HLI partitions because HLI host applications always use CAP reservations.

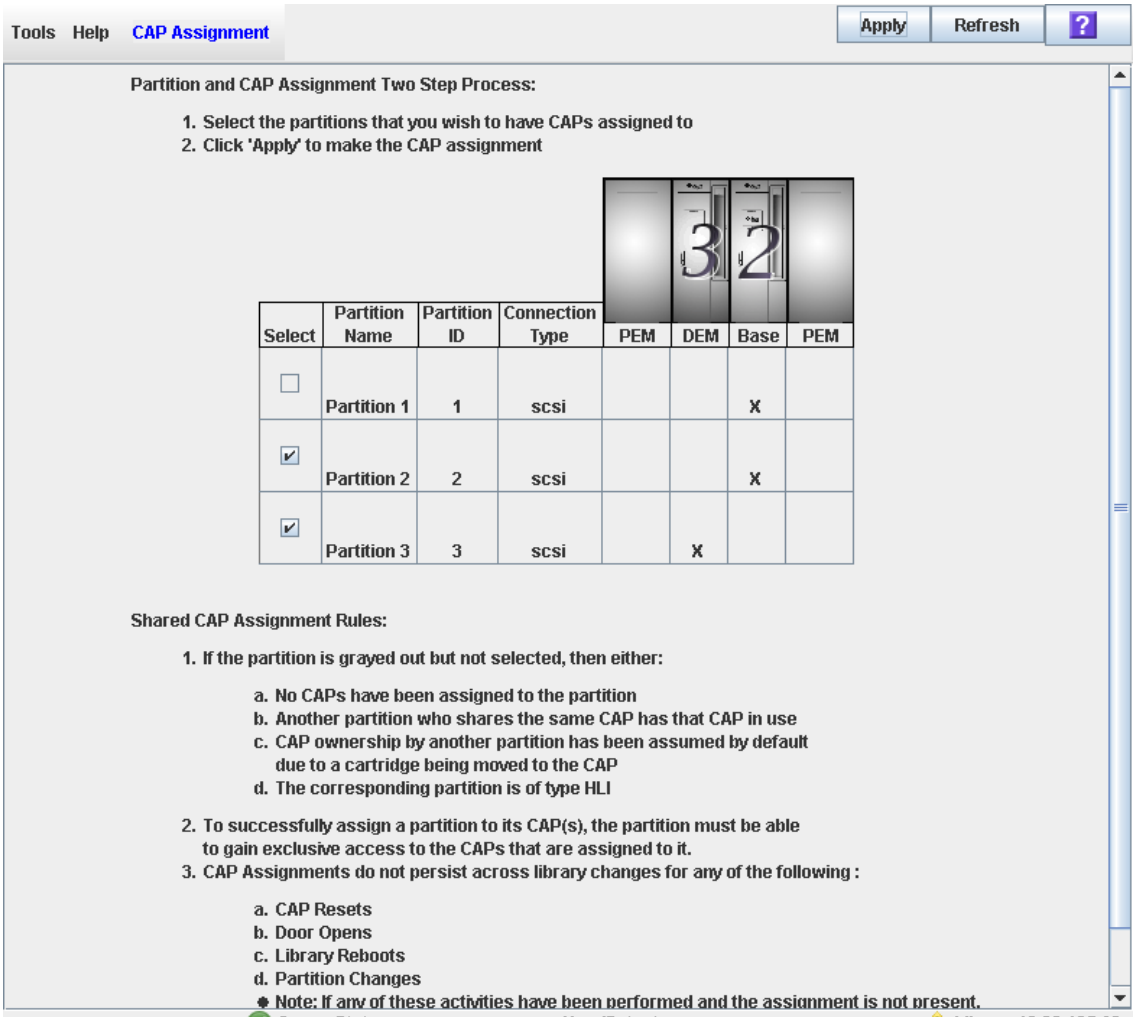
Note – This procedure is not necessary for dedicated FC-SCSI CAPs because a partition always has ownership of its dedicated CAPs.

Note – AEM CAPs are subject to the same partitioning rules and restrictions as rotational CAPs. Throughout this section, the term "CAP" refers to both types of CAPs.

Task Steps

1. **Select Tools > Shared CAP Assignment.**

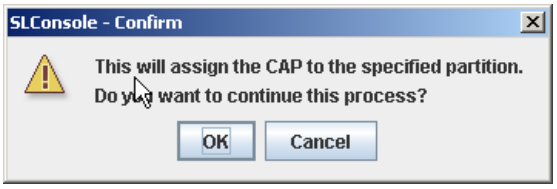
   The **Shared CAP Assignment** page appears.



2. **Select the check box of the partitions into which you want to enter cartridges. See "CAP Assignment" on page 338 for details on these page fields.**

3. **Click Apply.**

   The **CAP Confirm** message appears.



4. **Click OK.**

5. **Perform the enter or eject operation. See one of the following procedures for details:**

   - "Enter Cartridges Into a Partition" on page 261

- “Eject Cartridges From a Partition” on page 262

▼ Enter Cartridges Into a Partition

Task Tool

This procedure can be performed at either of the following:

- Standalone SL Console
- Web-launched SL Console

Task Purpose

Use this procedure to enter or bulk load cartridges into one or more partitions. Partitions can use only the rotational or AEM CAPs allocated to them.

> **Note –** If you are entering cartridges into an FC-SCSI partition that has one or more shared rotational or AEM CAPs, you must associate the partition to its CAPs before beginning this procedure. See "Associate an FC-SCSI Partition to Its Shared CAPs" on page 258 for details. Failure to do this will cause the CAP to remain locked and will prevent the partition from acquiring ownership of the CAP.

Task Steps

1. **Follow the steps in one of the following procedures, depending on whether you are using a rotational or AEM CAP:**
   - "Enter Cartridges Through a Rotational CAP" on page 418
   - "Bulk Load Cartridges Through an AEM CAP" on page 422
2. **At the completion of the procedure, the CAP reservation is released, as follows:**
   - If you initiated this procedure from an HLI host, the host removes the reservation, making the CAP available to other partitions.
   - If prior to performing this procedure you performed a manual partition-CAP association, you can now remove the association if the partition is finished with the CAP. See "Remove a Partition-CAP Association" for details.
   - If the FC-SCSI partition uses a dedicated CAP, the CAP remains unlocked and reserved to the partition.

▼ Eject Cartridges From a Partition

Task Tool

This procedure can be performed at either of the following:

- Standalone SL Console
- Web-launched SL Console

Task Purpose

Use this procedure to eject or bulk unload cartridges from a partitioned library. Partitions can use only the rotational or AEM CAPs allocated to them.

> **Note –** If you are entering cartridges into an FC-SCSI partition that has one or more shared rotational or AEM CAPs, you must associate the partition to its CAPs before beginning this procedure. See "Associate an FC-SCSI Partition to Its Shared CAPs" on page 258 for details. Failure to do this will cause the CAP to remain locked and will prevent the partition from acquiring ownership of the CAP.

Task Steps

1. **Follow the steps in one of the following procedures, depending on whether you are using a rotational or AEM CAP:**

- "Eject Cartridges Through a Rotational CAP" on page 420
- "Bulk Unload Cartridges Through an AEM CAP" on page 424

2. **At the completion of the procedure, the CAP reservation is released, as follows:**
   - If you initiated this procedure from an HLI host, the host removes the reservation, making the CAP available to other partitions.
   - If prior to performing this procedure you performed a manual partition-CAP association, you can now remove the association if the partition is finished with the CAP. See "Remove a Partition-CAP Association" for details.
   - If the FC-SCSI partition uses a dedicated CAP, the CAP remains unlocked and reserved to the partition.

▼ Remove a Partition-CAP Association

Task Tool

This procedure can be performed at either of the following:

- Standalone SL Console
- Web-launched SL Console

Task Purpose

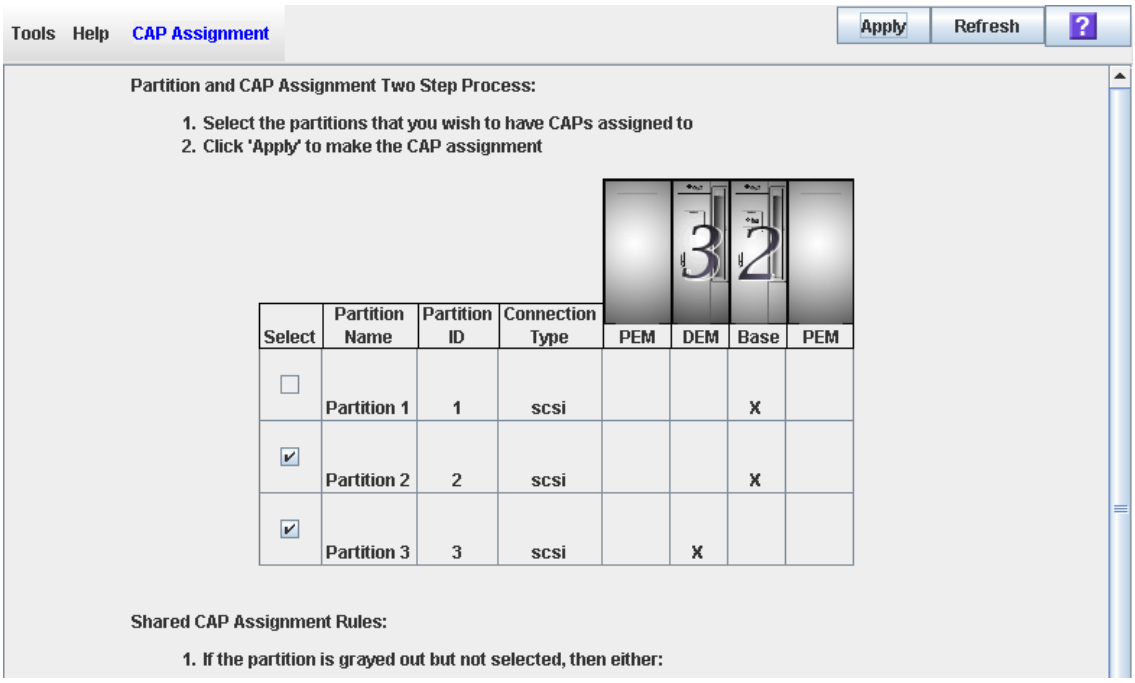
Use this procedure after completing an enter or eject operation if you have previously associated the partition to its shared rotational or AEM CAPs. This procedure removes the partition-CAP associations previously set, making the shared CAPs available to other partitions.

> **Note –** AEM CAPs are subject to the same partitioning rules and restrictions as rotational CAPs. Throughout this section, the term "CAP" refers to both types of CAPs.

Task Steps

1. **Select Tools > Shared CAP Assignment.**

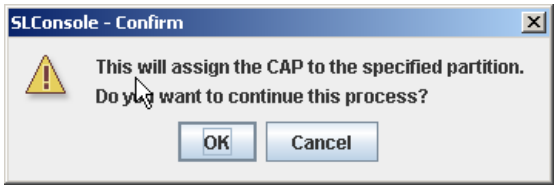
   The **Shared CAP Assignment** page appears.



2. **Deselect the check box of the partitions with the CAP associations. See "CAP Assignment" on page 338 for details on these page fields.**

3. **Click Apply.**

   The **CAP Confirm** message appears.



4. **Click OK.**

▼ Override a CAP Reservation

Task Tool

This procedure can be performed at either of the following:

- Standalone SL Console
- Web-launched SL Console

Task Purpose

Use this procedure when a partition has reserved a shared rotational or AEM CAP, but the reservation cannot be released through the ACSLS or ELS host.

> **Note –** This topic applies to partitioned libraries only. If a library is not partitioned, CAP reservations must always be released through ACSLS or ELS. See the ACSLS or ELS documentation for details.

> **Note –** You must follow all steps in this procedure. If you do not complete the procedure, the CAP could be left unavailable to all partitions, and/or cartridges assigned to one partition could be entered into another partition.

> **Note –** AEM CAPs are subject to the same partitioning rules and restrictions as rotational CAPs. Throughout this section, the term "CAP" refers to both types of CAPs.

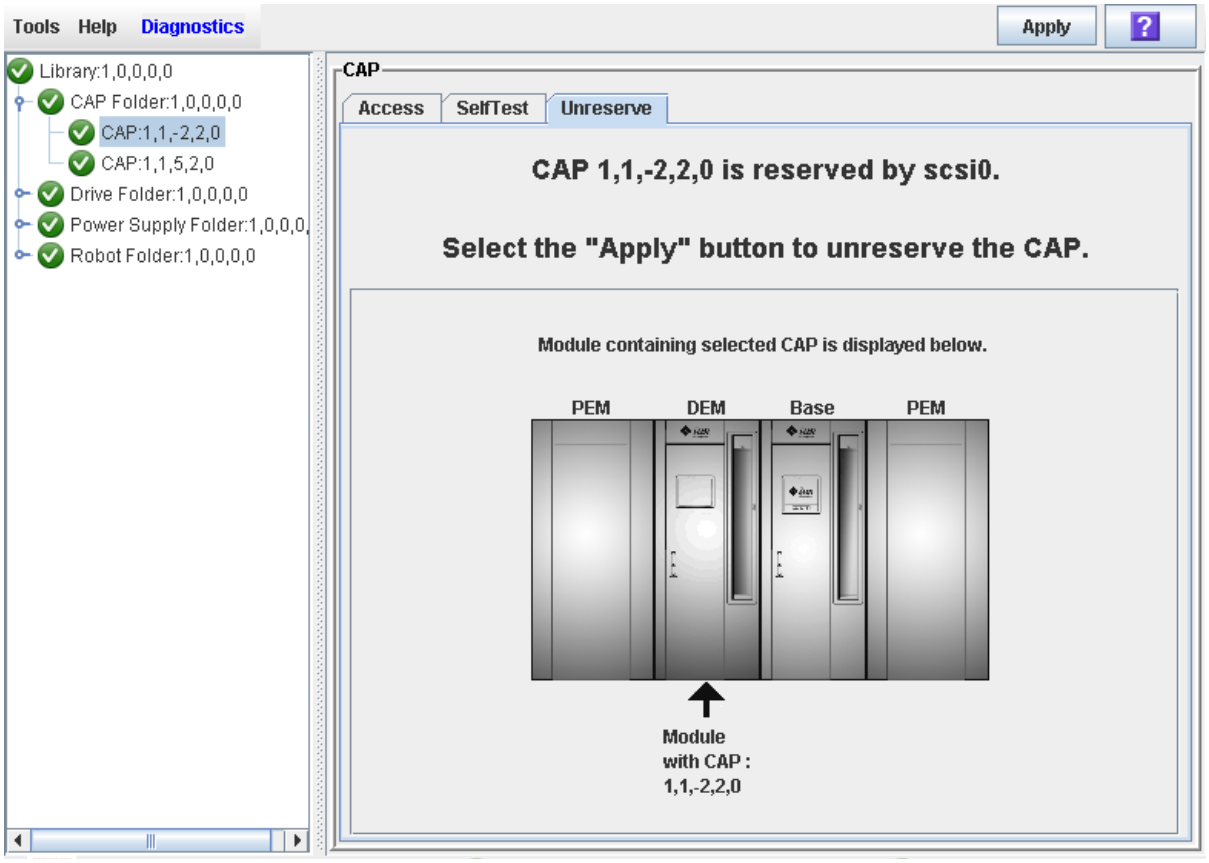
Task Steps

1. **Select Tools > Diagnostics.**
2. **Expand the CAP Folder, and click the CAP whose reservation you want to override (unreserve).**

> **Note –** AEM CAPs are identified as follows: column "–31" for a left AEM CAP, and column "31" for a right AEM CAP.

3. **Click the Unreserve tab.**

   The **Unreserve** page appears, identifying the partition that has r eserved the CAP.



4. **Click Apply to override the reservation.**

   The **Unreserve Confirm** message appears, indicating “T his will remove the reservatio n from the designated host...”

   - Click **OK** to continue wi th the override operation. The library removes the CAP reservation and sets the CAP user to “default,” which makes the CAP unavailable to all partitions.
   - Click **Cancel** to cancel the override operation an d return to Step 3.

5. **If the CAP is locked, unlock it at the SL Console. See “Unlock a CAP or AEM Access Door” on page 398 for the detailed procedure.**

6. **Push the CAP button to open the CAP.**

   - If it is empty, proceed to Step 8.
   - If it contains cartridge s, remove them all.

7. **Label the cartridges with the partition ID displayed in Step 3.**

8. **Push the CAP button to close the CAP.**

   The CAP closes and locks automatically, and the CAP button light turns of f.

   The library audits the CAP to verify that it is empty. It then sets the CAP status to “unreserved,” which makes the CAP available to all partitions it is allocated to.

Note – You might need to refresh the CAP display to see the new CAP status.

9. **Contact the person responsible for managing the removed cartridges to determine their disposition. If they are to be re-entered into the library, they must be entered into the correct partition.**

Partition Screen Reference

This section includes detailed descriptions of all SL Console partition screens, arranged by screen navigation path. For example, **Partitions—Summary (Step 2)—Add Connection** indicates the screen accessed by clicking **Tools** and then **Partitions** from the Menu Bar, and then clicking the **Summary (Step 2)** tab, and then the **Add Connection** button.

Partition Screens are organized into the following categories:

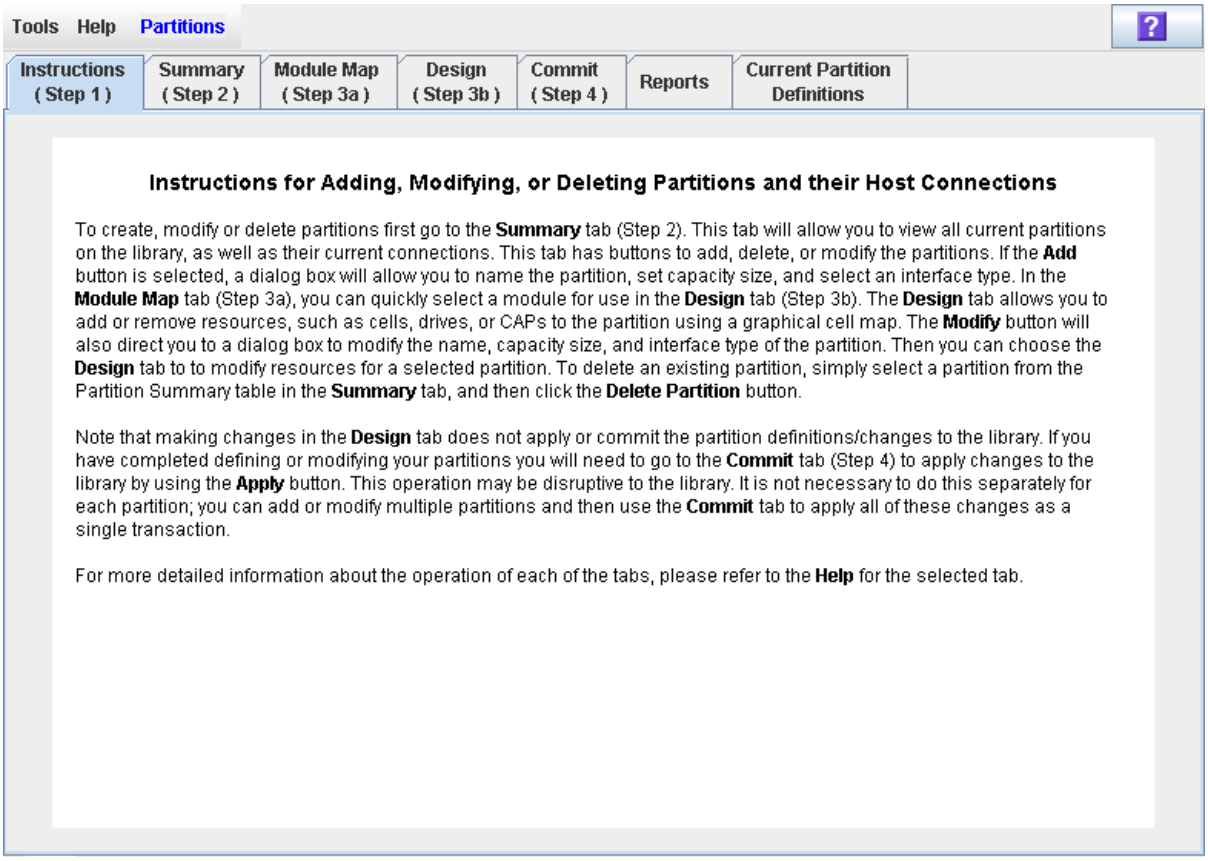
- "Partition Summary Screens" on page 269
- "Partition Design and Commit Screens" on page 291
- "Partition Report Screens" on page 316
- "Partition CAP Operation Screens" on page 337

> **Note –** The partition **Summary (Step 2)** and **Design (Step 3b)** screens, and all associated messages, give you a dynamic workspace to design your library partitions. All partition configuration information is automatically saved to the partition workspace in SL Console memory and retained for the duration of your SL Console session. This allows you to switch among partition views and leave and return to the partition screens any number of times without losing your configuration changes.
>
> **Caution –** Information in the SL Console partition workspace is saved to the library controller database only through the **Commit (Step 4)** screen. If your SL Console session ends or you refresh the workspace data before you have committed your updates through the **Commit (Step 4)** screen, you will lose any partition changes you have made through the **Summary (Step 2)** and **Design (Step 3b)** screens and all associated messages.

Partition Summary Screens

Partitions—Instructions (Step 1)

Sample Screen



Description

Displays instructions for using the partition screens.

> **Note –** This screen appears automatically the first time you select **Tools** > **Partitions** during an SL Console login session.

Screen Access

This screen can be accessed at either of the following:

- Standalone SL Console
- Web-launched SL Console

Screen Fields

None

Buttons and Controls

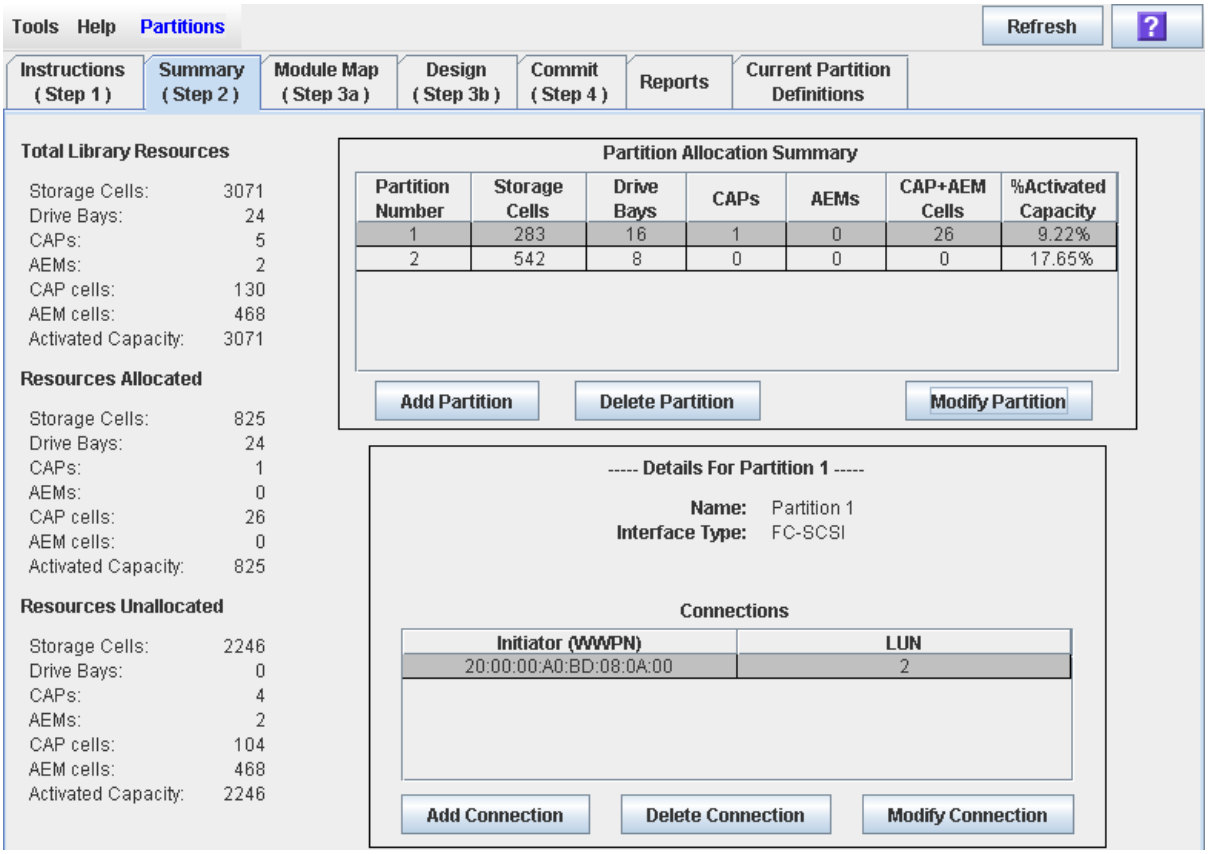
? (Help)

Click to display online help for the screen.

See Also

- “Partitions—Summary (Step 2)” on page 272
- “Partitions—Design (Step 3b)” on page 294
- “Partitions—Commit (Step 4)” on page 309
- “Partitions—Reports” on page 317

Partitions—Summary (Step 2)



Description

Displays summary information for the library and, optionally, a selected partition.

Also includes buttons that enable you to initiate any of the following activities:

- Add a new partition
- Delete a partition from the library
- Modify partition summary information

  Note – The following buttons are available for FC-SCSI host-partition connections only. HLI host-partition connections are configured through the host library management software (ELS or ACSLS), not through the SL Console. See the ELS or AC SLS documentation for details.

- Add a new host-partition connection
- Delete a host-partition connection
- Modify the configuration of a host-partition connection

Screen Access

This screen can be accessed at either of the following:

- Standalone SL Console

- Web-launched SL Console

Screen Fields

Partition Summary

Partition Number

Display only.

ID assigned to the partition. IDs can range from 1–8.

Storage Cells

Display only.

Total number of storage cells allocated to this partition.

Drives Bays

Display only.

Total number of tape drives allocated to thi s partition.

CAPs

Display only.

Total number of rotational CAPs allocated to this partition. This number represents whole CAPs, not individual CAP cells.

AEMs

Display only.

Total number of AEMs allocated to this par tition. This number represents whole AEMs, not individual AEM cells.

CAP+AEM Cells

Display only.

Total number of individual r otational and AEM CAP cells allocated to this partition.

%Activated Capacity

Display only.

Percentage of the library's activated capacity that has been allocated to this partition. Calculated as:

(partition) **Allocated Storage Cells** / (total library) **Activated Capacity**

Details for Partition n

Name

Display only.

The optional name assigned to the selected partition.

Interface Type

Display only.

Type of interface assigned to the select ed host-partition connection. Options are:

- HLI
- FC-SCSI

Note – The following fields are available for FC-SCSI host-partition connections only.

Connections

Initiator (WWPN)

Display only.

The World Wide Port Name of the FC-SCSI host bus adapter (HBA).

LUN

Display only.

The logical unit number of the library partition as seen f rom the host. Th is entry must be unique on the host.

Total Library Resources

Storage Cells

Display only.

Total physical capacity of the library .

Drives

Display only.

Total number of tape drives in the librar y.

CAPs

Display only.

Total number of rotational CAPs in the library .

AEMs

Display only.

Total number of AEMs in the library .

CAPs

Display only.

Total number of rotational CAP cells in the library .

AEM cells

Display only.

Total number of AEM cells in the library .

> **Note –** This field appears only if the library configuration includes one or more AEMs. Note to DonS--Use Case #59 indicates the field won' t appear on the screen if there's no AEM, but field appears anyway.

Activated Capacity

Display only.

Total activated storage capacity of the library.

Resources Allocated

Storage Cells

Display only.

Total number of storage cells allocated to all library partitions.in the **Design (Step 3b)** screen.

Drives

Display only.

Total number of tape drives allocated to all library partitions.

CAPs

Display only.

Total number of rotational CAPs allocated to all library partitions.

AEMs

Display only.

Total number of AEMs allocated to all library partitions.

CAP cells

Display only.

Total number of rotational CAP cells allocated to all library partitions.

AEM cells

Display only.

Total number of AEM cells allocated to all library partitions.

Activated Capacity

Display only.

Total activated storage capacity assigned to all library partitions through the **Add Partition** or **Modify Partition** screen.

Resources Unallocated

Storage Cells

Display only.

Total number of storage cells in the library that are not yet allocated to a partition.

Drive Bays

Display only.

Total number of tape drives in the library that are not yet allocated to a partition.

CAPs

Display only.

Total number of rotational CAPs in the library that are not allocated to any library partition.

AEMs

Display only.

Total number of AEMs in the library that are not allocated to any library partition.

CAP cells

Display only.

Total number of rotational CAP cells in the library that are not yet allocated to a partition.

AEM cells

Display only.

Total number of AEM cells in the library that are not allocated to any partition.

Capacity

Display only.

Total activated storage capacity not assigned to any library partition through the **Add Partition** or **Modify Partition** screen. Calculated as:

(total library) **Activated Capacity** – (allocated) **Activated Capacity**

Buttons and Controls

Refresh

Click to refresh the SL Console partition workspace with current data from the library controller database. All uncommitted partition changes you have made during this SL Console login session will be discarded. The **Partition Refresh** message appears, prompting you to confirm the refresh.

? (Help)

Click to display online help for the screen.

Add Partition

Click to add a new partition. The **"Partitions—Summary (Step 2)—Add Partition" on page 285** dialog box appears.

Delete Partition

Click to delete the currently selected partition. The **"Partitions—Summary (Step 2)—Delete Partition" on page 287** dialog box appears.

Modify Partition

Click to modify summary information for the currently selected partition. The **"Partitions—Summary (Step 2)—Modify Partition" on page 289** dialog box appears.

> **Note –** The following buttons are available for FC-SCSI host-partition connections only.

Add Connection

Click to add a new host connection to the currently selected partition. The **"Partitions—Summary (Step 2)—Add Connection" on page 279** dialog box appears.

Delete Connection

Click to delete the currently selected host-partition connection. The **"Partitions—Summary (Step 2)—Delete Connection" on page 281** dialog box appears.

Modify Connection

Click to modify the configuration of the currently selected host-partition connection. The **"Partitions—Summary (Step 2)—Modify Connection" on page 283** dialog box appears.

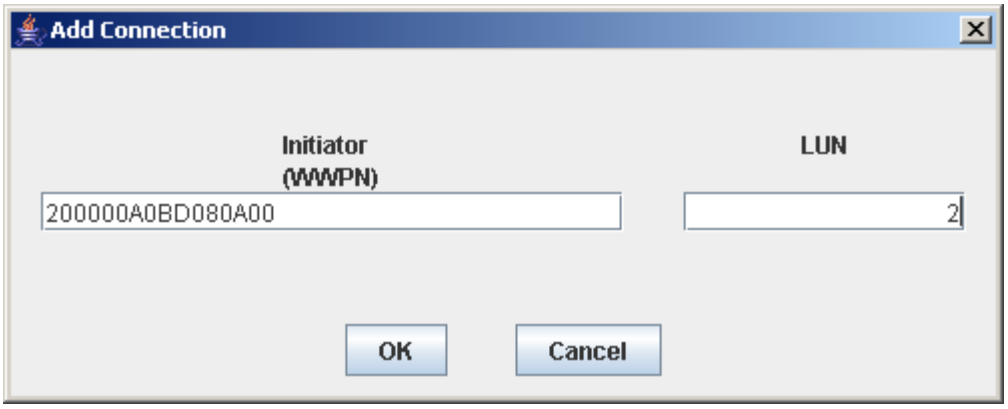
See Also

- "Partitions—Summary (Step 2)" on page 272
- "Partitions—Summary (Step 2)—Add Partition" on page 285

- “Partitions—Summary (Step 2)—Delete Partition” on page 287
- “Partitions—Summary (Step 2)—Modify Partition” on page 289
- “Partitions—Module Map (Step 3a)” on page 292
- “Partitions—Design (Step 3b)” on page 294
- “Partitions—Commit (Step 4)” on page 309
- “Partitions—Reports” on page 317

Partitions—Summary (Step 2)—Add Connection

Sample Screen



Description

Enables you to configure the connection between a host and the selected partition. of an unbridged library Each partition can have u p to nine host-partition connectio ns.

> **Note –** This screen is available for FC-SCSI host-partition connections only. HLI host-partition connections are configured through the host library management software (ELS or ACSLS), not through the SL Console. See the ELS or ACSL S documentation for details.

This screen is a dialog box that appears when you click **Add Connection** on the "Partitions—Summary (Step 2)" on page 272 screen.

> **Caution –** Information in the SL Console partition workspace is saved to the library controller database only through the **Commit (Step 4)** screen. If your SL Console session ends or you refresh the workspace data before you have committed your updates through the **Commit (Step 4)** screen, you will lose any partition changes you have made through the **Summary (Step 2)** and **Design (Step 3b)** screens and all associated messages.

Screen Access

This screen can be accessed at either of the following:

- Standalone SL Console
- Web-launched SL Console

Screen Fields

Connections *n*

Display only.

Partition ID of the selected partition.

Initiator (WWPN)

Required.

World Wide Port Name of the FC-SCSI host bus adapter (HBA).

Sixteen hexadecimal digits. You can enter upper- or lower-case hex digits, but the display is always shown in all up per-case.

LUN

Required.

Logical unit number of the librar y partition as seen from the host. This entry must be unique on the host. You can create up to nine unique LUNs per partition.

> **Note –** Each initiator connected to the library must have one library partition assigned to LUN 0. When you verify or commit partition configuration changes, the SL Console will notify you if an initiator does not meet this requirement.

Buttons and Controls

OK

Click to update the SL Conso le partition workspace with the current screen settings and return to the previous screen.

> **Note –** Clicking this button does not update the library controller database.

Cancel

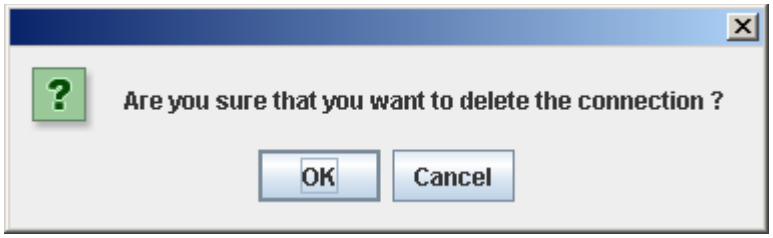
Click to discard the current screen settin gs and return to the previous screen.

See Also

- “Partitions—Summary (Step 2)” on page 272

Partitions—Summary (Step 2)—Delete Connection

Sample Screen



Description

Enables you to delete the selected host-partition connectio n.

> **Note –** This screen is available for FC-SCSI host-partition connections only. HLI host-partition connections ar e configured through the host library management software (ELS or ACSLS), not through the SL Console. See the ELS or ACSL S documentation for details.

This screen is a message that appears when you click **Delete Connection** on the "Partitions—Summary (Step 2)" on page 272 screen.

> **Caution –** Information in the SL Console partition workspace is saved to the library controller database only through the **Commit (Step 4)** screen. If your SL Console session ends or you refresh the workspace data before you have committed your updates through the **Commit (Step 4)** screen, you will lose any partition changes you have made through the **Summary (Step 2)** and **Design (Step 3b)** screens and all associated messages.

Screen Access

This screen can be accessed at either of the following:

- Standalone SL Console
- Web-launched SL Console

Screen Fields

None

Buttons and Controls

OK

Click to update the SL Conso le partition workspace with the current screen settings and return to the previous screen.

> **Note –** Clicking this button does not update the library controller database.

Cancel

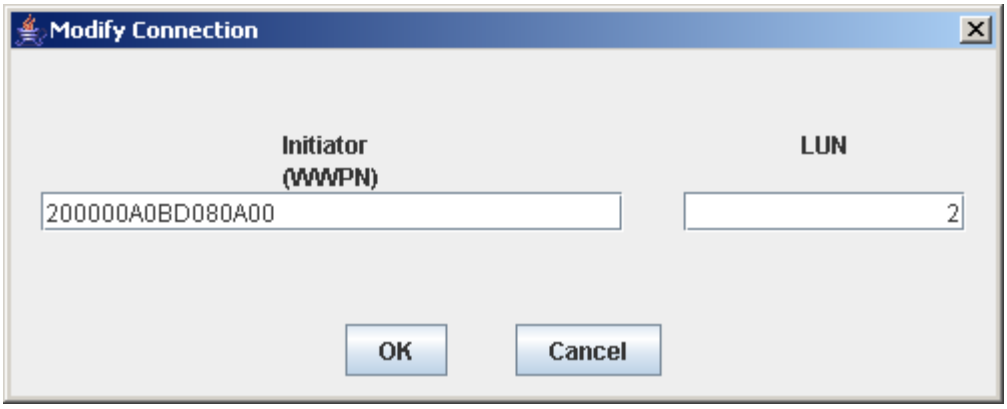
Click to discard the current screen settin gs and return to the previous screen.

See Also

- “Partitions—Summary (Step 2)” on page 272

Partitions—Summary (Step 2)—Modify Connection

Sample Screen



Description

In an unbridged library, enables you to modify the configuration of the selected host-partition connection.

> **Note –** This screen is available for FC-SCSI host-partition connections only. HLI host-partition connections are configured through the host library management software (ELS or ACSLS), not through the SL Console. See the ELS or ACSLS documentation for details.

This screen is a dialog box that appears when you click **Modify Connection** on the Partitions—Summary (Step 2)—Modify Connection screen.

> **Caution –** Information in the SL Console partition workspace is saved to the library controller database only through the **Commit (Step 4)** screen. If your SL Console session ends or you refresh the workspace data before you have committed your updates through the **Commit (Step 4)** screen, you will lose any partition changes you have made through the **Summary (Step 2)** and **Design (Step 3b)** screens and all associated messages.

Screen Access

This screen can be accessed at either of the following:

- Standalone SL Console
- Web-launched SL Console

Screen Fields

Initiator (WWPN)

World Wide Port Name of the FC-SCSI host bus adapter (HBA).

Sixteen hexadecimal digits. You can enter upper- or lower-case hex digits, but the display is always shown in all upper-case.

The screen displays the value assigned previously. You can leave it as is or make changes.

LUN

Required.

Logical unit number of the library partition on the host. This entry must be unique on the host.

> **Note –** Each initiator connected to the library must have one library partition assigned to LUN 0. When you verify or commit partition configuration changes, the SL Console will notify you if an initiator does not meet this requirement.

Buttons and Controls

OK

Click to update the SL Console partition workspace with the current screen settings and return to the previous screen.

> **Note –** Clicking this button does not update the library controller database.

Cancel

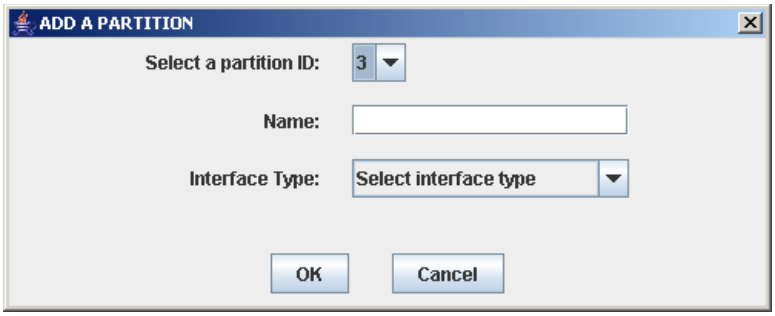
Click to discard the current screen settings and return to the previous screen.

See Also

- "Partitions—Summary (Step 2)" on page 272

Partitions—Summary (Step 2)—Add Partition

Sample Screen



Description

Enables you to add a new partition. You can create up to eight partitions, with IDs ranging from 1–8.

This screen is a dialog box that appears when you click **Add Partition** on the "Partitions—Summary (Step 2)" on page 272 screen.

> **Caution –** Information in the SL Console partition workspace is saved to the library controller database only through the **Commit (Step 4)** screen. If your SL Console session ends or you refresh the workspace data before you have committed your updates through the **Commit (Step 4)** screen, you will lose any partition changes you have made through the **Summary (Step 2)** and **Design (Step 3b)** screens and all associated messages.

Screen Access

This screen can be accessed at either of the following:

- Standalone SL Console
- Web-launched SL Console

Screen Fields

Select a Partition ID

Required.

Partition ID you want to add. Options are 1–8.

The list displays all available IDs. The default is the next available ID in numerical order.

Name

Optional.

Name you want to assign to the partition.

0–60 ASCII characters.

Interface Type

Required.

Type of interface to be used for this host-partition connection. Options are:

- HLI
- FC-SCSI

Buttons and Controls

OK

Click to update the SL Conso le partition workspace with the current screen settings and return to the previous screen.

> **Note –** Clicking this button does not update the library controller database.

Cancel

Click to discard the current screen settin gs and return to the previous screen.

See Also

- “Partitions—Summary (Step 2)” on page 272

Partitions—Summary (Step 2)—Delete Partition

Sample Screen

Description

Enables you to confirm that you want to delete the specified partition. All information for the partition – including host-partition connections, partition boundaries, and partition ID – are deleted from the SL Console partition workspace.

This screen is a message that appears when you click **Delete Partition** on the "Partitions—Summary (Step 2)" on page 272.

> **Caution –** Information in the SL Console partition workspace is saved to the library controller database only through the **Commit (Step 4)** screen. If your SL Console session ends or you refresh the workspace data before you have committed your updates through the **Commit (Step 4)** screen, you will lose any partition changes you have made through the **Summary (Step 2)** and **Design (Step 3b)** screens and all associated messages.

Screen Access

This screen can be accessed at either of the following:

- Standalone SL Console
- Web-launched SL Console

Screen Fields

None

Buttons and Controls

OK

Click to update the SL Conso le partition workspace with the current screen settings and return to the previous screen.

> **Note –** Clicking this button does not update the library controller database.

Cancel

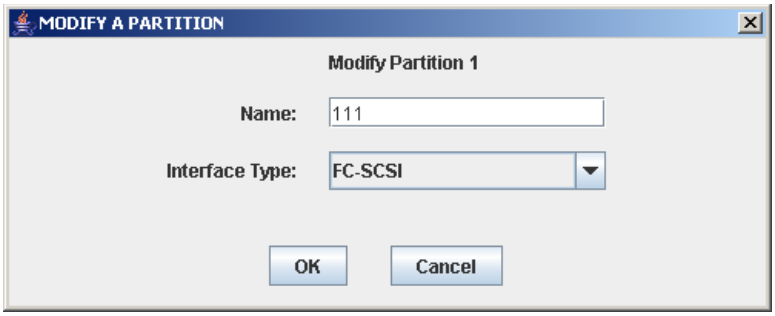
Click to discard the current screen settin gs and return to the previous screen.

See Also

- “Partitions—Summary (Step 2)” on page 272

Partitions—Summary (Step 2)—Modify Partition

Sample Screen



Description

Enables you to modify the name or host-partition con nection type assigned to the selected partition.

This screen is a dialog b ox that appears when you click **Modify Partition** on the "Partitions—Summary (Step 2)" on page 272 screen.

> **Caution –** Information in the SL Console partition workspace is saved to the library controller database only through the **Commit (Step 4)** screen. If your SL Console session ends or you refresh the workspace data before you have committed your updates through the **Commit (Step 4)** screen, you will lose any partition changes you have made through the **Summary (Step 2)** and **Design (Step 3b)** screens and all associated messagemessages.

Screen Access

This screen can be accessed at either of the following:

- Standalone SL Console
- Web-launched SL Console

Screen Fields

Modify Partition *n*

Display only.

ID of the partition you want to m odify.

Name

Required.

Name you want to assign to the partition.

0–60 ASCII characters.

The screen displays the value assigned previously. You can leave it as is or make changes.

The screen displays the value assigned previously. You can leave it as is or make changes.

Interface Type

Type of interface to be used for this host-partition connection. Options are:

- HLI
- FC-SCSI

The screen displays the value assigned previously. You can leave it as is or make changes.

> **Note –** Changing the interface type can result in the loss of active host connections and shared rotational or AEM CAP allocations. See "Modify the Interface Type of a Host-Partition Connection" on page 239 for details.

Buttons and Controls

OK

Click to update the SL Console partition workspace with the current screen settings and return to the previous screen.

> **Note –** Clicking this button does not update the library controller database.

Cancel

Click to discard the current screen settings and return to the previous screen.

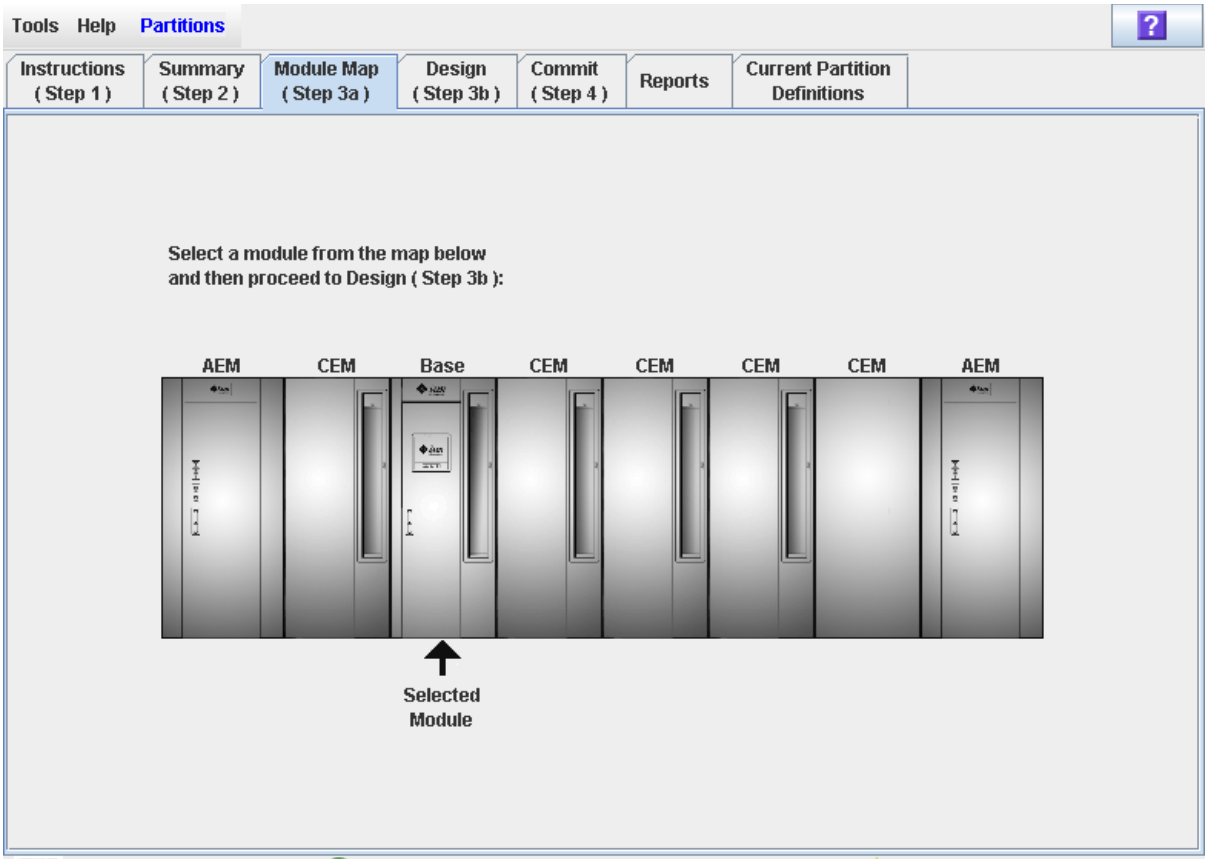
See Also

- "Partitions—Summary (Step 2)" on page 272

Partition Design and Commit Screens

Partitions—Module Map (Step 3a)

Sample Screen



Description

Enables you to select the library module for which you want to define partition boundaries.

Screen Access

This screen can be accessed at either of the following:

- Standalone SL Console
- Web-launched SL Console

Screen Fields

Select a module from the map below

Required.

The screen displays an illustration of the library's actual module configuration. This information is taken directly from the library controller database.

Click the module for which you want to design a partition, and then click the **Design (Step 3b)** tab.

Buttons

? (Help)

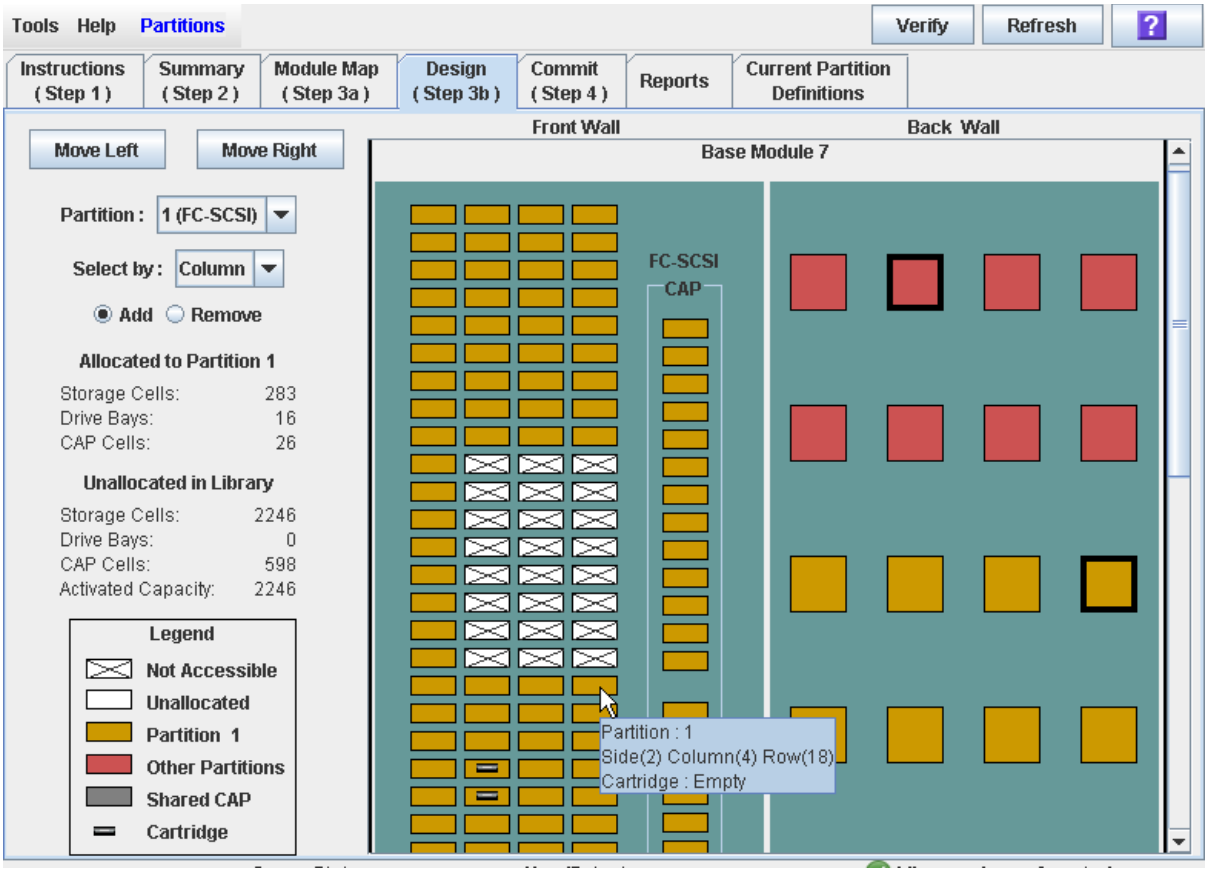
Click to display online help for the screen.

See Also

- “Partitions—Design (Step 3b)” on page 294
- “Partitions—Design (Step 3b) – AEMs Only” on page 300

Partitions—Design (Step 3b)

Note – This section describes the Design (Step 3b) screens for Base, Drive, and CEM modules. For AEM modules, see "Partitions—Design (Step 3b) – AEMs Only" on page 300.



Description

Enables you to define partition boundaries by selecting the resources (storage cells, tape drives, or rotational CAPs) you want to include in the partition. You can use any of the following methods to add or remove resources from a partition (see "Library Map (not labeled)" on page 297 for detailed instructions):

- Select individual cells or groups of cells
- Select an entire column within a library module (top to bottom)
- Select a side within a library module (front or back)
- Select an entire library module

Note – This screen is available only if partitions have been defined for the library through the "Partitions—Summary (Step 2)—Add Partition" on page 285 screen.

Caution – Changing partition boundaries can result in orphaned cartridges and data that could be lost. See "Planning for Partitioning" on page 206 for details.

Note – The partition **Summary (Step 2)** and **Design (Step 3b)** screens, and all associated messages, give you a dynamic workspace to design your library partitions. All partition configuration information is automatically saved to the partition workspace in SL Console memory and retained for the duration of your SL Console session. This allows you to switch among partition views and leave and return to the partition screens any number of times without losing your configuration changes.

Caution – Information in the SL Console partition workspace is saved to the library controller database only through the **Commit (Step 4)** screen. If your SL Console session ends or you refresh the workspace data before you have committed your updates through the **Commit (Step 4)** screen, you will lose any partition changes you have made through the **Summary (Step 2)** and **Design (Step 3b)** screens and all associated messages.

Screen Access

This screen can be accessed at either of the following:

- Standalone SL Console
- Web-launched SL Console

Screen Fields

Allocated to Partition n

Note – The data in these fields is automatically updated from the SL Console partition workspace when you select a partition.

Display only.

Total numbers of **Storage Cell**s, tape **Drives**, and **CAP Cells** allocated to the selected partition, based on the currently defined partition boundaries.

CAP Cells

Display only.

Total number of rotational and AEM CAP cells allocated to the selected partition, based on the currently defined partition boundaries.

Unallocated in Library

Note – The data in these fields is automatically updated from the SL Console partition workspace when you select a partition.

StorageCells Cells

Display only.

Total numbers of **Storage Cells**, tape **Drives**, and **CAP Cells** in the library that are not yet allocated to a partition.

Drives

Display only.

Total number of tape drives in the library that are not yet allocated to a partition.

CAP Cells

Display only.

Total number of rotational and AEM CAP cells in the library that are not yet allocated to a partition.

Activated Capacity

> **Note –** This field appears only if the library has unallocated activated capacity. If allocations exceed activated capacity (an oversubscription situation), the **Oversubscription** field appears.

Display only.

Total activated capacity of the library that is not allocated to any partition. Calculated as:

Total activated capacity – Total allocated storage cells

Oversubscription

> **Note –** This field appears only if allocations exceed activated capacity (an oversubscription situation). If the library has unallocated activated capacity, the **Activated Capacity** field appears.

Display only.

Total activated capacity of the library that has been exceeded through partition allocations. Calculated as:

Total allocated storage cells – Total activated capacity

You must remove the excess allocations before you can commit your changes through the **Commit (Step 4)** screen.

Legend

Legend for the library map. The state of each library resource (storage cell, tape drive, or rotational CAP cell) is indicated as follows:

- **Not Accessible** (white and x-ed out). Resource is not accessible to any partition, possibly because storage cells have been configured for diagnostic cartridges.
  - Storage cells are not included in the library's activated capacity.
- Unallocated. Resource is currently not allocated to any partition and therefore available to the selected partition.
- **Partition** *n* (gold). Resource is allocated to the selected partition, partition *n*.
- **Other Partitions** (red). Resource is allocated to another partition and therefore NOT available to the selected partition.
- Shared CAP (gray background). CAP has been assigned to at least one partition. The host interface type assigned to the CAP (HLI or FC-SCSI) is displayed.

- **Cartridge** (cartridge icon). Resource contains a tape cartridge.
- Drive slots with installed drives are outlined with a thick border. Empty drive slots have a narrow border.

Library Map (not labeled)

Graphical representation of the current library configuration. Initial display for the current SL Console login session is from the library controller database, and then the display reflects data from the SL Console partition workspace as you modify partition configurations. The display includes the following information:

- Type of module currently displayed (base module, drive expansion module, or parking expansion module)
- Numeric module ID (1–12)
- Host-partition connection type of a shared CAP (FC-SCSI or HLI)
- Location of all resources (storage cells, tape drives, rotational CAP cells) within the library

  Note – Move the cursor over any resource to display a tooltip of detailed information about the cell or drive, its partition assignment, and the identity of any resident cartridge.

  Note – If no partition IDs have been defined, the library map is display only.

Use the library map to modify the boundaries of the selected partition. Depending on whether you have clicked the **Add** or **Remove** radio button, all selected resources are either added to or removed from the partition.

Depending on your choice in the **Select by** field, you can perform any of the following actions.

- Select by cell: Select individual or groups of resources. Resources in a partition do not need to be adjacent to one another.
  - To select an individual resource, double-click it.
  - To select a rectangular group of resources, click the cell or drive at one corner of the rectangle, and then click the cell or drive diagonally opposite.
- Select by column: Select an entire column within the module. Columns in a partition do not need to be adjacent to one another. To select a column, click any resource within the column.
- Select by side: Select an entire side within a module, except the CAP. Sides in a partition do not need to be adjacent to one another. To select one side of a library module, click any resource in that side.
- Select by module: Select an entire module, except the CAP. Modules in a partition do not have to be adjacent to one another. To select a library module, click any resource in that module.

Buttons and Controls

Move Left

Click to display the library module directly to the left of the one currently displayed. This button is grayed out if there is no module to the left.

Move Right

Click to display the library module directly to the right of the one currently displayed. This button is grayed out if there is no module to the right.

Partition

Required.

Selectable list of available partitions.

Select the partition for which you want to assign resources (storage cells, tape drives, or rotational CAPs).

The list displays all valid partition IDs for the library.It also identifies their host interface type (FC-SCSI or HLI). If no partition IDs have been defined, the menu is blank.

> **Note –** When you select a partition, the screen is automatically updated to display data for that partition from the SL Console partition workspace.

Select by

Required.

Define partition boundaries as follows:

- Select **Cell** to select individual or rectangular groups of resources.
- Column: Select all resources within a column.
- Select **Side** to select all resources, except the CAP, on one side of a library module.
- Select **Module** to select all resources, except the CAP, within a library module.

Add | Remove

Required.

Radio button.

Click Add to select unallocated library map resources that you want to add to the partition design.

Click Remove to select currently allocated library map resources that you want to remove from the partition design.

Verify

Button.

Press **Verify Results** to verify changes that you have made to the partition configuration before committing them to the library controller database. The **Tools > Partitions—Design (Step 3b)—Verify Results** dialog box appears, indicating whether there are any orphaned cartridges or other errors in the current partition configuration.

> **Note –** This procedure verifies only one partition at a time. If you need to verify multiple partitions, you must repeat this procedure separately for each partition.

> **Note –** This verification is performed on the current partition configuration in the SL Console partition workspace only. It does not verify current partition boundaries against the library controller database. Therefore, it cannot identify configuration conflicts that may arise due to other users performing cartridge movements or library configuration changes (through the command line interface, other SL Console sessions, or host applications) at the same time you have made partition changes.

Refresh

Button.

Press to refresh the SL Console partition workspace with current data from the library controller database. All uncommitted partition changes you have made during this SL Console login session will be discarded. The **Partition Refresh** message appears, prompting you to confirm the refresh.

? (Help)

Click to display online help for the screen.

See Also

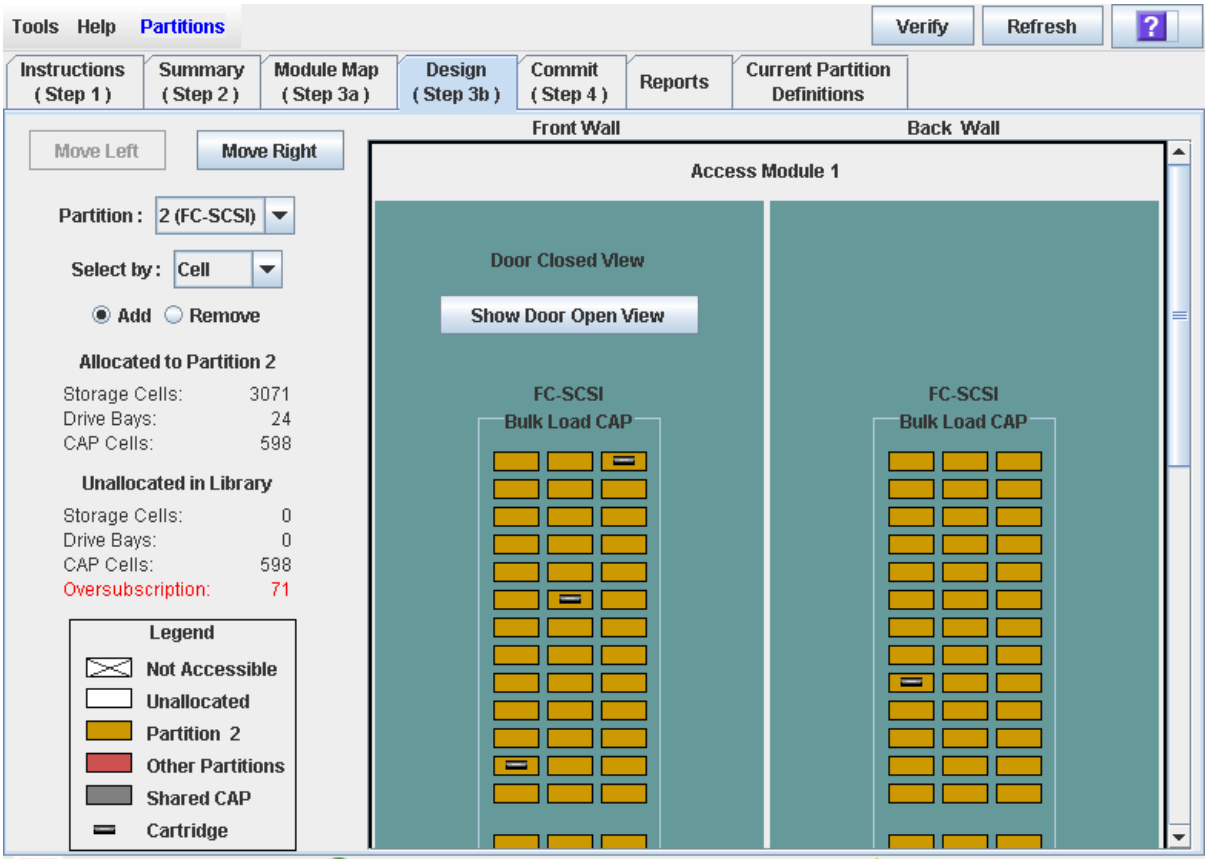
- "Partitions—Summary (Step 2)" on page 272
- "Partitions—Module Map (Step 3a)" on page 292
- "Partitions—Design (Step 3b) – AEMs Only" on page 300
- "Partitions—Design (Step 3b)—Verify Results" on page 306
- "Partitions—Commit (Step 4)" on page 309
- "Partitions—Current Partition Definitions" on page 314
- "Partitions—Reports" on page 317

Partitions—Design (Step 3b) – AEMs Only

Note – This section describes the Design (Step 3b) screen for AEM modules only. For Base, Drive, and CEM modules, see "Partitions—Design (Step 3b)" on page 294.

Note – This screen is available only if the library configuration includes one or more AEMs.

Sample Screen



Description

Enables you to define partition boundaries by allocating all cells in an AEM to a partition. As with rotational CAPs, multiple partitions can share an AEM CAP, if the partitions have the same host interface type (HLI or FC-SCSI).

Note – This screen is available only if partitions have been defined for the library through the "Partitions—Summary (Step 2)—Add Partition" on page 285 screen.

Caution – Changing partition boundaries can result in orphaned cartridges and data that could be lost. See "Planning for Partitioning" on page 206 for details.

Note – The partition **Summary (Step 2)** and **Design (Step 3b)** screens, and all associated messages, give you a dynamic workspace to design your library partitions. All partition configuration information is automatically saved to the partition workspace in SL Console memory and retained for the duration of your SL Console session. This allows you to switch among partition views and leave and return to the partition screens any number of times without losing your configuration changes.

Caution – Information in the SL Console partition workspace is saved to the library controller database only through the **Commit (Step 4)** screen. If your SL Console session ends or you refresh the workspace data before you have committed your updates through the **Commit (Step 4)** screen, you will lose any partition changes you have made through the **Summary (Step 2)** and **Design (Step 3b)** screens and all associated messages.

Screen Access

This screen can be accessed at either of the following:

- Standalone SL Console
- Web-launched SL Console

Screen Fields

Partition

Required.

Partition to which you want to add or remove AEM CAP cells.

The drop-down menu displays all valid partition IDs for the library. It also identifies their host interface type (FC-SCSI or HLI). If no partition IDs have been defined, the menu is blank.

Note – When you select a partition, the screen is automatically updated to display data for that partition from the SL Console partition workspace.

Select by

Required.

Indicates the method you want to use for defining partition boundaries. Regardless of the option you choose, all cells within the AEM will be selected at once.

Note – You must select either **Add** or **Remove**.

Add

Required.

Indicates you want to add the AEM to the partition. This option is valid only if the AEM is currently unallocated.

Remove

Required.

Indicates you want to remove the AEM from the partition. This option is valid only if the AEM is currently allocated.

Allocated to Partition n

Note – The data in these fields is automatically updated from the SL Console partition workspace when you select a partition.

Storage Cells

Display only.

Total number of storage cells allocated to the selected partition, based on the currently defined partition boundaries.

Drive Bays

Display only.

Total number of tape drives allocated to the selected partition, based on the currently defined partition boundaries.

CAP Cells

Display only.

Total number of rotational and AEM CAP cells allocated to the selected partition, based on the currently defined partition boundaries.

Unallocated in Library

Note – The data in these fields is automatically updated from the SL Console partition workspace when you select a partition.

Storage Cells

Display only.

Total number of storage cells in the library that are not allocated to any partition.

Drive Bays

Display only.

Total number of tape drives in the library that are not allocated to any partition.

CAP Cells

Display only.

Total number of rotational and AEM CAP cells in the library that are not allocated to any partition.

Activated Capacity

> **Note –** This field appears only if the library has unallocated activated capacity. If allocations exceed activated capacity (an oversubscription situation), the **Oversubscription** field appears.

Display only.

Total activated capacity of the library that is not allocated to any partition. Calculated as:

Total activated capacity – Total allocated storage cells

Oversubscription

> **Note –** This field appears only if allocations exceed activated capacity (an oversubscription situation). If the library has unallocated activated capacity, the **Activated Capacity** field appears.

Display only.

Total activated capacity of the library that has been exceeded through partition allocations. Calculated as:

Total allocated storage cells – Total activated capacity

You must remove the excess allocations before you can commit your changes through the **Commit (Step 4)** screen.

Legend

Legend for the library map. The state of each AEM CAP cell is indicated as follows:

- Not Accessible (white and x-ed out). Resource is not accessible to any partition. Following are some possible reasons:
  - Storage cells have been configured for diagnostic cartridges.
  - Storage cells are not included in the library's activated capacity.
- Unallocated. Resource is currently not allocated to any partition and therefore available to the selected partition.
- Partition *n* (gold). Resource is allocated to the selected partition, partition *n*.
- Other Partitions (red). Resource is allocated to another partition and therefore NOT available to the selected partition.
- Shared AEM CAP (gray background). AEM CAP has been assigned to at least one partition. The host interface type assigned to the AEM CAP (HLI or FC- SCSI) is displayed.
- Cartridge (cartridge icon). Resource contains a tape cartridge.

AEM Map

Graphical representation of the current AEM configuration. Initial display for the current SL Console login session is from the library controller database, and then the display reflects data from the SL Console partition workspace as you modify partition configurations. The display includes the following information:

- Type of module currently displayed. For AEMs, this is always "Access Module."

- Numeric module ID (1–12)
- Current module view indicator (“Door Closed View” or “Door Open View”)
- Host interface type of the partition(s) to which the AEM is allocated (FC-SCSI or HLI)
- CAP type. For AEMs, this is always “Bulk Load CAP.”
- Location of all storage cells within the AEM

Note – Move the cursor over any resource to display a tooltip of detailed information about the cell or drive, its partition assignment, and the identity of any resident cartridge.

Note – If no partition IDs have been defined, the library map is display only.

Use the library map to modify the partition allocation of the AEM. Depending on whether you have clicked the **Add** or **Remove** radio button, the entire AEM is either added to or removed from the partition.

Buttons

Move Left

Click to display the library module directly to the left of the one currently displayed. This button is grayed out if there is no module to the left.

Move Right

Click to display the library module directly to the right of the one currently displayed. This button is grayed out if there is no module to the right.

Note – The “Door Closed View” is the default AEM view. You can use the next two buttons to toggle between the alternate views.

Show Door Open View

Click to display the layout of the AEM CAP cells as if the AEM access door were open and you are looking directly at the interior of the AEM.

Show Door Closed View

Click to show display the layout of the AEM CAP cells as if the AEM access door were closed and you are “looking through” the front access door panel to the interior of the AEM.

Verify

Click to verify partition configuration changes you have made during this SL Console login session. The **Tools > Partitions—Design (Step 3b)—Verify Results** message appears, indicating whether there are any orphaned cartridges or other errors in the current partition configuration.

Note – This procedure verifies only one partition at a time. If you need to verify multiple partitions, you must repeat this procedure separately for each partition.

Note – This verification is performed on the current par tition configuration in the SL Console partition workspace only. It does not verify current partition boundaries against the library controller database. Therefore, it cannot identify configuration conflicts that may arise due to other users performing cartridge mo vements or library configuration changes (through the command line interface, other SL Console sessions, or host applications) at the same ti me you have m ade partition changes.

Refresh

Click to refresh the SL Conso le partition workspace with current data from the library controller database. All uncommitted partition changes you have m ade during this SL Console login session will be discarded. The **Partition Refresh** message appears, prompting you to confirm the refresh.

? (Help)

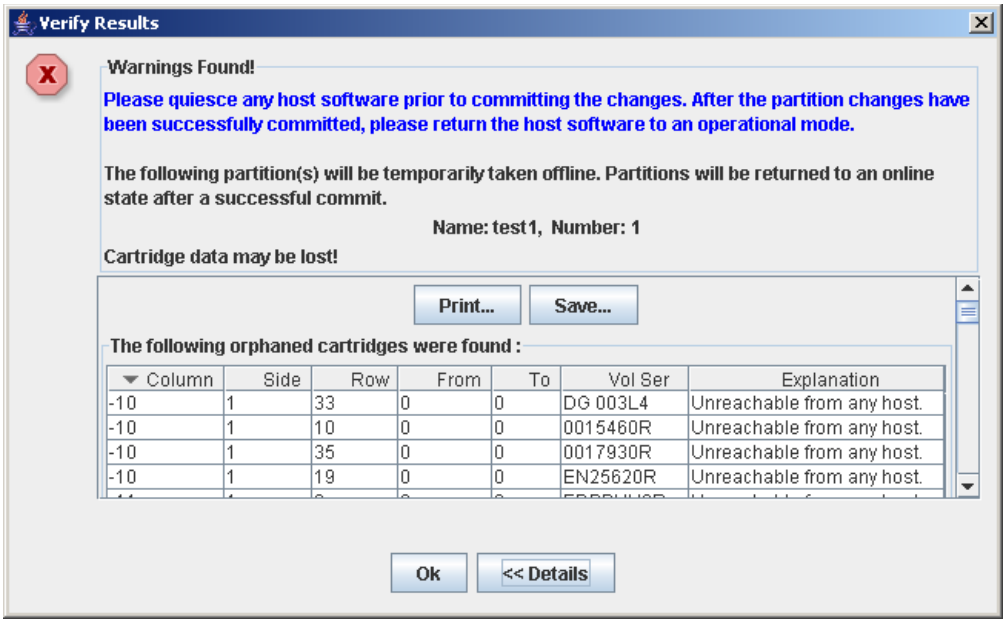
Click to display online help for the screen.

See Also

- "Partitions—Summary (Step 2)" on page 272
- "Partitions—Module Map (Step 3a)" on page 292
- "Partitions—Design (Step 3b)" on page 294
- "Partitions—Design (Step 3b)—Verify Results" on page 306
- "Partitions—Commit (Step 4)" on page 309
- "Partitions—Current Partition Definitions" on page 314
- "Partitions—Reports" on page 317

Partitions—Design (Step 3b)—Verify Results

Sample Screen



Description

Displays a list of configuration errors in the current SL Console partition workspace.

This screen is a message that appears when you click **Verify Results** on the "Partitions—Design (Step 3b)" on page 294 screen.

Possible errors include:

- A partition has orphaned cartridges. See "Resolve Orphaned Cartridges" on page 230 for details.
- Library resources have been removed from a partition.
- A host-partition connection does not have a partition assigned to LUN 0 (applies to FC-SCSI connections only).

If any of these error conditions are present, the screen initially displays summary warning messages. You can view detailed messages by clicking the **Details** button.

It is recommended that you resolve all errors before committing the data to the library controller database.

Optionally, you can print the screen data or save it to a comma-separated file.

> **Note –** The partition **Summary (Step 2)** and **Design (Step 3b)** screens, and all associated messages, give you a dynamic workspace to design your library partitions. All partition configuration information is automatically saved to the partition workspace in SL Console memory and retained for the duration of your SL Console session. This allows you to switch among partition views and leave and return to the partition screens any number of times without losing your configuration changes.

Caution – Information in the SL Console partition workspace is saved to the library controller database only through the **Commit (Step 4)** screen. If your SL Console session ends or you refresh the workspace data before you have committed your updates through the **Commit (Step 4)** screen, you will lose any partition changes you have made through the **Summary (Step 2)** and **Design (Step 3b)** screens and all associated messages.

Screen Access

This screen can be accessed at either of the following:

- Standalone SL Console
- Web-launched SL Console

Screen Fields

Note – The screen fields are the same as tho se displayed in the "Partitions—Commit (Step 4)—Confirm Apply" on page 311 message.

Warnings found

Display only.

Summary error messages regarding the partition configuration.

The library is oversubscribed. Please unallocate *nnn* storage cells.

Display only.

Indicates that the total partition allocations currently exceed the lib rary's activated capacity. *nnn* is the number of cells you must re move from partition allocations. The **Apply** button on the **Commit (Step 4)** screen remains deact ivated until the total allocated cells is within the library's activated capacity.

The following hosts will need re-audited

Display only.

World Wide Port Names (WWPNs) of any hosts that should re-audit their library partition. This may be because library resources have been deleted from the partition.

The following hosts do not have Lun 0 set

Display only.

World Wide Port Names (WWPNs) of any hosts that have not defined any library partitions as LUN 0 on the host. This error applies to FC-SCSI host-partition connections only.

The following orphaned cartridges were found

Display only.

Detailed information regarding all orphaned cartridges in the current partition configuration. Includes library, rail, column, side, and row location of the cartridge, cartridge volume serial number (VOLID), and probable causes and explanations why the cartridge is orphaned.

Buttons and Controls

Print

Click to print the report on a selected printer .

Save

Click to save the report to a designated comma-separated text file (.csv extension). Comma-separated files can be opened by a variety of spreadsheet and database programs.

OK

Click to cancel the update. The library controller database is not updated, but all partition changes from this login session are retained in the SL Console partition workspace.

Details

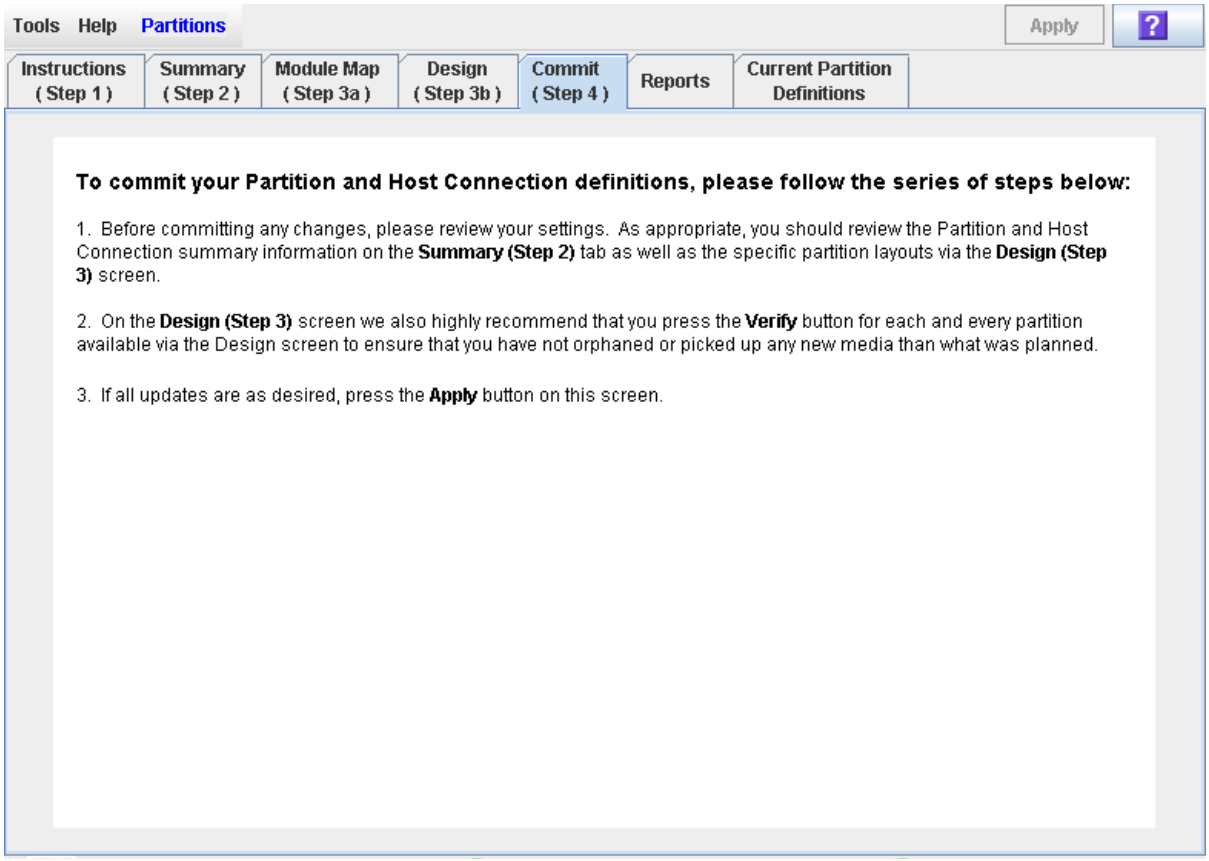
Click to toggle between the expanded and collapsed views of the warning message display.

See Also

- “Partitions—Design (Step 3b)” on page 294
- “Partitions—Commit (Step 4)—Confirm Apply” on page 311

Partitions—Commit (Step 4)

Sample Screen



Description

Commits the changes made in the current SL Console partition workspace to the library controller database and alters the partitioning of the library.

Caution – Although partition changes are not disruptive to library hosts, it is recommended that you make the library unavailable to other users before committing your partition workspace changes. Because the SL Console does not validate partition boundaries against the library controller database in real-time, configuration conflicts may arise if you change partition boundaries while other users are performing cartridge movements or library configuration changes. See See "Synchronizing the Display With the Controller Database" on page 63 for details.

Caution – Information in the SL Console partition workspace is saved to the library controller database only through the **Commit (Step 4)** screen. If your SL Console session ends or you refresh the workspace data before you have committed your updates through the **Commit (Step 4)** screen, you will lose any partition changes you have made through the **Summary (Step 2)** and **Design (Step 3b)** screens and all associated messages.

Caution – It is recommended that you follow the procedure "Resolve Orphaned Cartridges" on page 230 before using this screen.

Caution – The Apply button on this screen updates the library controller database with all partition configuration changes you have made during this SL Console session. Failure apply changes before logging out of the current SL Console session will cause all your library configuration changes to be lost.

Screen Access

This screen can be accessed at either of the following:

- Standalone SL Console
- Web-launched SL Console

Screen Fields

None

Buttons and Controls

Apply

Click to update the library controller database with the current settings from the SL Console partition workspace. The **Tools > Partitions—Commit (Step 4)—Confirm Apply** message appears, indicating whether there are any orphaned cartridges or other errors in the current partition configuration.

Note – This button is grayed out if total partition allocations currently exceed the library's activated capacity. To activate the button, you must remove storage cells from partition allocations to bring the total allocated cells within the library's activated capacity.

Note – This button is grayed out if you have not made any changes to the SL Console partition workspace since the last commit.

? (Help)

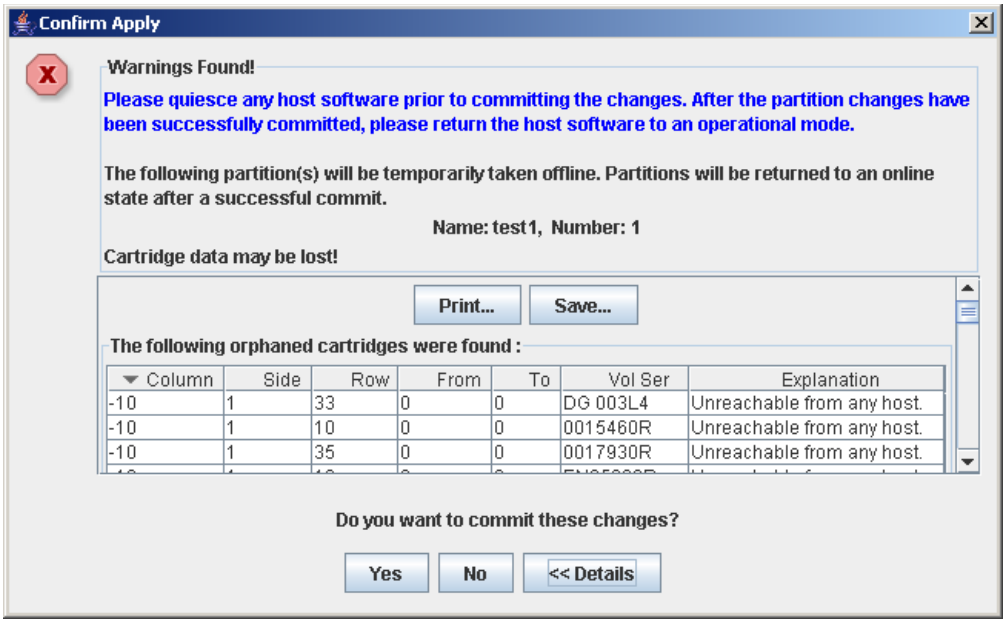
Click to display online help for the screen.

See Also

- "Partitions—Summary (Step 2)" on page 272
- "Partitions—Design (Step 3b)" on page 294
- "Partitions—Design (Step 3b)—Verify Results" on page 306
- "Partitions—Commit (Step 4)—Confirm Apply" on page 311
- "Partitions—Reports" on page 317

Partitions—Commit (Step 4)—Confirm Apply

Sample Screen



Description

Displays a list of configuration errors in the current SL Console partition workspace. This screen is a message that appears when you click **Apply** on the "Partitions—Commit (Step 4)" on page 309 screen.

After viewing the error messages, you can commit all data in the SL Console partition workspace to the library controller database by clicking the **Yes** button.

Possible errors include:

- A partition has orphaned cartridges. See "Resolve Orphaned Cartridges" on page 230 for details.
- Library resources have been removed from a partition.
- A host-partition connection does not have a partition assigned to LUN 0 (applies to FC-SCSI connections only).

If any of these error conditions are present, the screen initially displays summary warning messages. You can view detailed messages by clicking the **Details** button.

It is recommended that you resolve all errors before committing the data to the library controller database.

Optionally, you can print the screen data or save it to a comma-separated file.

> **Caution –** Information in the SL Console partition workspace is saved to the library controller database only through the **Commit (Step 4)** screen. If your SL Console session ends or you refresh the workspace data before you have committed your updates through the **Commit (Step 4)** screen,

you will lose any partition changes you have made through the **Summary (Step 2)** and **Design (Step 3b)** screens and all associated messages.

Screen Access

This screen can be accessed at either of the following:

- Standalone SL Console
- Web-launched SL Console

Screen Fields

Note – The screen fields are the same as tho se displayed in the "Partitions—Design (Step 3b)—Verify Results" on page 306 message.

Warnings found

Display only.

Summary error messages regarding the partition configuration.

The library is oversubscribed. Please unallocate *nnn* storage cells.

Display only.

Indicates that the total partition allocations currently exceed the lib rary's activated capacity. *nnn* is the number of cells you must re move from partition allocations. The **Apply** button on the **Commit (Step 4)** screen remains deactivated until the total allocated cells is within the library's activated capacity.

The following hosts will need re-audited

Display only.

World Wide Port Names (WWPNs) of any hosts that should re-audit their library partition. This may be because library resources have been deleted from the partition.

The following hosts do not have Lun 0 set

Display only.

World Wide Port Names (WWPNs) of any hosts that have not defined any library partitions as LUN 0 on the host. This error applies to FC-SCSI host-partition connections only.

The following orphaned cartridges were found

Display only.

Detailed information regarding all orphaned cartridges in the current partition configuration. Includes library, rail, column, side, and row location of the cartridge, cartridge volume serial num ber (VOLID), and probable causes and explanations why the cartridge is orphaned.

Buttons and Controls

Print

Click to print the report on a selected printer .

Save

Click to save the report to a d esignated comma-separated text file (.csv extension). Comma-separated files can be opened by a variety of spreadsheet and database programs.

Yes

Click to confirm that you want to update the library controller database with the current settings from the SL Console workspace.

No

Click to cancel the update. The library controller database is not updated, but all partition changes from this login session are retained in the SL Console partition workspace.

Details

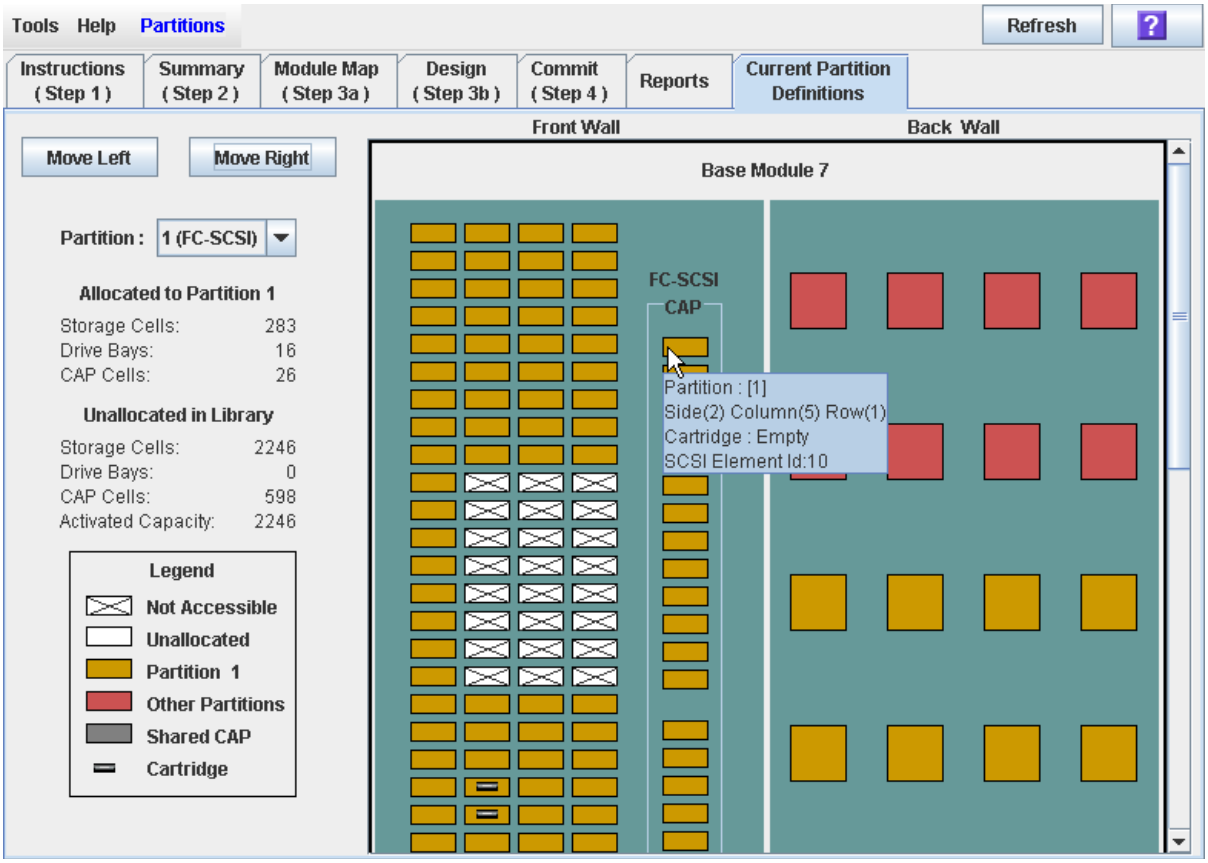
Click to toggle between the expanded and collapsed views of the warning message display.

See Also

- “Partitions—Commit (Step 4)” on page 309
- “Partitions—Design (Step 3b)—Verify Results” on page 306

Partitions—Current Partition Definitions

Sample Screen



Description

Displays current partition boundaries and allocations. This is the only Partitions screen that is available on the local operator panel.

Note – This screen is display only.

Screen Access

This screen can be accessed at any of the following:

- Local operator panel
- Standalone SL Console
- Web-launched SL Console

Screen Fields

For detailed descriptions of the screen fields, see one of the following sections:

- "Partitions—Design (Step 3b)" on page 294, for Base, Drive, and CEM modules
- "Partitions—Design (Step 3b) – AEMs Only" on page 300, for AEMs

Buttons

Refresh

Click to refresh the display with current data from the library controller database.

? (Help)

Click to display online help for the screen.

See Also

- “Partitions—Design (Step 3b)” on page 294
- “Partitions—Design (Step 3b) – AEMs Only” on page 300

Partition Report Screens

Partitions—Reports

Sample Screen

Description

Enables you to generate library partition reports for the most recently committed configuration.

> **Note –** The partition reports display data saved to the library controller database. If you have made partition configuration changes without commiting the changes to the library controller through the **Commit (Step 4)** screen, the data in these reports will differ from data shown on the partition **Summary (Step 2)** and **Design (Step 3b**) screens.

Screen Access

This screen can be accessed at either of the following:

- Standalone SL Console
- Web-launched SL Console

Screen Fields

Please select a report to display

Required.

Selectable list of **Cartridge Cell** and **Media Summary**, **Host Connections Summary**, **Orphaned Cartridge Report**, **Partition Details**, and **Partition Summary**.

Select the report that you want to display.

Buttons and Controls

? (Help)

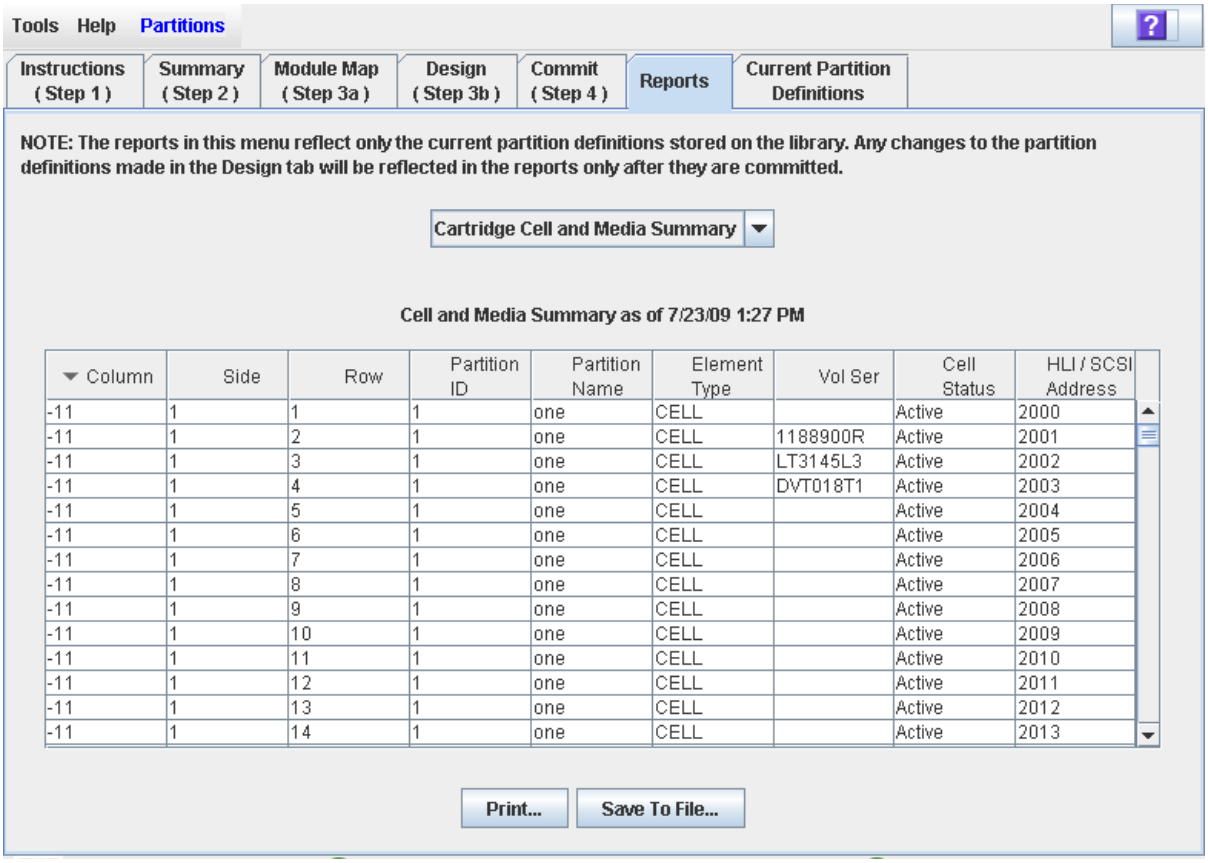
Click to display online help for the screen.

See Also

- "Partitions—Summary (Step 2)" on page 272
- "Partitions—Design (Step 3b)" on page 294
- "Partitions—Commit (Step 4)" on page 309
- "Partitions—Reports—Cartridge Cell and Media Summary" on page 319
- "Partitions—Reports—Host Connections Summary" on page 322
- "Partitions—Reports—Orphaned Cartridge Report" on page 327
- "Partitions—Reports—Partition Details" on page 330
- "Partitions—Reports—Partition Summary" on page 334

Partitions—Reports—Cartridge Cell and Media Summary

Sample Screen



Description

Lists storage cells, rotational or AEM CAP cells, drives, and resident cartridges.

> **Note –** The partition reports display data saved to the library controller database. If you have made partition configuration changes without commiting the changes to the library controller through the **Commit (Step 4)** screen, the data in these reports will differ from data shown on the partition **Summary (Step 2)** and **Design (Step 3b**) screens.
>
> **Note –** AEM CAP cells are identified as follows: left AEM CAP cells are in columns “-33” to “-31”. Right AEM CAP cells are in columns “31” to “33”.
>
> **Note –** You can modify the layout and display of this screen. See “Modifying the Screen Layout” on page 62 for details.

Optionally, you can print the screen data or save it to a comma-separated file.

Screen Access

This screen can be accessed at either of the following:

- Standalone SL Console

- Web-launched SL Console

Screen Fields

Column

Display only.

Column number where the library resource is located. Column location is referenced from the left edge of the Base Module. “+1” is to the right. “-1” is to the left.

Side

Display only.

Module side where the library resource is lo cated. “1” is the back wall. “2” is the front wall.

Row

Display only.

Row number where the library resource is located. Rows are numbered consecutively from the top down, with row “1” at the top.

Partition ID

Display only.

Partition ID to which the library res ource is allocated, if applicable.

Partition Name

Display only.

Name of the partition to which the library resource is allo cated, if applicable.

Element Type

Display only.

Type of library resource. Options are:

- CAP (rotational or AEM)
- CELL
- DRIVE

Vol Ser

Display only.

Volume serial number (VOLID) of the cartridge resident in the library resource, if applicable.

Cell Status

Display only.

Capacity status of the library resource. Applies to storage cells only. Options are:

- Active – Cell is activated for use based on assigned capacity. Can be used for cartridge storage.
- Inactive – Cell is not activated for use. Cannot be used for cartridge storage.

HLI/SCSI Address

Display only.

Host address of the library resource. Format of the entry depends on the host-partition connection type (HLI or FC-SCSI).

- HLI – Format is eight digits in the following format. See "HLI-PRC Address" on page 211 for additional details.

  ll – Library number, always 0

  pp – Column number

  rr – Row number

  cc – Column number

- FC-SCSI – Format is four digits. See "Host SCSI Element Address" on page 209 for details.

Buttons and Controls

Print

Button.

Click to print the report on a selected printer.

Save to File

Button.

Press to save the report to a comma-separated value (.csv) file compatible with many spreadsheet applications.

? (Help)

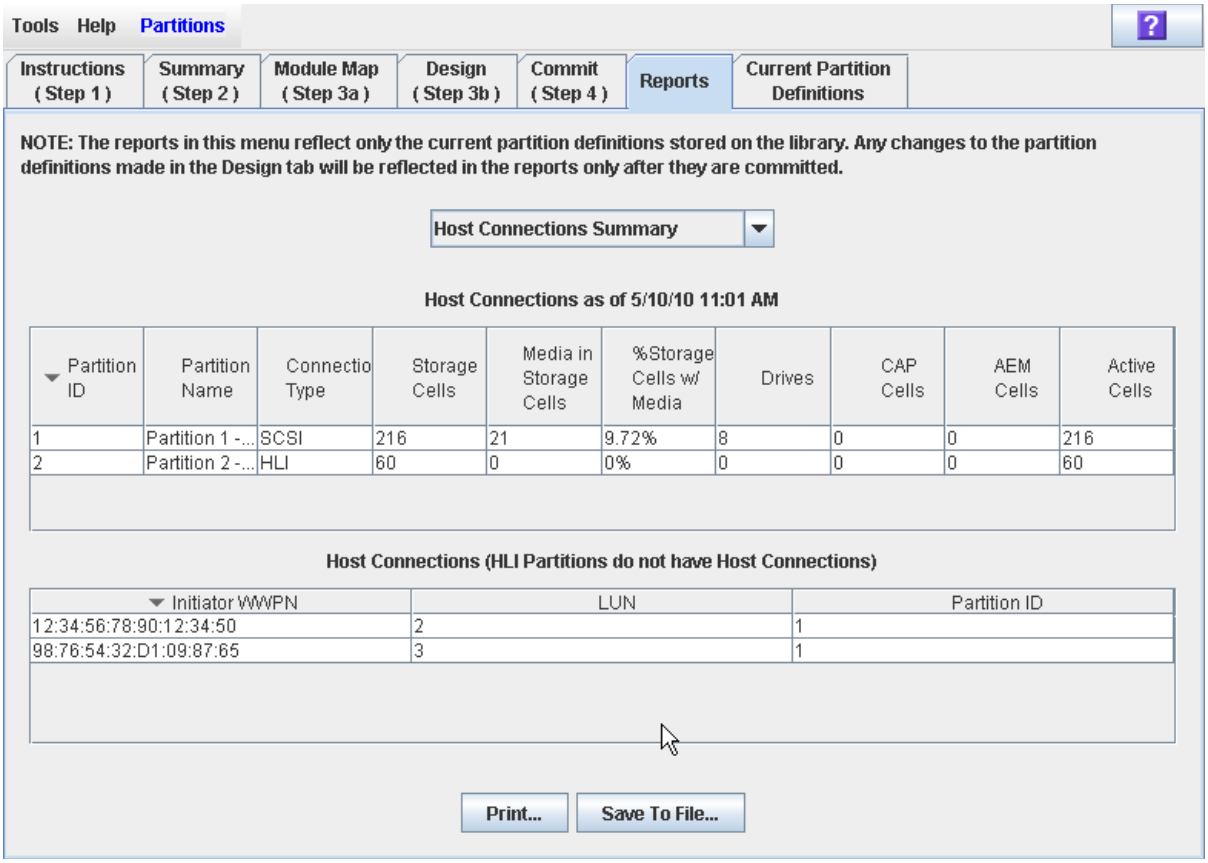
Click to display online help for the screen.

See Also

- "Partitions—Reports—Host Connections Summary" on page 322
- "Partitions—Reports—Orphaned Cartridge Report" on page 327
- "Partitions—Reports—Partition Details" on page 330
- "Partitions—Reports—Partition Summary" on page 334

Partitions—Reports—Host Connections Summary

Sample Screen



Description

Displays host-partition connections for the library.

> **Note –** The partition reports display data saved to the library controller database. If you have made partition configuration changes without commiting the changes to the library controller through the **Commit (Step 4)** screen, the data in these reports will differ from data shown on the partition **Summary (Step 2)** and **Design (Step 3b**) screens.

You can modify the layout and display of this screen. See "Modifying the Screen Layout" on page 62 for details.

Optionally, you can print the screen data or save it to a comma-separated file.

Screen Access

This screen can be accessed at either of the following:

- Standalone SL Console
- Web-launched SL Console

Screen Fields

Partitions (Unbridged Libraries)

Note – The screen fields in this section also appear on the "Partitions—Reports—Partition Summary" on page 334 report.

Partition ID

Display only.

ID of the partition (1–8).

Partition Name

Display only.

Name of the partition, if any.

Connection Type

Display only.

Type of interface used by the host-partition connection. Options are:

- HLI
- FC-SCSI

Storage Cells

Display only.

Total number of storage cells allocated to the partition.

Media in Storage Cells

Display only.

Total number of tape cartridges resident in the partition's storage cells.

% Storage Cells w/ Media

Display only.

Percentage of storage cells containing tape cartridges (Media in Storage Cells divided by Storage Cells).

Partitions (Bridged Libraries)

Drives

Display only.

Total number of drives allocated to the partition.

CAP Cells

Display only.

Total number of rotational CAP cells allocated to the partition.

AEM Cells

Display only.

Total number of AEM CAP cells allocated to the partition.

Active Cells

Display only.

Total storage cell capacity assigned to the partition in the **Add Partition** screen.

Partition ID

Display only.

ID of the partition (1–8).

Partition Name

Display only.

Name of the partition, if any.

Storage Cells

Display only.

Total number of storage cells allocated to the partition.

Media in Storage Cells

Display only.

Total number of cartridges resident in storage cells that are allocated to the partition.

% Storage Cells w/ Media

Display only.

The percentage of the total storage cells allocated to the partition that contains cartridges.

Drives

Display only.

Total number of drives allocated to the partition.

CAPs

Total number of Cartridge Access Ports (CAPs) allocated to the partition.

***Total Media**

Display only.

Total number of cartridges resident in the partition (includes media resident in allocated drives, storage cells, and CAP cells).

Host Connections (Unbridged Libraries)

FC-SCSI

LUN

Display only.

Logical unit number of the library partition as seen from the host.

Partition ID

Display only.

Partition ID to which the host has a connection.

Host Connections (Bridged Libraries)

LUN

Display only.

Logical unit number of the library partition as seen from the host.

Partition ID

Display only.

Buttons and Controls

Print

Click to print the report on a selected printer .

Save to File

Click to save the report to a designated comma-separated text file (.csv extension). Comma-separated files can be opened by a variety of spreadsheet and database programs.

? (Help)

Click to display online help for the screen.

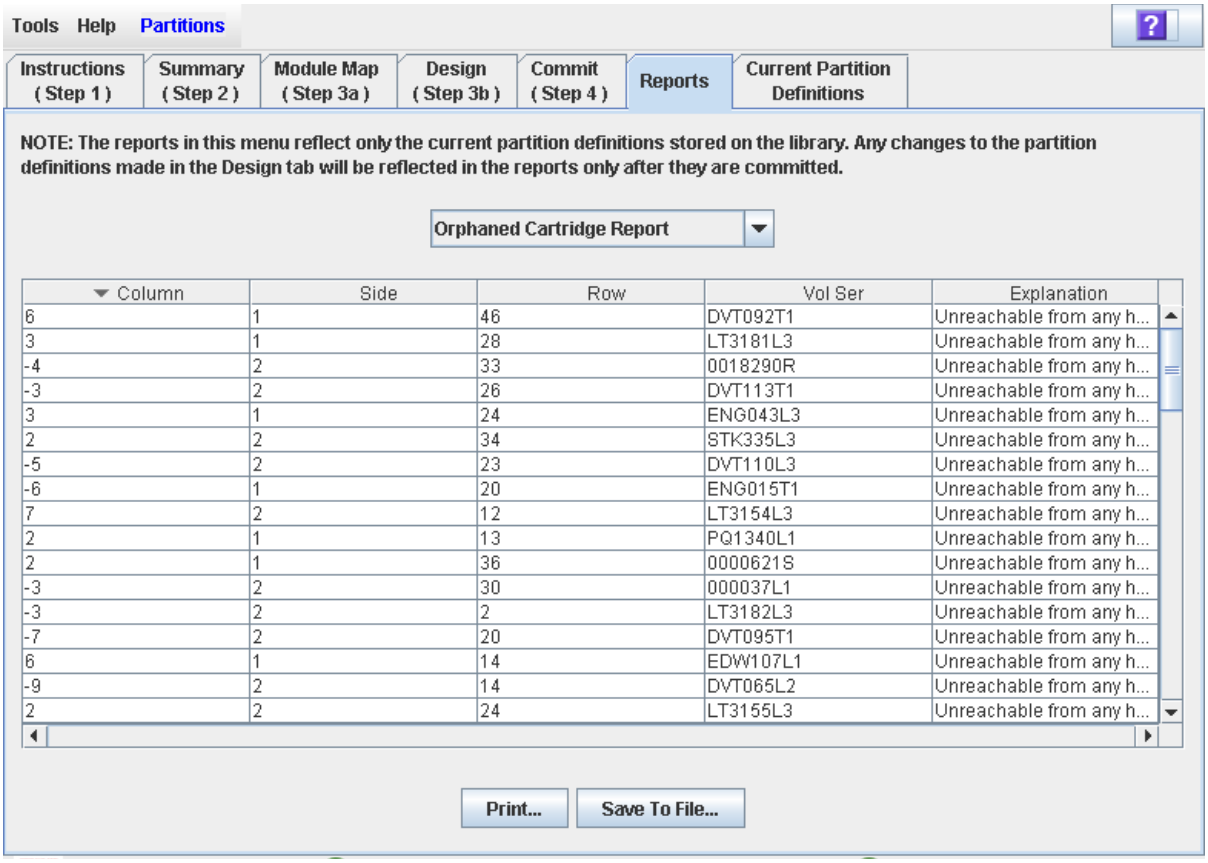
See Also

- “Partitions—Reports—Cartridge Cell and Media Summary” on page 319
- “Partitions—Reports—Orphaned Cartridge Report” on page 327
- “Partitions—Reports—Partition Details” on page 330

- “Partitions—Reports—Partition Summary” on page 334

Partitions—Reports—Orphaned Cartridge Report

Sample Screen



Description

Displays the locations and volume serial numbers (VOLIDs) of all orphaned cartridges in the library. Also identifies why the cartridge is orphaned.

> **Note –** The partition reports display data saved to the library controller database. If you have made partition configuration changes without commiting the changes to the library controller through the **Commit (Step 4)** screen, the data in these reports will differ from data shown on the partition **Summary (Step 2)** and **Design (Step 3b)** screens.

You can modify the layout and display of this screen. See "Modifying the Screen Layout" on page 62 for details.

Optionally, you can print the screen data or save it to a comma-separated file.

Screen Access

This screen can be accessed at either of the following:

- Standalone SL Console
- Web-launched SL Console

Screen Fields

Column

Display only.

Column number where the orphaned cartridge is located. Column location is referenced from the left edge of the Base Module. “+1” is to the right; “-1” is to the left.

Side

Display only.

Module side where the orphaned cartridge is located. “1” is the back wall; “2” is the front wall.

Row

Display only.

Row number where the orphaned cartridge is located. Rows are numbered consecutively from the top down, with row “1” at the top.

Vol Ser

Display only.

Volume serial number (VOLID) of the orphaned cartridge.

Explanation

Display only.

Explanation of why the cartridge is orphaned.

Because this report is produced from the library controller database, the only option is:

- Unreachable from any host

Buttons and Controls

Print

Button. Press to print the report on a selected printer.

Save to File

Button.

Press to save the report to a comma-separated value (.csv) file compatible with many spreadsheet applications.

? (Help)

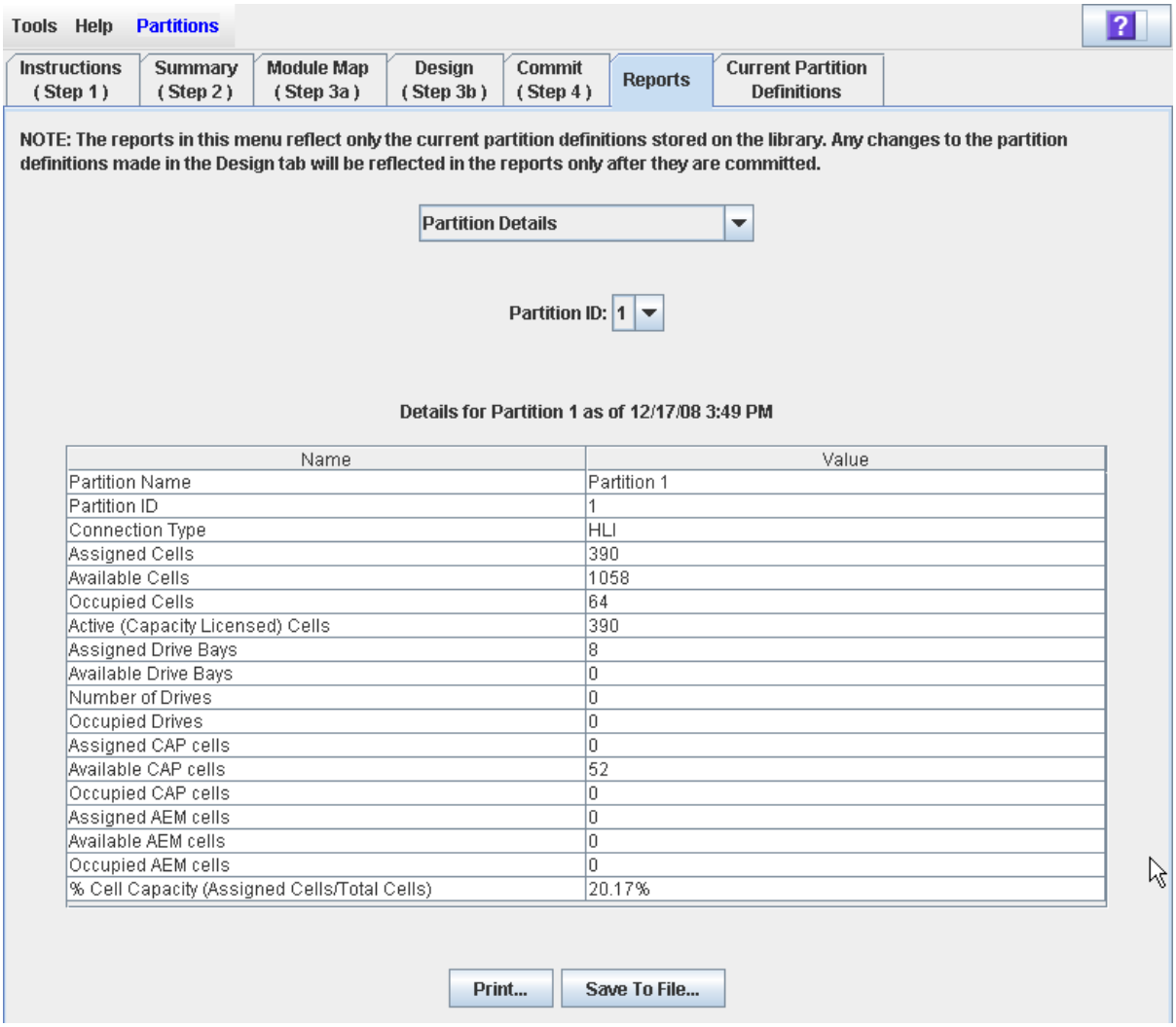
Click to display online help for the screen.

See Also

- “Partitions—Reports—Cartridge Cell and Media Summary” on page 319
- “Partitions—Reports—Host Connections Summary” on page 322
- “Partitions—Reports—Partition Details” on page 330
- “Partitions—Reports—Partition Summary” on page 334

Partitions—Reports—Partition Details

Sample Screen



Description

Displays a sortable table of name/value pairs for each of the properties of the selected partition.

> **Note –** The partition reports display data saved to the library controller database. If you have made partition configuration changes without commiting the changes to the library controller through the **Commit (Step 4)** screen, the data in these reports will differ from data shown on the partition **Summary (Step 2)** and **Design (Step 3b**) screens.

You can modify the layout and display of this screen. See "Modifying the Screen Layout" on page 62 for details.

Optionally, you can print the screen data or save it to a comma-separated file.

Screen Access

This screen can be accessed at either of the following:

- Standalone SL Console
- Web-launched SL Console

Screen Fields

Name

Display only.

Display only.

Name of the partition property.

Value

Display only.

The value of the partition property.

Partition properties include:

- Partition ID

  A digit in the range [1–8].

- Bar Code

  The bar code format used on cartridges assigned to the partition.

Connection Type

Display only.

Type of interface used by the host-partition connection. Options are:

- HLI
- FC-SCSI

- Assigned Cells

  The total number of storage cells allocated to the partition.

- Available Cells

  Total number of storage cells in the library available for allocation to the partition.

- Occupied Cells

  Total number of storage cells in the partition with tape cartridges present.

Activated Capacity

Display only.

Total storage cell capacity assigned to the partition in the **Add Partition** screen.

- Assigned Drive Bays

Total number of drive bays allocated to the partition.

- Available Drive Bays

  Total number of drive bays in the library available for allocation to the partition.

Number of Drives

Display only.

Total number of installed tape drives allocated to the partition.

- Occupied Drives

  Total number of installed tape drives in the partition with tape cartridges present.

- Assigned CAP cells

  Total number of rotational CAP cells allocated to the partition through dedicated or shared CAPs.

- Available CAP cells

  - Total number of rotational CAP cells in the library available for allocation to the partition. This number includes all rotational and AEM CAP cells in the following: CAPs not allocated to any partition.
  - CAPs not currently allocated to this partition, but allocated to other partitions with the same host interface type as this one.

  This number excludes all rotational and AEM CAP cells in the following:.

  - CAPs currently allocated to this partition.
  - CAPs allocated to partitions with a different host interface type.

- Occupied CAP cells

  Total number of rotational CAP cells in the partition with tape cartridges present.

Assigned AEM cells

Display only.

Total number of AEM CAP cells allocated to the partition through dedicated or shared AEMs.

Available AEM cells

Display only.

Total number of AEM CAP cells in the library available for allocation to the partition. This number includes all AEM cells in the following:

- AEMs not allocated to any partition.
- AEMs not currently allocated to this partition, but allocated to other partitions with the same host interface type as this one.

This number excludes all AEM cells in the following:

- AEMs currently allocated to this partition.

- AEMs allocated to partitions with a different host interface type.

Occupied AEM cells

Display only.

Total number of AEM CAP cells in the partition with tape cartridges present.

- **% Cell Capacity (Assigned Cells/Total Cells)**

  The percentage of storage cells in the library allocated to this partition (the number of cells allocated to the partition divided by the total physical capacity of the library)

Buttons and Controls

Print

Button.

Click to print the report on a selected printer.

Save to File

Button

Press to save the report to a comma-separated value (.csv) file compatible with many spreadsheet applications.

? (Help)

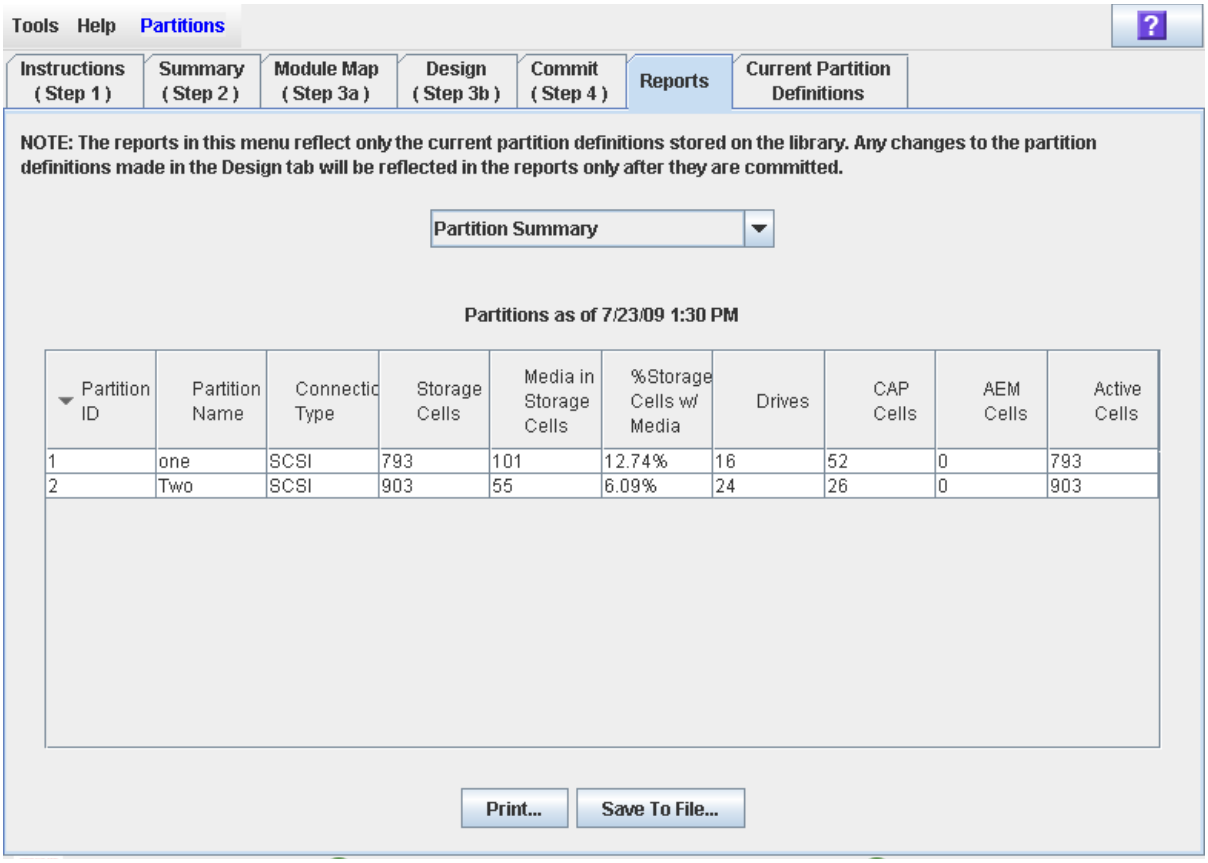
Click to display online help for the screen.

See Also

- "Partitions—Reports—Cartridge Cell and Media Summary" on page 319
- "Partitions—Reports—Host Connections Summary" on page 322
- "Partitions—Reports—Orphaned Cartridge Report" on page 327
- "Partitions—Reports—Partition Summary" on page 334

Partitions—Reports—Partition Summary

Sample Screen



Description

Displays summary information for all partitions in the library.

> **Note –** The partition reports display data saved to the library controller database. If you have made partition configuration changes without commiting the changes to the library controller through the **Commit (Step 4)** screen, the data in these reports will differ from data shown on the partition **Summary (Step 2)** and **Design (Step 3b**) screens.

You can modify the layout and display of this screen. See "Modifying the Screen Layout" on page 62 for details.

Optionally, you can print the screen data or save it to a comma-separated file.

Screen Access

This screen can be accessed at either of the following:

- Standalone SL Console
- Web-launched SL Console

Screen Fields

Note – These screen fields also appear on the "Partitions—Reports—Host Connections Summary" on page 322 report.

Partition ID

Display only.

ID of the partition (1–8).

Partition Name

Display only.

Name of the partition.

Connection Type

Display only.

Type of interface used by the host-partition connection. Options are:

- HLI
- FC-SCSI

Storage Cells

Display only.

Total number of storage cells allocated to the partition.

Media in Storage Cells

Display only.

Total number of tape cartridges resident in the partition's storage cells.

% Storage Cells w/ Media

Display only.

Percentage of storage cells containing tape cartridges. Calculated as **Media in Storage Cells** / **Storage Cells**.

Drives

Display only.

Total number of drives allocated to the partition.

CAP Cells

Display only.

Total number of rotational CAP cells allocated to the partition.

AEM Cells

Display only.

Total number of AEM CAP cells allocated to the partition.

Active Cells

Display only.

Total storage cell capacity assigned to the partition in the **Add Partition** screen.

Buttons and Controls

Print

Button.

Click to print the report on a selected printer .

Save to File

Button

Press to save the report to a comma-separated value (.csv) file compatible with many spreadsheet applications.

? (Help)

Click to display online help for the screen.

See Also

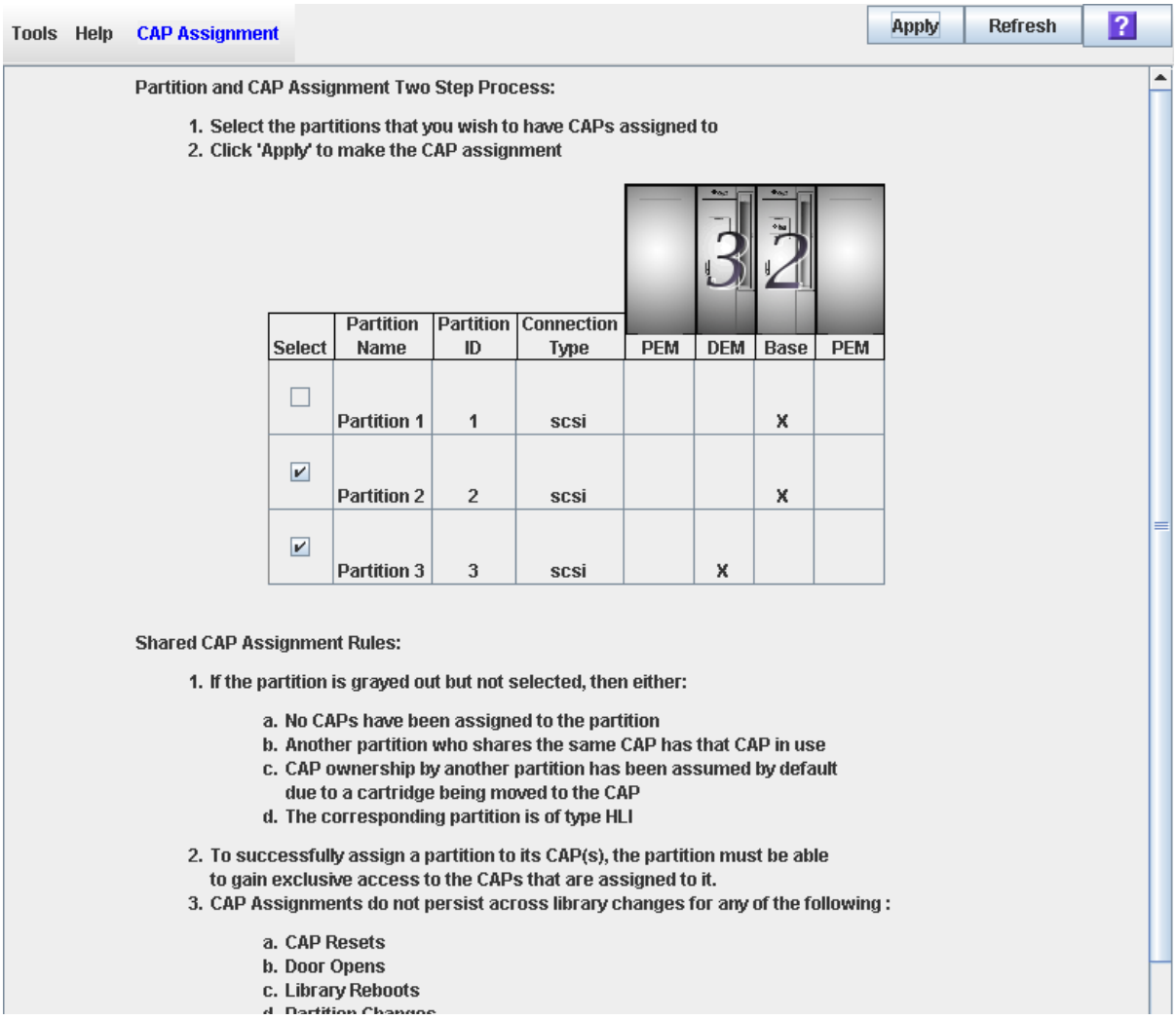
- “Partitions—Reports—Cartridge Cell and Media Summary” on page 319
- “Partitions—Reports—Host Connections Summary” on page 322
- “Partitions—Reports—Orphaned Cartridge Report” on page 327
- “Partitions—Reports—Partition Details” on page 330

Partition CAP Operation Screens

Screen	Page
CAP Assignment	338
Diagnostics > CAP—Unreserve	319

CAP Assignment

Sample Screen



Description

Enables you to perform either of the following actions:

- For shared FC-SCSI CAPs only, you can perform partition-CAP associations prior to using the CAP to enter or eject cartridges to or from a partition. Partition-CAP associations reserve a shared FC-SCSI CAP for the exclusive use of the selected partition. All shared CAPs are modified in the same way. It is not possible to modify control of just one shared CAP.
- For all FC-SCSI CAPs (shared or dedicated), you can give control of a CAP to the library controller for diagnostic operations.

Modifications made with this screen remain in effect until they are explicitly removed.

Note – This screen is not available if the library has no FC-SCSI CAPs.

Note – The example screen is used for both rotational and AEM CAPs. Throughout this section, the term "CAP" refers to both types of CAPs.

The following rules apply when using this screen:

- You can use this screen for shared FC-SCSI CAPs only. You cannot use this screen for HLI partitions because HLI host applications always use CAP reservations.
- You do not need to use this screen for dedicated CAPs because a partition always has ownership of its dedicated CAPs.
- You can associate only one partition at a time to a CAP.
- Selecting a partition causes all its allocated CAPs to be associated to it at once. You cannot select individual CAPs to be associated to the partition.
- Partition-CAP associations remain active until you explicitly remove them. The associations are not automatically removed when the enter or eject operation completes.
- Partition-CAP associations are removed during library reboots, power cycles, library door open/close operations, or CAP initializations
- Partition-CAP associations are removed if the CAP becomes allocated to a different partition through the **Design (Step 3b)** screen.
- If a partition-CAP association is removed while the CAP is open or has cartridges in it, the CAP ownership will be changed to the "default" requester (the library controller), and the CAP will be unavailable to all partitions. You must empty and close the CAP before it can be associated to any partitions.

See "Enter Cartridges Into a Partition" on page 261 and "Eject Cartridges From a Partition" on page 262 for complete details on using this screen in conjunction with the **CAP Open** button.

Screen Access

This screen can be accessed at either of the following:

- Standalone SL Console
- Web-launched SL Console

Screen Fields

Select

Select one or more partitions for which you want to enter or eject cartridges, as follows:

- Select the check box to select the partition. The screen updates as follows:
  - All CAPs allocated to that partition are marked with the partition number on the module map.
  - All other partitions sharing CAPs with that partition are grayed out.
- Deselect the check box to deselect the partition.

Partitions that are grayed out cannot be selected. A partition may be grayed out for any of the following reasons:

- No CAPs have been allocated to the partition.

- The partition has an HLI host-connection type.
- The CAP is currently in use by another partition that shares the CAP.
- The CAP is currently in use by the "default" user (library operator).

Partition Name

Display only.

Name assigned to the partition.

Partition ID

Display only.

ID assigned to the partition. IDs can range from 1–8.

Connection Type

Display only.

Type of interface assigned to the host-partition connection. Options are:

- HLI
- FC-SCSI

Library module map

Display only.

The screen displays an illustration of the library's actual module configuration. This information is taken directly from the library controller database.

The CAP allocations for each partition are indicated, as follows:

- An "X" in a library module column indicates the CAP in that module is allocated to the partition in that row.
- No "X" in a library module column indicates the CAP in that module is not allocated to the partition in that row.

Buttons

Apply

Click to update the library controller database with the current settings from this screen. The **CAP Confirm** message appears, prompting you to confirm the update.

Refresh

Click to refresh the SL Console partition workspace with current data from the library controller database. All uncommitted partition changes you have made during this SL Console login session will be discarded. The **Partition Refresh** message appears, prompting you to confirm the refresh.

? (Help)

Click to display online help for the screen.

See Also

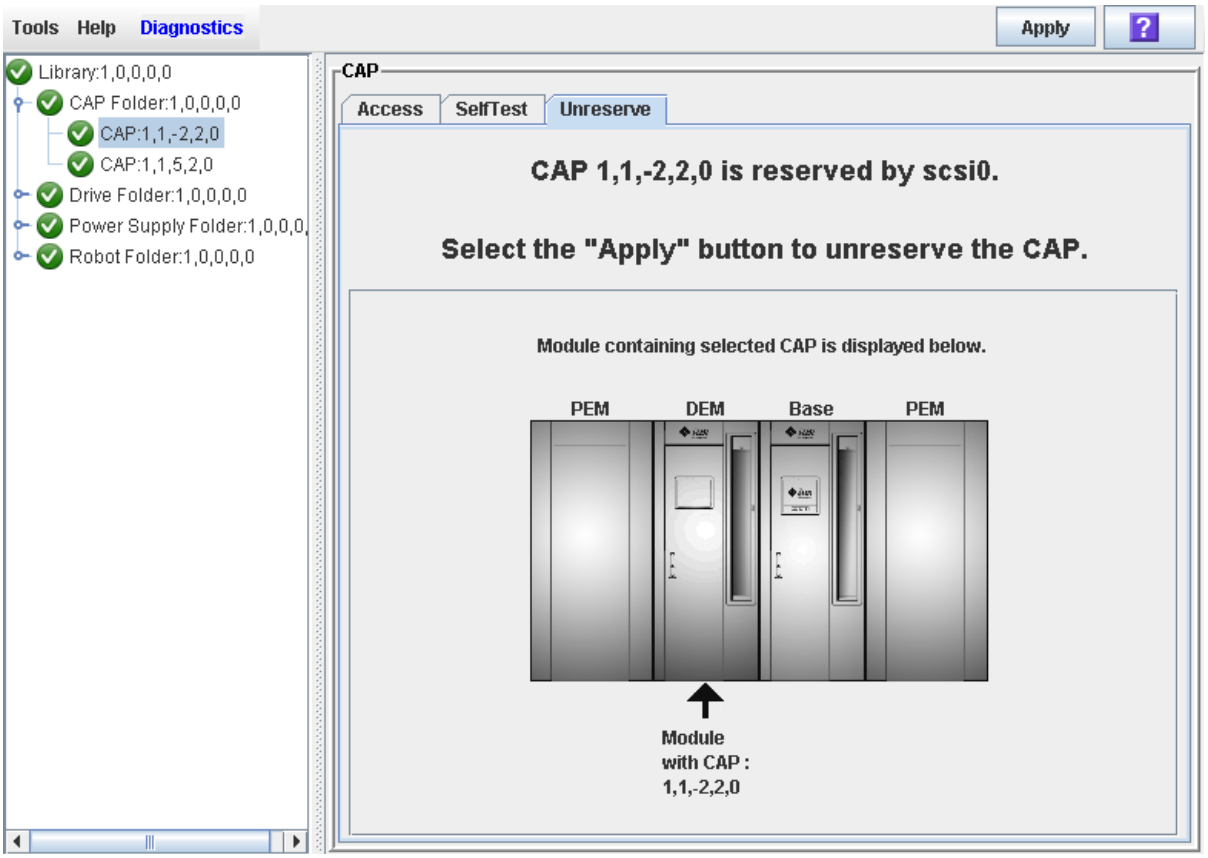
- “Partitions—Design (Step 3b)” on page 294

Click to refresh the SL Conso le partition workspace with current data from the library controller database. All uncommitted partition changes you have made during this SL Console login session will be discarded. The **Partition Refresh** message appears, prompting you to confirm the refresh.

Click to display online help for the screen.

Diagnostics > CAP—Unreserve

Sample Screen



Description

Allows you to override a CAP reservation that has been initiated by a host. This causes the library controller to remove the CAP reservation and set the CAP user to “default,” which makes the rotational or AEM CAP unavailable to all partitions.

After overriding the reservation you will need to open the CAP and remove any cartridges. After you close the CAP, the library controller will lock and audit the CAP to verify that it is empty. It will then set the CAP status to “unreserved,” which makes the CAP available to all partitions.

> **Note –** For FC-SCSI CAPs, overriding a CAP reservation breaks any partition-CAP association, even if the CAP is dedicated to the FC- SCSI partition. You must explicitly associate the partition to the CAP again before the partition can use the CAP.

> **Note –** The example screen is used for both rotational and AEM CAPs. Throughout this section, the term “CAP” refers to both types of CAPs.

See “Override a CAP Reservation” on page 265 for the detailed procedure.

Screen Fields

CAP *CAP_id* **is** *status***.**

Display only.

Status of the selected CAP. Possible options are:

- `reserved by` *host_name*: A CAP operation has been initiated by the specified host. You can use this screen to unreserve the CAP .
- `reserved by default`: A CAP operation has been in itiated at the SL Console. You cannot use this screen to unreserve the CAP.
- `not reserved`: The CAP is not reserved. You do not need to unreserve the CAP .

Module containing selected CAP is displayed below

Display only.

The screen displays an illustration of the lib rary's actual module configuration. This information is taken directly fro m the library controller database.

The CAP you have selected is marked by an arrow .

Buttons

Apply

Click to override the host CAP reservation. The **CAP Confirm** popup appears, prompting you to confirm the update.

> **Note –** This button is active only if the CAP status is "`reserved by` *host_name*".

? (Help)

Click to display online help for the screen.

See Also

- CAP Assignment

6

Library Management

This chapter covers the management of the SL3000 library, including:

Automated Mode of Operation

When in automated mode of operation, the library or library complex automatically mounts and dismounts cartridges without physical intervention by a person.

Automated operations include the following activities:

- Mounting and dismounting cartridges
- Entering and ejecting cartridges through a CAP
- Pass-thru port (PTP) activities
- Logging library events
- Drive cleaning

Cartridge Mount and Dismount Activities

The primary function of the library is the automated mounting and dismounting of cartridges. Host mount and dismount commands are accepted by the library controller and translated into robotic commands that are performed by the robot.

Mount Sequence

A simplified mount sequence involves the following steps:

1. A host requests that a specific volume serial number (VOLID or volser) be mounted in a drive.
2. The library controller transmits to the host that the VOLID is located within the library and a drive is available to satisfy the mount request.
3. The library assumes responsibility for the mount.

4. The library controller translates the host command into motion commands for the robot.
5. The robot takes the cartridge from its storage cell and places it in the drive.
6. The library returns status to the host that the mount operation is completed.
7. The drive performs the read/write activity directed by the host.

Dismount Sequence

A simplified dismount sequence involves the following steps:

1. A host requests that a specific VOLID be dismounted from a drive.
2. The library controller transmits to the host that the VOLID is located in the drive and the library is available to satisfy the dismount request.
3. The library assumes responsibility for the dismount.
4. The library controller translates the host command into mechanical commands for the robot.
5. The robot takes the cartridge from its storage cell and places it in its home cell.
6. The library returns status to the host that the dismount operation is completed.

Determining When the Library is Not in Automated Mode

The library is not in automated mode when it is not able to accept host requests. The following conditions indicate that the library is not in automated mode:

- A library main access door is open.
- The robot does not automatically mount and dismount cartridges.
- The navigation tree in the SL Console indicates that there is a problem with the library.

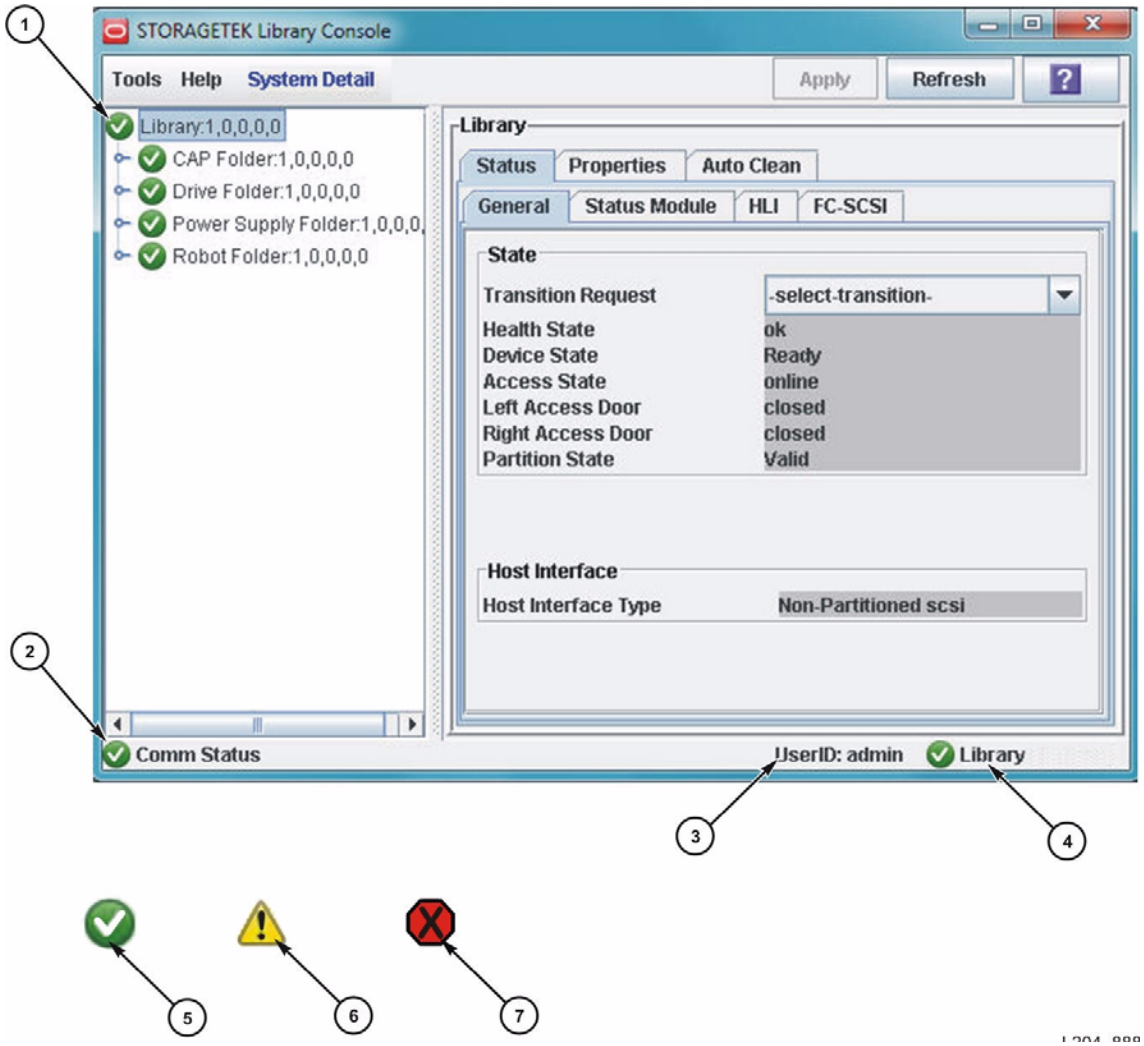
Library and Device Status

The SL Console screen displays health indi cators for each of the f ollowing devices:

- Library
- CAPs
- Drives
- Robot

TABLE 6-1 describes the health m onitor indicators shown in FIGURE 6-1.

FIGURE 6-1 SL Console Health Status Indicators



For more information, see TABLE 6-1.

TABLE 6-1 Health Status Indicator and Icon Descriptions

Indicator	Icon	Health Status Description
1: Health status by each device	5	Normal. All library devices are functioning normally. (Green circle with check mark)
	6	Warning. One or more devices in the library is offline or operating in a degraded state. (Yellow caution triangle with exclamation point)
	7	Error. One or more devices in the library has experienced a failure. (Red stop sign shape with black X)
2: Communication status between SL Console and library controller	5	Normal. The heartbeat monitor flashes periodically when the SL Console is communicating normally with the library controller. (Green circle with check mark)
	6	Warning. Appears if the server takes longer than 10 seconds to respond. (Yellow caution triangle with exclamation point)
	7	Error. Appears when the server response takes longer than 30 seconds. (Red stop sign shape with black X)
3: Userid	N/A	User ID currently logged in to the SL Console.
4: Overall health status of library and devices	5	Normal. All library devices are functioning normally. (Green circle with check mark)
	6	Warning. One or more devices in the library is offline or operating in a degraded state. (Yellow caution triangle with exclamation point)
	7	Error. One or more devices in the library has experienced a failure. (Red stop sign shape with black X)

If there are multiple problems with a device or status alert conditions, the health indicator displays the one that is most severe. For example, if the library has been taken offline (a “yellow” condition) and a CAP has experienced a failure (a “red” condition), the library health indicator will be red. After the CAP problem is fixed, the library health indicator will change to yellow. The indicator will not return to green until the library has also been taken online.

Communications Failures

If the SL Console loses communication with the library controller, after about 30–60 seconds the heartbeat monitor turns gray, then red, and the following error message appears:

```
Heartbeat message not received from the library controller.
```

Log off from the SL Console, and then log on again to restore communication.

See “Library Control Path” on page 51 for details.

Library Management Tasks

▼ Display Library Status

Task Tool

This procedure can be performed at any of the following:

- Local operator panel
- Standalone SL Console
- Web-launched SL Console

Task Purpose

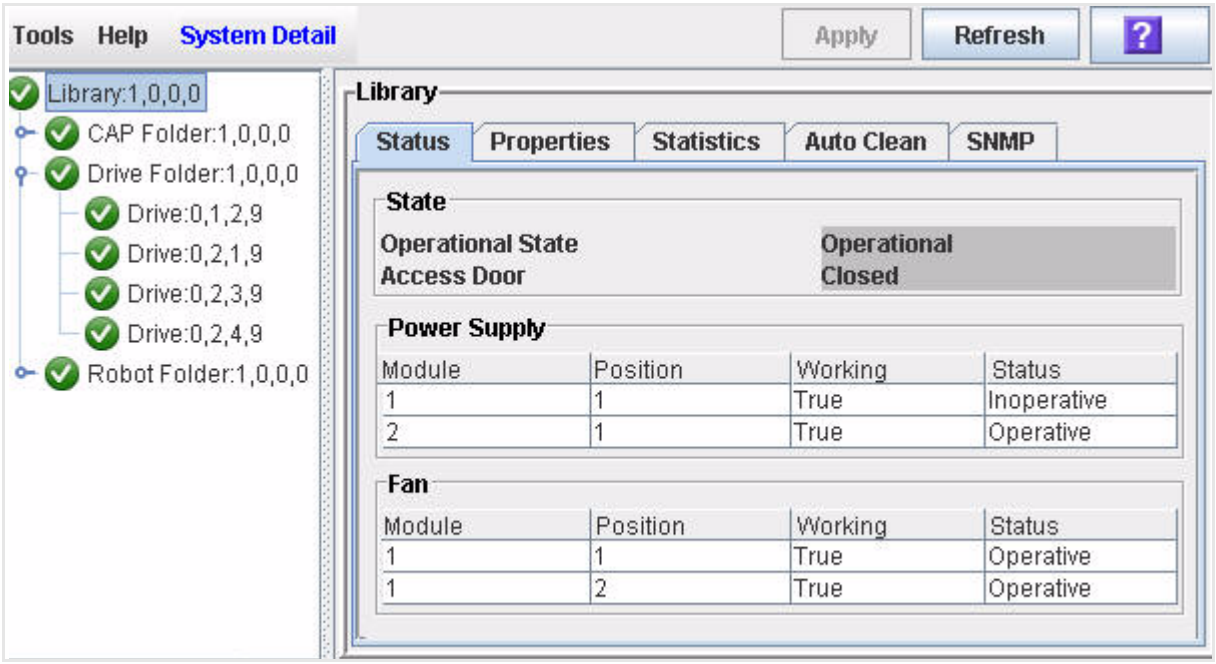
Use this procedure to view the current operational state of the library. These values update whenever there is host activity, background operations, or operator activity.

> **Note –** This information is also available through **Reports > Library Details**. See "Display a Library Report" on page 90 for detailed instructions.

Task Steps

1. **Select Tools > System Detail, and click the Library folder in the navigation tree.**
2. **Click the Status tab, and then the General tab.**

   The page displays the current status of the library.



▼ Display Library Configuration Properties

Task Tool

This procedure can be performed at any of the following:

- Local operator panel
- Standalone SL Console
- Web-launched SL Console

Task Purpose

Use this procedure to display the physical, mechanical, logical, and network configuration of the library. Some of the information can be set up automatically during library initialization, while other information can be defined by the user.

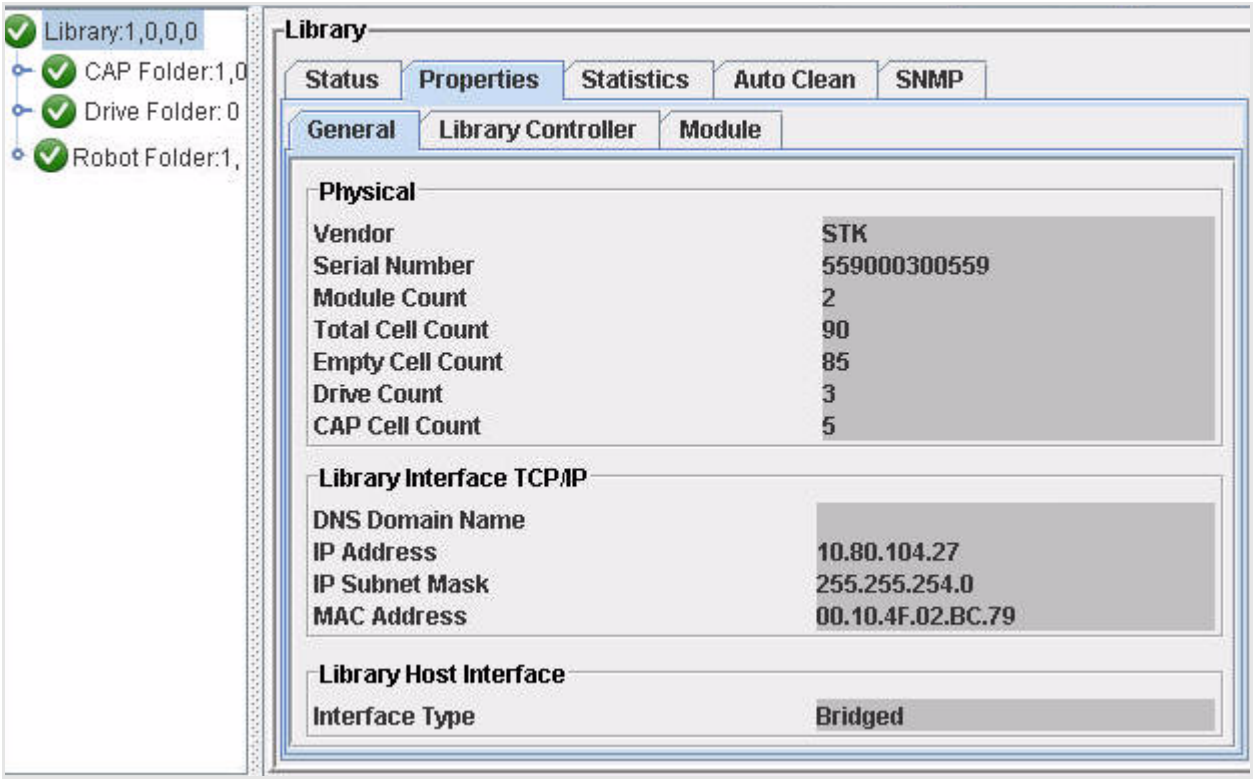
This information is also available through Reports > Library Information. See "Display a Library Report" on page 90 for detailed instructions.

Task Steps

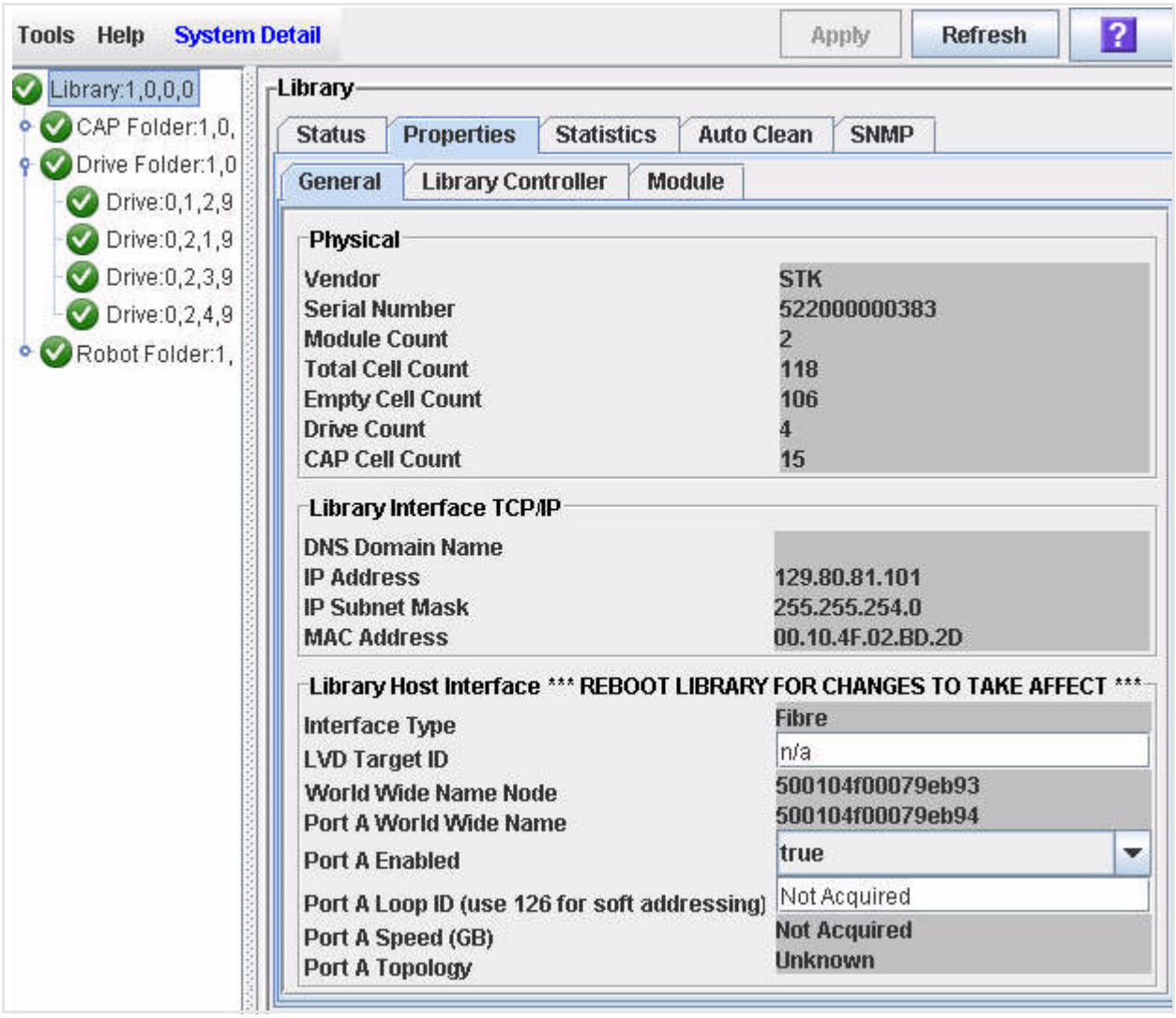
1. **Select Tools > System Detail, and click the Library folder.**
2. **Click the Properties tab, and then the General tab.**

   The page displays the properties specific to a Bridged library or an Unbridged library:

   - Bridged library



- Unbridged library



Screen Fields

Vendor

Vendor is STK (for Oracle S torageTek).

Serial Number

Serial number of the library base m odule.

Library Base WWN

World Wide Node Name (WWNN) for the library.

Module Count

Total number of modules in the library .

Total Cell Count

Total number of physical storage cells installed in the library. Includes data cartridge cells as well as reserved system cells. Not all of these cells may be enabled for use, however. See "Display Current Hardware Activation Files" on page 127 for details on displaying the number of cells that are actually enabled.

Empty Cell Count

Total number of unoccupied data storage cells.

Drive Count

Total number of drives installed.

CAP Cell Count

Total number of CAP (cartridge access port) cells.

Library Interface TCP/IP

These fields apply to the standard library TCP/IP port.

DNS Domain Name

DNS domain name assigned to the library.

IP Address

IPv4 (IP version 4) address for the port, if applicable.

IP Subnet Mask

Netmask defined for the subnet that the port is on.

MAC Address

MAC address for the port.

Library Host Interface

Interface Type

Type of host-library interface. Options are:

- Bridged
- Fibre (Fibre Channel)
- LVD (parallel LVD SCSI)

LVD Target ID (Unbridged Library Only)

SCSI target identifier that identifies the library controller to the initiator on the host.

World Wide Name Node (Unbridged Library Only)

The World Wide Node Name (WWNN) that identifies the library on a Fibre Channel Storage Area Network (SAN). The WWNN is a 64-bit hardware identifier in IEEE format. It is set at the factory and cannot be changed.

Port A World Wide Name (Unbridged Library Only)

The World Wide Port Name (WWPN) that identifies controller port A on a Fibre Channel Storage Area Network (SAN). The WWPN is a 64-bit hardware identifier in IEEE format. It is set at the factory and cannot be changed.

Port A Enabled (Unbridged Library Only)

Possible values include:

- **true**: enables FC-AL static (hard) addressing
- **false:** enables FC-AL dynamic (soft) addressing

Port A Loop ID (Unbridged Library Only)

The identifier for controller port A when used on a Fibre Channel Arbitrated Loop (FC-AL) Storage Area Network (SAN). If static (hard) addressing is used, the Loop ID is in the range 1-125. If dynamically arbitrated (soft) addressing is used, the Loop ID is 126.

Port A speed (Unbridged Library Only)

The Fibre Channel data transfer rate between the host and controller port A.

Port A topology (Unbridged Library Only)

The Fibre Channel storage area network topology that connects controller port A to the host.

The following info is for on SL500 Lib > Props> General screen.

- Port X Enabled: Setting this value will turn on or off the physical port (A or B) on the drive. The network software automatically configures the Port (A or B) address. This is called soft mode addressing.
  - True
  - False: The communication channel between the host software and the drive is disabled.

    Note – The arbitrated loop topology (hard ALPAs [Arbitrated Loop Physical Addresses]) cannot be enabled for the SL3000 library or drives.

▼ Set Up an FC Control Path on an Unbridged Library

Task Tool

This procedure can be performed at either of the following:

- Standalone SL Console
- Web-launched SL Console

Task Purpose

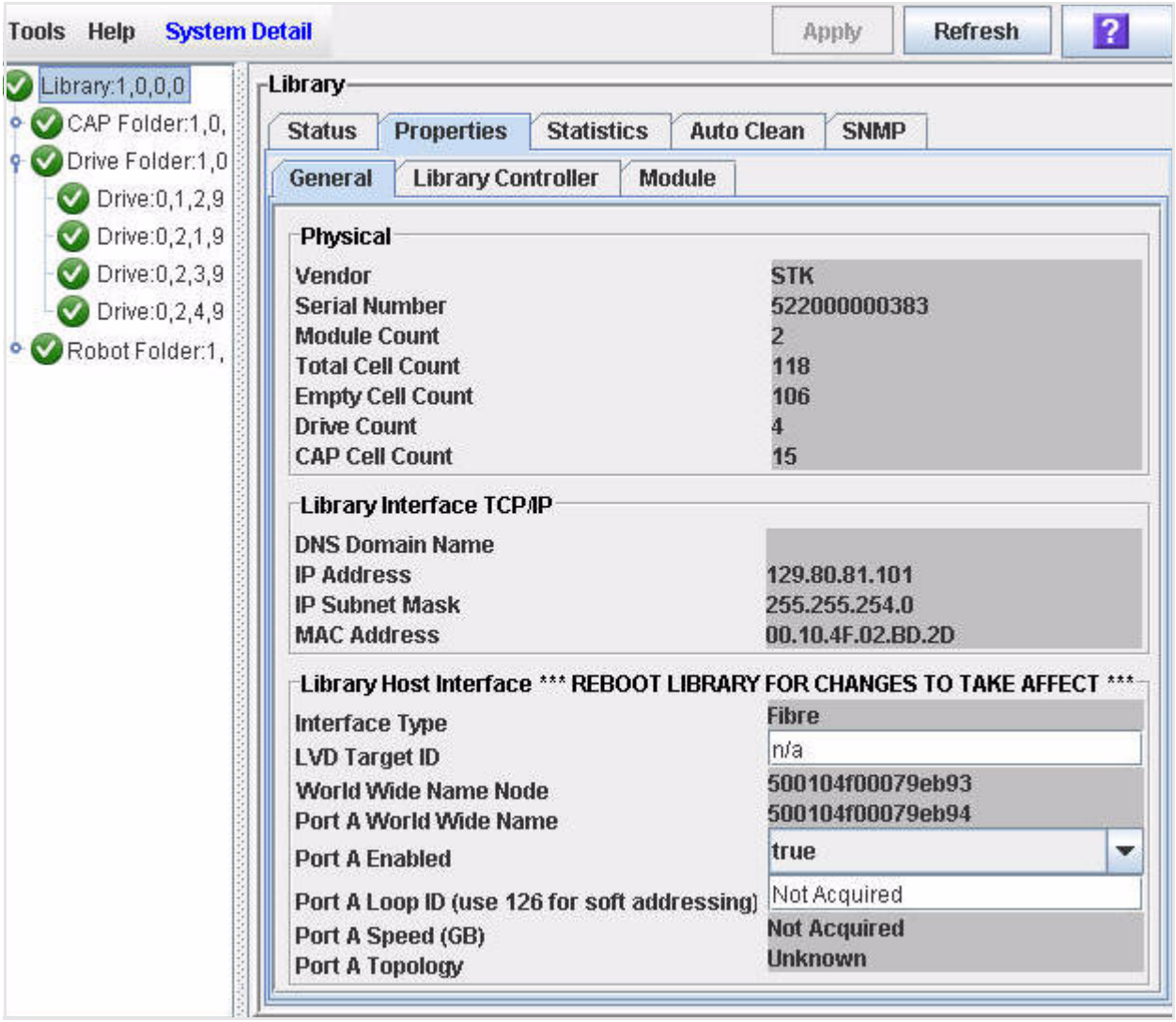
If the control path for the library is Fibre Channel (FC), you must set up the Fibre Channel port (**Port A**) on the library controller.

Task Steps

1. **Select Tools > System Detail, and click the Library folder.**

2. **Select Properties > General.**

   The page displays detailed information abou t the library.



3. **If you are using a Fibre Channel Arbitrated Loop (FC-AL) topology and static (hard) addressing on the Storage Area Network, set the Port A Enabled control to true and enter the correct Loop ID in the Port A Loop ID field.**

   FC-AL Loop IDs fall in the range 1-125.

4. **If you are using a Fibre Channel Arbitrated Loop (FC-AL) topology and dynamically arbitrated (soft) addressing on the Storage Area Network, set the Port A Enabled control to false and enter 126 in the Port A Loop ID field.**

5. **Click Apply to save the changes.**

6. **Reboot the library for the changes to take effect.**

▼ Display Library Controller Properties

Task Tool

This procedure can be performed at any of the following:

- Local operator panel
- Standalone SL Console
- Web-launched SL Console

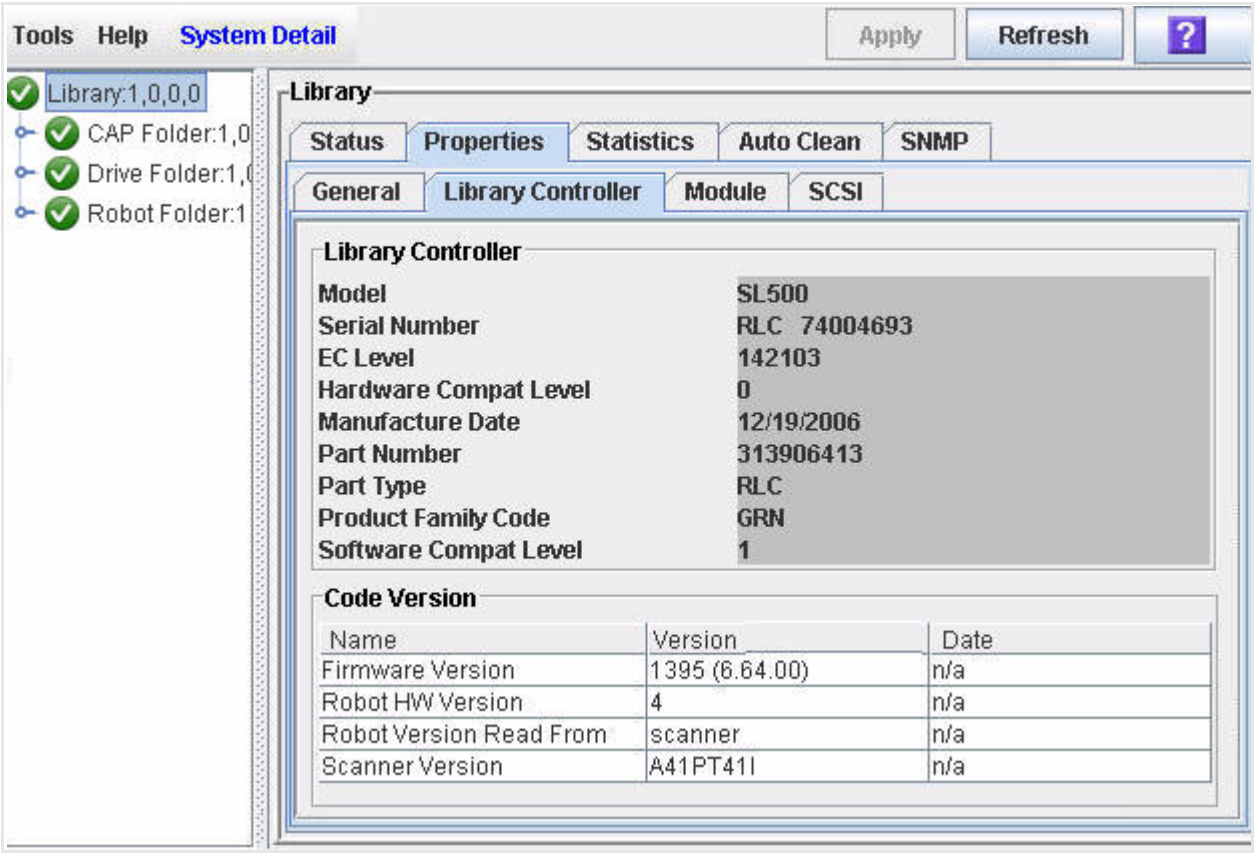
Task Purpose

Use this procedure to view details of the library controller, including the serial number and firmware versions.

> **Note –** This information is also available through **Reports > Library Information**. See "Display a Library Report" on page 90 for detailed instructions.

Task Steps

1. **Select Tools > System Detail, and click the Library folder.**
2. **Click the Properties tab, and then the Library Controller tab.**



▼ Display Library Physical Configuration

Task Tool

This procedure can be performed at any of the following:

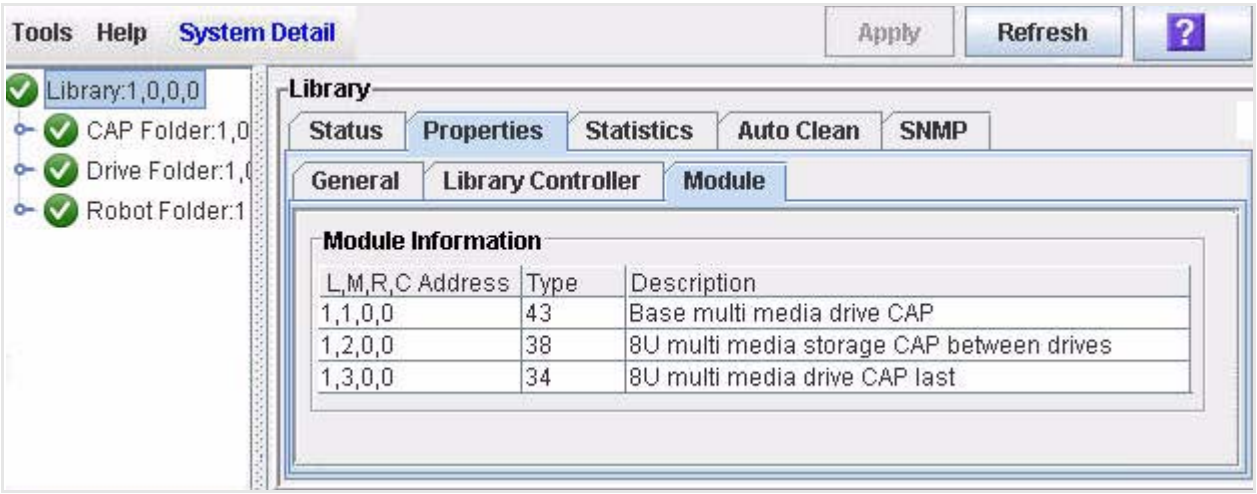
- Local operator panel
- Standalone SL Console
- Web-launched SL Console

Task Purpose

Use this procedure to view the current physical configuration of the library.

Task Steps

1. **Select Tools > System Detail, and click the Library folder.**
2. **Click the Properties tab, and then the Module tab.**



▼ Display Library SCSI Configuration

Task Tool

This procedure can be performed at any of the following:

- Local operator panel
- Standalone SL Console
- Web-launched SL Console

Task Purpose

Use this procedure to view the configuration of the library SCSI ports.

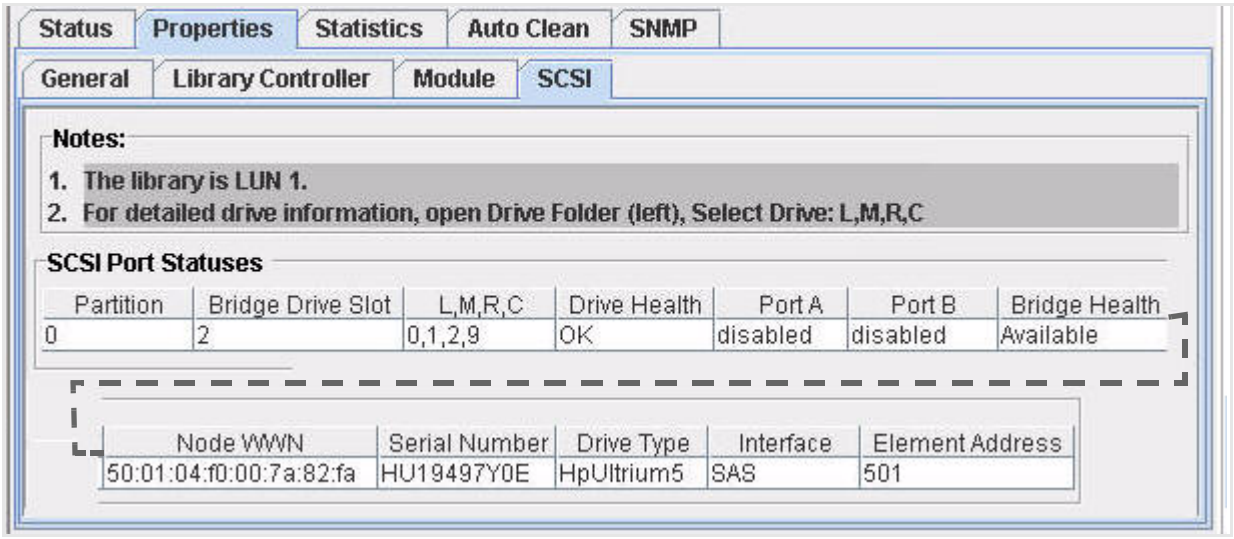
Task Steps

1. **Select Tools > System Detail, and click the Library folder.**
2. **Click the Properties tab, and then the SCSI tab.**

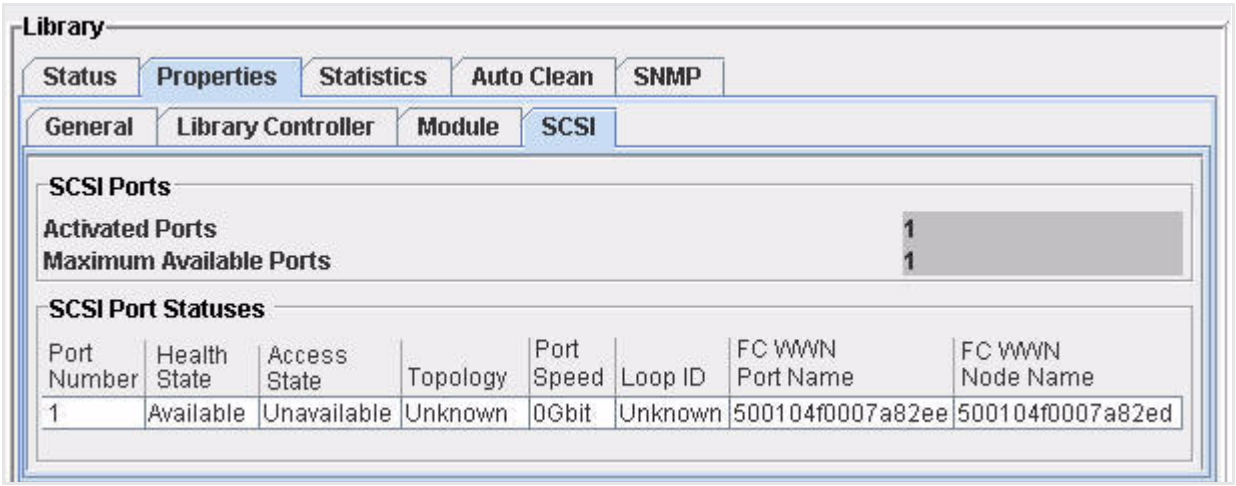
   The interface displays the SCSI Port screen for a bridged library or an unbridged library:

   - Bridged libraries display the:
     - **Partition** ID (a digit in the range **[1-8]** or **0** if unconfigured)
     - **Bridge Drive Slot** number
     - Bridge drive's L,M,R,C (Library, Module, Row, and Column) library address
     - **Drive Health**
     - Statuses of **Port A** and **Port B**
     - **Bridge Health**
     - Drive's **Node WWN** (**W**orld **W**ide **N**ame)
     - Drive manufacturer's **Serial Number**
     - **Drive Type**
     - Drive **Interface**

- Drive's SCSI **Element Address**.



- Unbridged libraries display the fields:
  - **Port Number**
  - **Health State**
  - **Access State**
  - **Topology**
  - **Port Speed**
  - Fibre Channel arbitrated **Loop ID**
  - **FC WWN** (**F**ibre **C**hannel **W**orld **W**ide **N**ame) **Port Name** and **Node Name**



Screen Fields

Bridged Libraries

Partition

The partition ID, a digit in the range **[1-8]** or **0** if no partitions are configured.

Bridge Drive Slot

The slot location of the drive that handles the control path for the drives allocated to the partition.

L,M,R,C

Library, **M**odule, **R**ow, and **C**olumn. The library address of the bridge drive.

Drive Health

The overall condition of the drives allocated to the partition. Check the **System Details** > **Drive Folde**r for details.

Port A, Port B

The status of the SCSI ports.

Bridge Health

The status of the control path to the library.

Node WWN

The Node World Wide Name of the bridge drive.

Serial Number

The manufacturer's serial number for the drive.

Drive Type

The vendor and LTO (Linear Tape Open) generation. For example, **HpUltrium5** is the HP Ultrium 5 LTO tape drive.

Interface

The drive interface. For example, **SAS** (Serial Attached SCSI).

Element Address

The SCSI element address of the drive.

▼ Display Library Statistics

Task Tool

This procedure can be performed at any of the following:

- Local operator panel
- Standalone SL Console
- Web-launched SL Console

Task Purpose

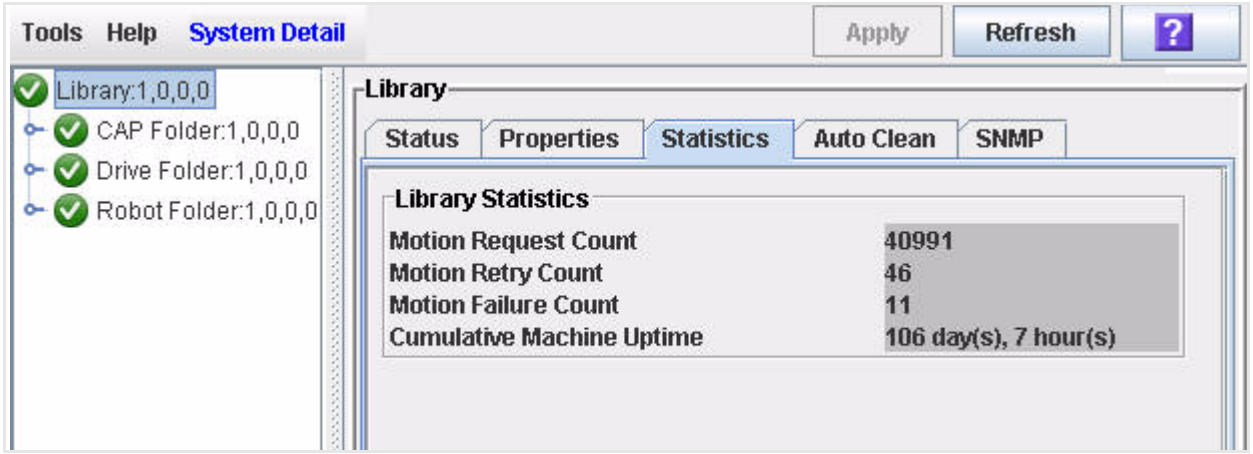
Use this procedure to view library statistics, such as the request, retry, and failure count of the robot and the library uptime.

> **Note –** This information is also available through **Reports > Statistics**. See "Display a Library Report" on page 90 for detailed instructions.

Task Steps

1. **Select Tools > System Detail, and click the Library folder.**
2. **Click the Statistics tab.**

   The **Statistics** page appears.



▼ Display the Library Utilization Reports

Task Tool

This procedure can be performed at any of the following:

- Local operator panel
- Standalone SL Console
- Web-launched SL Console

Task Purpose

The Library Utilization Reports summarize library activity that has occurred during a selected time period. robot, drive, and CAP activity is broken into regular time intervals within the time period. You can use this report to determine patterns of library activity over time and whether there are peak and low periods of usage.

By default, the report is sorted chronologically by time interval. Optionally, you can change the sort order and rearrange and resize the columns. See "Modifying the Screen Layout" on page 62.

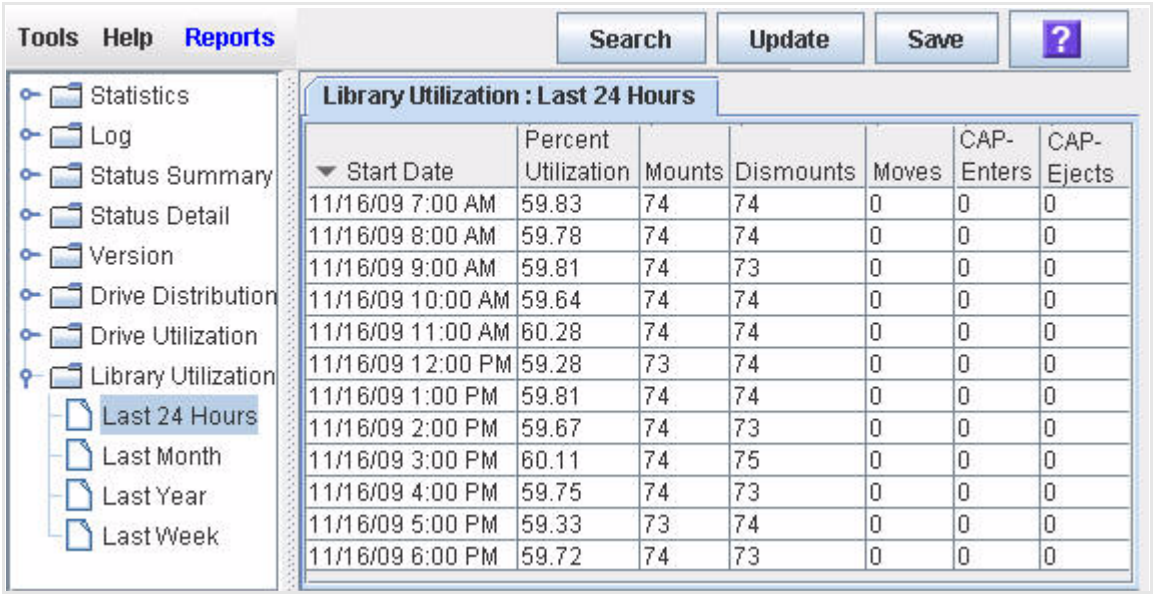
> **Note –** This feature is available starting with SL500 firmware version 1393 and SL Console version FRS_4.50.

Task Steps

1. **Select Tools > Reports.**
2. **Expand the Library Utilization folder in the navigation tree, and select the time period for which you want to display summary activity. Options are:**
   - Last 24 Hours: The previous 24 hours, divided into hourly intervals
   - Last 7 Days: The previous 7 days, divided into daily intervals
   - Last Month: The previous 31 days, divided into daily intervals

- Last Year: The previous 52 weeks, divided i nto weekly intervals

The selected report displays.



Start Date	Percent Utilization	Mounts	Dismounts	Moves	CAP-Enters	CAP-Ejects
11/16/09 7:00 AM	59.83	74	74	0	0	0
11/16/09 8:00 AM	59.78	74	74	0	0	0
11/16/09 9:00 AM	59.81	74	73	0	0	0
11/16/09 10:00 AM	59.64	74	74	0	0	0
11/16/09 11:00 AM	60.28	74	74	0	0	0
11/16/09 12:00 PM	59.28	73	74	0	0	0
11/16/09 1:00 PM	59.81	74	74	0	0	0
11/16/09 2:00 PM	59.67	74	73	0	0	0
11/16/09 3:00 PM	60.11	74	75	0	0	0
11/16/09 4:00 PM	59.75	74	73	0	0	0
11/16/09 5:00 PM	59.33	73	74	0	0	0
11/16/09 6:00 PM	59.72	74	73	0	0	0

Screen Fields

Start Date

Display only.

Starting date and time for each interval.

Percent Utilization

Display only.

Percentage of time the robot was busy during the time period. This includes time spent in the following activities:

- Moving cartridges between cells
- Moving cartridges to and from CA Ps
- Mounting and dismounting cartridges to and from drives
- Waiting for cartridges to load and thread in drives

This value is expressed as a percentage of total time in the interval. For example, a value of 25.70 means the robot was busy 25.7 percent of the time. The value is calculated as follows:

```
Seconds busy / total seconds in time interval
```

Mounts

Display only.

Total number of cartridge mounts initiated during the selected time period.

Dismounts

Display only.

Total number of cartridge dismounts initiated during the selected time period.

Moves

Display only.

Total number of cartridge moves from one storage cell to another that were initiated during the selected time period.

CAP-Enters

Display only.

Total number of cartridge moves from a CAP cell to a storage cell that were initiated during the selected time period.

CAP-Ejects

Display only.

Total number of cartridge moves from a storage cell to a CAP cell that were initiated during the selected time period.

7

Redundant Electronics Management

> **Note –** The information in this chapter applies only to libraries in which the Redundant Electronics feature has been installed and activated.
>
> **Note –** This feature is available starting with SL3000 firmware version FRS_3.0 and SL Console version FRS_5.00.
>
> **Note –** This feature is available to hosts using the HLI (TCP/IP) interface and to FC-SCSI hosts using ACSLS tape management software. It is NOT available to hosts using a native FC-SCSI interface. See the *SL3000 FRS_3.0 Release Notes* for details on the ACSLS and ELS software versions that are required.

The optional SL3000 Redundant Electronics feature provides failover protection in HLI libraries. If the library controller experiences errors, it automatically switches operations to an alternate library controller, with minimal disruption to library and host operations. This Enables your Oracle support representative to replace the faulty card while the library continues normal operations.

The Redundant Electronics feature also provides minimal disruption of library operations during firmware upgrades.

> **Note –** The SL3000 offers redundancy in a variety of components, including robots and power systems. The term “Redundant Electronics” refers specifically to redundancy in the library and drive controller components.

Activating Redundant Electronics

The Redundant Electronics feature requires all of the following hardware components:

- Active library controller (HBCr) card
- Alternate library controller (HBCr) card
- Active drive controller (HBT) card
- Alternate drive controller (HBT) card

Redundant Electronics Operations

The library controller (HBCr) and drive controller (HBT) cards installed across from one another in the card cage are partnered with one another into a "cardset." Each HBCr card determines its role whenever the card is reset or rebooted. If the HBCr card is the active controller and its partner HBT card is installed, the controller loads active code and assumes the role of active controller. If the HBCr card is the alternate and its partner HBT card is installed, it loads standby code. The HBT card assumes the same role (active or alternate) as its partner HBCr card.

Role of the Active Controller

The active library controller behaves, for the most part, like the library controller in a non-redundant library. It accepts connections and processes requests from HLI hosts and the SL Console and command line interface (CLI).

In addition to these functions, the active library controller in a library with Redundant Electronics continually monitors the status of the alternate library controller. If the active controller determines that the alternate is not healthy and able to become active, it will not allow an automated or manual failover.

Role of the Alternate Controller

The alternate library controller accepts HLI host connections, but processes only the `set host path group` and `force switchover` requests. All other requests are sent to the active controller.

The alternate controller continually monitors the status of the active controller. If the alternate controller determines that the active one is not functioning normally, it initiates an automatic failover. See "Automatic Failover Initiation" on page 370 for details.

Role of the Drive Controllers

The two drive controller cards (HBTA and HBTB) are partnered with the library controller cards installed across from one another in the card cage. The active drive controller communicates with the library drives. The alternate drive controller does not run until its partner library controller card becomes the active controller.

IP Addresses

Each library controller card requires its own unique IP address. If the Dual TCP/IP feature is active on the library, each card requires two unique IP addresses: one for the primary port (2B) and one for the secondary (2A) port. A library equipped with both Redundant Electronics and Dual TCP/IP requires four unique IP addresses.

When you use the SL Console to log into a library, you need to connect to the primary port on the active controller. The SL Console does not allow you to connect to the alternate controller, and if you attempt to do so an error message is displayed.

After an automatic failover or manual switch, the IP address or DNS alias you need to specify changes because the previously active controller is now the alternate, and vice versa.

How Failover Works

In a failover, control of the library is switched from the current active controller to the alternate. The alternate library and drive controller cards become active, and the active ones become alternate. Each library controller and its partnered drive controller are always switched as a pair.

A failover can be initiated either automatically or manually. This section describes characteristics of all failovers. See the following sections for additional details specific to the automatic and manual processes:

- "Automatic Failover Initiation" on page 370
- "Manual Switch" on page 370

Failover Process

The failover process is minimally disruptive to library operations, usually taking only a few minutes. The process is summarized as follows:

1. Failover is initiated automatically or manually.
2. The status of the alternate controllers is checked. The alternate library and drive controllers must be operating normally in order for failover to proceed. If any of the following conditions exist, the failover cannot proceed:
   - The alternate library or drive controller is in a fault state.
   - The alternate library or drive controller card is in the eject state.
   - The standby code is not running on the alternate library or drive controller cards.
   - A firmware download is in progress.
   - A card initialization is in progress.
3. If functional, the active library controller attempts to complete all in-process jobs and copy the cartridge database to the alternate controller card.
4. After all in-process jobs have completed or timed out, the card roles are switched.
5. Active software is brought up on the alternate controller, and this controller becomes the active one.
6. Standby software is brought up on the previously active controller, if possible, and this controller becomes the alternate. If the standby software cannot be brought up on this controller, the controller enters a fault state.

What Happens to Connections

The failover process is minimally disruptive to host operations. The following changes occur to various connections:

- Tape management software (Symantec or Virtual Storage Manager, for example) users do not see an interruption.
- HLI host applications (ACSLS and ELS) queue requests during the failover process, and then submit them to the library controller after the failover is complete. For ACSLS, the queuing and retry affects mount and dismount requests only. See the ACSLS and ELS documentation for details.

- SL Console and CLI connections are terminated. YouUsers must re-establish connections to the library using the IP address of the new active library controller (the former alternate controller). See "Log In to the Library After a Failover" on page 382 for detailed instructions.

In-transit Cartridge Recovery

Any cartridges that are in-transit at the time a failover is initiated are returned to their home slots, if possible. If a cartridge cannot be moved to its home slot, it is moved to a library system cell, and the host must return the cartridge to its home cell.

Audits

The cartridge location database resides on the active controller only and is not mirrored on the alternate. If the database can be copied to the alternate prior to the failover, a cartridge audit is not necessary afterwards. Usually it is possible to copy the database in the following circumstances:

- A manual switch
- The active drive controller (HBTA) card is pulled or failed

Usually it is not possible to copy the database if there is a sudden hard failure in the active library controller.

If an audit must be done after the failover, it is done in the background, while other jobs are processed. As a result, you may notice that library operations take slightly longer to perform until the audit is complete. In addition, if a particular request requires information about a location that has not yet been audited, the location will be audited first, causing a slight delay in processing the request.

Automatic Failover Initiation

An automatic failover can be initiated by either the active or alternate library controller.

The active library controller initiates an automatic failover in any of the following situations:

- It determines that its partner drive controller (HBTA) card is not installed.
- It does not receive communication from its partner drive controller (HBTA) card within a defined time-out period.
- It detects a catastrophic internal software error.

The alternate library controller initiates an automatic failover if it determines that the active controller is not responsive.

Manual Switch

You may want to perform a manual switch in the following circumstances, to verify that the alternate cards are functioning normally:

- After initial installation of the alternate library and drive controller cards
- After a firmware upgrade
- Periodically (once a month or once a quarter, for example)

Each library controller and its partnered drive controller are always switched as a pair. It is not possible to manually switch only the library controllers and not the drive controllers, for example.

Manual Switch Initiation

A manual switch can be initiated through any of the following connections:

- Host tape management (ACSLS or ELS) console: From either the active or alternate library controller.
- Remote SL Console: From the active library controller only. Since the SL Console cannot log into the alternate library controller, you cannot use the SL Console to initiate a manual switch from the alternate. Also, the manual switch function is not available from the local operator panel.
- CLI: From either the active or alternate library controller. This function is available to your Oracle support representative only.

Before initiating a manual switch, you should verify that the alternate library and drive controllers are running normally. See the following topics for additional information on card status:

- "SL Console Displays" on page 371
- "Display Redundant Electronics Detail" on page 376

See "Manually Switch Redundant Electronics Cards" on page 380 for detailed instructions on initiating a manual switch from the SL Console.

Monitoring Status of the Controllers

LEDs and Controls

The LEDs and controls are the same on all four cards. The following TABLE 7-1 lists what the LED lights mean.

TABLE 7-1 LED and Control Descriptions

LED	Color	Definition
ACTIVE	Green	Card is functioning as the active and is running active code.
STANDBY	Amber	Card is functioning as the alternate and is running standby code.
FAULT	Red	Card has experienced a serious error.
EJECT OK	Blue	Card can be safely removed. Your Oracle support representative can initiate a card eject through the CLI.

SL Console Displays

You can display the status of all four controller cards through the SL Console.

Card Positions

Some SL Console displays identify the individual library controller cards as HBCA and HBCB and the drive controller cards as HBTA and HBTB. For both types of cards, the A or B suffix indicates the card's position within the card cage, as viewed from the back of the machine, as follows:

- A: Bottom card slot
- B: Top card slot

Card Statuses

The possible status of the controller cards are described in the following TABLE 7-2.

TABLE 7-2 Possible Status of Controller Card

Status	Applies to	Definition
Duplex: software ready, switch possible	Active library controller only	Card is functioning normally.
Not installed	All cards	Card is not installed in the machine.
ok	Active or alternate drive controller	Card is functioning normally.
Pre-standby: Software not ready	Alternate library controller only	Card is loading standby code and is not ready to be used in an automatic failover or manual switch.
Standby: software ready	Alternate library controller only	Card is functioning normally and can be used in the event of an automatic failover or manual switch.

See the following topics for additional details:

- "Display Redundant Electronics Summary Information" on page 374
- "Display Redundant Electronics Detail" on page 376

Event Log Entries

Significant library and drive controller activities, such as deteriorated health, errors, failovers, and card ejects, are logged to the Event Log. Routine activities, such as a card monitoring the status of its partner, are not.

Redundant Electronics and Firmware Upgrades

Firmware upgrades for libraries with the redundant electronics feature are minimally disruptive to library operations. New code is loaded and unpacked simultaneously on the active and alternate controller cards and on all devices. The code is then activated, and the active and alternate controllers and most devices are reinitialized. Under most circumstances, robot initialization is bypassed.

The loading, unpacking, and activation of code are not disruptive to library operations until the library is rebooted. During the reboot process (which takes approximately 10 minutes), the HLI host applications (ACSLS and ELS) queue all mount and dismount requests. After the reboot is complete, the queued requests are submitted to the library controller.

Redundant Electronics Management Tasks

▼ Display Redundant Electronics Summary Information

Task Tool

This procedure can be performed at any of the following:

- Local operator panel
- Standalone SL Console
- Web-launched SL Console

Task Purpose

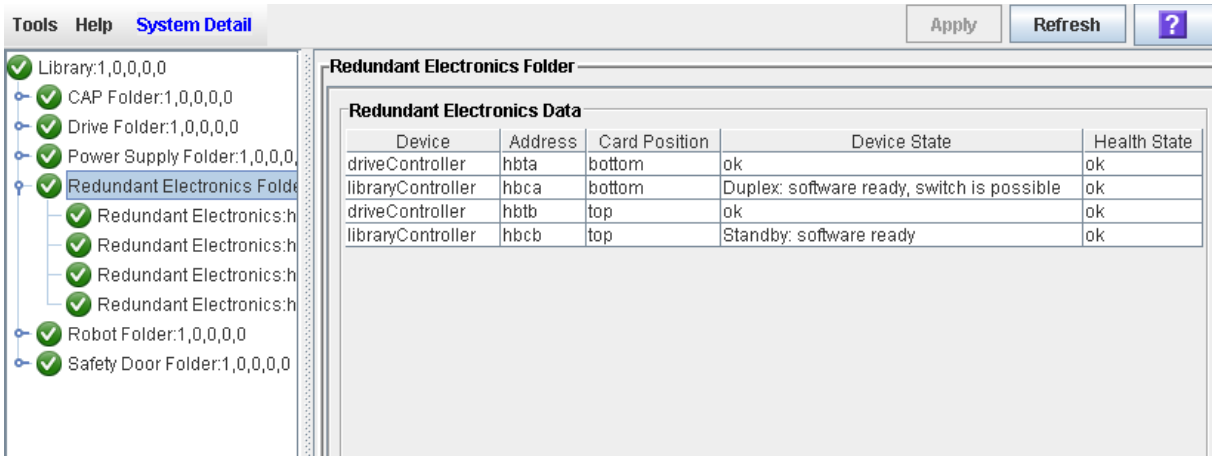
Use this procedure to display summary information about all Redundant Electronics cards in the library.

> **Note –** This feature is available starting with SL3000 firmware version FRS_3.0 and SL Console version FRS_5.00.

Task Steps

1. **Select Tools > System Detail, and click the Redundant Electronics folder.**

   The **Redundant Electronics Data** page appears.



Screen Fields

Device

Options are:

Type of card. Options are:

- libraryController: Library controller card
- driveController: Drive controller card

Address

The card's address within the library. Options are:

- hbca: Library controller, A (bottom) slot
- hbcb: Library controller, B (top) slot
- hbta: Drive controller, A (bottom) slot
- hbtb: Drive controller, B (top) slot

Card Position

Position of the card within the card cage, as viewed from the back of the machine. Options are:

- bottom: Bottom card slot. Also referred to as the A slot.
- top: Top card slot. Also referred to as the B slot.

Device State

Current operating state of the card. Options are:

- Duplex: Software ready, switch possible: Card is functioning normally. Used only for an active HBC card in a library with Redundant Electronics.
- Initializing State 0: Internal hardware manager state which may be seen during initialization.
- Initializing State 1: Internal hardware manager state which may be seen during initialization.
- Not installed: Card is not installed in the machine. The library has the Redundant Electronics feature activated, but the alternate HBC or HBT card is not installed.
- ok: Card is functioning normally. Used only for HBT cards.
- Pre-simplex: software not ready. Card is loading code. Used only for an HBC card in a library without Redundant Electronics.
- Pre-standby: software not ready. Card is loading standby code and is not ready to be used in the event of an automatic failover or manual switch. Used only for an alternate HBC card in a library with Redundant Electronics.
- Simplex: software ready. Card is functioning normally. Used only for an HBC card in a library without Redundant Electronics.
- Standby: software ready: Card is functioning normally and can be used in the event of an automatic failover or manual switch. Used only for an alternate HBC card in a library with Redundant Electronics.
- Unknown: unknown value: The active HBC card cannot communicate with the alternate and does not have any information about the alternate's status.

Health State

Current health of the card. Options are:

- error: Card has experienced a fault, such as it is in the Not Installed state.
- warn: Card is in a degraded state, such as the card has been ejected or its alternate is not yet in the Standby state.
- ok: Card is functioning normally

▼ Display Redundant Electronics Detail

Task Tool

This procedure can be performed at any of the following:

- Local operator panel
- Standalone SL Console
- Web-launched SL Console

Task Purpose

Use this procedure to display detailed status information for the active and alternate library controller and drive controller cards.

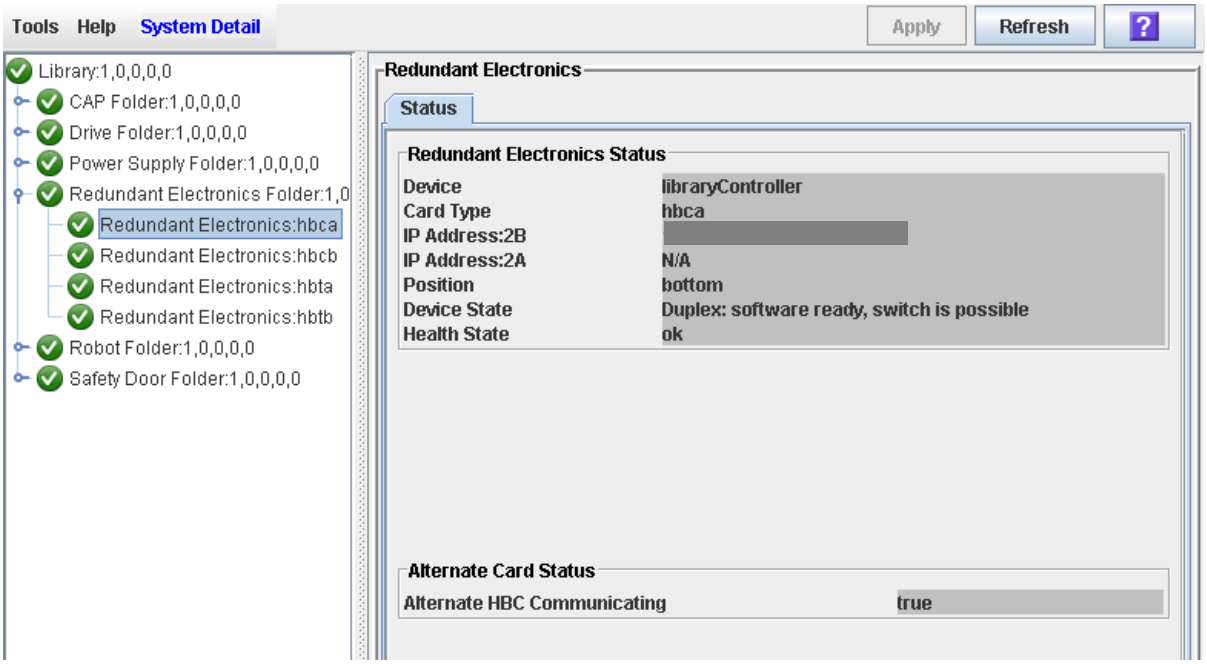
> **Note –** If redundant electronics is not enabled on this library, the display shows as much detail as is applicable.

> **Note –** This feature is available starting with SL3000 firmware version FRS_3.0 and SL Console version FRS_5.00.

Task Steps

1. **Select Tools > System Detail.**
2. **Expand the Redundant Electronics folder in the navigation tree, and click the card you want to display. Cards are as follows:**
   - hbca: Library controller, A (bottom) slot
   - hbcb: Library controller, B (top) slot
   - hbta: Drive controller, A (bottom) slot
   - hbtb: Drive controller, B (top) slot

The page displays the current status of the selected card.



Screen Fields

Device

Type of card. Options are:

- libraryController: Library controller card
- driveController: Drive controller card

Card Type

The card's address within the library. Options are:

- hbca: Library controller, A (bottom) slot
- hbcb: Library controller, B (top) slot
- hbta: Drive controller, A (bottom) slot
- hbtb: Drive controller, B (top) slot

IP Address: 2B

IP address of the 2B port on the selected library controller card. The 2B port is the primary port for host communications.

If no card is installed, this field displays N/A.

> **Note –** This field applies only to library controller (HBCr) cards. Drive controller (HBT) cards do not have a 2B or 2A port and therefore always display N/A.

IP Address: 2A

IP address of the 2A port on the specified HBCr card. The 2A port is the secondary port for host communications.

If no card is installed, this field displays N/A.

> **Note –** This field applies only to library controller (HBCr) cards. Drive controller (HBT) cards do not have a 2B or 2A port and therefore always display N/A.

Position

Position of the card within the card cage, as viewed from the back of the machine. Options are:

- Left: Bottom card slot; also referred to as the A side
- Right: Top card slot; also referred to as the B side

Device State

Current operating state of the card. Options are:

- Duplex: Software ready, switch possible: Card is functioning normally. Used only for an active HBC card in a library with Redundant Electronics.
- Initializing State 0: Internal hardware manager state which may be seen during initialization.
- Initializing State 1: Internal hardware manager state which may be seen during initialization.
- Not installed: Card is not installed in the machine. The library has the Redundant Electronics feature activated, but the alternate HBC or HBT card is not installed.
- ok: Card is functioning normally. Used only for HBT cards.
- Pre-simplex: software not ready. Card is loading code. Used only for an HBC card in a library without Redundant Electronics.
- Pre-standby: software not ready. Card is loading standby code and is not ready to be used in the event of an automatic failover or manual switch. Used only for an alternate HBC card in a library with Redundant Electronics.
- Simplex: software ready. Card is functioning normally. Used only for an HBC card in a library without Redundant Electronics.
- Standby: software ready: Card is functioning normally and can be used in the event of an automatic failover or manual switch. Used only for an alternate HBC card in a library with Redundant Electronics.
- Unknown: unknown value: The active HBC card cannot communicate with the alternate and does not have any information about the alternate's status.

Health State

Current health of the card. Options are:

- error: Card has experienced a fault, such as it is in the Not Installed state.

- warn: Card is in a degraded state, such as the card has been ejected or its alternate is not yet in the Standby state.
- ok: Card is functioning normally

Alternate HBC Communicating

Current communications status of the alternate library controller (HBCB) card. Options are:

- true: Alternate HBCr card is successfully communicating with the active card.
- false" Alternate HBCr card is not communicating with the active card.
- N/A: Alternate HBCr card is not installed; or the selected card is not a library controller.

Software Switch Allowed

Indicator of whether an automatic failover or manual switch is possible, given the current status of the alternate library and drive controller cards. Options are:

- true: Automatic failover or manual switch is possible.
- false: Automatic failover or manual switch is not possible.
- N/A: Alternate HBCr card is not installed; or the selected card is not a library controller

▼ Manually Switch Redundant Electronics Cards

Task Tool

This procedure can be performed at any of the following:

- Local operator panel
- Standalone SL Console
- Web-launched SL Console

Task Purpose

Use this procedure to switch the active and alternate controller cards. Each library controller and its partnered drive controller are always switched as a pair. The current alternate library and drive controller cards become active, and the active ones become alternate.

Before performing this procedure you should verify that the **Software Switch Allowed** indicator on the Redundant Electronics Status Detail screen is "true". See "Display Redundant Electronics Detail" on page 376 for detailed instructions.

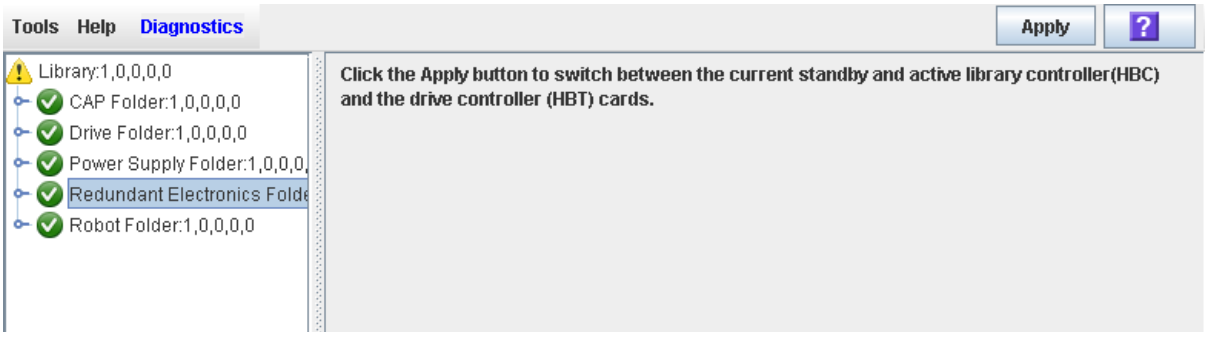
> **Note –** You will be logged off the library as part of this procedure. After the switch completes, to log back into the library, you must specify the IP address or DNS alias of the new active library controller card.

> **Note –** This feature is available starting with SL3000 firmware version FRS_3.0 and SL Console version FRS_5.00.

Task Steps

1. **Select Tools > Diagnostics and select Redundant Electronics Folder.**

   The **Redundant Electronics Switch** screen appears.



2. **Click Apply to begin the switch process.**

   - If the alternate library and drive controller cards are operating normally, the **Confirm** dialog appears, prompting you to confirm that you want to proceed with the switch.

- If there is a problem with the alternate library and drive controller cards, an error message is displayed and you are not allowed to continue with the switch.

3. **Click Yes to begin the switch process.**

   The switch process begins, and a message appears indicating that your SL Console session will be terminated.

4. **Click OK to dismiss the message and log off the SL Console.**
5. **Wait until the switch is complete before logging back into the library. In addition, you must specify the IP address or DNS alias of the new active controller to log in. See "Log In to the Library After a Failover" on page 382 for detailed instructions.**

▼ Log In to the Library After a Failover

Task Tool

This procedure can be performed at any of the following:

- Local operator panel
- Standalone SL Console
- Web-launched SL Console

Task Purpose

Use this procedure to log in to the library after an automatic failover or manual switch. You need to log in by connecting to the library controller that was the alternate prior to the failover or switch.

> **Note –** This feature is available starting with SL3000 firmware version FRS_3.0 and SL Console version FRS_5.00.

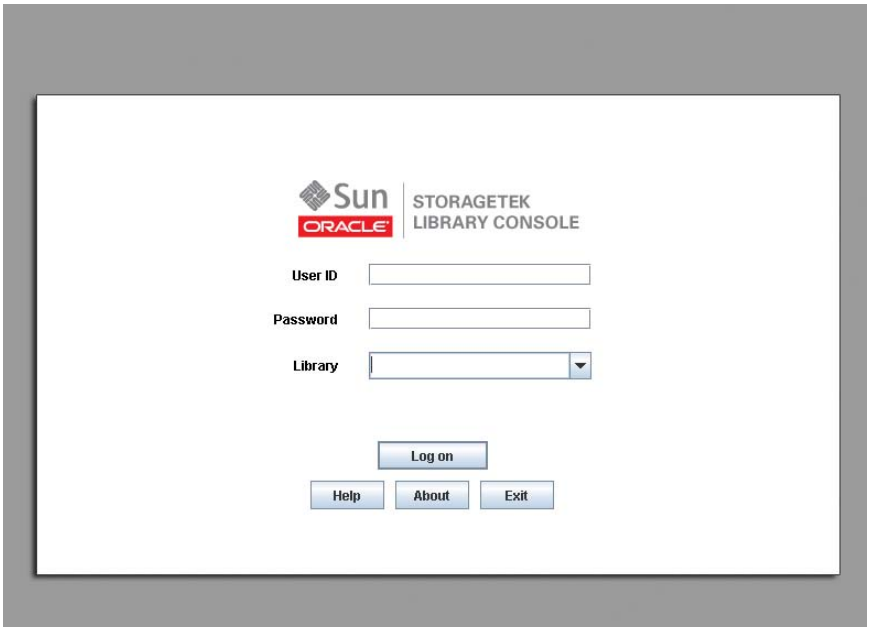
Task Steps

1. **Obtain the IP address or DNS alias of the new active library controller.**

   This was the alternate library controller prior to the failover or switch.

2. **Bring up the SL Console. See "General SL Console Usage Tasks" on page 73 for a list of procedures to do this.**

   The SL Console Login screen appears.



3. **Enter your login information, and click Log on.**

   `User ID:` *SLC_login*
   `Password:` *password*
   `Library:` *library_ID*

where:

- *SLC_login* is the SL Console user ID.
- *password* is the password assigned to this user ID.
- *library_ID* is the library to which you want to connect, expressed in either of the following ways:
  - IP address of the library
  - DNS alias of the library

    Note – Beginning with SL Console FRS 4.50, your password must be limited from 5 - 8 characters.

    Note – The user ID you use determines the screens you can access. See "SL Console Security".

4. **If you are attempting to log into the wrong controller, the following dialog appears. You cannot use the SL Console to log into the alternate controller.**

Click **OK** and return to Step 3, this time entering the information for the correct controller.

8

Rotational and AEM CAP Management

By using cartridge access ports (CAPs), you can enter (or import) or eject (or export) cartridges to or from the library. You can use CAPs only when the library is in automated mode.

This chapter describes general CAP activities that apply to the SL3000 library including:

> **Note –** Most CAP functions described in this section apply to AEMs as well as regular CAPs. In cases where there is a distinction between the two, the term "rotational CAP" is used to refer to regular CAPs.

Rotational CAPs

One rotational CAP is always present in the base module. Optionally, the drive expansion module and cartridge expansion module can also have one rotational CAP each.

A rotational CAP contains two removable 13-slot magazines. You can import or export up to 26 cartridges at one time through each CAP.

AEM CAPs

See "AEM Operations" on page 389 for a detailed description of AEM CAPs.

CAP Open Sequence

To open a rotational or AEM CAP:

1. A host issues a command to unlock the CAP.
2. The CAP status updates to "unlocked."
3. Press the CAP button.
4. The CAP status updates to "open."
5. For rotational CAPs, the CAP motor activates, and the CAP rotates outward to expose the magazines (rotational CAPs).

   For AEM CAPs, after the **Enter** LED is illuminated, you can lift the latch and open the AEM access door (AEM CAPs).

CAP Close Sequence

To close a rotational or AEM CAP:

1. For rotational CAPs, press the CAP button on the key pad. The CAP motor activates, and the CAP rotates inward to close the CAP.

   For AEM CAPs, close the AEM access door and secure the latch.
2. Press the CAP button to start the close sequence.
3. The CAP status updates to "closed" and "locked."
4. The robot audits all CAP slots.

CAP Auto Enter Mode

> **Note –** Only HLI libraries support the CAP auto enter mode. FC-SCSI libraries do not support it.

CAP auto enter mode enables you to open a rotational or AEM CAP and begin an enter operation, without:

- Issuing an explicit enter request
- An explicit reservation from a host application

When in auto mode, a CAP is unlocked and its LED is on. The system locks the CAP only during cartridge enter, eject, or audit operations.

Host applications manage the auto enter mode. See the appropriate tape management software documentation for details. To place a CAP in auto enter mode, enter the appropriate tape management command to unlock the CAP.

To initiate an enter operation using an automatic CAP, press the **CAP Open** button on the key pad. Auto enter mode does not affect CAP operations for ejecting cartridges. Therefore, always issue an explicit eject command to eject cartridges through the CAP.

Manual CAP Mode

Manual mode is the most secure method of CAP operations.

When in manual mode, the system locks a rotational or AEM CAP by default, and its LED is not on. To initiate an enter or eject operation using a manual CAP, enter an explicit enter or eject request before pressing the CAP Open button on the keypad.

CAP States

A CAP must be unlocked before you can open it to insert or remove cartridges. When a CAP is unlocked, the light on the CAP button turns on.

When you close a CAP, the robot performs an audit to determine whether there are cartridges present. During the audit the CAP is locked and the light on the CAP button is turned off. After the audit is completed, the CAP returns to its default state.

The following TABLE 8-1 lists the default states of the various types of CAPs within a non-partitioned library.

TABLE 8-1 CAP Default States in Non-Partitioned Libraries

Type of CAP	Default State	Default CAP Button Light Condition
HLI: Manual mode	Locked	Off
HLI: Auto enter mode	Unlocked	On
FC-SCSI	Unlocked	On

CAP Assignment Mode

The CAP assignment mode applies only to:

- Libraries with FC-SCSI host connections. It is not applicable to libraries with only HLI (TCP/IP) host connections.
- Non-partitioned libraries.

The CAP assignment mode controls whether library CAPs can be used for normal host operations or for manual operations, such as recovery moves.

Prior to performing a recovery move to or from a CAP, change the library CAP assignment mode to “diagnostics.” This causes all library CAPs to be unavailable to library hosts and available to SL Console control.

For detailed instructions on setting the CAP assignment mode, see "Change the CAP Assignment Mode for an FC-SCSI Library" on page 402.

> **Note –** This feature is available starting with SL3000 firmware version FRS_2.33 and SL Console version FRS_4.47.

CAP Priorities for Cartridge Ejects by FC-SCSI Hosts

When you initiate an eject operation from an HLI host, you can specify the CAP to use. The SCSI interface, however, does not provide this level of control.

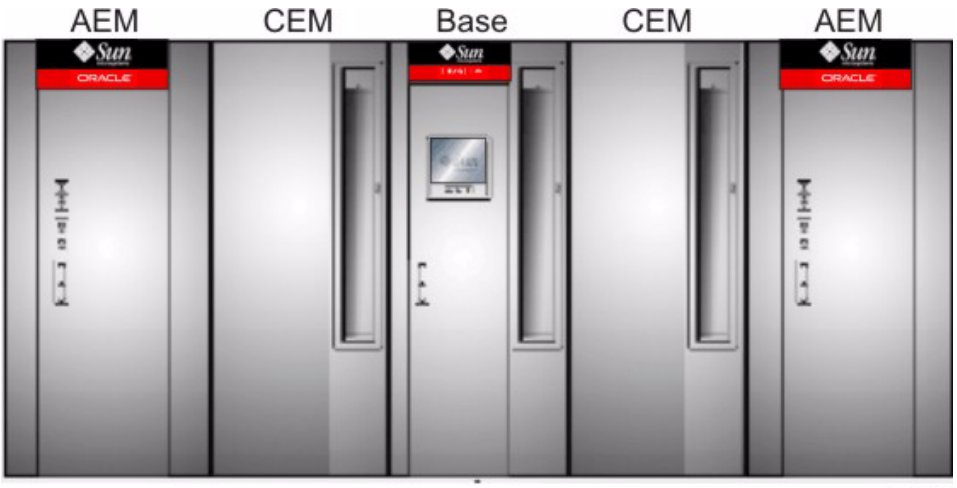
The SCSI interface aggregates all CAPs and AEMs in the library and treats them as one large CAP. When you initiate an eject operation from an FC-SCSI host, the robot places cartridges in CAPs. Working from left to right, the robot starts first with rotational CAPs, and then moves to AEMs, if applicable.

> **Note –** The following example assumes either a non-partitioned library, or a partitioned library in which all CAPs and AEMs are shared by all hosts. For partitioned libraries, the CAP priority is dependent on how CAPs are allocated to partitions.

For example, assume an FC-SCSI library with the following configuration:

- Base module, with standard rotational CAP
- Two CEMs, with optional rotational CAPs
- Two AEMs

FIGURE 8-1 Example Configuration



For an eject operation of 350 cartridges, the robot fills CAP cells the order shown in the following TABLE 8-2.

TABLE 8-2 Order of Filling CAP Cells in Eject Operation of 350 Cartridges

Order	Module	Number of Cartridges	Total Cartridges
1	Left CEM	26	26
2	Base Module	26	52
3	Right CEM	26	78
4	Left AEM	234	312
5	Right AEM	38	350

Using CAPS in a Partitioned Library

Note – This topic applies to partitioned libraries only. See "Partitioning Concepts and Features" on page 196 for details about defining library partitions.

A rotational or AEM CAP is a shared library resource, meaning all partitions in the library can use the CAP. However, only one partition at a time can use a CAP. While a partition is using a CAP for enters or ejects, the CAP is reserved to that partition and unavailable to all others.

For a partition to reserve a CAP, the CAP must meet all these conditions:

- Be available, meaning not reserved by any other partition
- Be empty
- Be closed and locked

Additional CAP Information

See the following for complete details about rotational and AEM CAPs:

- Usage information that applies specifically to AEM CAPs: "AEM Operations" on page 389
- Procedures for displaying CAP status and properties: "Rotational and AEM CAP Management Tasks" on page 392
- Procedures for using CAPs: "Three LEDs: Wait, Enter, and Unlocked." on page 390
- Partition configuration information relating to CAPs: "Library Partitioning" on page 195

AEM Operations

With the Access Expansion Module (AEM), you can perform bulk loads or unloads of up to 234 cartridges at a time to or from the library. The AEM also allows for non-disruptive maintenance of a library robot.

Note – AEMs share many of the same features and functions as rotational CAPs, but they also have some unique characteristics. This section describes what is unique to AEMs.

AEM Access Door

The AEM access door is the external door you open to bulk load or unload cartridges to or from the library. The front panel of the access door includes the following components:

- Three LEDs: Wait, Enter, and Unlocked.
- Two locks:
  - Service Access: Only an Oracle support representative can open. Opening this lock releases the access door deadbolt.
  - Deadbolt Override: Enables you "fast access" to the inside of the AEM. This action has the same effects on library operations as opening the main library access door.
- "Operator Request CAP" button: For normal access to the inside of the AEM, to load or unload cartridges. Pressing this button releases the access door deadbolt.
- Latch: Opens and closes the access door. The latch can be opened only after you release the deadbolt or use the deadbolt override.

AEM Safety Door

The safety door is an internal vertically sliding door, which lowers from the top to separate the AEM from the rest of the library. This door provides safe access the inside the AEM. Then you can load or unload cartridges safely, or an Oracle support representative can perform service on the robot or other AEM components.

The door lowers when you press the "Operator Request CAP" button on the AEM access door or when an Oracle support representative uses the Service Access lock. The door does not lower if you perform an AEM "fast access" by unlocking the Deadbolt Override lock.

The safety door raises automatically when you close the AEM access door. The robot enters the AEM and conducts an audit of all AEM cells. A full audit of an AEM should take less than three minutes.

AEM CAP Functions

Each AEM CAP contains 18 removeable cartridge magazines with 13-slots each located on the front and back walls, for a total of 234 cartridge slots. The magazines are arranged in a 3 X 3 configuration on each wall. The magazines are the same as those used in rotational CAPs.

In terms of cartridge loads and unloads, the library controller treats each AEM as a very large CAP. See "Most CAP functions described in this section apply to AEMs as well as regular CAPs. In cases where there is a distinction between the two, the term "rotational CAP" is used to refer to regular CAPs." on page 385 for information on CAP functions that apply to AEMs.

Partitions and AEMs

With regard to library partitioning, AEM CAPs are subject to the same rules and restrictions as rotational CAPs. You can allocate AEM CAPs for exclusive use by one partition or to be shared by multiple partitions with the same host interface type. See "Rotational and AEM CAPs and Partitions" on page 199 for details.

Non-disruptive Maintenance

The AEM enables an Oracle support representative to safely access and service a library robot without taking the library offline. If a robot is defective, it parks in the AEM. The library remains online. If a redundant robot is installed, the library can continue normal operations through the remaining functional robot.

An Oracle support representative can use a special key to unlock the Service Access lock on the access door. This causes the AEM safety door to slide down and divide the AEM from the rest of the library. After the safety door closes completely, the Oracle support representative can open the AEM access door and safely perform maintenance on the defective robot or other AEM components, while the library remains online. The AEM itself is offline during the maintenance period, which suspends cartridge load/unload functions.

When maintenance is complete:

1. The Oracle support representative closes the access door.
2. The safety door slides up.
3. The robot re-initializes and performs an audit of the AEM CAP cartridge slots.
4. The AEM comes back online.

Additional AEM Information

See the following sections of this manual for complete details about AEMs:

- Usage information that applies to both rotational CAPs and AEM CAPs: "Most CAP functions described in this section apply to AEMs as well as regular CAPs. In cases where there is a distinction between the two, the term "rotational CAP" is used to refer to regular CAPs." on page 385
- Procedures for displaying AEM CAP status and properties: "Rotational and AEM CAP Management Tasks" on page 392
- Procedures for using AEM CAPs to load and unload cartridges: "Cartridge Management Tasks" on page 417
- Procedures for displaying status and properties of the AEM sliding safety door: "AEM Safety Door Management Tasks" on page 404
- Partition configuration information relating to both rotational and AEM CAPs: "Rotational and AEM CAPs and Partitions" on page 199
- Procedures for rebooting the AEM sliding safety door: "AEM Safety Door Management Tasks" on page 404
- Procedures for "fast access" to the AEM: "Manual Operation Tasks" on page 590.
- Detailed diagram of the wall layouts: TABLE B-1, "Access Expansion Module Walls" on page 622

Rotational and AEM CAP Management Tasks

▼ Display Rotational and AEM CAP Summary Information

Task Tool

This procedure can be performed at any of the following:

- Local operator panel
- Standalone SL Console
- Web-launched SL Console

Task Purpose

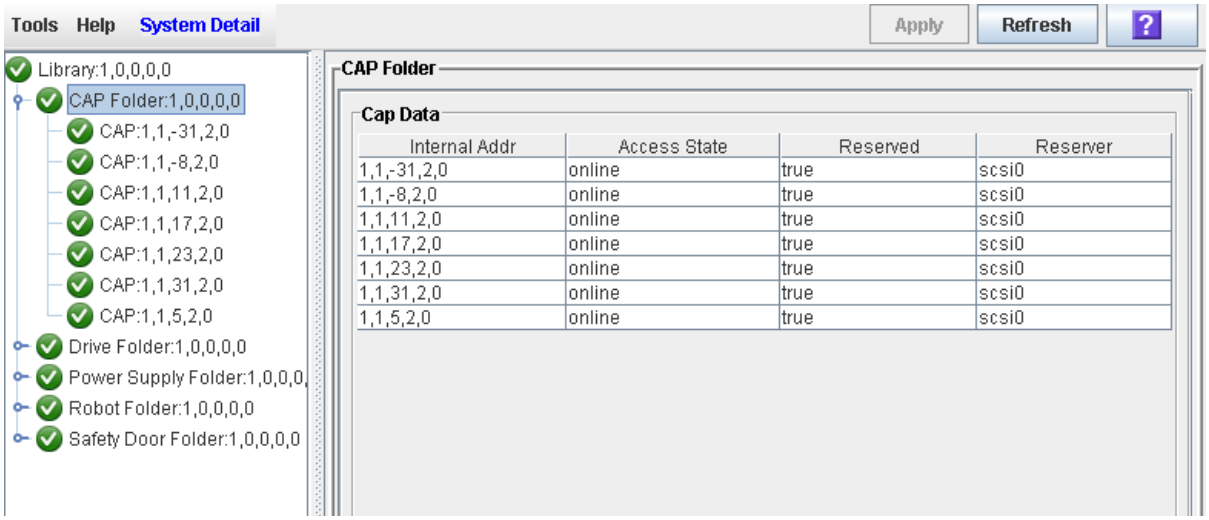
To display summary information for all rotational and AEM CAPs in the library, complete the following steps.

> **Note –** This information is also available through **Reports > CAP Summary**. See "Display a Library Report" on page 90 for detailed instructions.

Task Steps

1. **Select Tools > System Detail.**
2. **Select the CAP folder in the navigation tree.**

   The system lists all the library's rotational and AEM CAPs and their locations.



▼ Display Current Rotational or AEM CAP Status

Task Tool

This procedure can be performed at any of the following:

- Local operator panel
- Standalone SL Console
- Web-launched SL Console

Task Purpose

To display the current operational state of a rotational or AEM CAP, complete the following steps.

Note – This information is also available on the **CAP Details** report. See "Display a Library Report" on page 90 for detailed instructions.

Note – Status information on the AEM safety door displays on the **Safety Door Status** screen. The AEM safety door is the internal sliding door that lowers to separate the AEM from the rest of the library. See "Display AEM Safety Door Status" on page 405 for detailed instructions.

Note – The example screen is used for both rotational and AEM CAPs. Throughout this section, the term "CAP" refers to both types of CAPs.

Task Steps

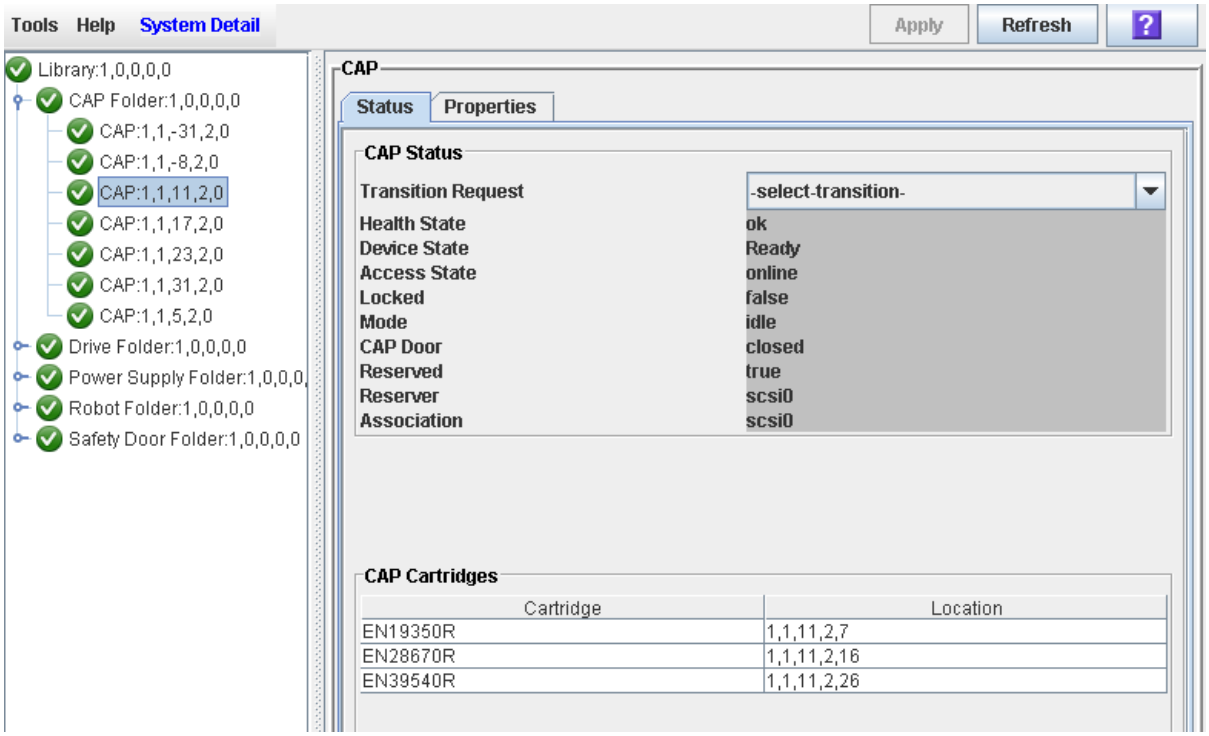
1. **Select Tools > System Detail.**
2. **Expand the CAP Folder, and select the CAP you want to display.**

   Note – AEM CAPs are identified as follows: column "–31" for a left AEM CAP, and column "31" for a right AEM CAP.

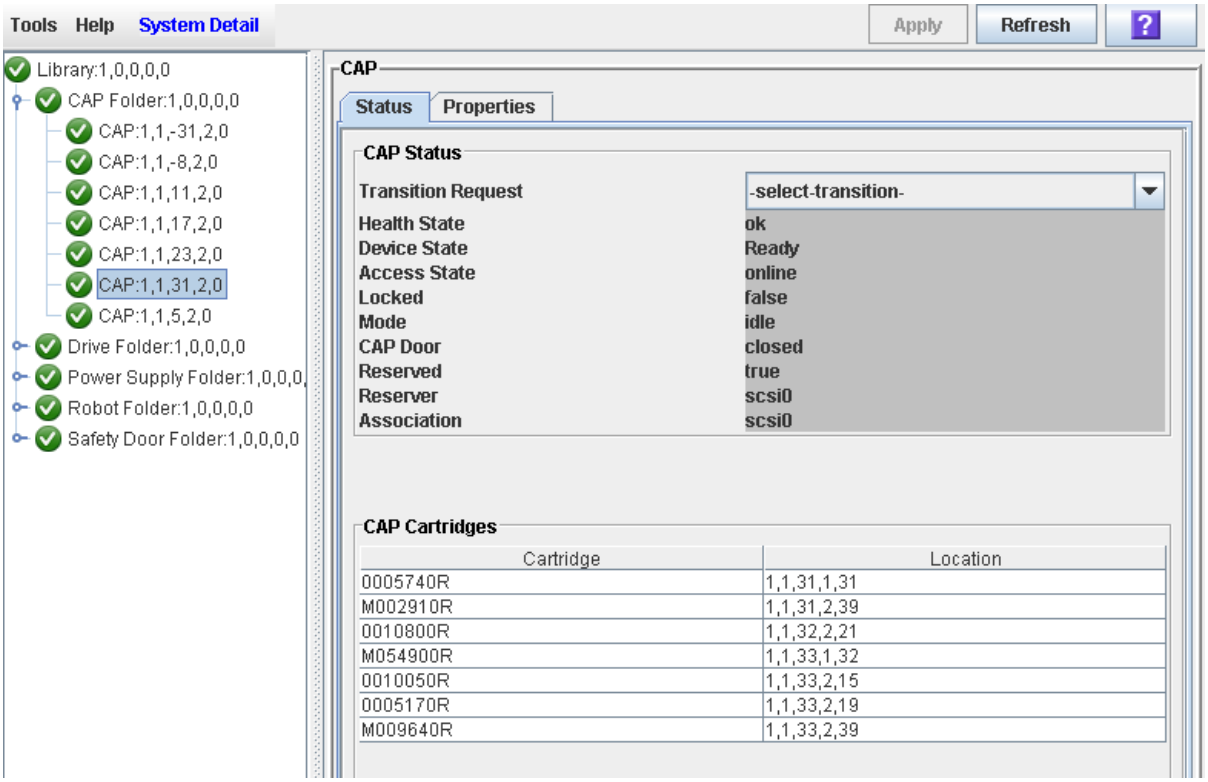
3. **Click the Status tab.**

   The **CAP** page displays the current status of the selected CAP.

- The CAP page displays the cu rrent status of the rotational CAPs.



- The CAP page displays the cu rrent status of AEM CAPs.



▼ Display Rotational or AEM CAP Properties

Task Tool

This procedure can be performed at any of the following:

- Local operator panel
- Standalone SL Console
- Web-launched SL Console

Task Purpose

Use this procedure to display static information for a rotational or AEM CAP, including the serial number and number of cells.

> **Note –** This information is also available through **Reports > CAP Details**. See "Display a Library Report" on page 90 for detailed instructions.

> **Note –** For AEM CAPs, the **Safety Door Properties** screen also displays static information. See "Display AEM Safety Door Properties" on page 406 for detailed instructions.

> **Note –** The example screen is used for both rotational and AEM CAPs. Throughout this section, the term "CAP" refers to both types of CAPs.

Task Steps

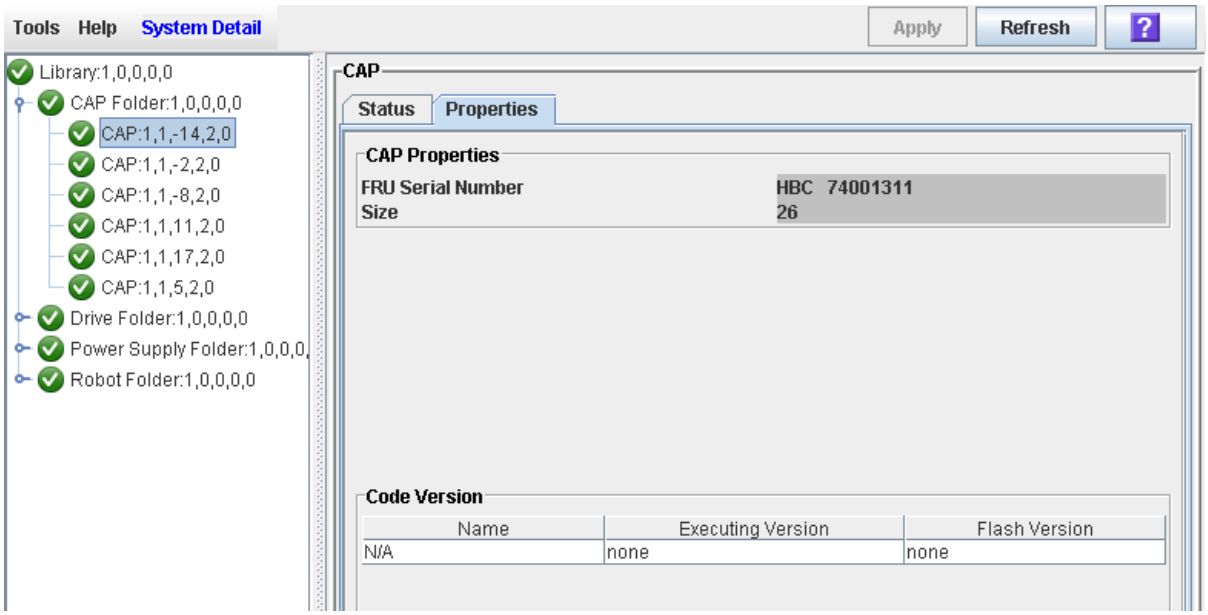
1. **Select Tools > System Detail.**
2. **Expand the CAP Folder, and select the CAP you want to display.**

   > **Note –** AEM CAPs are identified as follows: column "–31" for a left AEM CAP, and column "31" for a right AEM CAP.

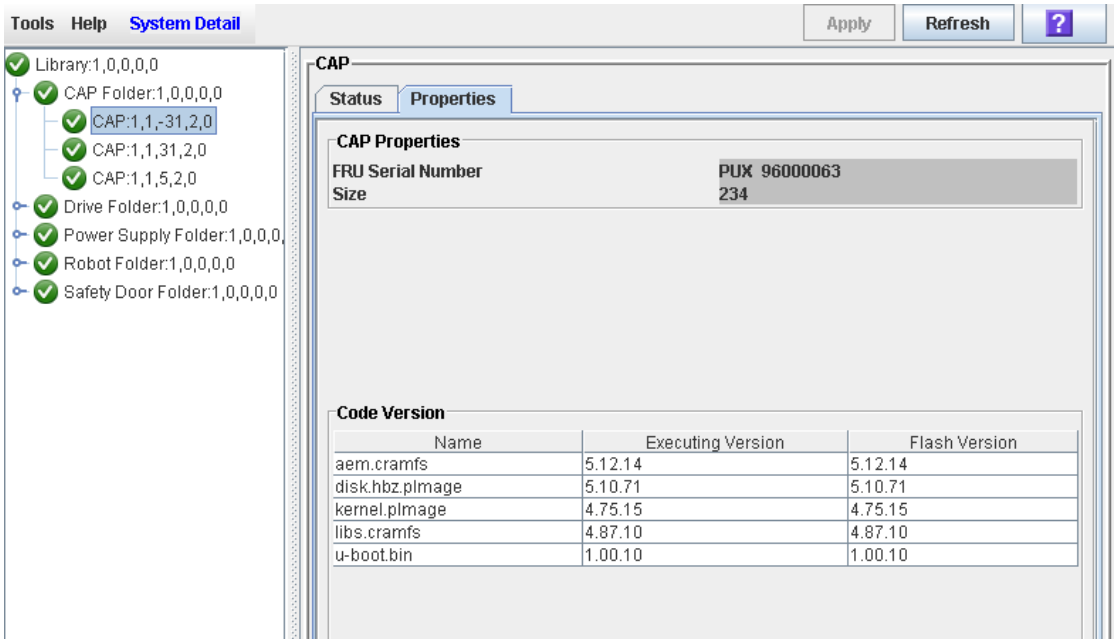
3. **Click the Properties tab.**

   The **CAP Properties** page appears.

- For rotational CAPs, the CAP properties page shows CAP properties, including code version.



- For AEM CAPs, the CAP properties page show s CAP properties, including code version.



▼ Unlock a CAP or AEM Access Door

Task Tool

This procedure can be performed at any of the following:

- Local operator panel
- Standalone SL Console
- Web-launched SL Console

Task Purpose

Normally, the host unlocks a CAP or AEM access door. Use this procedure when you need to perform the unlock operation manually at the SL Console.

Note – If the CAP is reserved by a host, the host must release the CAP reservation before you can use this procedure.

Note – The example screen is used for both rotational and AEM CAPs. Throughout this section, the term "CAP" refers to both types of CAPs.

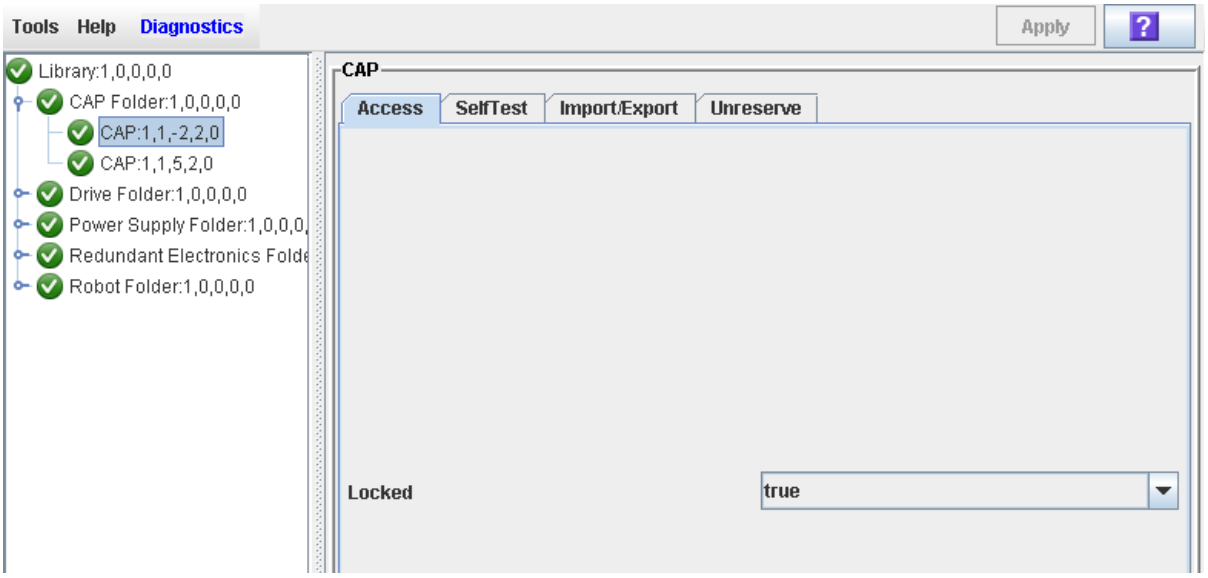
Task Steps

1. **Select Tools > Diagnostics.**
2. **Expand the CAP Folder, and select the CAP you want to modify.**

   Note – AEM CAPs are identified as follows: column "–31" for a left AEM CAP, and column "31" for a right AEM CAP.

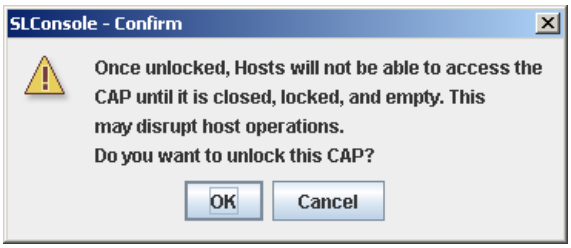
3. **Click the Access tab.**

   The **Access** page appears.



4. **In the Locked list, select false. Click Apply.**

   The **Confirm** message appears.



5. **Click OK.**

   The CAP door unlocks, and the CAP button light turns on.

   Note – The CAP status changes to “unlocked” in the host library management software.

   Note – The library reserves the CAP or AEM and makes it inaccessible to all library hosts until you close and lock the CAP or AEM access door. See “Lock a CAP or AEM Access Do or” on page 400 for details.

▼ Lock a CAP or AEM Access Door

Task Tool

This procedure can be perform ed at any of the following:

- Local operator panel
- Standalone SL Console
- Web-launched SL Console

Task Purpose

Normally a CAP or AEM access door is locked from a host. Use this procedure when you must perform the lock operation manually at th e SL Console. This procedure applies only to HLI CAPs.

Note – The example screen is used for both rotational and AEM CAPs. Throughout this section, the term "CAP " refers to both types of CAPs.

Note – If you unlock a CAP or AEM access door (see "Unlock a CAP or AEM Access Door" on page 398 for details.), the CAP or AEM i s reserved by the library and unavailable to all hosts until you perform this procedure.

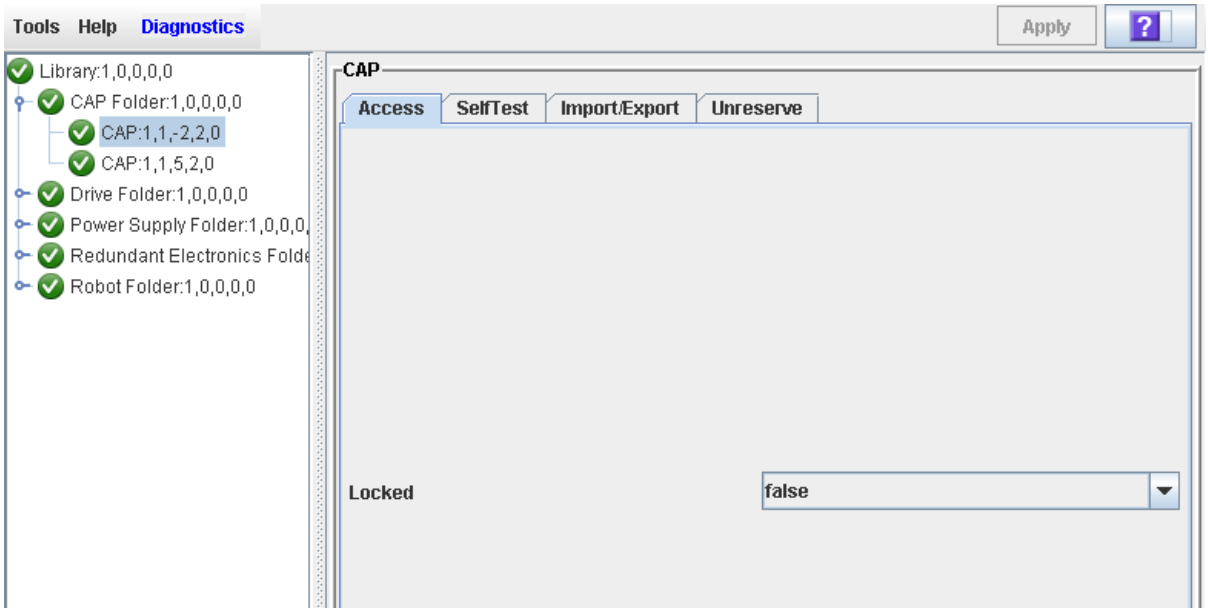
Task Steps

1. **Select Tools > Diagnostics.**
2. **Expand the CAP Folder, and click the CAP you want to modify.**

   Note – AEM CAPs are identified as follo ws: column "–31" for a left AEM CAP, and column "31" for a right AEM CAP .

3. **Click the Access tab.**

   The **Access** page appears.



4. **At the Locked list, select true. Click the Apply button.**

   The CAP locks, and the CAP button light turns of f.

▼ Change the CAP Assignment Mode for an FC-SCSI Library

Task Tool

This procedure can be performed at any of the following:

- Local operator panel
- Standalone SL Console
- Web-launched SL Console

Task Purpose

Use this procedure to change the CAP assignment mode for all CAPs in an FC-SCSI library. The CAP assignment mode controls whether library CAPs can be used for normal host operations or for diagnostic moves. For additional information, see "CAP Assignment Mode" on page 387.

> **Note –** This procedure applies only to libraries with FC-SCSI host connections that are not partitioned. It is not applicable to libraries that have only HLI (TCP/IP) host connections or partitioned libraries.

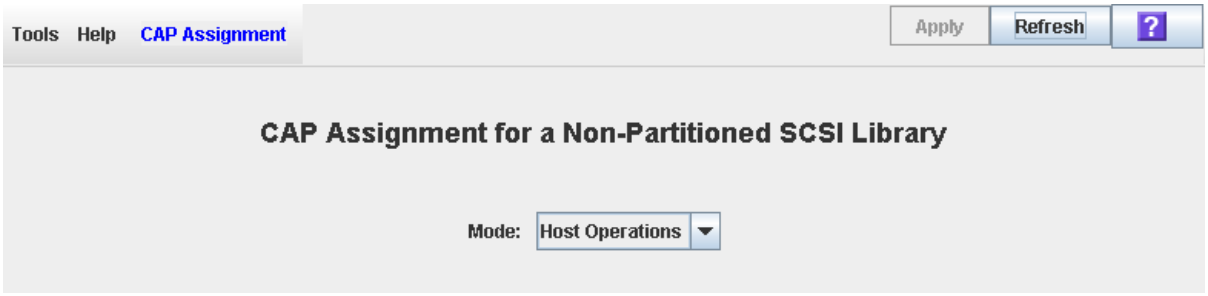
> **Note –** This feature is available starting with SL3000 firmware version FRS_2.33 and SL Console version FRS_4.47.

Task Steps

1. **Verify that the condition of all library CAPs are:**
   - Available: Meaning not reserved by any host
   - Empty
   - Closed and locked
2. **If you are changing the CAPs to diagnostics mode, quiesce the library to all hosts. See the appropriate tape management software documentation for the procedures and commands.**
3. **Select Tools > CAP Assignment.**

   The **CAP Assignment** page appears. The list displays the current assignment mode setting for all CAPs in the library.

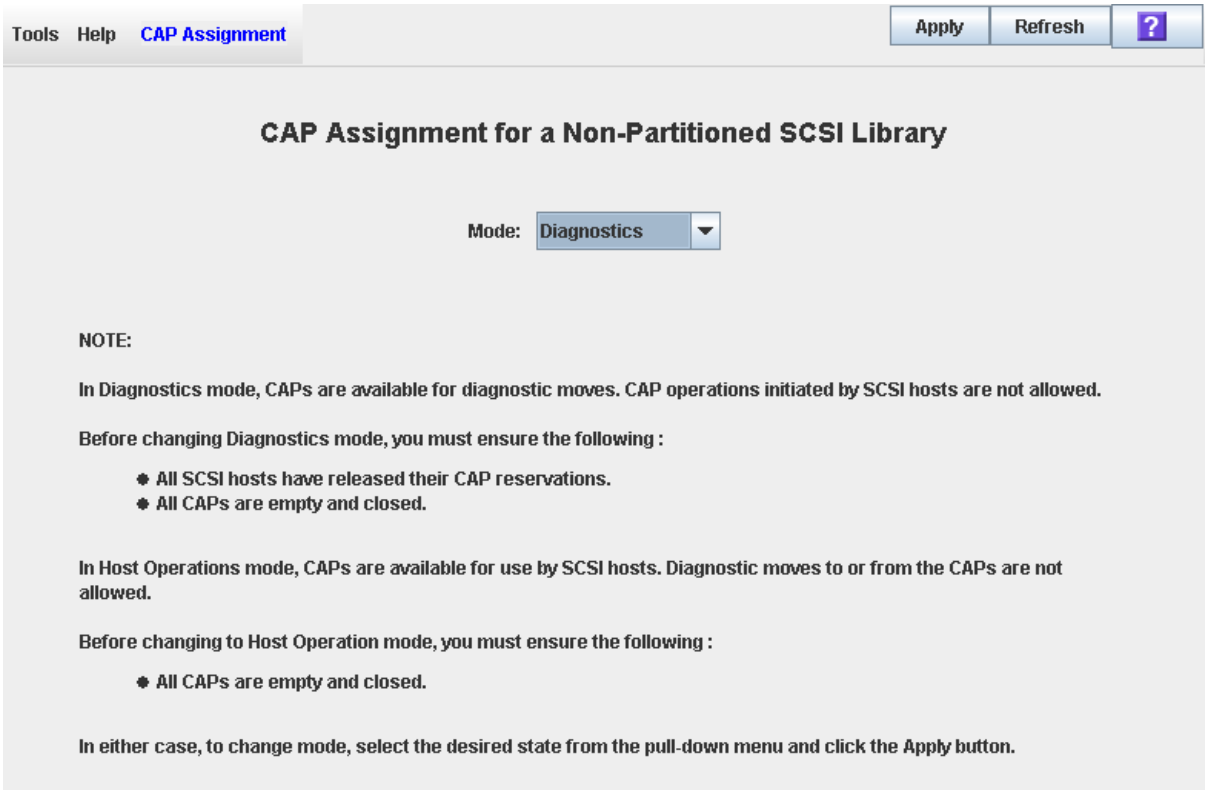
   > **Note –** The example screen is used for both rotational and AEM CAPs. Throughout this section, the term "CAP" refers to both types of CAPs.



4. **At the Mode list, select the mode you want to assign.**

   Options are:

   - Diagnostics: Causes all CAPs to be available for di agnostic operations. Select this if you want to perform m anual cartridge moves, such as moving cleaning or diagnostic cartridges from the CAPs to system cells.
   - Host Operations: Causes all CAPs to be available for normal host operations. Select this if you want to return the library to normal tape mount/dismount operations.



5. **Click the Apply button.**

   A confirmation message appears. The new CA P mode is effective immediately. The library does not need to be rebooted.

6. **Click OK to dismiss the message.**

AEM Safety Door Management Tasks

▼ Display AEM Safety Door Status

Task Tool

This procedure can be performed at any of the following:

- Local operator panel
- Standalone SL Console
- Web-launched SL Console

Task Purpose

Use this procedure to display the current state of an AEM safety door. The safety door is the internal sliding door which lowers to separate the AEM from the rest of the library.

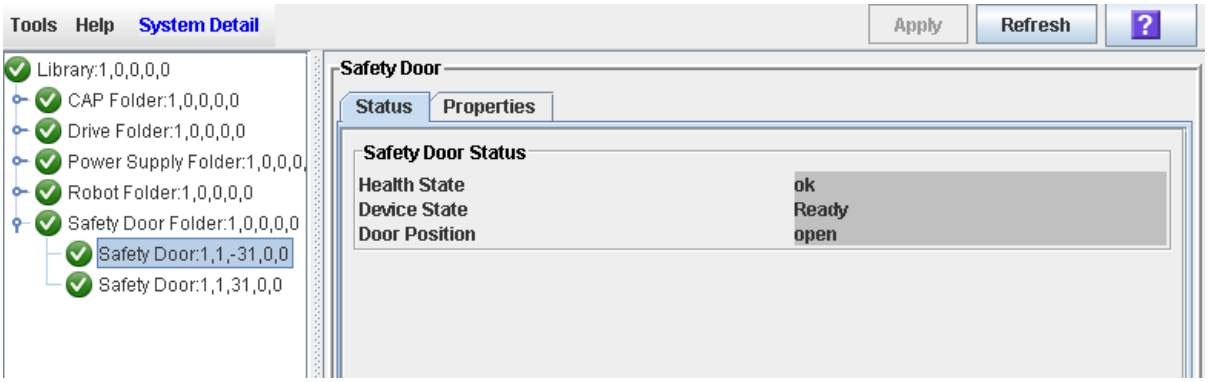
> **Note –** Status information on the AEM access door (the door you open to bulk load or unload cartridges to or from the library) is displayed on the **CAP Status** screen. See "Display Current Rotational or AEM CAP Status" on page 394 for detailed instructions.

Task Steps

1. **Select Tools > System Detail.**
2. **Expand the Safety Door Folder, and select the safety door you want to display.**
3. **Click the Status tab.**

   The **Safety Door Status** page appears.

   Beside the **Door Position** label,"open" indicates the safety door is up and the robot is free to move in and out of the AEM. "Closed" in dicates the safety door is completely closed and it is safe for you to open the AEM access door.



▼ Display AEM Safety Door Properties

Task Tool

This procedure can be performed at any of the following:

- Local operator panel
- Standalone SL Console
- Web-launched SL Console

Task Purpose

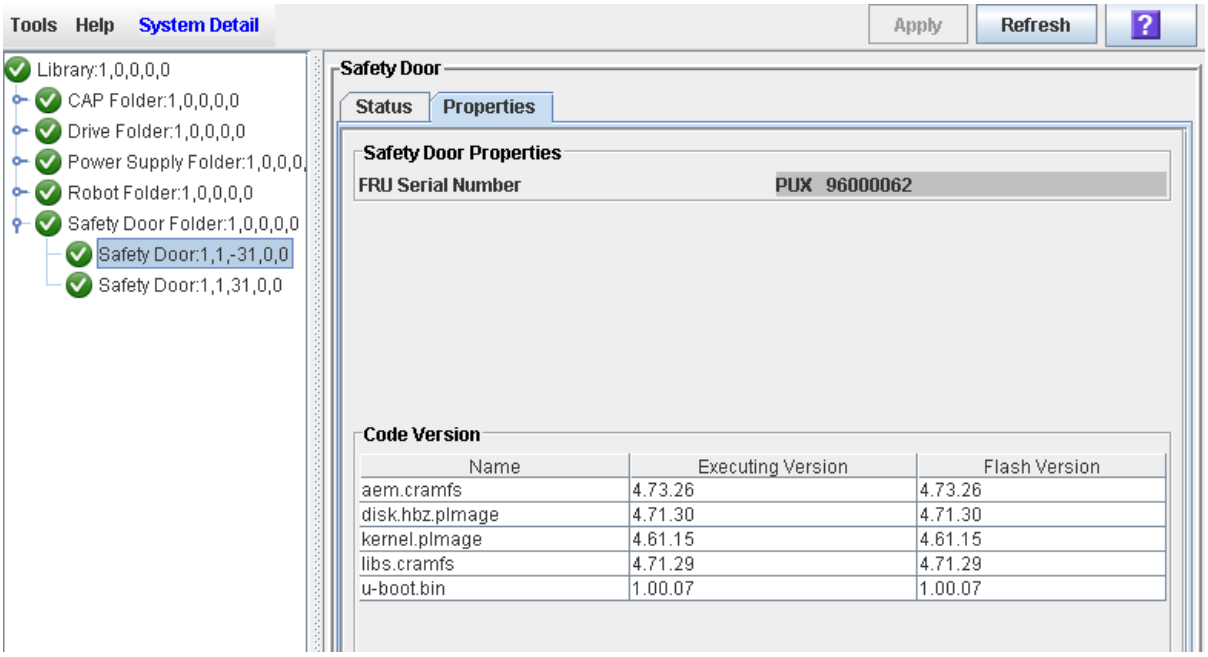
Use this procedure to display detailed information for an AEM safety door, including the serial number and current firmware versions. The safety door is the internal sliding door which lowers in preparation for you to open the AEM access door .

> **Note –** This information is also available through the **CAP Properties** screen and the **CAP Details** report. See "Display Rotational or AEM CAP Properties" on page 396 and "Display a Library Report" on page 90 for detailed instructions.

Task Steps

1. **Select Tools > System Detail.**
2. **Expand the Safety Door Folder, and select the safety door you want to display.**
3. **Click the Properties tab.**

   The **Properties** page appears.



9

Drive Management

This chapter includes the following topics:

Maximum Drive Capacity

See "Tape Drives" on page 43 for a list of supported tape drives.

See "Library Resource Addresses" on page 601 for details on drive identification and addressing schemes.

See "SL500 Wall Diagrams and Specifications" on page 425 for details on drive identification and addressing schemes.

Drive States

A drive can be in one of the following states:

- Online: The drive is available for read/ write operations.
- Offline: The drive is not available for read/write operation s.

Drive Management Tasks

▼ Display Drive Summary Information

Task Tool

This procedure can be performed at any of the following:

- Local operator panel
- Standalone SL Console
- Web-launched SL Console

Task Purpose

Use this procedure to display summary information for all drives in the library.

The following information displays:

- Drive State:
  - Empty
  - Unloaded: Cartridge is present
  - Ready: Cartridge is loaded
  - NotCommunicating
  - rewindUnload: Drive is busy rewinding and unloading
- Drive Type
- Drive serial number
- Current code version

> **Note –** This information is also available through **Reports > Drive Summary**. See "Search a Library Report" on page 92 for detailed instructions.

Task Steps

1. **Select Tools > System Detail, and click the Drive folder in the navigation tree.**

   The page lists the library drives and displays their locations.

▼ Display Drive Status

Task Tool

This procedure can be performed at any of the following:

- Local operator panel
- Standalone SL Console
- Web-launched SL Console

Task Purpose

Use this procedure to display the current operational state of a drive. The information includes:

- Current drive and drive tray status information
- Whether the drive is loaded
- Drive cleaning information

> **Note –** This information is also available through **Reports > Drive Details**. See "Display a Library Report" on page 90 for detailed instructions.

Task Steps

1. **Select Tools > System Detail**
2. **Expand the Drive Folder in the navigation tree, and click the drive you want to display.**
3. **Click the Status tab.**

   The page displays the current status of the selected drive.

▼ Display Drive Properties

Task Tool

This procedure can be performed at any of the following:

- Local operator panel
- Standalone SL Console
- Web-launched SL Console

Task Purpose

View detailed drive configuration information, including the drive type and serial number and port configuration.

> **Note –** This information is also available through **Reports > Drive Details**. See "Display a Library Report" on page 90 for detailed instructions.

Task Steps

1. **Select Tools > System Detail.**
2. **Expand the Drive Folder in the navigation tree, and click the drive you want to display.**
3. **Click the Properties tab.**

   The **Properties** page appears.

> **Note –**
>
> **Note –**

10

Cartridge Management

This chapter includes the following topics:

Cartridge Labels

All library cartridges must have a readable external label.

The ELS and ACSLS host software applications do not support unlabeled cartridges and will not allow you to enter them through the CAP. If you place an unlabeled cartridge in a CAP, the host leaves it there and you must remove it from the CAP.

If you place an unlabeled cartridge into a storage cell manually, the robot leaves it there during a hardware audit and does not attempt to place another cartridge into the slot. During an ACSLS or ELS audit, however, the host moves the cartridge to the CAP for ejection from the library.

The library controller will not allow you to mount an unlabeled or unknown type cartridge into any tape drive.

Entering Cartridges

You can enter up to 26 cartridges at one time through each rotational CAP. You can bulk load up to 234 cartridges through each AEM CAP.

Before entering a cartridge into the library, verify it is labeled properly. Insert each cartridge into a CAP slot with the:

- Customer label (if present) facing you
- Hub gear facing down

- Cartridge label facing you

You can place cartridges in any CAP slot in any order. The robot audits all CAP slots when the CAP door is closed.

> **Note –** The CAP design prevents you from placing a T9840 or T10000 cartridge upside-down in the CAP. It does not, however, prevent you from placing an LTO cartridge upside-down in the CAP.

The robot's bar-code scanner reads cartridge labels only during enter operations. This is because the VOLIDs are new and must be added to the library controller database. The robot does not need to read cartridge labels during ejects.

When the system enters a cartridge into the library, the host either assigns the cartridge a home cell or mounts it on a drive, depending on the reason why it was entered. The system records the stored cartridge's location in the library controller database, using the library internal address format (see "Library Internal Address" on page 602"SL500 Wall Diagrams and Specifications" on page 425). The system also transmits the location to the host for inclusion in the host's cartridge database.

Ejecting Cartridges

You can eject up to 26 cartridges at one time through each rotational CAP . You can bulk unload up to 234 cartridges through each AEM CAP .

To eject a cartridge, you must specify the VOLID of the cartridge you want to remove from the library. The robot moves to the storage location indicated in the library controller database, removes the cartridge from the slot, and places the cartridge in a CAP slot. See "CAP Priorities for Cartridge Ejects by FC-SCSI Hosts" on page 388 for details on the order in which CAPs are used in FC-SCSI libraries.

After the CAP opens, the system deletes the cartridge and its location from the library controller database and the host database.

> **Note –** The robot does not read cartridge labels during eject operations.

Locating Cartridges

Through the SL Console, you can display the library internal address of any cartridge. You can locate a cartridge based on any of the following criteria:

- VOLID: See "Locate a Cartridge by VOLID" on page 437 for details.
- Library internal address: See "Locate a Cartridge by Address" on page 439 for details.
- Host address (FC-SCSI or HLI): See "Locate a Cartridge by Address" on page 439 for details.

This utility is especially useful when you must perform a manual mount of a cartridge. The library management software (ELS or ACSLS) provides the:

- VOLID
- HLI-PRC or FC-SCSI address of the cartridge
- Drive bay address of an available drive

Before you enter the library, write down the VOLID, cartridge location, and the drive slot location.

Barcode Presentation

Note – This feature is available starting with SL3000 firmware version FRS_2.33 and SL Console version FRS_4.47.

Note – This feature applies only to libraries with FC-SCSI host connections. It is not applicable to libraries that have only HLI (TCP/IP) host connections.

With the barcode presentation feature, you can specify which part of a standard cartridge barcode the library passes to FC-SCSI host applications.

Standard cartridge barcodes are eight characters in length, in 6+2 format, where:

- The first six characters indicate the unique volume ID (VOLID). For example, “NGD084.”
- The last two characters indicate the media type and domain. For example, “L1” for LTO Gen 1 or “T1” for T10000. These characters are referred to as the media/domain suffix.

For both HLI and FC-SCSI connections, normally the library passes only the six VOLID characters to a host. Some FC-SCSI host applications, however, may need the full eight-character barcode in order to uniquely identify a cartridge. You can supply the entire barcode by configuring the library or partition to provide this information in all library/host communications.

The barcode presentation feature does not affect how cartridge labels are displayed in library reports and screens. Nor does it affect which part of the label you must use when submitting a request through the SL Console or CLI. The full eight-character barcode is always used in such cases.

For detailed instructions on setting the barcode presentation feature, see:

- “Configure Cartridge Barcode Presentation in a Non-Partitioned FC-SCSI Library” on page 426
- “Configure Cartridge Barcode Presentation for an FC-SCSI Partition” on page 428

Recovery Moves

Using the recovery move diagnostic function, you can move a cartridge from one location to another. For example, you can:

- Return a cartridge to its original location from a CAP cell, drive, or another storage cell location.
- Decide to group cartridges by data type or move them closer to their assigned drives.
- Eject a cleaning or diagnostic cartridge that has expired.
- Enter a new cleaning or diagnostic cartridge and move it to a reserved storage cell.

A cartridge currently in a storage cell can be moved only to a CAP, a system cell, or another storage cell—not to a drive. A cartridge currently in a drive, CAP, or system cell can be moved to any other unoccupied location in the library. See the following procedures for complete details:

- “Move a Specified Cartridge by VOLID” on page 441
- “Move a Cartridge From a Specified Location” on page 443

Before moving any cartridge, it is helpful to display or print a report sh owing where cartridges are currently located and which storage cells are unoccupied. See the following procedures for detailed instructions:

- “List Library Cartridges” on page 434

Cartridge Management Tasks

▼ Enter Cartridges Through a Rotational CAP

Task Tool

This task can be performed the host and the CAP.

Task Purpose

Use this procedure to enter cartridges into a non-partitioned library through a rotational CAP.

> **Note –** This procedure applies to non-partitioned libraries. For partitioned libraries, see "Enter Cartridges Into a Partition" on page 261.

> **Note –** For detailed instruction on loading cartridges through an AEM CAP, see "Bulk Load Cartridges Through an AEM CAP" on page 422.

Task Steps

1. **Initiate the enter operation at the host. See the appropriate tape management software documentation for the procedures and commands.**

   > **Note –** If the CAP is in auto enter mode, you can skip this step and proceed directly to Step 2.

2. **Push the CAP button to open the CAP.**

   The CAP door opens.

   > **Caution –** *Possible Equipment Damage*. DO NOT force the CAP to open or close.

3. **Place the cartridges in the CAP.**

   Insert the cartridges so that the:

   - Customer label (if present) faces up
   - Hub gear faces down
   - Cartridge label faces you

   You can enter the cartridges directly into the magazines while the magazines are in the CAP. Or you can remove the magazines from the CAP, insert cartridges into the magazines, and then replace the cartridge-filled magazines into the CAP.

   > **Note –** You can place cartridges in any CAP slot in any order. The robot audits all CAP slots when the CAP door closes.

   > **Caution –** *Possible Media Damage*. While you can enter cartridges that do not contain external labels or place cartridges upside-down, this is not advisable. Such conditions present problems when the system performs an audit. Likewise, do not enter cartridges containing unreadable or damaged labels.

   > **Caution –** *Possible Equipment Damage*. When replacing magazines on the AEM walls, make sure you seat them correctly.

4. **Close and latch the AEM access door.**

Caution – *Possible Equipment Damage*. DO NOT force the AEM access door to open or close.

5. **Push the AEM CAP button.**

   The **Enter** light goes off, and the **Wait** light starts blinking. The safety door moves up.

6. **The robot moves into the AEM, audits the AEM CAP, and moves the cartridges from the AEM CAP to available storage cells.**

When the robot moves all cartridges from the AEM CAP, the library recognizes that the AEM is empty and returns the AEM to its default state.

▼ Eject Cartridges Through a Rotational CAP

Task Tool

This task can be performed at the host and the CAP.

Task Purpose

Use this procedure to eject cartridges from the library through a rotational CAP.

> **Note –** This procedure applies to non-partitioned libraries. For partitioned libraries, see "Eject Cartridges From a Partition" on page 262.

> **Note –** For detailed instruction on unloading cartridges through an AEM CAP, see "Bulk Load Cartridges Through an AEM CAP" on page 422.

Task Steps

1. **Initiate the eject operation at the host. See the appropriate tape management software documentation for the procedures and commands.**

   You must specify the VOLIDs of the cartridges you want to remove from the library. For HLI hosts, you can specify the CAPs to use. For FC-SCSI hosts, the library uses CAPs in a pre-defined order. See "CAP Priorities for Cartridge Ejects by FC-SCSI Hosts" on page 388 for details.

2. **The TallBot places the cartridges into the CAPs.**

   When all the requested cartridges have been placed in CAPs, or all CAPs are full, the CAPs are unlocked.

3. **Push the CAP button to open the CAP.**

   The CAP door opens.

   > **Caution –** *Possible Equipment Damage*. DO NOT force the CAP to open or close.

4. **Remove the cartridges from the CAP.**

   You can remove the cartridges directly from the magazines while the magazines are in the CAP; or you can take the magazines out of the CAP, remove the cartridges from the magazines, and then replace the empty magazines in the CAP.

   > **Note –** If you do not replace the magazines in the CAP, the cells will be marked "absent" by the library controller.

5. **Push the CAP button to close the CAP.**

   The CAP closes and locks automatically, and the CAP button light turns off.

   > **Caution –** *Possible Equipment Damage*. DO NOT force the CAP to open or close.

   If more cartridges need to be exported, the robot continues filling the necessary CAPs. Wait until the CAP door is unlocked and repeat Step 3 through Step 5.

   The eject operation ends automatically when all specified cartridges have been ejected.

6. **The TallBot audits the CAP to verify that it is empty.**

   The CAP is returned to i ts default state.

▼ Bulk Load Cartridges Through an AEM CAP

Task Tool

This task can be performed at the host and the CAP.

Task Purpose

Use this procedure to load cartridges into the library through an AEM CAP. You can load up to 234 cartridges at a time.

> **Note –** This procedure applies to non-partitioned libraries. For partitioned libraries, see "Enter Cartridges Into a Partition" on page 261.

> **Note –** For detailed instruction on entering cartridges through a rotational CAP, see "Enter Cartridges Through a Rotational CAP" on page 418.

Task Steps

1. **Initiate the enter operation at the host. See the appropriate tape management software documentation for the procedures and commands.**

   > **Note –** If the AEM CAP is in auto enter mode, you can skip this step and proceed directly to Step 2.

The **Unlocked** light on the AEM access door is lit.

2. **Push the AEM CAP button.**

   The **Wait** light on the AEM access door starts blinking as all in-process jobs are finished. The robot is cleared from the AEM, and the safety door comes down. Depending on the level of activity in the library, this may take several minutes.

   Once the safety door is completely down and the AEM is sealed, the **Wait** light stops blinking and the **Enter** light goes on solid.

3. **Lift the latch, and open the door.**

   > **Caution –** *Possible Equipment Damage*. DO NOT force the AEM access door to open or close.

4. **Place the cartridges in the AEM CAP.**

Insert the cartridges so that the customer label (if present) is facing up, the hub gear is facing down, and the cartridge label is facing you.

You can enter the cartridges directly into the magazines while the magazines are in the CAP. Or you can remove the magazines from the CAP, insert cartridges into the magazines, and then replace the cartridge-filled magazines into the CAP.

> **Note –** Cartridges may be placed in any CAP slot, in any order; the robot audits all CAP slots when the CAP door closes.

> **Caution –** *Possible Media Damage*. While cartridges that do not contain external labels or are placed upside-down can be entered, this is not advisable. It presents problems when an audit is performed. Likewise, cartridges that contain unreadable or damaged labels should not be entered.

Caution – *Possible Equipment Damage*. When replacing magazines on the AEM walls, make sure you seat them correctly.

5. **Close and latch the AEM access door.**

   Caution – *Possible Equipment Damage*. DO NOT force the AEM access door to open or close.

6. **Push the AEM CAP button.**

   The **Enter** light goes off, and the **Wait** light starts blinking.

   The safety door goes up.

7. **The robot moves into the AEM, audits the AEM CAP, and then moves the cartridges from the AEM CAP to available storage cells.**

   When all cartridges have been moved from the AEM CAP, the library recognizes that the AEM is empty and it is returned to its default state.

▼ Bulk Unload Cartridges Through an AEM CAP

Task Tool

This task can be performed at the host and the CAP.

Task Purpose

Use this procedure to unload cartridges from a non-partitioned library through an AEM CAP. You can unload up to 234 cartridges at a time.

> **Note –** For eject operations initiated from an FC-SCSI host, AEM CAPs are used only after all rotational CAPs have been filled. See "CAP Priorities for Cartridge Ejects by FC-SCSI Hosts" on page 388 for complete details.

> **Note –** This procedure applies to non-partitioned libraries. For partitioned libraries, see "Eject Cartridges From a Partition" on page 262.

> **Note –** For detailed instruction on ejecting cartridges through a rotational CAP, see "Enter Cartridges Through a Rotational CAP" on page 418.

Task Steps

1. **Initiate the eject operation at the host. See the appropriate tape management software documentation for the procedures and commands.**

   Specify the VOLIDs of the cartridges you want to remove from the library. For HLI hosts, specify the AEM CAPs to use. For FC-SCSI hosts, the library uses rotational and AEM CAPs in a pre-defined order; see "CAP Priorities for Cartridge Ejects by FC-SCSI Hosts" on page 388 for details.

2. **The TallBot places the cartridges into the AEM cells.**

   When the TallBot places all the requested cartridges in the AEM, the system unlocks the AEM and turns on the **Unlocked** light on the AEM access door.

3. **Push the AEM CAP button.**

   The **Wait** light on the AEM access door begins blinking as all in-process jobs finish. The system clears the robot from the AEM, and the safety door moves down. Depending on the level of activity in the library, this process may take several minutes.

   After the safety door is completely down and the system seals the AEM, the **Wait** light stops blinking and the **Enter** light displays solid.

4. **Lift the latch, and open the door.**

   > **Caution –** *Possible Equipment Damage*. DO NOT force the CAP to open or close.

5. **Remove the cartridges from the AEM CAP.**

   You can remove the cartridges directly from the magazines while the magazines are in the AEM. Or you can take the magazines out of the AEM, remove the cartridges from the magazines, and then replace the empty magazines in the AEM.

Caution – *Possible Equipment Damage*. When replacing magazines on the AEM walls, make sure you seat them correctly.

Note – If you do not replace the magazines in the AEM, the cells will be marked "absent" by the library controller.

6. **Close and latch the AEM access door.**

   Caution – *Possible Equipment Damage*. DO NOT force the AEM access door to open or close.

7. **Push the AEM CAP button.**

   The **Enter** light goes off, and the **Wait** light begins blinking. The safety door moves up.

8. **If more cartridges need to be exported, the robot continues filling the necessary AEMs. Wait until the AEM Unlocked light is lit and repeat Step 3 through Step 6.**

   The system ends the eject operation automatically when it has ejected all specified cartridges.

   The TallBot moves into the AEM and audits the AEM CAP to verify that the CAP is empty. The AEM CAP returns to its default state.

   Note – The audit of the AEM CAP should take less than three minutes.

▼ Configure Cartridge Barcode Presentation in a Non-Partitioned FC-SCSI Library

Task Tool

This procedure can be performed at any of the following:

- Local operator panel
- Standalone SL Console
- Web-launched SL Console

Task Purpose

Use this procedure to configure the cartridge barcode presentation format for an FC-SCSI library. This specifies which part of a cartridge barcode the library passes to host applications that use the FC-SCSI interface.

> **Note –** This procedure applies only to libraries with FC-SCSI host connections that are not partitioned. It is not applicable to libraries that have only HLI (TCP/IP) host connections. For partitioned libraries, see "Configure Cartridge Barcode Presentation for an FC-SCSI Partition" on page 428.

> **Note –** This feature is available starting with SL3000 firmware version FRS_2.33 and SL Console version FRS_4.47.

Task Steps

1. **Select Tools > Configuration.**

   The **Library Configuration** page appears.

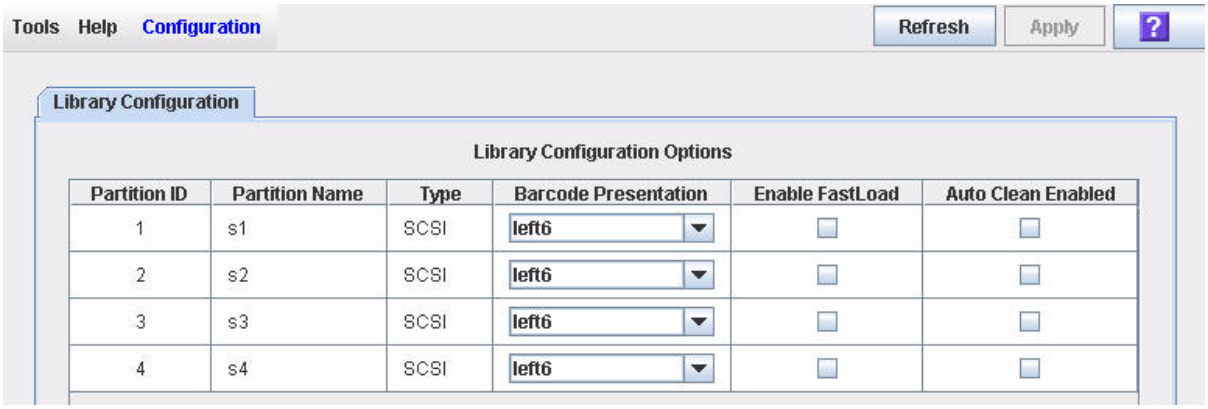
2. **In the Barcode Presentation list, select the presentation format you want to use for the entire library.**

   > **Note –** The Partition Name "scsi0" indicates a non-partitioned library.

   Options are:

   - **all**: All eight barcode characters are passed to host applications.

- **left6**: Only the six VOLID characters, which are on the left side of the barcode, are passed to host applications. The domain and type characters, which are the two characters on the right, are not passed. This is the default setting.



3. **Click Apply.**

   A confirmation message appears. The new barcode presentation setting is effective immediately. You do not need to reboot the library.

4. **Click OK to dismiss the message.**

▼ Configure Cartridge Barcode Presentation for an FC-SCSI Partition

Task Tool

This procedure can be performed at any of the following:

- Local operator panel
- Standalone SL Console
- Web-launched SL Console

Task Purpose

Use this procedure to configure the cartridge barcode presentation format for an FC-SCSI partition. With this process, you specify which part of a cartridge barcode the library passes to host applications that are accessing the partition. For details on this feature, see "Barcode Presentation" on page 415.

You can assign different presentation methods to each library partition.

> **Note –** This procedure applies only to libraries with FC-SCSI host connections that are not partitioned. It is not applicable to libraries that have only HLI (TCP/IP) host connections. For non-partitioned libraries, see "Configure Cartridge Barcode Presentation in a Non-Partitioned FC-SCSI Library" on page 426.

> **Note –** This feature is available starting with SL3000 firmware version FRS_2.33 and SL Console version FRS_4.47.

Task Steps

1. **Select Tools > Configuration.**

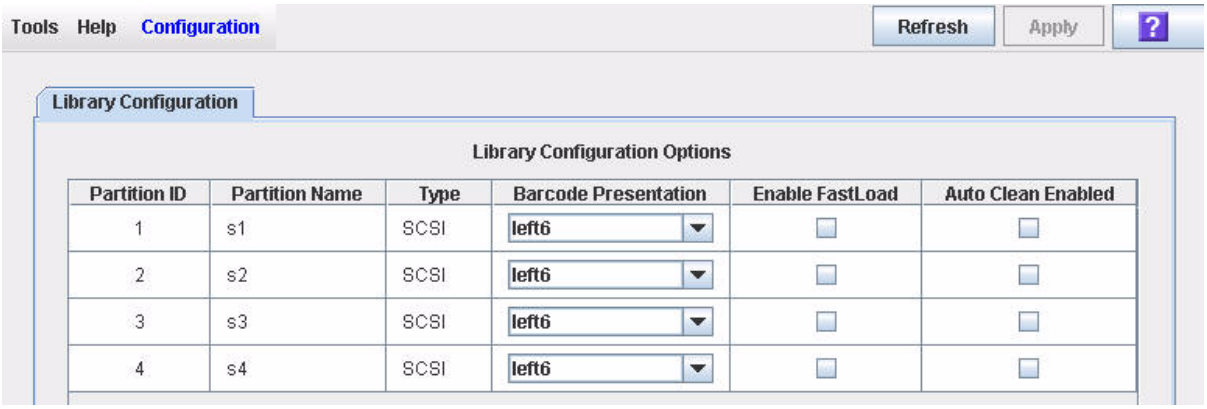
   The **Library Configuration** page appears.

2. **In the partition Barcode Presentation list, select the presentation format you want to use for that partition. You can use multiple lists to select settings for more than one partition at a time.**

   Options are:

   - **all**: All eight barcode characters are passed to host applications.

- **left6**: Only the six VOLID characters, which are on the left side of the barcode, are passed to host applications. The domain and type characters, which are the two characters on the right, are not passed. This is the default setting.



3. **Click Apply.**

   A confirmation message appears. The new barcode presentation settings are effective immediately. You do not need to reboot the library.

4. **Click OK to dismiss the message.**

▼ Display Library Cartridge Information in Tabular Format

Note – This feature is available starting with SL3000 firmware version FRS_2.33 and SL Console version FRS_4.47.

Task Tool

This procedure can be performed at any of the following:

- Local operator panel
- Standalone SL Console
- Web-launched SL Console

Task Purpose

Use this procedure to display detailed information about all library cartridges in a sortable, tabular format. The information includes the cartridge VOLIDs, locations, and media types. You can use this report for a variety of purposes, such as to:

- Locate cartridges by library internal address
- Verify that all cartridges in the library have valid, readable barcode labels
- Identify cleaning and diagnostic cartridges
- Identify cartridge media types in a mixed-media library

You can modify the layout and display of this screen. See "Modifying the Screen Layout" on page 62 for details. To display most of the same data in a straight text format, see "List Library Cartridges" on page 434.

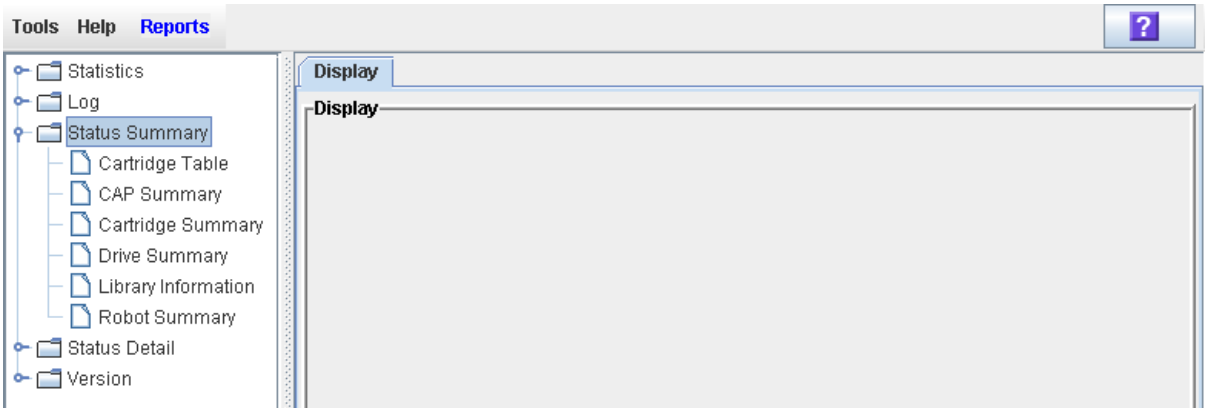
Task Steps

1. **Select Tools > Reports.**

   The navigation tree lists all library report options.

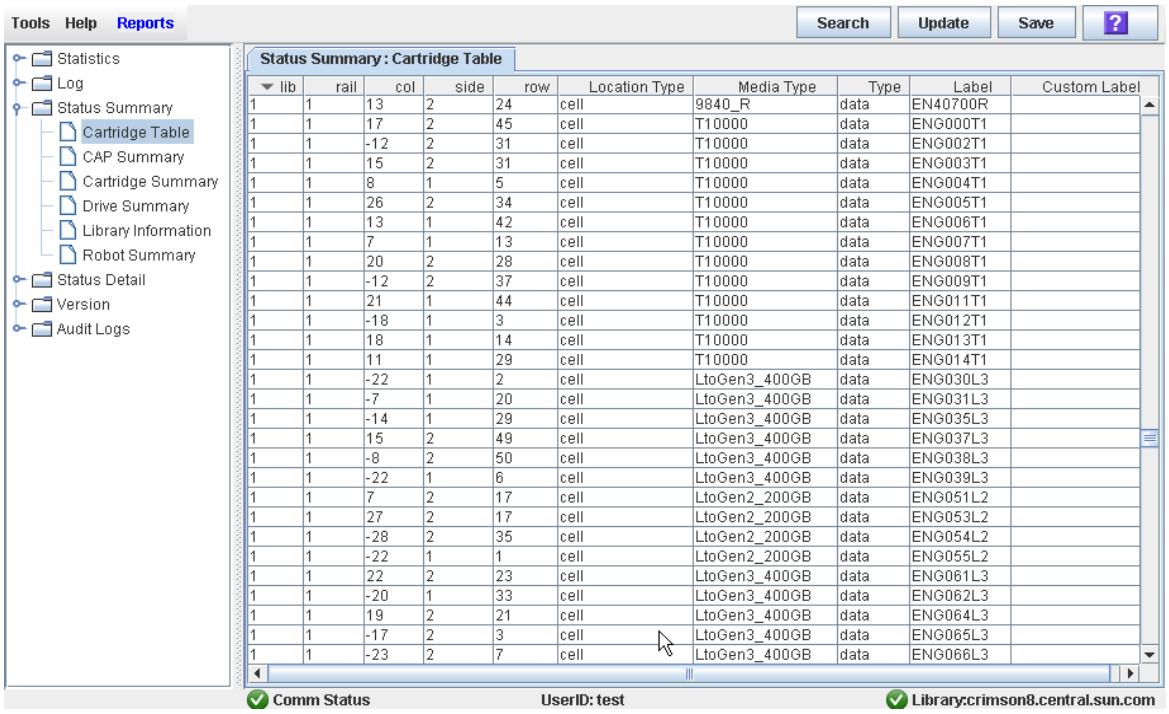
2. **Expand the Status Summary folder in the navigation tree.**

   The **Status Summary** reports display in a list.



3. **In the navigation tree, select Cartridge Table in the navigation tree.**

   The **Cartridge Table Report** displays. See "Screen Fields" on page 432 below for a detailed description of each screen field.



4. **If you want to search the report data or save it to a file, complete the following procedures:**

   - "Search a Library Report" on page 92
   - "Save Library Report Data to a Fil e" on page 94

Screen Fields

lib, rail, col, side, row

Library, rail, column, side, and row. Together, these values identify the library internal address where the cartridge is located.

For a detailed description of the library internal address format, see "Library Internal Address" on page 602.

Location Type

Type of library location where the cartridge is located. Options are:

- **CAP**: Rotational or AEM CAP cell
- **cell**: Regular storage cell
- **drive**: Loaded in a tape drive
- **sysCell**: System (reserved) cell; cleaning or diagnostic cartridges are typically stored in these cells

Media Type

Type of media in the cartridge. For example, Lto Gen3_400GB, 9840_R, T10000.

Type

Domain, or usage type, of the cartridge. Options are:

- **clean**: Cleaning cartridge
- **data**: Data cartridge
- **diagnostic**: Diagnostic cartridge

Label

Unique VOLID of the cartridge. Standard VOLIDs are eight characters in length.

A value of #UREAD indicates the barcode label is unreadable. Possible reasons for this are as follows:

- The label is missing, damaged, or upside-down. In this case, the **Custom Label** field also indicates #UREAD.
- The label has a non-standard format, such as a ten-character VOLID, or an unrecognized cartridge domain or media type indicator. In this case, the non-standard VOLID displays in the **Custom Label** field.

  The library controller does not allow you to mount an unlabeled or unknown type cartridge into any tape drive.

Custom Label

Non-standard VOLID of the cartridge, if applicable (requires the Open Format Volser feature). Possible entries for this field are as follows:

- **Blank**: The cartridge has a readable, standard eight-character VOLID cartridge label, as indicated in the **Label** field.

- **#UREAD**: The cartridge label is truly not read able, possibly because it is missing, damaged, or upside-down.
- Any other value: Indicates the non-standard VOLID of the cartridge.

▼ List Library Cartridges

Task Tool

This procedure can be performed at any of the following:

- Local operator panel
- Standalone SL Console
- Web-launched SL Console

Task Purpose

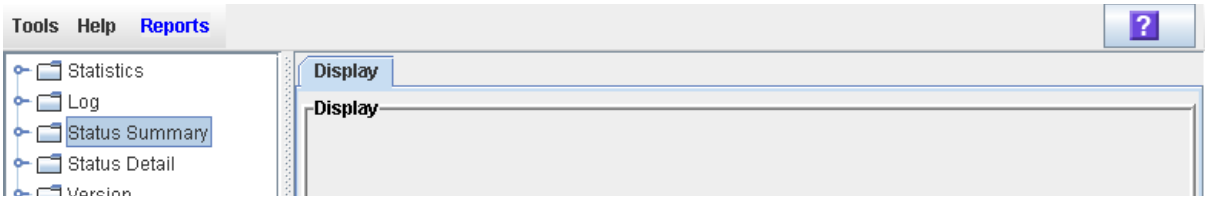
Use this procedure to display information about all library cartridges, including their VOLIDs, locations, and media types.

To display the same data in a tabular format, see "Display Library Cartridge Information in Tabular Format" on page 430

Task Steps

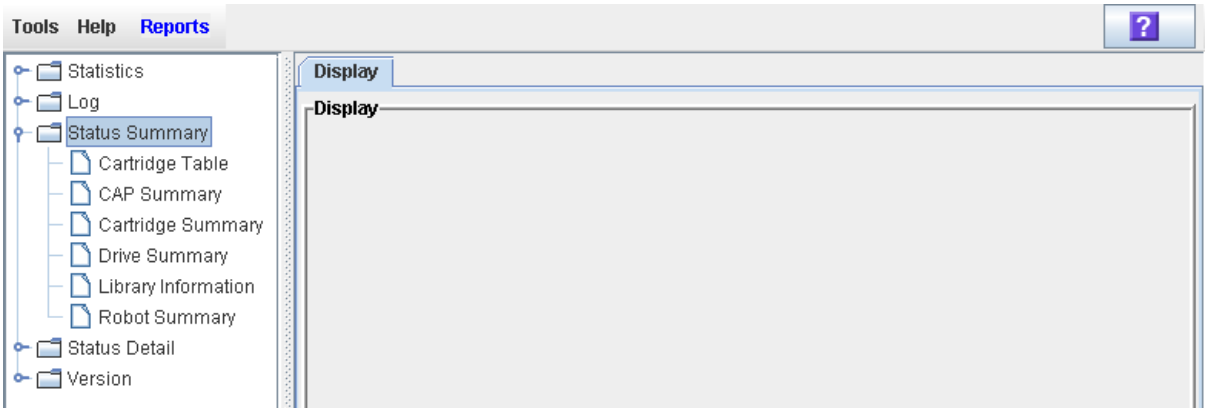
1. **Select Tools > Reports.**

   The navigation tree lists all library report options.



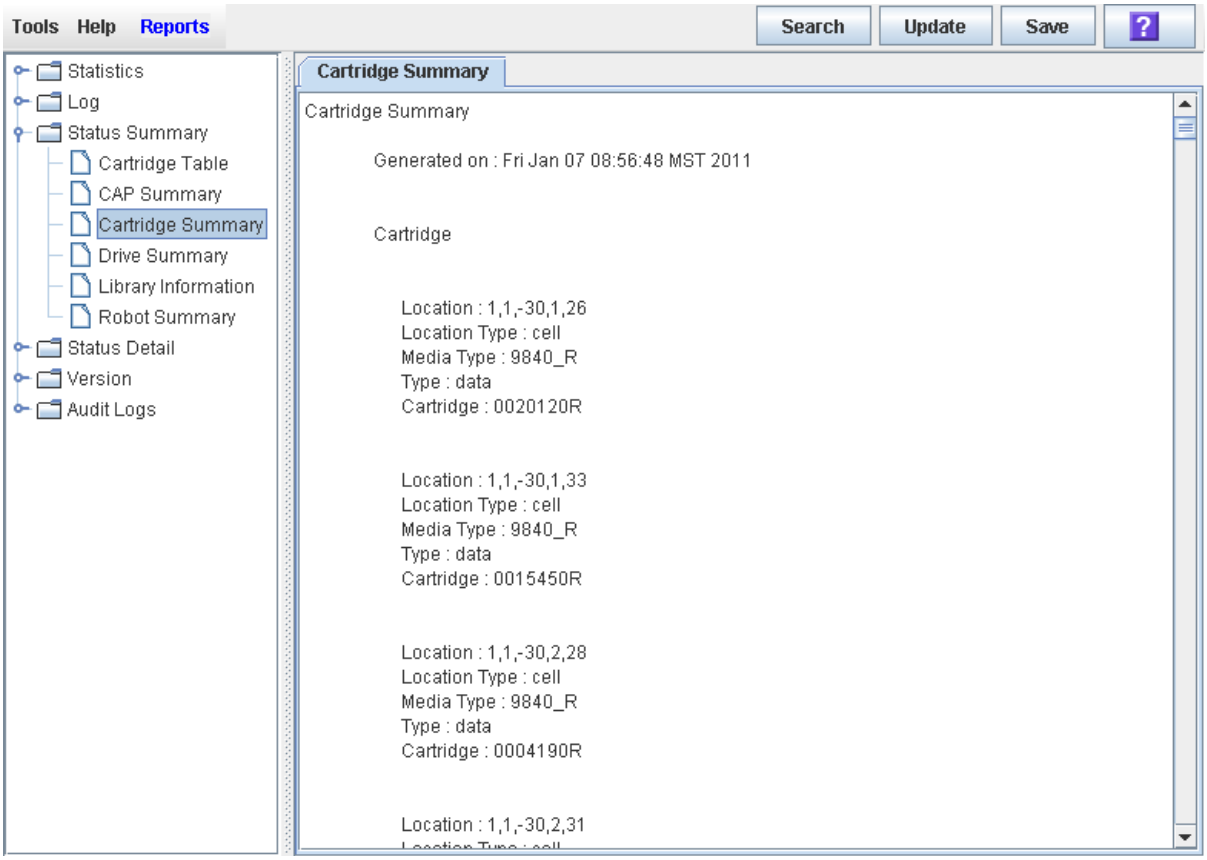
2. **Expand the Status Summary folder in the navigation tree.**

   The **Status Summary** reports display in a list.



3. **Select Cartridge Summary.**

   The **Cartridge Summary** report displays. See the following "Screen Fields" on page 435 for a detailed description of each screen field.



4. **If you want to search the report data or save it to a file, see the following procedures:**

   - "Display a Library Report" on page 90
   - "Save Library Report Data to a Fil e" on page 94

Screen Fields

Location

Library, rail, column, side, an d row. Together, these values identify the library int ernal address where the cartridge is located.

For a detailed description of the library internal address format, see "Library Internal Address" on page 1228.

Location Type

Type of library location where the cartridge is located. Options are:

- CAP: Rotational or AEM CAP cell
- cell: Regular storage cell
- drive: Loaded in a tape drive

- sysCell: System (reserved) cell; cleaning or diagnostic cartridges are typically stored in these cells

Media Type

Type of media in the cartridge.

Type

Domain, or usage type, of the cartridge. Options are:

- **clean**: Cleaning cartridge
- **data**: Data cartridge
- **diagnostic**: Diagnostic cartridge

Cartridge

Unique VOLID of the cartridge. Standard VOLIDs are eight characters in length.

A value of #UREAD indicates the barcode label is unreadable. Possible reasons for this are as follows:

- The label is missing or damaged.
- The label has a non-standard format, such as a ten-character VOLID, or an unrecognized cartridge domain type or media type indicator.

The library controller does not allow you to mount an unlabeled or unknown type cartridge into any tape drive.

▼ Locate a Cartridge by VOLID

Task Tool

This procedure can be performed at any of the following:

- Local operator panel
- Standalone SL Console
- Web-launched SL Console

Task Purpose

Use this procedure to display the current location of a cartridge with a specified volume ID. The location can be displayed in one of the following formats:

- Library internal address
- HLI-PRC address (HLI hosts only)

Task Steps

1. **Select Tools > Diagnostics, and click the Library folder.**
2. **Click the Search tab.**

   The **Library Search** page appears.
3. **In the Search Type list, select VOLID.**
4. **Enter the VOLID, Requester, and Cartridge Type.**

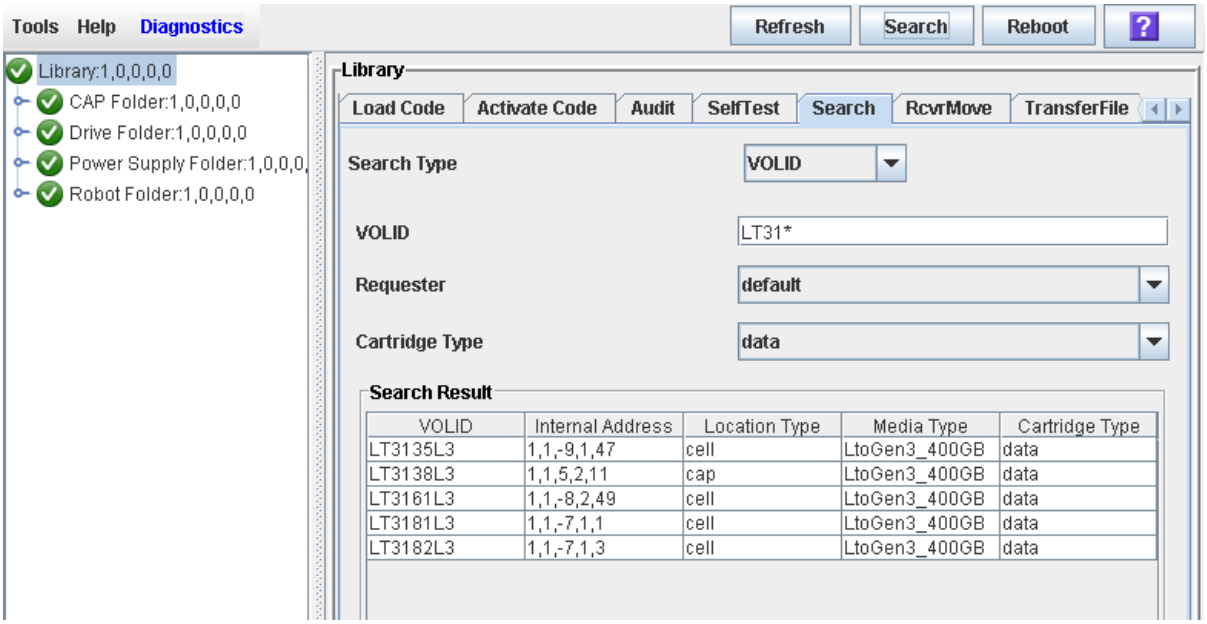
   The **Requester** field controls the address format that will be displayed for the cartridge location.

   - To display the library internal address, select `default`.
   - To display the HLI-PRC address, select `hli0` or `hli1`.

     Note – You can use wildcards in the VOLID field.

5. **Click the Search tab.**

   The **Search Result** section displays all cartridges meeting the search criteria.



▼ Locate a Cartridge by Address

Task Tool

This procedure can be performed at any of the following:

- Local operator panel
- Standalone SL Console
- Web-launched SL Console

Task Purpose

Use this procedure to display detailed information for cartridges with a specified location. Using wildcards, you can display all cartridges in a specified general area (for example, in a specified panel, row, or column). You can specify the location using one of the following formats:

- Library internal address
- HLI-PRC address (HLI hosts only)
- FC-SCSI address (FC-SCSI hosts only)

Task Steps

1. **Select Tools > Diagnostics, and click the Library folder.**
2. **Click the Search tab.**

   The **Library Search** page appears.
3. **In the Search Type list, select Location.**

   Note – The default Search Type is VOLID.

   The page updates to display fields enabling you to search by location.
4. **In the Location list, select the type of match you want to perform in the search.**
5. **In the Requester list, select the type of address format you want to use for the search.**
6. **In the Location field, enter the parameters for the search.**

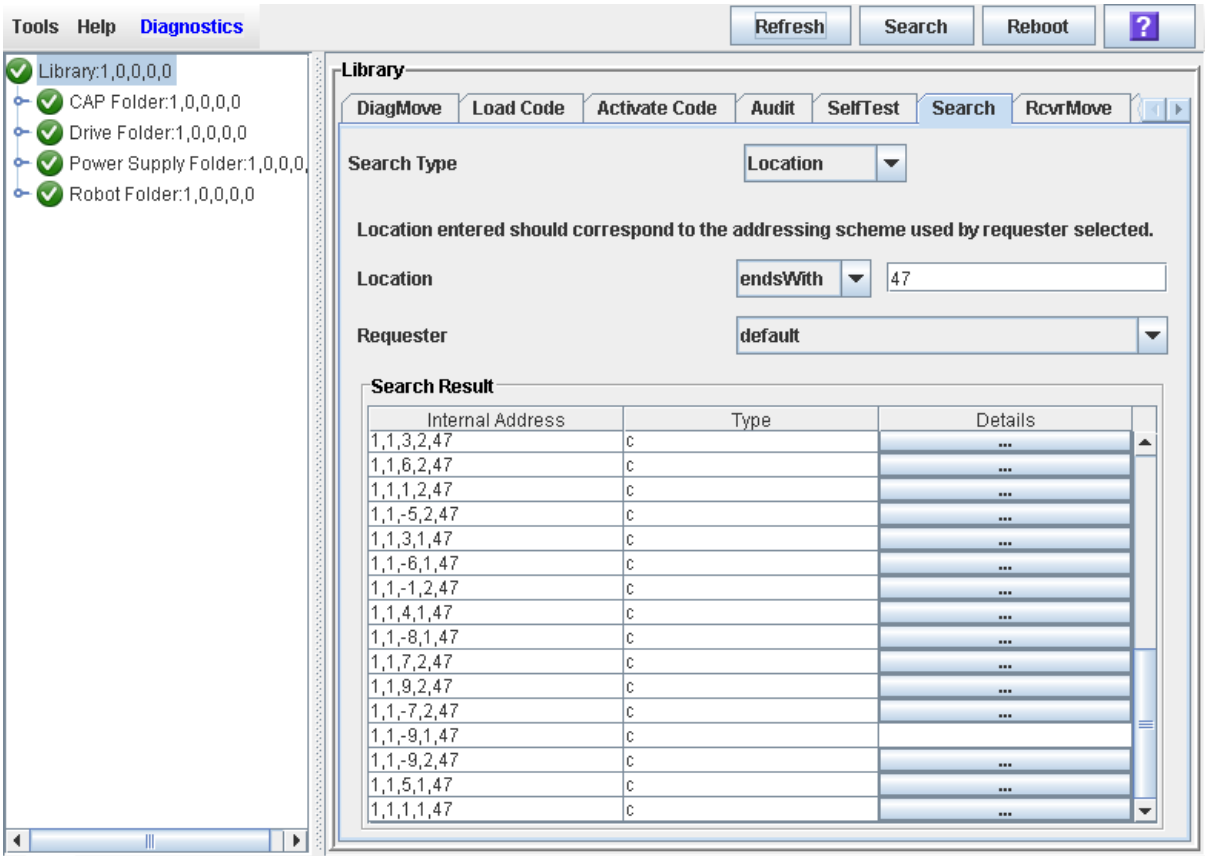
   The format you use must correspond to the **Requester** you have specified. For example:

   - Use the library internal address format if **Requester** is "`default`".
   - Use the HLI-PRC address if **Requester** is an HLI host.
   - Use the FC-SCSI address if **Requester** is an FC-SCSI host.

     Note – You cannot use wildcards in the **Location** field.

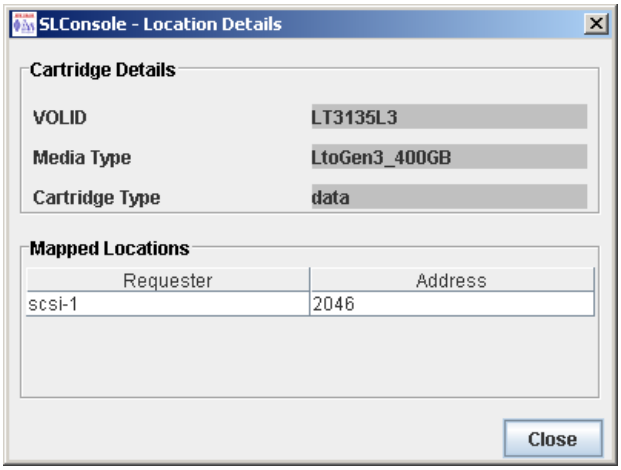
7. **Click the Search tab.**

   The **Search Result** section displays all locations meeting the search criteria.



8. **To see details about a cartridge or to view a location mapping, click the ... button in the Details column.**

   The **Location Details** dialog box appears.



9. **Click Close to close the dialog box.**

▼ Move a Specified Cartridge by VOLID

Task Tool

This procedure can be performed at any of the following:

- Local operator panel
- Standalone SL Console
- Web-launched SL Console

Task Purpose

Use this procedure to move a cartridge with a specified VOLID to a specified location within the library.

> **Note –** This procedure updates the cartridge's location in the library controller database, but not in the host database. Therefore after performing this procedure, you must perform an audit from the host software to update the host database. Failure to do so will cause future mount requests from the host software to fail.
>
> **Caution –** *Potential data overwrite.* Use caution when performing this procedure in partitioned libraries. You could inadvertently move a cartridge from one partition to another, which would allow the new partition to overwrite data on the cartridge.

Task Steps

1. **Select Tools > Diagnostics, and click the Library folder.**
2. **Click the RcvrMove tab.**

   The **Recovery Move** page appears.
3. **In the Source Location Mode section, select VOLID.**

   The page updates with the appropriate **Source Location** choices.
4. **In the VOLID field, enter the VOLID of the cartridge you want to move.**
5. **In the Destination Location Type list, select the type of location where you want to move the cartridge to. Options are:**

   - **CAP**
   - **Storage Slots**
   - **Drive**
   - **Reserved Slots**

   The following restrictions apply to your selection:

   - The destination can be a drive only if the source is a CAP or reserved slot.
   - For you to move a cartridge to a drive, the cartridge media type must be compatible with the drive type.
   - You cannot move a cartridge to a location that is already occupied.

- Although not strictly enforced, it is recommended that only diagnostic or cleaning cartridges be moved to reserved slots.

6. **In the Destination Location table, specify the library internal address of the destination location by making the appropriate selections in the following lists:**

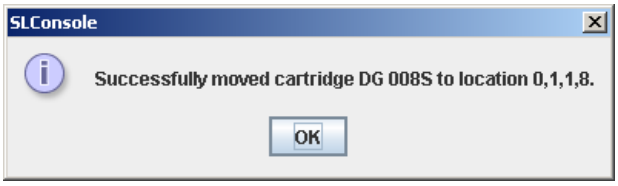
   The following special selections are available on the lists:

   - Min: First element of that location type ( ) in the library
   - Max: Last element of that location type () in the library

     Caution – *Potential overwrite of data or loss of access.* If the library is partitioned, make sure to keep the cartridge in the same partition it is currently allocated to. If you move a cartridge to a cell allocated to a different partition, the host could treat the cartridge as scratch and overwrite the data. If you move the cartridge to an unallocated cell, no hosts will be able to access the cartridge.

7. **Click the Start button.**

   The robot moves the cartridge. A success message appears when the operation completes.



8. **Click OK.**
9. **To verify the new location, you can display a Cartridge Summary Report. See "List Library Cartridges" on page 434 for details. For example:**
10. **To update the new cartridge location in the host database, initiate a library audit from the host software. See the appropriate tape management software documentation for the procedures and commands.**

▼ Move a Cartridge From a Specified Location

Task Tool

This procedure can be performed at any of the following:

- Local operator panel
- Standalone SL Console
- Web-launched SL Console

Task Purpose

Use this procedure to move a cartridge from one specified location to another within the library.

> **Note –** This procedure updates the cartridge's location in the library controller database, but not in the host database. Therefore, after performing this procedure, perform an audit from the host software to update the host database. If you do not perform the audit, future mount requests from the host software will fail.
>
> **Caution –** *Potential overwrite of data.* Use caution when performing this procedure in partitioned libraries. You could inadvertently move a cartridge from one partition to another, causing the new partition to overwrite data on the cartridge.

1. **Select Tools > Diagnostics, and click the Library folder.**
2. **Click the RcvrMove tab.**

   The **Recovery Move** page appears.
3. **In the Source Location Mode section, select Location.**

   The screen updates with the appropriate **Source Location** choices.
4. **In the Source Location Type list, select the cartridge's current location type. Options are:**
   - **CAP**
   - **Slot**
   - **Drive**
   - **Reserved Slots**
5. **In the Source Location table, specify the library internal address of the source location by making the appropriate selections in the following lists:**

   The following special selections are available on the lists:
   - Min: First element of that location type ( ) in the library
   - Max: Last element of that location type () in the library
6. **In the Destination Location Type list, select the type of location where you want to move the cartridge to. Options are:**
   - **CAP**

- **Storage Slots**
- **Drive**
- **Reserved Slots**

The following restrictions apply:

- The destination location can be a drive only if the source is a CAP or reserved slot.
- For you to move a cartridge to a drive, the cartridge media type must be compatible with the drive type.
- You cannot move a cartridge to a location that is already occupied.
- Although not strictly enforced, it is recommended that only diagnostic or cleaning cartridges be moved to reserved slots.

7. **In the Destination Location table, specify the library internal address of the destination location by making the appropriate selections in the following lists:**

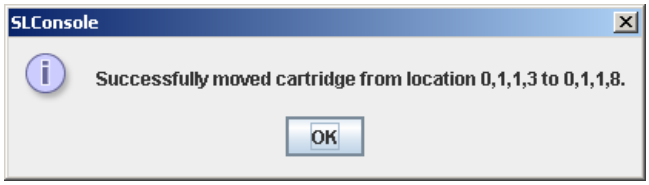
   The following special selections are available on the lists:

   - Min: First element of that location type ( ) in the library
   - Max: Last element of that location type () in the library

   > **Caution –** *Potential overwrite of data or loss of access.* If the library is partitioned, keep the cartridge in the same partition it is currently allocated to. If you move a cartridge to a cell allocated to a different partition, the host could treat the cartridge as scratch and overwrite the data. If you move the cartridge to an unallocated cell, no hosts will be able to access the cartridge.

8. **Click the Start button.**

   The robot moves the cartridge, and then a success message appears.



9. **Click OK.**
10. **To verify the new location, you can display a Cartridge Summary Report. See "List Library Cartridges" on page 434 for details.**

The following is an example.

11. **To update the new cartridge location in the host database, initiate a library audit from the host software. See the appropriate tape management software documentation for the procedures and commands.**

▼ Display the Media Events Report

Task Tool

This procedure can be performed at any of the following:

- Local operator panel
- Standalone SL Console
- Web-launched SL Console

Task Purpose

The Media Events Report summarizes library cartridge media events and updates whenever a media event or error occurs on any drive. Displaying up to 2000 entries, the report is helpful for identifying and diagnosing faulty cartridges.

For each cartridge that has experienced media events, the report lists:

- The VOLID of the cartridge
- The type of event
- The number of occurrences
- The date and time of the last such event

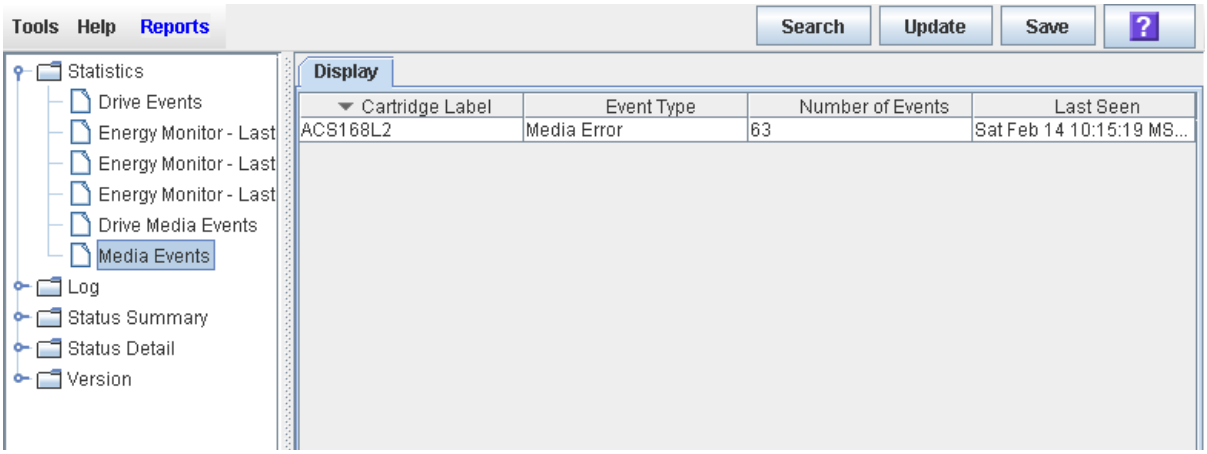
The report is sorted in VOLID order by default. Optionally, you can change the sort order, and rearrange and resize the columns. See "Modifying the Screen Layout" on page 62.

Note – For cartridge events associated with particular drives, see "Display the Drive Media Events Report" on page 436.

Note – This feature is available starting with SL3000 firmware version FRS_2.30 and SL Console version FRS_4.30.

Task Steps

1. **Select Tools > Reports.**
2. **Expand the Statistics folder, and select Media Events.**



Screen Fields

Cartridge Label

VOLID of the cartridge that has experienced an event.

Event Type

Type of media event being tracked. Options are:

- **Media Error**: The drive indicated there was a problem with the media. Also, this possibly could indicate a problem with the drive.
- **Misbuckle Error**: The drive was unable to grab the buckle of the media and could not thread the tape. The media is likely damaged.

Number of Events

Total number of events of this type that have been recorded for this cartridge.

Last Seen

Date and time of the most recent occurrence of the event.

11

Drive Cleaning

Library tape drives require periodic cleaning to prevent read/write errors. A drive cleaning occurs when the system mounts a compatible cleaning cartridge in response to a cleaning request from the drive.

This chapter includes the following topics:

You can manage cartridge and drive cleaning of the SL3000 in either of the following ways.

- Host-Managed Tape Cleaning: Host applications (such as ACSLS or ELS) or direct-attach applications (such as Symantec and NetBackup) manage all cleaning cartridge and drive clean functions. This method is available for HLI libraries and partitions.
- Library Auto Clean: The library controller manages all cleaning cartridge and drive clean functions. Check your tape management software documentation to determine whether this method is recommended for your library.

  See "Library Auto Clean" on page 448 for a detailed description of this feature.

  > **Note –** Host-managed tape cleaning and library auto clean are mutually exclusive. In non-partitioned libraries, you must choose one method or the other for the entire library. In partitioned libraries, you can assign the method by partition, but each partition must use only one method.

Library Auto Clean

> **Note –** This feature is available starting with SL3000 firmware version FRS_3.0 and SL Console version FRS_5.00.

The library auto clean feature enables the library controller to manage all drive clean functions. You can import cleaning cartridges into the library, where they are stored in reserved system cells. As soon as a drive indicates that it needs cleaning, the library controller automatically selects a compatible cleaning cartridge from the system cells and mounts it on the drive. When the cleaning activity is completed, the library controller dismounts the cartridge and returns it to a system cell.

With the auto clean feature, the library tracks cleaning cartridge usage and sends notification when cleaning cartridges have expired or have reached a user-defined usage threshold. Cleaning cartridges can be automatically exported from the library in bulk, by expiration date, or by selected cartridge volume ID (VOLID or volser).

In partitioned libraries, auto clean can be configured for the entire library or for individual library partitions.

See "Library Auto Clean Special Considerations" on page 449 for additional details about library auto clean operations.

Library Auto Clean Process Summary

The following is a summary of the actions needed to configure and use the library auto clean feature.

1. Enable library auto clean. In partitioned libraries, you can enable or disable the feature separately for each partition. See "Configure Library Auto Clean" on page 454 for details.
2. Configure the maximum usage warning threshold for each cleaning cartridge type. See "Define Cleaning Cartridge Warning Thresholds" on page 455 for details.
3. Import cleaning cartridges into the library. The cartridges are placed in reserved system cells.See "Import Cleaning Cartridges" on page 457 for details.

   > **Note –** When using the library auto clean feature, DO NOT use ACSLS or ELS to enter cleaning cartridges into the library. ACSLS and ELS store cleaning cartridges in regular storage cells. The library controller does not have access to these cells for the auto clean function.

4. Have the library controller manage drive cleaning as required.
5. Monitor status of cleaning cartridges and drives. See the following procedures for details:
   - "Display Cleaning Cartridges" on page 463
   - "Display Drive Cleaning Status" on page 465
6. Export cleaning cartridges from the library as necessary. You can use any of the following methods:
   - Export all cartridges
   - Export expired cartridges
   - Export selected cartridges

   See "Export Cleaning Cartridges" on page 460 for details.

See "Drive Cleaning Tasks" on page 453 for a list of all tasks related to drive cleaning.

Library Auto Clean Special Considerations

The following are details and special considerations about the library auto clean feature.

Host Interactions

With the auto clean feature, the library controller initiates a drive clean operation immediately upon receipt of a cleaning request from the drive. This request typically occurs when the drive dismounts a data cartridge. While the drive is being cleaned, the data cartridge dismount remains pending to the host. The host is not notified that the data cartridge dismount is complete until the drive clean operation has finished and the cleaning cartridge has been returned to a system cell.

While a drive is being cleaned, the system marks it as busy to all hosts. If an FC-SCSI host requests the drive while the drive is being cleaned, the request is rejected.

Unsuccessful Cleaning Operations

If the library controller cannot locate a non-expired cleaning cartridge that is compatible with the drive, the library controller sends messages to the system Event Log and the **Status Module** page. See "Library Events" on page 483 and "Status Alert Messages" on page 352 for details.

After a cleaning cartridge has been mounted on a drive and the drive indicates that the cartridge is unusable, the library controller automatically returns the cartridge to a reserved system cell. The drive will not be cleaned until the next dismount, preventing a response timeout on the dismount. The next clean attempt will use a non-expired cleaning cartridge if one is available.

Use of Reserved System Cells

When cleaning cartridges are imported into the library, the library distributes the cartridges as evenly as possible among the sides of the library. Cleaning cartridges can be stored in any available system cell.

The reserved system cells are not assigned to partitions. Therefore, a cleaning cartridge can be used to clean compatible drives allocated to any library partition.

Cleaning Cartridge Management

Ensure that the library contains a sufficient number of cleaning cartridges that are compatible with each drive type in your library. See the drive manufacturers' documentation for compatibility requirements.

The library auto clean feature requires that cleaning cartridge volume IDs (VOLIDs or volsers) be eight characters in length, with "CLN" as the first three characters. The library Import/Export function only accepts cleaning cartridges that have labels with this format.

With the library auto clean feature, cleaning cartridges are stored in reserved system cells which the library controls. These reserved cells are not accessible to library host applications. The number of system cells available for cleaning cartridge storage varies, depending on the configuration of your SL3000 library. See "Reserved System Cells" on page 625 for details.

Importing and Exporting Cleaning Cartridges

You must enter cleaning cartridges into the library using the SL Console Import function to make the cartridges available for the library auto clean feature. See "Import Cleaning Cartridges" on page 457 for detailed instructions.

Any cleaning cartridges entered with the host tape management software (ACSLS or ELS) are stored in data cells and cannot be used for the library auto clean feature.

To remove cleaning cartridges from a library using the auto clean feature, use the SL Console Export function. See "Export Cleaning Cartridges" on page 460 for detailed instructions. You can choose to export all cartridges, selected cartridges, or all expired cartridges.

> **Note –** The command line interface (CLI) also provides cleaning cartridge import and export commands accessible to your system administrator and Oracle support representative.

Cartridge Usage Count

Cleaning cartridges have a limited life span. See the drive manufacturers' documentation for maximum recommended usage for each type of cleaning cartridge. For LTO cleaning cartridges, also refer to the cleaning cartridge manufacturers' documentation.

When you import a cleaning cartridge into the library, the library controller considers the cartridge to be new and sets the usage count to zero. Therefore, if you import a used cleaning cartridge, the usage count for that cartridge will not be accurate.

Each time a cleaning cartridge is mounted on a drive, the library controller increments the usage count for that cartridge. See "Display Cleaning Cartridges" on page 463 to display the current usage count.

Warning Threshold

Use the cleaning cartridge warning threshold to notify you when a cleaning cartridge is nearing time for replacement. You can selectively activate or deactivate the warning threshold feature for each cleaning cartridge type. By default, the feature is deactivated for all.

To activate the feature, assign a threshold to a selected cartridge type. All cleaning cartridges of this type are assigned the threshold you define. See "Define Cleaning Cartridge Warning Thresholds" on page 455 for details. The warning threshold is based on the cartridge usage count. Set the warning threshold lower than the cartridge's maximum recommended usage to allow time to replace the cartridge.

When a cleaning cartridge's usage count reaches the threshold you have defined, the library controller updates the cartridge's status to "warning" and sends messages to the system Event Log and the **Status Module** page. (See "Library Events" on page 483 and "Status Alert Messages" on page 352 for details.) The messages are repeated each time the cleaning cartridge is used, until it is exported from the library or expires.

Cleaning Cartridge Expiration

Cleaning cartridges are expired based on information from the drives. If a drive cannot use a cleaning cartridge (due to reaching the end of tape, for example), the drive sends a "cleaning cartridge expired" notification to the library controller.

The library controller:

- Dismounts the cartridge from the drive and returns it to a system cell
- Updates the cartridge's status to "expired"
- Sends messages to the system Event Log and the **Status Module** page.

  See "Library Events" on page 483 and "Status Alert Messages" on page 352 for details.

The library controller does not use expired cleaning cartridges for cleaning operations. Replace expired cartridges as soon as possible. When you export an expired cleaning cartridge from the library, be sure to remove it from the CAP. If you leave an expired cartridge in the CAP, another user could inadvertently re-enter it into the library.

> **Note –** Although the library controller keeps track of cleaning cartridge usage, it does not expire cleaning cartridges on the basis of the usage count.

Cleaning Cartridge Status

You can use the SL Console to display the status of a cleaning cartridge at any time. A cleaning cartridge can have any of the following statuses:

- **OK**: The cartridge is usable for cleaning.
- **warning**: The usage count has reached or exceeded the warning threshold defined for this cartridge type.
- **expired**: The cartridge has expired, based on information from the drives.

See "Display Cleaning Cartridges" on page 463 for details.

Manual Cleaning

Normally, the library auto clean feature or the host tape management software (ACSLS or ELS) manages drive cleaning. However, there may be occasions when you need to perform a manual clean.

> **Caution –** *Potential excess wear of drive head.* Cleaning a drive before it is due is not recommended. Excessive drive cleaning can wear out a drive head prematurely.

See the drive manufacturer's documentation for information on whether manual cleaning is allowed. Some drive types allow manual cleaning at any time, while others do not allow cleaning to be initiated unless a usage threshold has been met. If a usage threshold is not met, the library controller may allow you to mount a cleaning cartridge on a drive, but the drive will not actually perform the cleaning operation.

To verify whether a drive needs cleaning, display the drive's cleaning status and the date when it was last cleaned. See "Display Drive Cleaning Status" on page 465 for details.

To locate the correct type of cleaning cartridge for a particular drive, generate a list of available cleaning cartridges and their types. See "Display Library Cartridge Information in Tabular Format" on page 430 for details.

Drive Cleaning Tasks

▼ Configure Library Auto Clean

Task Tool

This task can be performed at either of the following:

- Local operator panel
- Standalone SL Console
- Web-launched SL Console

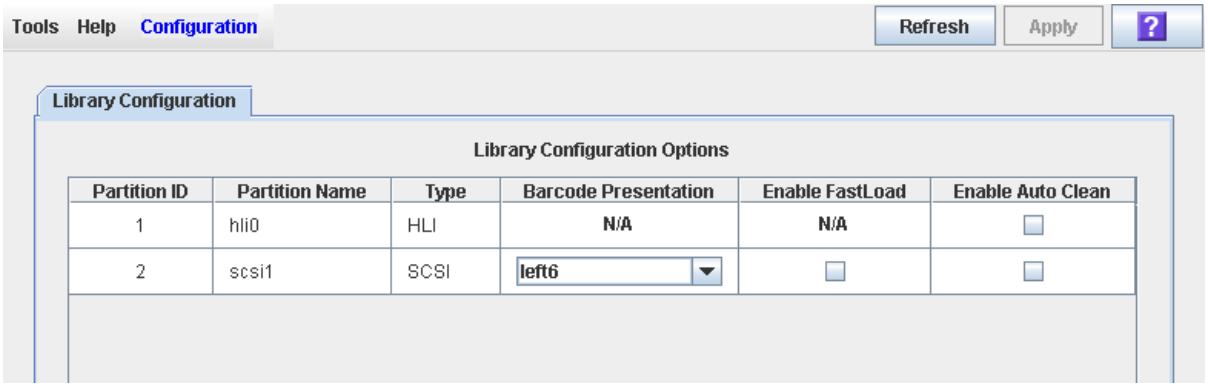
Task Purpose

Use this procedure to enable or disable the library auto clean feature. If the library is partitioned, you can enable or disable library auto clean for individual partitions.

Task Steps

1. **Select Tools > Configuration.**

   The **Library Configuration** page appears.



2. **Set the Enable Auto Clean check box for the partition you want to configure. Options are:**

   - **Checked**: Turns library auto clean on. The library controller will manage all drive cleaning functions.
   - **Unchecked**: Turns library auto clean off. Drive cleaning must be managed through the host library management software (ACSLS or ELS). This is the default setting.

     Note – If the library is partitioned, there is one check box for each partition. Select or deselect the partition's check box to enable or disable library auto clean separately for each partition. If the library is not partitioned, there is only one check box (labeled **Partition 1**), which applies to the whole library.

3. **Click Apply.**

   The library configuration is updated, and the feature settings are available immediately.

▼ Define Cleaning Cartridge Warning Thresholds

Task Tool

This task can be performed at either of the following:

- Local operator panel
- Standalone SL Console
- Web-launched SL Console

Task Purpose

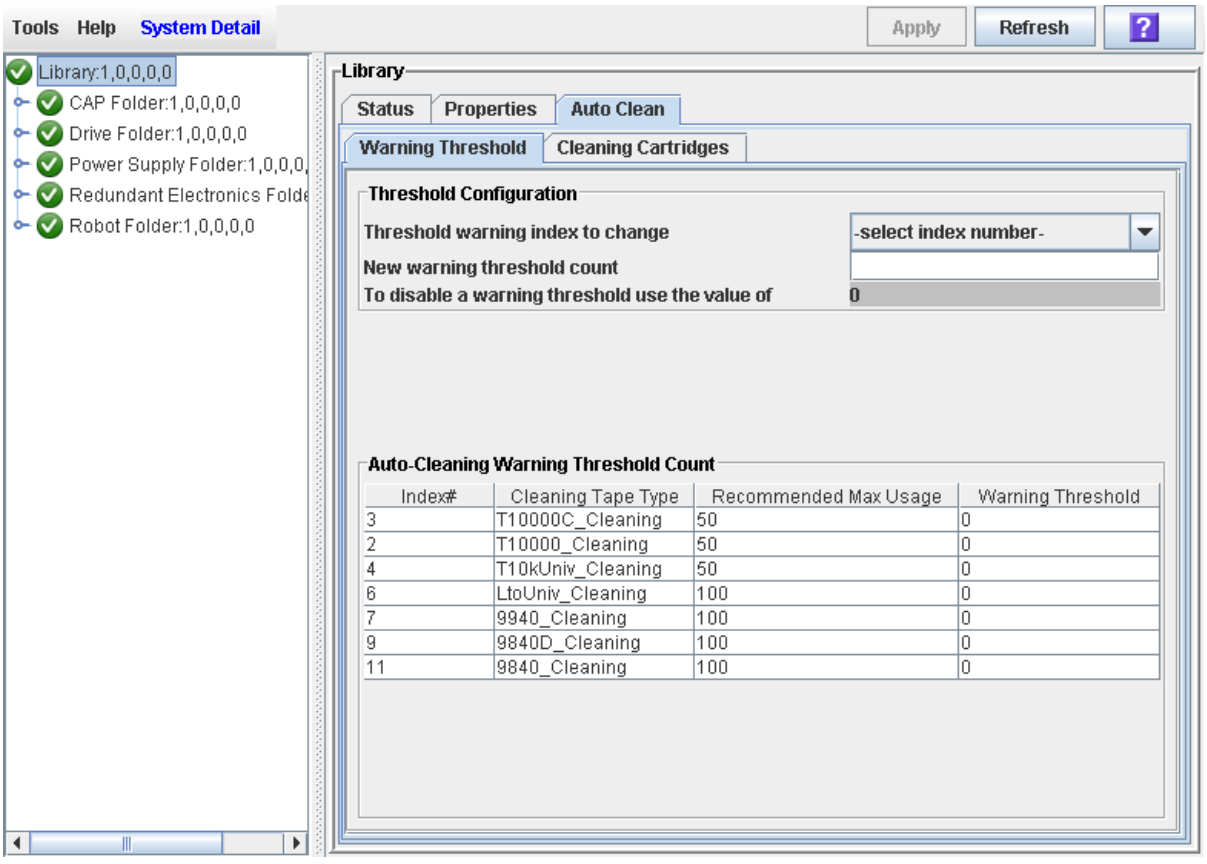
Use this procedure to assign usage warning thresholds to selected cleaning cartridge types.

> **Note –** This procedure applies only to libraries or partitions that have the library auto clean feature enabled.

Task Steps

1. **Select Tools > System Detail, and select the library folder on the navigation tree.**
2. **Click Auto Clean, and then the Warning Threshold tab.**

   The **Warning Threshold** page appears.



3. **Complete the fields as follows:**

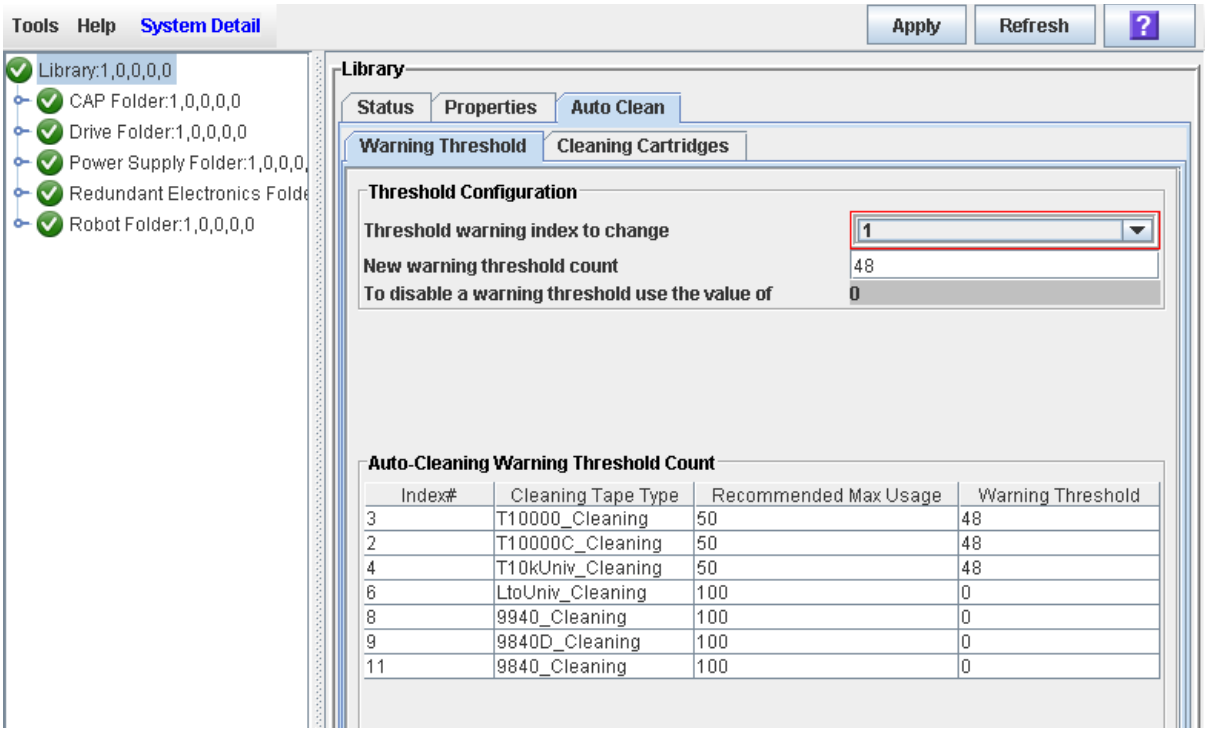
- In the **Threshold warning index to change** list, select the index number of the cleaning cartridge type you want to configure.

  The numbers in the list refer to the **Index** entries in the table on the bottom part of the page.

- In the **New warning threshold count** field, enter the warning threshold you want to assign to the cartridge type. All cleaning cartridges of this type are assigned the threshold you assign.

  An entry of 0 deactivates the warning threshold feature for this cartridge type. The default is 0.

  Note – You should set the threshold lower than the cartridge's recommended maximum usage to allow time to replace the cartridge. The **Recommended Max Usage** values on this page are pre-defined, based on the manufacturers' published recommendations. See your drive manufacturers' documentation for additional information.



4. **Click Apply.**

   The new threshold value is assigned to the cartridge type, and the **Warning Threshold** value on the page updates.

▼ Import Cleaning Cartridges

Task Tool

This task can be performed at either of the following:

- Local operator panel
- Standalone SL Console
- Web-launched SL Console

Task Purpose

Use this procedure to enter cleaning cartridges into the library through a specified rotational CAP. Only rotational CAPs, not AEM CAPs, can be used for this procedure.

The library controller reserves the CAP for the entire operation. The cleaning cartridges are distributed as evenly as possible in reserved system cells, and their usage counts are set to 0. Only one cleaning or diagnostic cartridge import or export operation can be performed at a time.

> **Note –** This procedure applies only to libraries or partitions that have the library auto clean feature enabled.

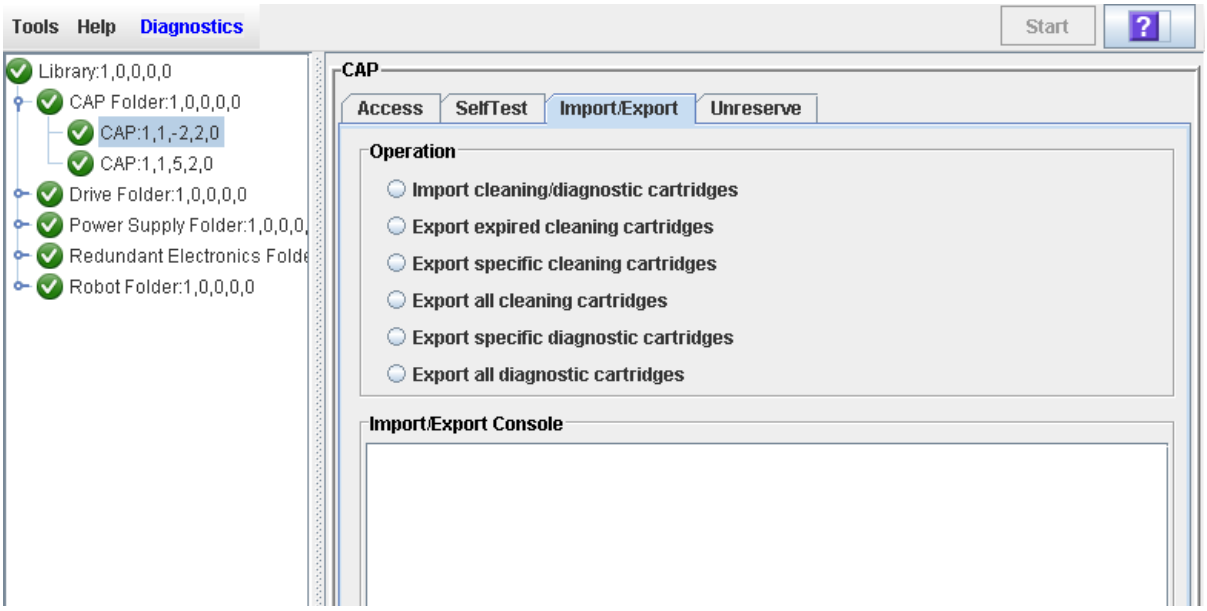
Before beginning this procedure, verify that the following conditions are met:

- The CAP is empty, available for use (not reserved by a host), closed, and locked.
- The library has enough empty reserved system cells to store the cleaning cartridges you want to import. At least one system cell on each side of the library must be left open for robot recovery or library initialization.

Task Steps

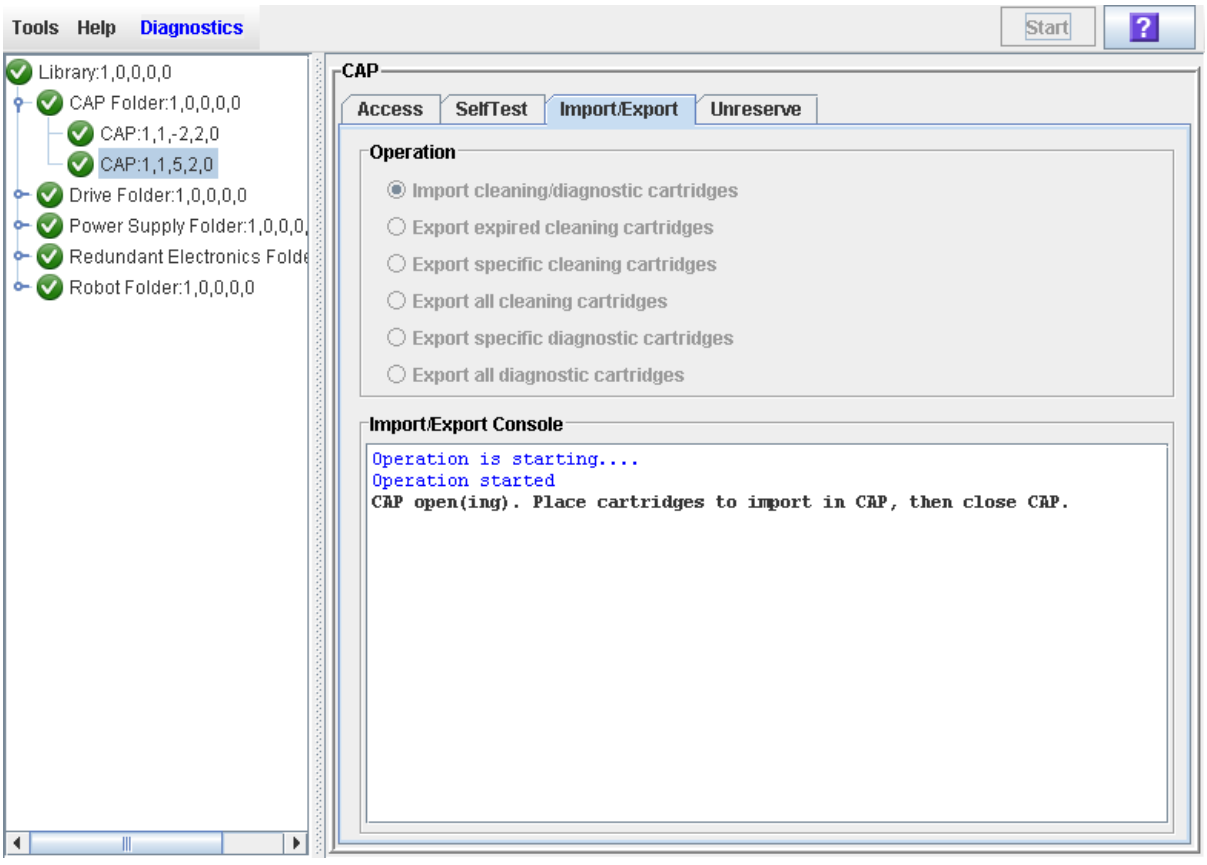
1. **Select Tools > Diagnostics.**
2. **Expand the CAP Folder, highlight the CAP you want to use, and then select the Import/Export tab.**

The **Import/Export** page appears.



3. **Select Import Cleaning/Diagnostic cartridges.**
4. **Click Start.**

   The import operation begins, and the **Import/Export** page displays the ongoing status.



5. **The library controller reserves the CAP and unlocks and opens the CAP door.**

If the library is partitioned and the CAP is associated to an FC-SCSI partition, the library controller associates the CAP to the `default` requestor for the duration of the import operation.

6. **Load the cleaning cartridges into the CAP.**

   For detailed instructions, see "Enter Cartridges Through a Rotational CAP" on page 418.

7. **After you close the door, the cleaning cartridges are moved to available system cells.**

   Any data cartridges or cleaning cartridges with invalid labels are ignored and left in the CAP.

8. **When all cleaning cartridges have been moved from the CAP, the library controller proceeds as follows:**

   - If the CAP is empty, the library controller releases the CAP reservation and re-associates the CAP to the original FC-SCSI partition, if applicable.
   - If cartridges are left in the CAP, the CAP door is opened, and the Import/Export page displays a message that the cartridges need to be removed.

▼ Export Cleaning Cartridges

Task Tool

This task can be performed at either of the following:

- Local operator panel
- Standalone SL Console
- Web-launched SL Console

Task Purpose

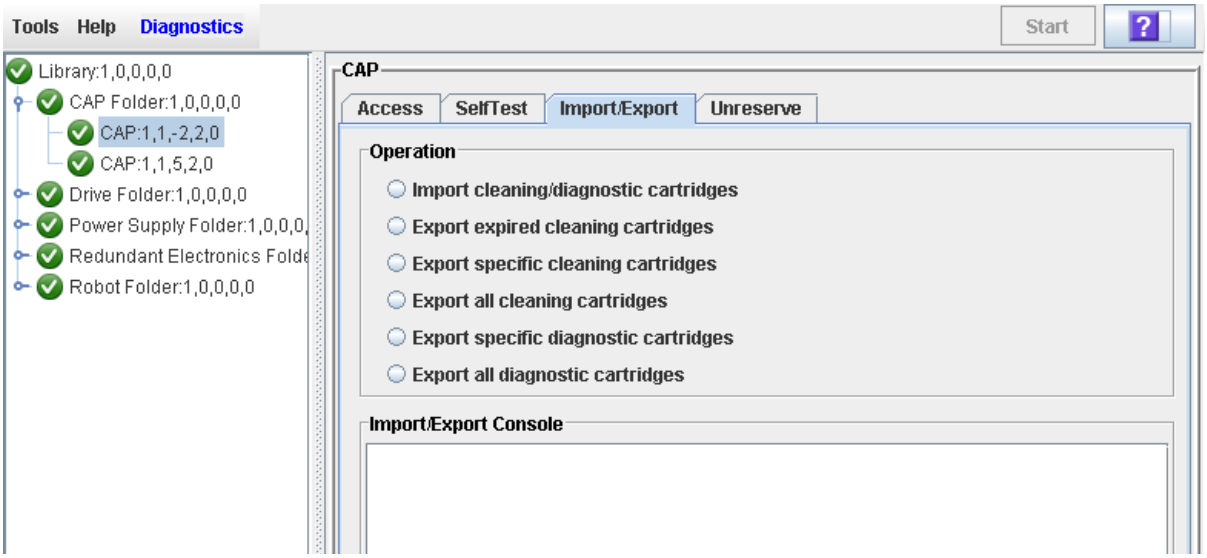
Use this procedure to export cleaning cartridges from the library through a specified rotational CAP. (Only rotational CAPs, not AEM CAPs, can be used for this procedure.) The library controller reserves the CAP for the entire operation. The system retrives the cleaning cartridges from reserved system cells and places them in the CAP for removal. Only one cleaning cartridge import or export operation can be performed at a time.

Before beginning this procedure, verify that the CAP is empty, available for use (not reserved by a host), and closed and locked.

Task Steps

1. **Select Tools > Diagnostics.**
2. **Expand the CAP Folder in the navigation tree, highlight the CAP you want to use, and then click the Import/Export tab.**

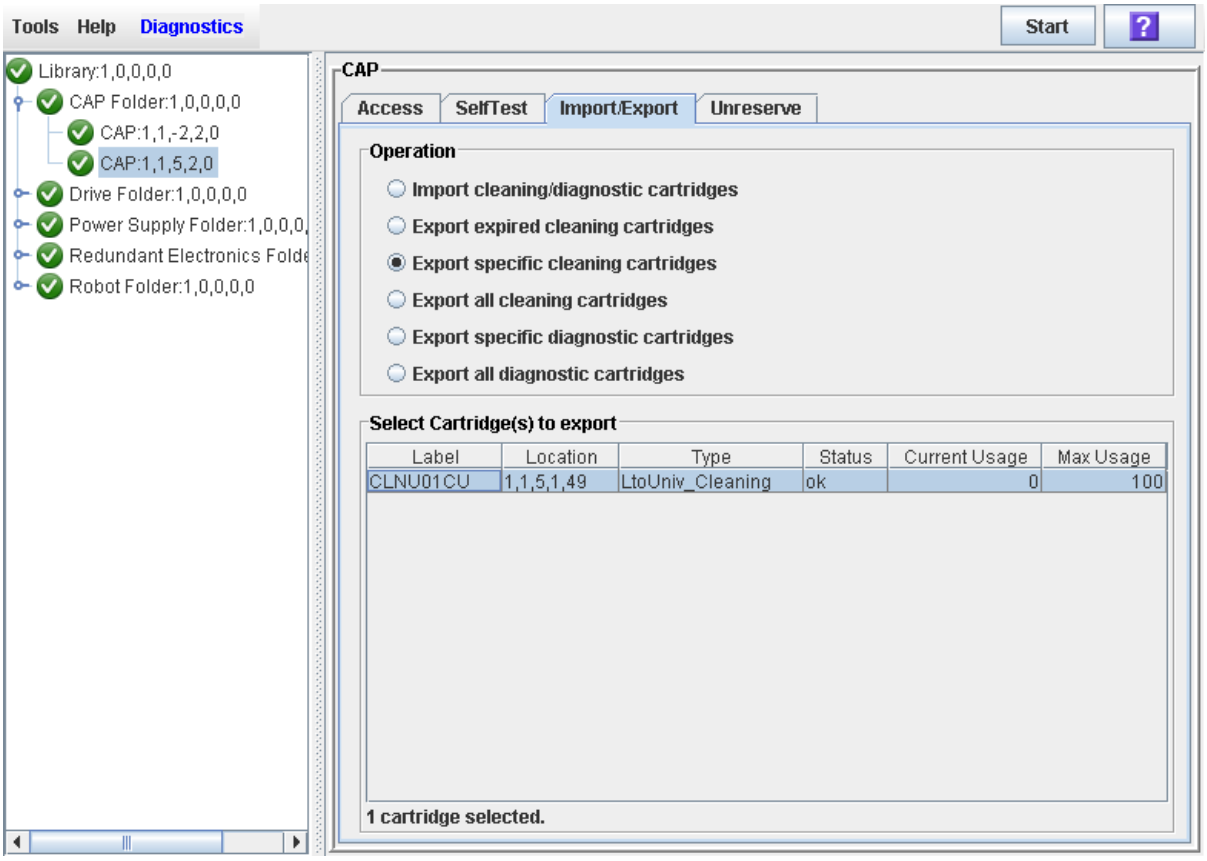
   The **Import/Export** page appears.



3. **Select the type of export operation you want to perform. You have the following options:**

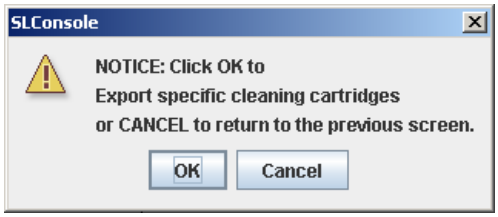
   - **Export expired cleaning cartridges**: Automatically exports all cleaning cartridges with a status of "expired." To display a list of expired cartridges, see "Display Cleaning Cartridges" on page 463.

- **Export specific cleaning cartridges**: Specify the cleaning cartridges you want to eject. The page displays a list of all cleaning cartridges in the library. Select one or more for export.
- **Export all cleaning cartridges**: Exports all cleaning cartridges from the library.



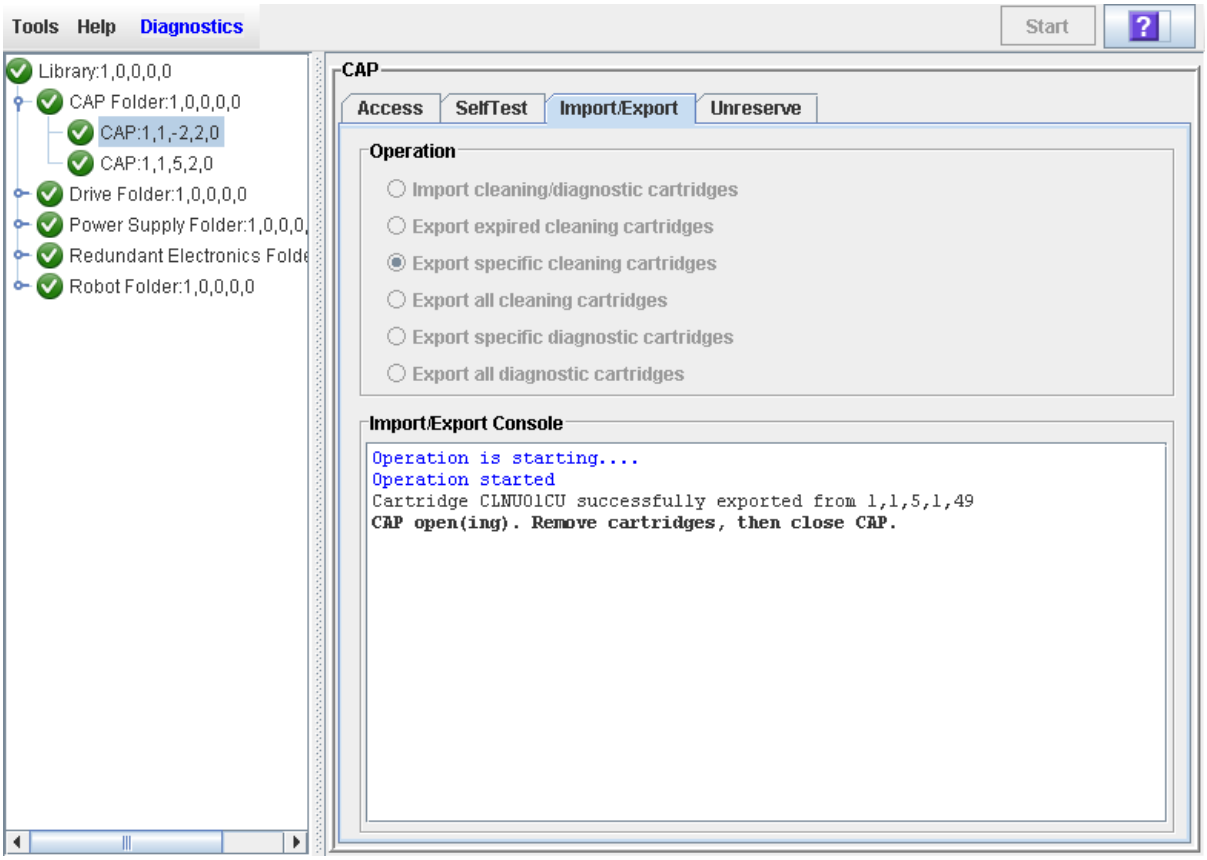
4. **Click Start.**

   A confirmation message appears.



5. **Click OK to continue.**

The export operation begins, and the **Import/Export** page displays the ongoing status.



The export operation proceeds as follows:

a. If the library is partitioned and the CAP is associated to an FC-SCSI partition, the library controller associates the CAP to the `default` requestor for the duration of the export operation.

b. The library controller reserves the CAP.

c. The cleaning cartridges are moved to the CAP, according to your request.

d. The **Import/Export** page displays a message when the CAP is ready to be unloaded.

6. **Remove the cartridges from the CAP.**

   For detailed instructions, see "Eject Cartridges Through a Rotational CAP" on page 420.

7. **Close the CAP door.**

   The library controller proceeds as follows:

   - If the CAP is empty, the library controller releases the CAP reservation and re-associates the CAP to the original partition, if applicable.
   - If cartridges are left in the CAP, the CAP door opens, and the **Import/Export** page displays a message that the cartridges need to be removed.

     Note – This procedure applies only to libraries or partitions that have the library auto clean feature enabled.

▼ Display Cleaning Cartridges

Task Tool

This task can be performed at any of the following:

- Local operator panel
- Standalone SL Console
- Web-launched SL Console

Task Purpose

Use this procedure to display detailed information about all cleaning cartridges stored in reserved system cells. In particular, you can use this procedure to monitor the status and usage count for all cleaning cartridges under library control.

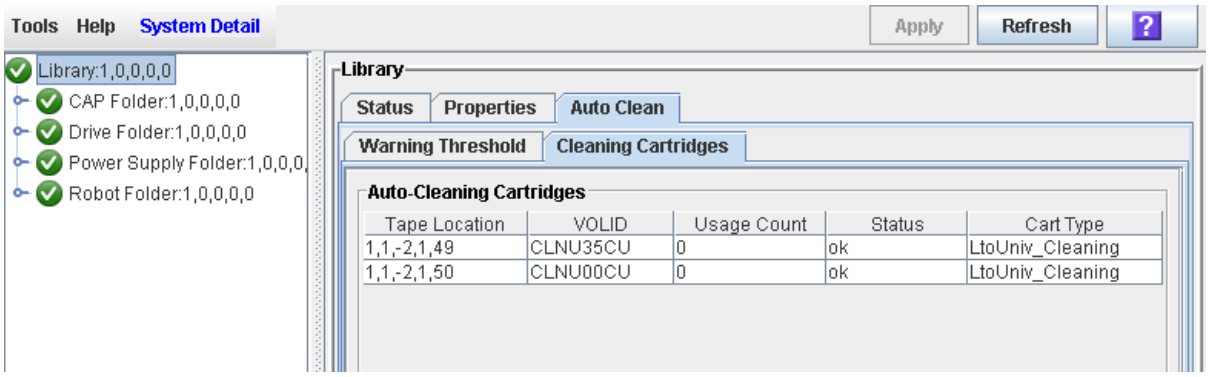
A cleaning cartridge may not appear on this page in the following cases:

- The cartridge is in use.
- The cartridge is in transit.
- The cartridge was entered into the library using the host tape management software (ACSLS or ELS). See your tape management software documentation for details about managing these cartridges.

Task Steps

1. **Select Tools > System Detail, and select the library folder on the navigation tree.**
2. **Click the Auto Clean tab, and then the Cleaning Cartridges tab.**

   The **Library Cleaning Cartridges** page appears.



Screen Fields

Tape Location

Library, rail, column, side, and row. Together, these values identify the library internal address where the cartridge is located.

All cartridges in this report are located in reserved system cells.

VOLID

Volume ID (VOLID or volser) of the cartridge. The first three characters are always "CLN."

Usage Count

Number of times the cartridge has been used for cleaning. When a cleaning cartridge is imported into the library, its usage count is set to 0. Each time the cartridge is mounted on a drive, its usage count is incremented.

Status

Current status of the cartridge. Options are:

- **expired**: The cartridge has expired, based on information from the drives (see "Cleaning Cartridge Expiration" on page 451). This cartridge is not usable and should be replaced as soon as possible.

  This status supersedes the "warning" status. Therefore, if a cartridge is both expired and has reached or exceeded its usage count threshold, only "expired" is displayed.

- **OK**: The cartridge is usable for cleaning.

- **warning**: The usage count has reached or exceeded the warning threshold defined for this cartridge type (see "Warning Threshold" on page 450). The cartridge can still be used for cleaning, but you may want to replace it at your earliest convenience.

Cart Type

Type of cleaning cartridge. You should have an adequate supply of usable cleaning cartridges for each type of drive in the library. See the drive manufacturer's documentation for cleaning cartridge requirements.

▼ Display Drive Cleaning Status

Task Tool

This task can be performed at any of the following:

- Local operator panel
- Standalone SL Console
- Web-launched SL Console

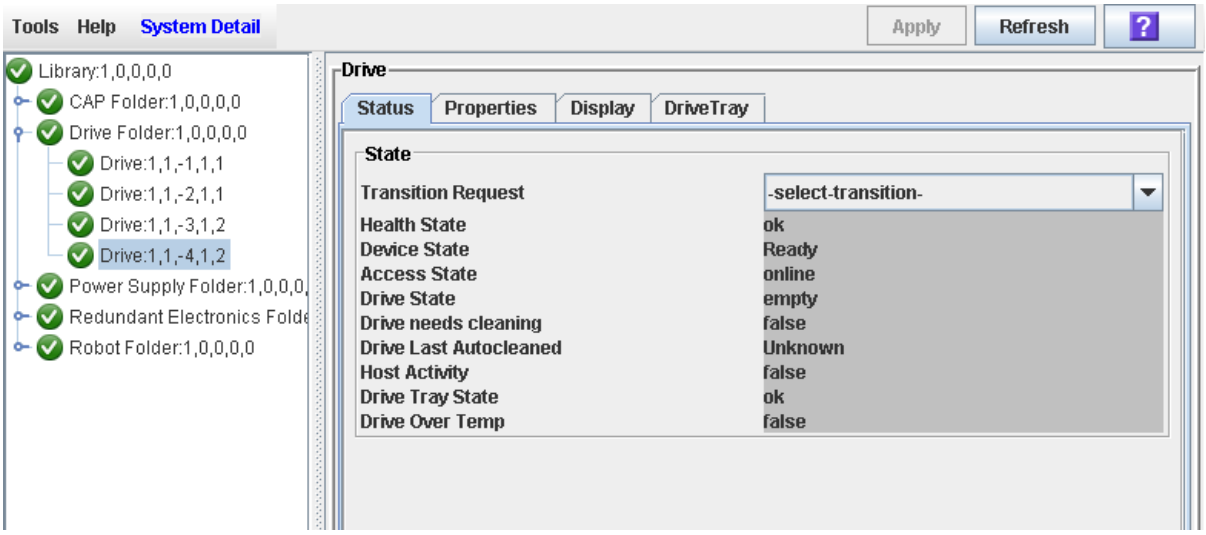
Task Purpose

Use this procedure to display the current cleaning status of a drive.

Task Steps

1. **Select Tools > System Detail.**
2. **Expand the Drive Folder in the navigation tree, and highlight the drive you want to display.**

   The **Drive Status** page appears.



Screen Fields

The following fields relate to drive cleaning.

Drive needs cleaning

Indicates whether the drive has issued an unfulfilled cleaning request. Options are:

- **true**: Drive needs cleaning.
- **false**: Drive does not need cleaning.

Drive Last Autocleaned

Date and time when the drive was last cleaned using the library auto clean feature.

The field indicates "Unknown" if either of these are true:

- The library auto clean feature is not enabled.
- The drive was last cleaned using the host tape management software (ACSLS or ELS).

If the library auto clean feature is not enabled or if the drive was last cleaned using the host tape management software (ACSLS or ELS), the field indicates "unknown."

▼ Clean a Drive Manually

Task Tool

This task can be performed at either of the following:

- Local operator panel
- Standalone SL Console
- Web-launched SL Console

Task Purpose

Normally, either the library auto clean feature or the host tape management software (ACSLS or ELS) manages drive cleaning. However, there may be occasions when you need to perform a manual clean.

> **Caution –** Cleaning a drive before it is due is not recommended. Excessive drive cleaning can wear out a drive head prematurely.

Task Steps

1. **Display the drive status to verify that it needs cleaning.**

   See "Display Drive Cleaning Status" on page 465 for detailed instructions.

2. **Display a list of cleaning cartridges.**

   See "Display Cleaning Cartridges" on page 463 for detailed instructions.

   Your library could contain more than one type of drive. Verify there is a compatible cleaning cartridges for the drive.

3. **Move a compatible cleaning cartridge from a system cell to the drive that needs cleaning.**

   See "Move a Cartridge From a Specified Location" on page 443 for detailed instructions.

4. **Display the status of the cleaning operation on the Drive Clean Status Console.**

   See "Display Drive Cleaning Status" on page 465 for detailed instructions.

5. **When the cleaning operation is complete, move the cleaning cartridge from the drive back to a system cell.**

   See "Move a Cartridge From a Specified Location" on page 443 for detailed instructions.

12

Robot and Power Supply Management

This chapter includes the following topics:

TallBots

The library TallBot moves cartridges throughout the library storage slots, tape drives, and CAPs. It also performs audits of the library.

The TallBot is included with the base module and is accessible from the front of the rack, or through the optional Access Expansion Module (AEM). The three main components of the TallBot are:

- X table assembly: Provides 180-degree lateral motion
- Z drive assembly: Provides vertical motion
- Hand assembly: Includes the following components:
  - Grippers to carry cartridges
  - Laser bar-code scanner to calibrate position and read cartridge labels
  - Proximity sensor to detect empty storage cells and unlabeled cartridges

See "Robot Monitoring Tasks" on page 471 for details about displaying and managing robot status and other information.

SCSI FastLoad Feature

Note – This feature is available starting with SL3000 firmware version FRS_2.33 and SL Console version FRS_4.47.

Note – This feature applies only to libraries with FC-SCSI host connections. It is not applicable to libraries that have only HLI (TCP/IP) host connections.

SCSI FastLoad is an optional feature which can enable faster mount and dismount operations for libraries or partitions with FC-SCSI host connections.

Normally with the SCSI interface, a cartridge mount is considered complete only when the drive indicates that it is ready for read/write operations. This can result in the robot standing idle for several seconds between mount/dismount requests while it waits for the cartridge to load and thread in the drive.

When SCSI FastLoad is enabled, a cartridge mount is considered complete as soon as the drive indicates that it has accepted the cartridge. As soon as the robot puts the cartridge in the drive, the robot is released and the library returns a success status to the host. The robot is immediately available to process the next library request.

The advantage of the FastLoad feature is that it allows for faster activity in the library. However, if a cartridge fails to load after the robot has been released, it is up to the FC-SCSI host to move the cartridge from the drive back to the source element.

In a partitioned library, the FastLoad feature can be enabled or disabled separately for each FC-SCSI partition.

For detailed instructions on enabling the FastLoad feature, see the following procedures:

- "Configure SCSI FastLoad in a Non-Partitioned Library " on page 472
- "Configure SCSI FastLoad for a Partition" on page 474

Robot Procedures

For detailed robot management procedures, see "Robot Monitoring Tasks" on page 471.

Power Supplies

The SL3000 provides full redundancy for tape drives, robotics units, and electronics. The following redundancy options are available:

- N+1
- 2N
- 2N+1

> **Note –** The second power distribution unit (PDU) supports N+1 for tape drives and electronics only, not robotics.

The following power source options are available:

- 120–127 VAC, single phase (not available with the redundant robotics feature)
- 200–240 VAC, single phase

See "Power Options" on page 48 for additional details.

Power Supply Procedures

For detailed power supply procedures, see "Power Supply Monitoring Tasks" on page 479.

Robot Monitoring Tasks

▼ Configure SCSI FastLoad in a Non-Partitioned Library

Task Tool

This procedure can be performed at any of the following:

- Local operator panel
- Standalone SL Console
- Web-launched SL Console

Task Purpose

Use this procedure to configure the SCSI FastLoad feature for an FC-SCSI library. For details on this feature, see "SCSI FastLoad Feature" on page 469.

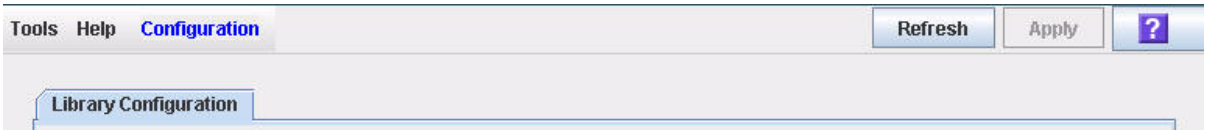
> **Note –** This procedure applies only to libraries with FC-SCSI host connections that are not partitioned. It is not applicable to libraries that have only HLI (TCP/IP) host connections. For partitioned libraries, see "Configure SCSI FastLoad for a Partition" on page 474.

> **Note –** This feature is available starting with SL3000 firmware version FRS_2.33 and SL Console version FRS_4.47.

Task Steps

1. **Select Tools > Configuration.**

   The **Library Configuration** page appears.

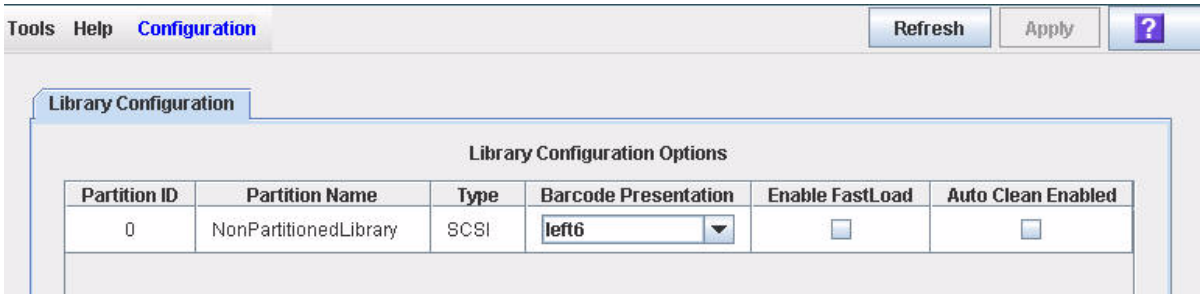


2. **Use the Enable FastLoad Feature check box to indicate whether you want to enable the FastLoad feature for the entire library.**

   > **Note –** The Partition Name "scsi0" indicates a non-partitioned library.

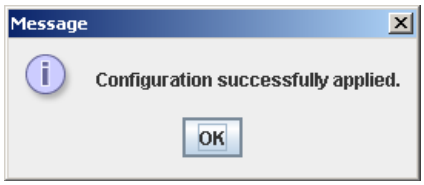
   Check box settings are as follows:

   - **Checked**: Turns SCSI FastLoad on. A cartridge mount is considered complete as soon as the drive indicates that it has accepted the cartridge.
   - **Unchecked**: Turns SCSI FastLoad off. A cartridge mount is considered complete only after the cartridge has been loaded and threaded in the drive and the drive indicates that it is ready for read/write operations. This is the default setting.



3. **Click Apply.**

   A confirmation message appears. The new SCSI FastLoad feature setting is effective immediately. The library does not need to be rebooted.



4. **Click OK to dismiss the message.**

▼ Configure SCSI FastLoad for a Partition

Task Tool

This procedure can be performed at any of the following:

- Local operator panel
- Standalone SL Console
- Web-launched SL Console

Task Purpose

Use this procedure to configure the SCSI FastLoad feature for an FC-SCSI library. For details on this feature, see "SCSI FastLoad Feature" on page 469.

You can enable or disable SCSI FastLoad separately for each partition.

> **Note –** This procedure applies only to libraries with FC-SCSI host connections that are partitioned. It is not applicable to libraries that have only HLI (TCP/IP) host connections. For non-partitioned libraries, see "Configure SCSI FastLoad in a Non-Partitioned Library" on page 472.

> **Note –** This feature is available starting with SL3000 firmware version FRS_2.33 and SL Console version FRS_4.47.

Task Steps

1. **Select Tools > Configuration.**

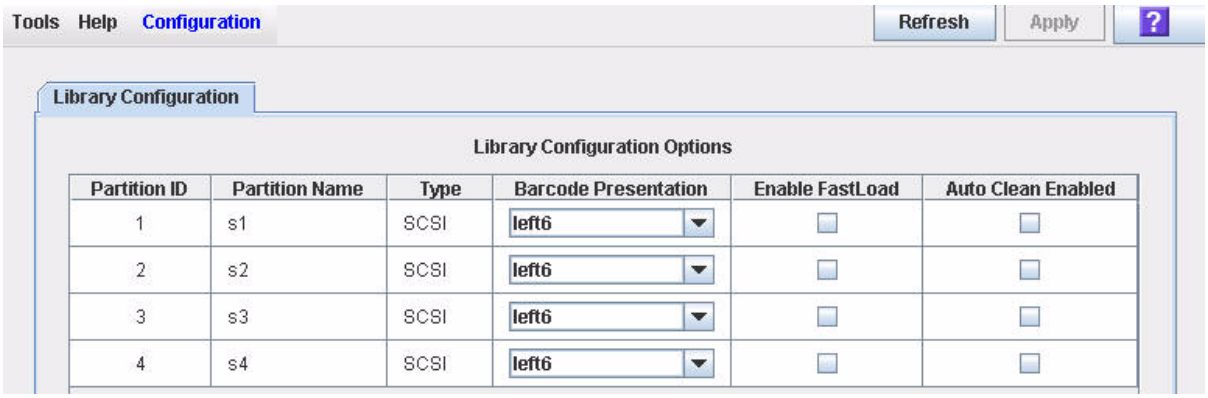
   The **Library Configuration** page appears.

2. **Use the Enable FastLoad Feature check box for each partition to indicate whether you want to enable the FastLoad feature. You can use multiple checkboxes to indicate settings for more than one partition at a time.**

   Check box settings are:

   - **Checked**: Turns SCSI FastLoad on. A cartridge mount is considered complete as soon as the drive indicates that it has accepted the cartridge.

- **Unchecked**: Turns SCSI FastLoad off. A cartridge mount is considered complete only after the cartridge has been loaded and threaded in the drive and the drive indicates that it is ready for read/write operations. This is the default setting.



3. **Click Apply.**

   A confirmation message appears. The new SCSI FastLoad settings are effective immediately. The library does not need to be rebooted.

4. **Click OK to dismiss the message.**

▼ Display Robot Summary Information

Task Tool

This procedure can be performed at any of the following:

- Local operator panel
- Standalone SL Console
- Web-launched SL Console

Task Purpose

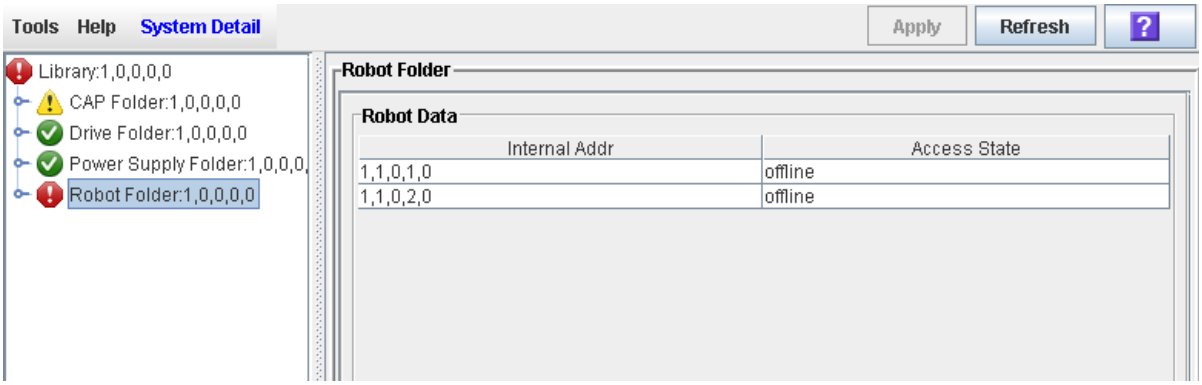
Use this procedure to display summary information for the library robots.

> **Note –** This information is also available through **Reports > Robot Summary**. See "Display a Library Report" on page 90 for detailed instructions.

Task Steps

1. **Select Tools > System Detail.**
2. **Click the Robot folder on the navigation tree.**

   The **Robot Data** page appears.



▼ Display Robot Status

Task Tool

This procedure can be performed at any of the following:

- Local operator panel
- Standalone SL Console
- Web-launched SL Console

Task Purpose

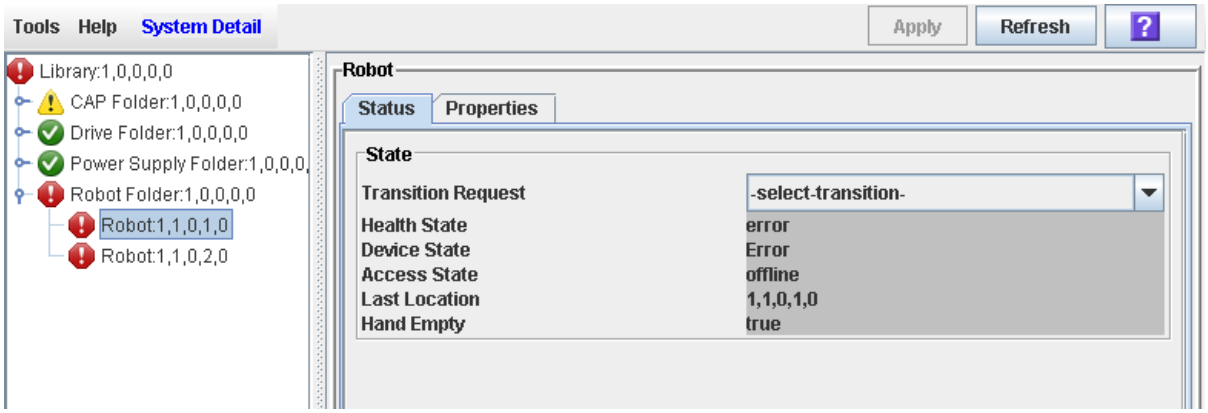
Use this procedure to display the current operational state of a robot.

> **Note –** This information is also available through **Reports > Robot Details**. See "Display a Library Report" on page 90 for detailed instructions.

Task Steps

1. **Select Tools > System Detail.**
2. **Expand the Robot Folder in the navigation tree, and click the robot you want to display.**
3. **Click the Status tab.**

   The page displays the current status of the selected robot.



▼ Display Robot Properties

Task Tool

This procedure can be perform ed at any of the following:

- Local operator panel
- Standalone SL Console
- Web-launched SL Console

Task Purpose

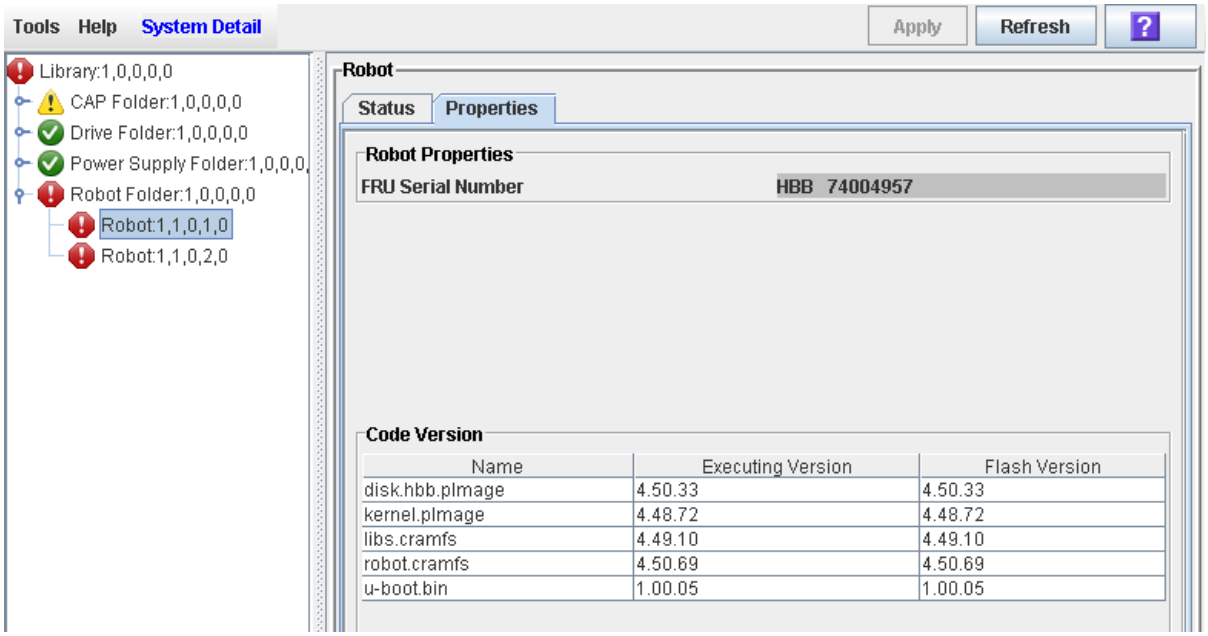
Use this procedure to display detailed robot c onfiguration information, including the serial number and current firmware levels.

> **Note –** This information is also available through **Reports > Robot Details**. See "Display a Library Report" on page 90 for detailed instructions.

Task Steps

1. **Select Tools > System Detail.**
2. **Expand the Robot Folder, and click the robot you want to display.**
3. **Click the Properties tab.**

   The **Properties** page appears.



Power Supply Monitoring Tasks

▼ Display Power Supply Summary Information

Task Tool

This procedure can be performed at any of the following:

- Local operator panel
- Standalone SL Console
- Web-launched SL Console

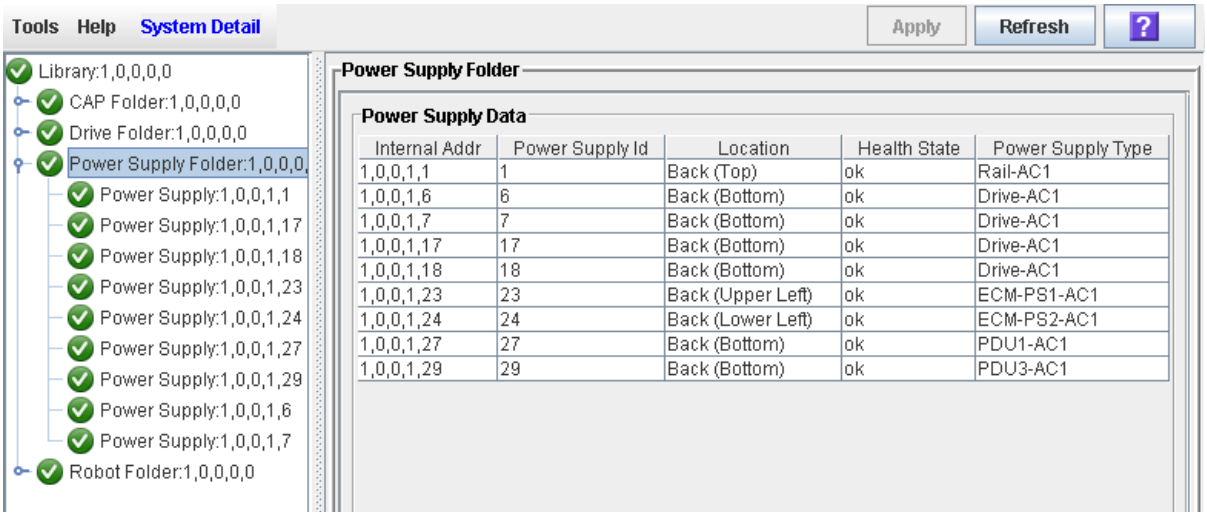
Task Purpose

The Power Supply Data screen displays summary information for all power supplies in the library. You can use this screen to monitor the status of the power supplies.

By default, the display is sorted by power supply internal address. Optionally, you can change the sort order, and rearrange and resize the columns. See "Modifying the Screen Layout" on page 62.

Task Steps

1. **Select Tools > System Detail.**
2. **In the Library navigation tree, click the Power Supply Folder.**
3. **The Power Supply Folder page displays.**



Internal Addr	Power Supply Id	Location	Health State	Power Supply Type
1,0,0,1,1	1	Back (Top)	ok	Rail-AC1
1,0,0,1,6	6	Back (Bottom)	ok	Drive-AC1
1,0,0,1,7	7	Back (Bottom)	ok	Drive-AC1
1,0,0,1,17	17	Back (Bottom)	ok	Drive-AC1
1,0,0,1,18	18	Back (Bottom)	ok	Drive-AC1
1,0,0,1,23	23	Back (Upper Left)	ok	ECM-PS1-AC1
1,0,0,1,24	24	Back (Lower Left)	ok	ECM-PS2-AC1
1,0,0,1,27	27	Back (Bottom)	ok	PDU1-AC1
1,0,0,1,29	29	Back (Bottom)	ok	PDU3-AC1

▼ Display Power Supply Detail

Task Tool

This procedure can be performed at any of the following:

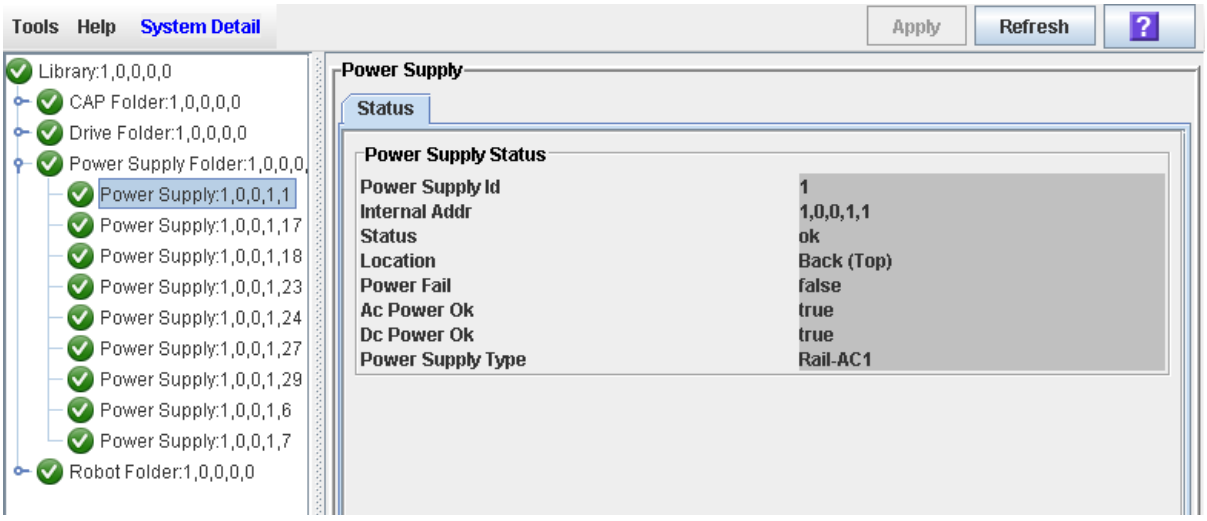
- Local operator panel
- Standalone SL Console
- Web-launched SL Console

Task Purpose

The Power Supply Status screen displays detailed information for a selected power supply. You can use this screen to determine whether the power supply is in need of maintenance or replacement.

Task Steps

1. **Select Tools > System Detail.**
2. **In the Library navigation tree, expand the Power Supply Folder.**
3. **Click the power supply you want to display.**
4. **The Status screen displays.**



13

SL Console Diagnostics and Utilities

The StorageTek Library (SL) Console enables you to perform many diagnostic tasks, including library self-tests and firmware upgrades.

This chapter includes information on the following:

Library Events

The library controller continually monitors library operations and logs all events.

Event Monitors

The system stores event monitors under the following three headings:

- Communication events: Includes host-to-library, library-to-library, and library-to-drive communications.
- Error event: Each error event is assigned a four-digit (hexadecimal) action code.
- Warning events: Indicate a loss of performance or conditions that may be indicative of future fatal errors.

You or your Oracle support representative can use the SL Console to review library events. Also, you can spool event data to a text file with the SL Console.

The following information can help you diagnose the cause of the event:

- Date/time stamp: Identifies when the event occurred.
- Action codes: Identifies the command that was issued, such as "load drive."
- Result codes: Identify the result of the requested action. To look up a result code, see "List a Result Code" on page 505.

- Known service plan diagnosis: Identifies the mechanism or component responsible for the task or fault.

TABLE 13-1 Event Codes

Event Type	Description	Valid Codes
Activity Code	Activity associated with the event. For example, HLI host mount, diagnostic fetch, robot communication diagnostic.	0000: no action / no activity 0100199: common/shared activity (across devices and the controller) 0200–0299: common/shared activity (across devices - robot, drive, and so on) 0400–0499: common/shared configuration activity 1000–1999: host interface activity 2000–2999: management interface activity 3000–3999: internal server/library activity 4000–4999: partner library-initiated activity 5000–5999: robot activity 6000–6999: drive activity 7000–7999: CAP activity 8000–8999: elevator activity

TABLE 13-1 Event Codes

Result Code	Reason for the activity. For example, Activity: HLI host mount Result: robot X cartridge fetch failure	0000: no problem / normal 0100–0199: common/shared results (across devices and the controller) 1000–1999: host interface results 2000–2999: management interface results 3000–3999: internal server/library controller results 4000–4999: partner library interface results 5000–5999: robot results 6000–6999: drive results 7000–7999: CAP results 8000–8999: elevator results
Severity	Identifies the significance of the event from the perspective of the activity associated with the event. The severity levels also identify log activity that must persist in the system across machine power cycles from that which might be considered volatile.	**Error (1)**: Indicates a fault occurred which prevented a request (host or diagnostic) from completing successfully. Error data is non-volatile and accumulates across machine power cycles. **Warning (2):** Indicates a fault occurred, but the fault has not stopped the library's ability to complete requests (host or diagnostic). Warning data is non-volatile and accumulates across machine power cycles. **Information (3):** Indicates data that is not significant, but may be important to establish a history of activity around a severity 1 or 2 event. Information data is volatile. **Configuration (4)**: Indicates change in the library's configuration. This includes the addition and removal of drives, robots, controllers, and interface cards. This also includes changes to the software configuration. Configuration data are non-volatile resources and accumulate across machine power cycles. **Diagnostic (5)**: Records normal diagnostic activity tracing. This is independent of the debug or trace activity when a diagnostic activity affects the availability of drives or other devices to host operations. Diagnostic data is volatile.
Request Identifier	Identifies all host interface requests. Helps track the sequence of log activity resulting from each host request.	

Library Firmware Upgrades

The library firmware resides on the library controller. Initial firmware is installed at the factory. Library firmware does not contain drive code upgrades. When new firmware is released, you must use the code load utility to upgrade the firmware on the library and associated devices (rotational or AEM CAP and robot).

Firmware Upgrade Process

The steps for loading firmware code on the library controller are as follows:

1. Locate the firmware upgrade package (`.jar` file) on the Oracle download site. See "Firmware Download Site" on page 486.
2. Download the code to a folder on your local PC or workstation.
3. Download the firmware package from your PC or workstation to the library controller. This process also unpacks the package after downloading to make it ready for activation. See "Download Code to the Library Controller" on page 508.
4. Activate the downloaded code on the library controller. See "Activate Code on the Library Controller" on page 513.
5. Reboot the library to make the code operational. See "Download Code to the Library Controller" on page 508.

Firmware Download Site

The SL3000 library firmware package is a `.jar` (Java Archive) file. The file is available at the Oracle Software Delivery Cloud at the following URL:

`http://edelivery.oracle.com/`

Multiple Versions of Firmware

You can store up to two versions of the SL3000 firmware in the library controller flash memory. By storing two versions:

- The library can continue normal operations and run one version of firmware, while you download and unpack an upgrade package. Then you can activate the upgrade at a time that is convenient for library users.
- You can revert to a previous version of firmware without having to download and unpack the code package again.

Upgrades and Redundant Electronics

Note – This feature is available starting with SL3000 firmware version FRS_3.0 and SL Console version FRS_5.00.

Firmware upgrades for libraries with the Redundant Electronics feature are minimally disruptive to library operations. New code loads simultaneously on the active and alternate controller cards and on all devices. The system activates the code, and reinitializes the active

and alternate controllers, and most devices. In most circumstances, robot initialization is bypassed. During the upgrade process, the library continues normal operations without interruption.

For details about this feature, see "Redundant Electronics Management" on page 367.

Related Procedures

For detailed firmware upgrade procedures, see "Library Utility Tasks" on page 507.

Library Self-Tests

The self-test diagnostic utility is intended to help diagnose basic problems with the library. A self-test typically runs after the library is installed. The test also can be run whenever necessary.

You can run library self-test routines in either non-disruptive or disruptive mode. In non-disruptive mode, all cartridges used in the test are returned to their original locations. Disruptive mode may leave cartridges in a different location from where they started.

When performing a self-test, the system:

1. Checks the communication path between the library controller, drives, and robots.
2. Performs get and put operations to check the health of the robots and rotational or AEM CAPs. This includes get and put operations from a reserved system cell to a random empty storage cell or CAP cell.
3. Performs a full library audit.
4. Performs mounts and dismounts of diagnostic cartridges for all the drives installed in the library. The self-test does not begin unless a diagnostic cartridge is found in the system cells. If the system finds a compatible diagnostic cartridge, the self-test repeats for each drive type. If the system does not find a diagnostic cartridge for a drive type, the system skips the mount/dismount operation for the drive.

Related Procedures

For detailed procedures, see "Library Utility Tasks" on page 507.

Diagnostic Cartridge Management

Library self-tests and some other diagnostic activities require the use of diagnostic cartridges. Ensure the library contains a sufficient number of diagnostic cartridges for these activities.

Diagnostic cartridge volume IDs (VOLIDs or volsers) must be eight characters in length, with "DG" as the first two characters. The library import/export function works only for diagnostic cartridges with labels in this format.

The system stores diagnostic cartridges in reserved system cells which the library controls. Host library applications cannot access diagnostic cartridges. The number of system cells available for diagnostic cartridge storage varies, depending on the configuration of your library. See "Reserved System Cells" on page 625 for details.

CAP Import/Export Screen

You can use the **Diagnostics > CAP > Import/Export** screen to import and export:

- Diagnostic cartridges. See "Importing and Exporting Diagnostic Cartridges" on page 489 below.
- Cleaning cartridges ONLY IF the library is configured to use the library auto clean function. See "Library Auto Clean" on page 448 for complete details.

Importing and Exporting Diagnostic Cartridges

Diagnostic cartridges are available for library diagnostic activities only you when enter them into the library using the SL Console Import function. See "Import Diagnostic Cartridges" on page 533 for detailed instructions.

Any diagnostic cartridges entered with the host tape management software (ACSLS or ELS) are stored in data cells and cannot be used for library diagnostic activities.

To remove diagnostic cartridges from the library, use the SL Console Export function.See "Export Diagnostic Cartridges" on page 536 for detailed instructions. You can choose to export all diagnostic cartridges or selected ones.

> **Note –** The command line interface (CLI) also provides diagnostic cartridge import and export commands accessible to your Oracle support representative.

Related Procedures

For detailed procedures, see "Diagnostic Cartridge Management Tasks" on page 532.

Audits

During an audit, the system reads and catalogs cartridges within a library, and verifies the locations of cartridges or validates a range of slot locations. The library controller maintains a cartridge database that contains the following information for all the cartridges in the library:

- Volume ID (VOLID or volser)
- Current location (in library internal address format)
- Verified status (true or false)

The library audits all cartridge locations in the storage and reserved areas at the following times:

- After one or both access doors have been opened and closed
- An audit request is made through the SL Console
- A host request to audit the library is entered

You can use the SL Console to perform the following types of audits:

- "Physical Audit" on page 491
- "Verified Audit" on page 491

Caution – System-level problems may occur if a host's record of the cartridge does not match what is in the cartridge database of the library controller.

Audit Indicator

Note – The audit indicator feature is available starting with SL3000 firmware version FRS_3.60 and SL Console version FRS_5.60.

The SL Console displays a spinning visual indicator and the message "Audit in progress" to indicate an audit is in progress. The audit indicator displays:

- Whenever a library access door has been opened and closed
- In libraries with an AEM, whenever the AEM access door is closed

The indicator may also display during power up in libraries with redundant electronics or after a reboot.

When you see the audit indicator at the bottom of the screen along with the message "Audit in progress," do not open the library access door. Otherwise, the library must start the audit process from the beginning.

Note – The audit indicator does not display for audits you initiate through the SL Console or the host.

Physical Audit

In a physical audit, the robot visits cartridge locations and verifies the VOLID of resident cartridges. The library controller updates the cartridge database based on the physical audit. This audit changes the "verified" status of the cartridge locations to "True." Audit times vary according to the size of the library. Audits take approximately 1/2 second per cartridge slot, per TallBot.

The library performs a physical audit at the following times:

- At library power-up, or when a library access door has been opened and closed. This is always a full audit of the entire library.
- In libraries with an AEM, whenever the AEM access door is closed. This is a full audit of the AEM.
- When initiated manually from the SL Console. The following are the two types of manually initiated physical audits.
  - Entire library audit: The robot:
    - Visits all cells (storage, rotational and AEM CAP, and drive)
    - Catalogs the VOLIDs and locations
    - Updates the library controller cartridge database

    This audit is a background process, meaning it does not interrupt online library operations. See "Audit the Entire Library" on page 543 for details.
  - Specific range audit: The robot visits only a specific range of cells (storage, rotational or AEM CAP, and drive) and updates the library controller cartridge database. The audit information is displayed on the SL Console while the audit is performed. See "Audit a Range of Cells" on page 545 for details.

Verified Audit

A verified audit validates the status of a specific cartridge location or range of locations (including rotational and AEM CAPs and drives) in the cartridge database. If a cartridge address has a verified status of "false," a physical audit of that location is performed and the cartridge database is updated. The progress of the audit is displayed in the Audit Console section of the SL Console. See "Perform a Verified Audit" on page 548 for details.

Related Procedures

For detailed procedures, see "Audit Tasks" on page 542.

Robot Diagnostic Moves

Diagnostic moves are used to monitor or diagnose a problem with a robot. The move can be performed with or without cartridges.

Successful diagnostic moves do not rearrange the cartridges in the storage cells. Instead, the system returns cartridges to their original locations after the diagnostic move completes. However, some diagnostic move failures can cause cartridges to be left in new locations.

A diagnostic move involves the following elements:

- "Target Address Range" on page 492
- "Pool Address Range" on page 492
- "Move Access Order" on page 493
- "Robot Selection" on page 493

Target Address Range

The system performs the get operation in a diagnostic move within a target address range of the library. There are two types of access orders for a target address:

- "Sequential Access Order" on page 493
- "Random Access Order" on page 493

Valid target address types are:

- Storage cells: Reserves storage locations as the target/pool range
- CAP: Reserves cells in a rotational or AEM CAP as the target/pool range
- Drive and storage cells: Reserves drives and storage cells as the target/pool range
- System cells: Reserves system cells, which contain cleaning or diagnostic cartridges, as the target/pool range
- All: Reserves storage cells, system cells, rotational or AEM CAP cells and drives as the target/pool range

> **Note –** Selecting the Storage, CAP, Drive, System, or All option does reserve all the associated locations as the target range. However, only the location currently being accessed by the robot for a get/put operation is unavailable to the host.

Pool Address Range

The system uses the pool address range locations to supply cartridges required for diagnostic moves to and from the target address range. Also, the system uses a pool address in a get operation if a target address does not contain a cartridge.

There is no specified access order within the pool address range. The pool address ranges do not and cannot include drive locations.

Move Access Order

Sequential Access Order

In a diagnostic move with a sequential access order, the robot performs a get operation starting with the first location in the target address ranges. The robot continues visiting the locations sequentially through the range until it completes the requested number of moves.

> **Note –** If you choose not to move cartridges, the get/put operations are not performed. In such a case, the robot positions itself at the target and pool addresses.

Random Access Order

In a diagnostic move with a random access order, the robot randomly picks a location in the target address range to get a cartridge. The robot can also visit the same location in the in the target address range multiple times to get a cartridge. The random access routine ends after the requested number of moves is complete.

If you choose not to move cartridges the get/put operations are not performed. The robot just positions itself at the target and pool addresses.

Robot Selection

The system chooses a robot for the diagnostic move based on the minimum and maximum ranges you set for the target and pool addresses. Multiple robots maybe selected if the address range requires it.

Diagnostic Move Control Functions

The following TABLE 13-2 lists the options available to manage moves that are currently open.

TABLE 13-2 Menu Options for Open Diagnostic Moves

To	Select Menu Option	Notes
Start	File > Start Sequence	
Pause	File > Pause Sequence	Stops all diagnostic moves, but maintains the current location in the access order
Stop	File > Stop Sequence	Stops a running or paused exerciser
Resume	File > Start Sequence	Resumes a paused exerciser starting with the last known location in the target address range
Clear the messages displayed in the monitor window	File > Clear Output Window	Erases the previous message lines and continues to fill the screen with new messages
Spool	Spool File > Start Spooling	Directs the move output to a file
Stop spooling the exerciser output to a file	Spool File > Stop Spooling	Stops directing the move output to the spool file

Note – If multiple diagnostic moves are open, each move has its own monitor screen.

Related Procedures

For detailed procedures, see "Robot Utility Tasks" on page 562.

Troubleshooting

Before you run diagnostic tests, check the following areas of the library by using the following troubleshooting tips in the following TABLE 13-3.

TABLE 13-3 Troubleshooting Tips Prior to Running Diagnostic Tests

Problem	What to do
Service Required (amber) LED is constantly on.	Using the SL Console, check the health of the library and the attached devices (drives, rotational and AEM CAPs, and robots). See "StorageTek Library Console" on page 59 for more details about operations. To perform a health check: 1. Log in to the SL Console application. 2. Access the System Detail module, View > System Detail. 3. Check the navigation tree for the following indicators: • Device Healthy • Device Error Additional checks: • Check the Status (for example, online/offline) and Statistics (for example, uptime, downtime, errors and warnings) tabs for more information on the health of the library and devices. • Make sure the cartridges are fully seated and properly oriented in their storage cells. • Inspect the X table for any foreign objects or debris and remove them if found.
CAP Open LED is on and blinking.	Open the rotational or AEM CAP and make sure the cartridges in the CAP cells are properly seated.
The SL Console does not display modified data or information remains static.	Check the SL Console Heartbeat icon.

TABLE 13-3 Troubleshooting Tips Prior to Running Diagnostic Tests

Problem	What to do
Robot Fault or Library Fault Amber LED is constantly on.	1. Check the SL Console for any displayed error messages. Write down the error messages reported. 2. Open the front door. Observe and note the state of the cartridges, hand, and tape drives. 3. Make sure cartridges are fully seated and properly oriented in their storage cells. 4. Make sure packing materials have been removed. 5. Inspect the library floor for any objects or debris. If there are any , remove them. 6. Check the status of the tape drives. 7. Close the front door. 8. Make sure the tape drives are fully seated and locked forward by pushing and pulling on the rear of the drive tray. Any motion of the tray indicates that it requires reseating and locking down.
Tape drive is unable to eject a cartridge.	Manually remove the cartridge from the tape drive. See "Remove a Cartridge from a Tape Drive" on page 421.
The client computer cannot communicate with the library or tape drives.	Make sure cables are securely attached to their connectors on the rear of the library, the tape drives, and the client computer .
The library is unable to communicate with the drives. Drive status on the SL Console displays Not communicating.	Make sure cables are securely attached to their connectors on the rear of the library, the drives, and the client computer .
Repeated or excessive drive cleanings or cleaning messages.	1. Replace the cleaning cartridge with a new cleaning cartridge. 2. Run the Library Self-Test and note if errors are reported for the drive. 3. Run any client computer-based drive diagnostic tests.

Diagnostic Support Files

The library maintains the MIB File and the Library Log Snapshot File to aid in troubleshooting and problem diagnosis. Depending on circumstances, your Oracle support representative can capture and transfer these files, or request that you do so.

MIB File

The Management Information Base (MIB) file is an SNMP database used to manage your library devices. This file can be saved as a text file. See "Transfer the Library MIB File" on page 521 for detailed instructions.

Library Log Snapshot File

Note – This feature is available starting with SL3000 firmware version FRS_2.30 and SL Console version FRS_4.30.

The Library Log Snapshot File is an encrypted snapshot of the library event log. You cannot view or edit this file. This file is available for only 15 minutes from the time it is generated. See "Generate and Transfer the Library Log Snapshot File" on page 524 for detailed instructions.

Related Procedures

For detailed procedures, see "Library Utility Tasks" on page 507.

Diagnostic and Utility Tasks

Library diagnostic and utility tasks are divi ded into the following categories:

Event Monitor Tasks

▼ Display an Event Monitor

Task Tool

This task can be performed at any of the following:

- Local operator panel
- Standalone SL Console
- Web-launched SL Console

Task Purpose

Event monitors are useful tools for root cause analysis of errors. If the library is experiencing reproducible errors, you can open an event monitor and spool all events to a file to capture the data. Later, you can send the file to your Oracle support representative for analysis.

Event monitor information is dynamically updated depending upon the occurrence of selected events. The information sent during an e-mail, print, save, or spool operation reflects the data (and format) shown on-screen at the time the operation is requested.

> **Note –** To monitor multiple events, see "Display Multiple Monitors" on page 502.

Task Steps

1. **Select Tools > Monitors.**
2. **Expand the Permanent Monitors folder in the navigation tree.**

   The system displays the library monitors accessible to you.
3. **Click the event monitor you want to use, and then click the Open button in the upper right corner.**

   The system displays the associated data collected for the event.
4. **Manage the information displayed on the screen for the event selected using the appropriate options.**

   The following TABLE 13-4 lists the options available and how to access them.

TABLE 13-4 Options for Managing Event Monitor Information

To	Select
Pause the continuous display of data related to the event selected	Monitor > Pause
Resume displaying the events	Monitor > Resume
Permanently stop the continuous display of data related to the event selected	Monitor > Stop
Clear the event monitor display	Monitor > Clear

5. **To close a monitor, click the X in the upper right corner of the window.**

▼ Spool Event Monitor Data to a File

Task Tool

This task can be performed at any of the following:

- Local operator panel
- Standalone SL Console
- Web-launched SL Console

Task Purpose

Use this procedure to spool and save event monitor data to a file. You can send the file to your Oracle support representative to assist in diagnosing problems.

Task Steps

1. **Select Tools > Monitors.**
2. **Expand the Permanent Monitors folder in the navigation tree.**

   The system displays the library monitors accessible to you.
3. **Click the event monitor you want to use, and then click Open in the upper right corner.**

   The system displays the event monitor window.
4. **In the event monitor window, select Spool File > Start Spooling.**

The **Save** dialog box appears.

5. **Browse to the directory where you want to save the file. In the File Name field, enter the file name, and click Save.**

   All event data is spooled to the specified file.
6. **To stop spooling, select Monitor > Stop Spooling.**

   Following is a sample of the spool file:

```
2008-05-29T11:23:27.448  0,1,0,0     root  default       internal       281
warn   0  rb_Reboot::reboot(): Resetting drive [0,3,4,9]
2008-05-29T11:23:27.760  0,1,0,0     root  default       internal       281
info   0  Service Beacon is ACTIVE: Current Health Event indicates Drive 04 in
Module 03 is not operational
2008-05-29T11:23:53.211  0,1,0,0     root  default       internal       281
info   0  Service Beacon is ACTIVE: Current Health Event indicates Drive 04 in
Module 03 is operational
```

▼ Display Multiple Monitors

You can open and manage multiple event monitors using the selections from the Options Bar shown in the following TABLE 13-5.

TABLE 13-5 Options for Opening and Managing Multiple Event Monitors

To	Select
Custom arrange the open monitors on screen	Window > Arrange
Arrange the event monitor windows horizontally	Window > Tile Horizontal
Arrange the event monitor windows vertically	Window > Tile Vertical
Stack the event monitors	Window > Cascade

▼ List a Device Status Code

Task Tool

This task can be performed at either of the following:

- Local operator panel
- Standalone SL Console
- Web-launched SL Console

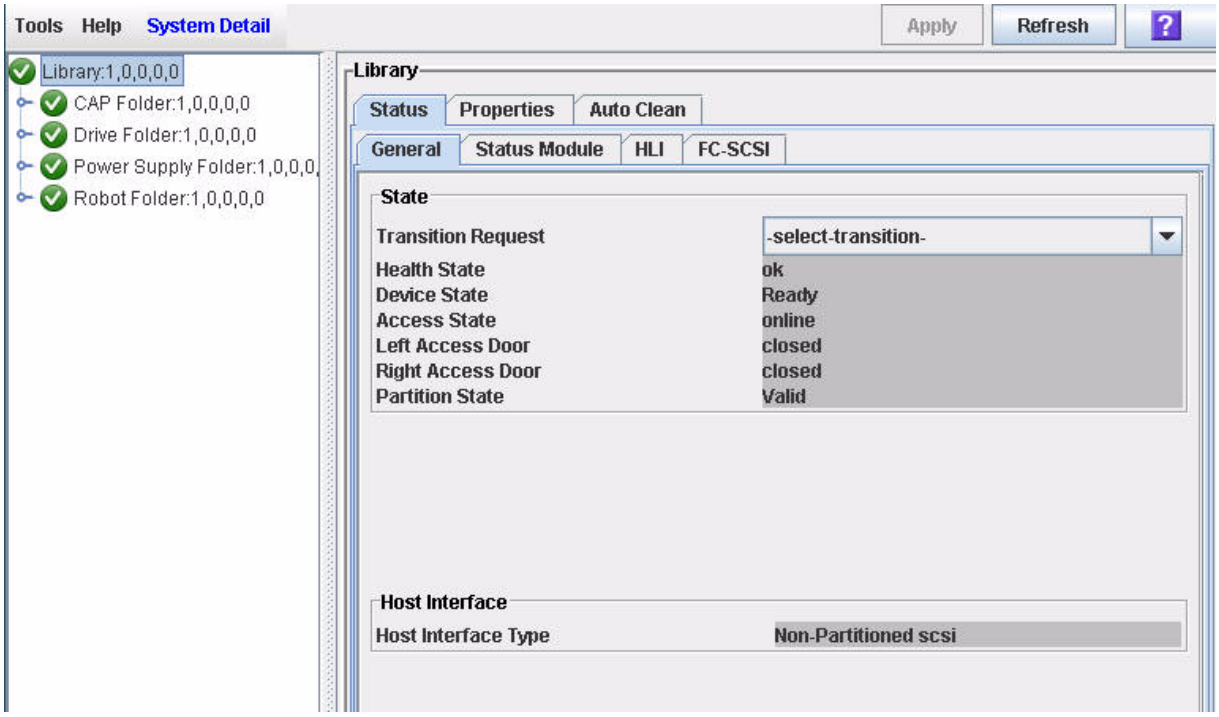
Task Purpose

Use this procedure to list device status codes and their descriptions.

Task Steps

1. **Select Tools > Diagnostics.**
2. **Click the Library folder in the navigation tree.**

   The **Library** page appears.



3. **Click the Search tab.**

   The **Search** page appears.

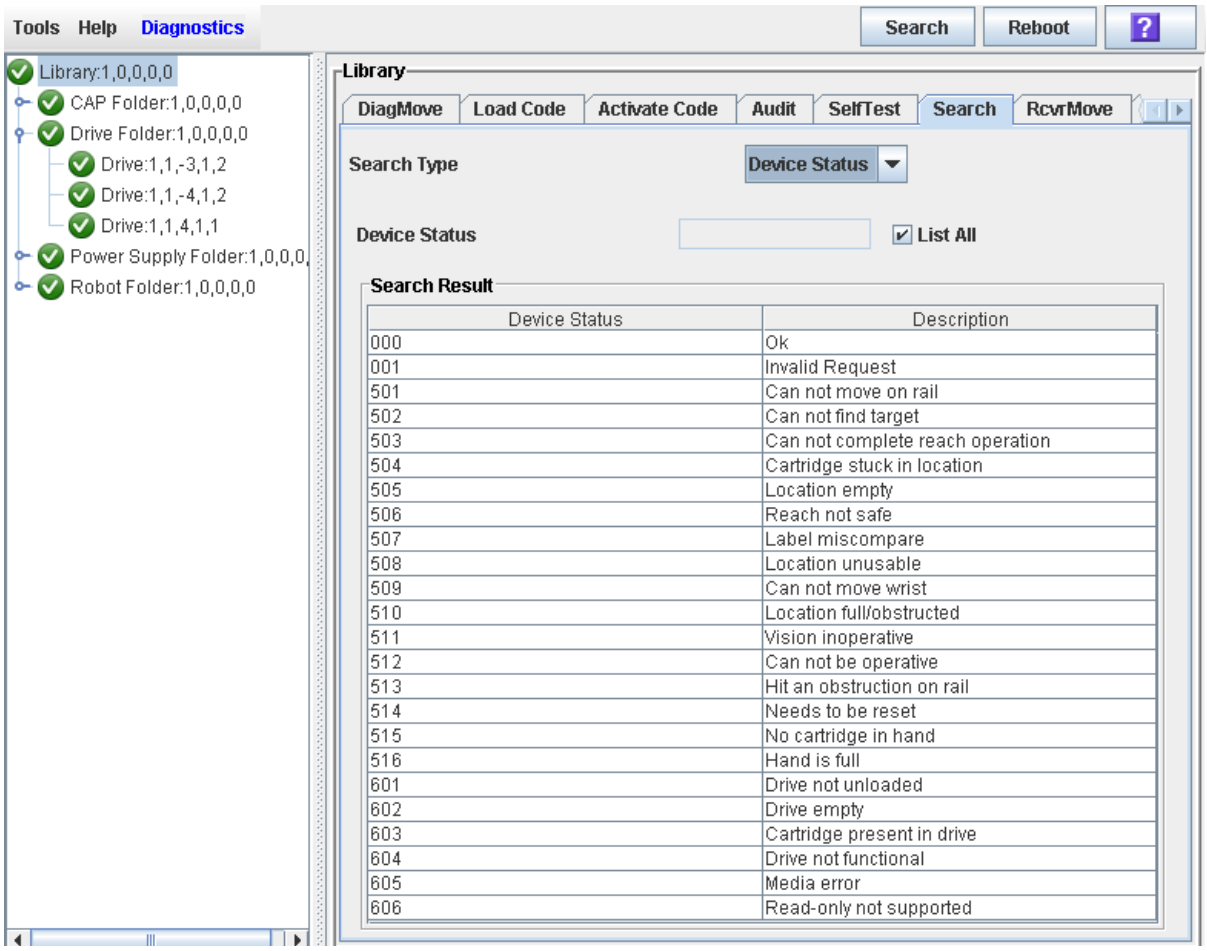
4. **In the Search Type list, select Device Status.**
5. **Complete the Device Status field, as follows:**

   - To search for a specific device status code, enter the complete code. Wildcards or partial codes are not accepted.

- To list all device status codes, click the **List All** check box.

6. **Click the Search button in the upper right corner.**

   The screen lists the specified device status codes and their descriptions.



▼ List a Result Code

Task Tool

This task can be performed at either of the following:

- Local operator panel
- Standalone SL Console
- Web-launched SL Console

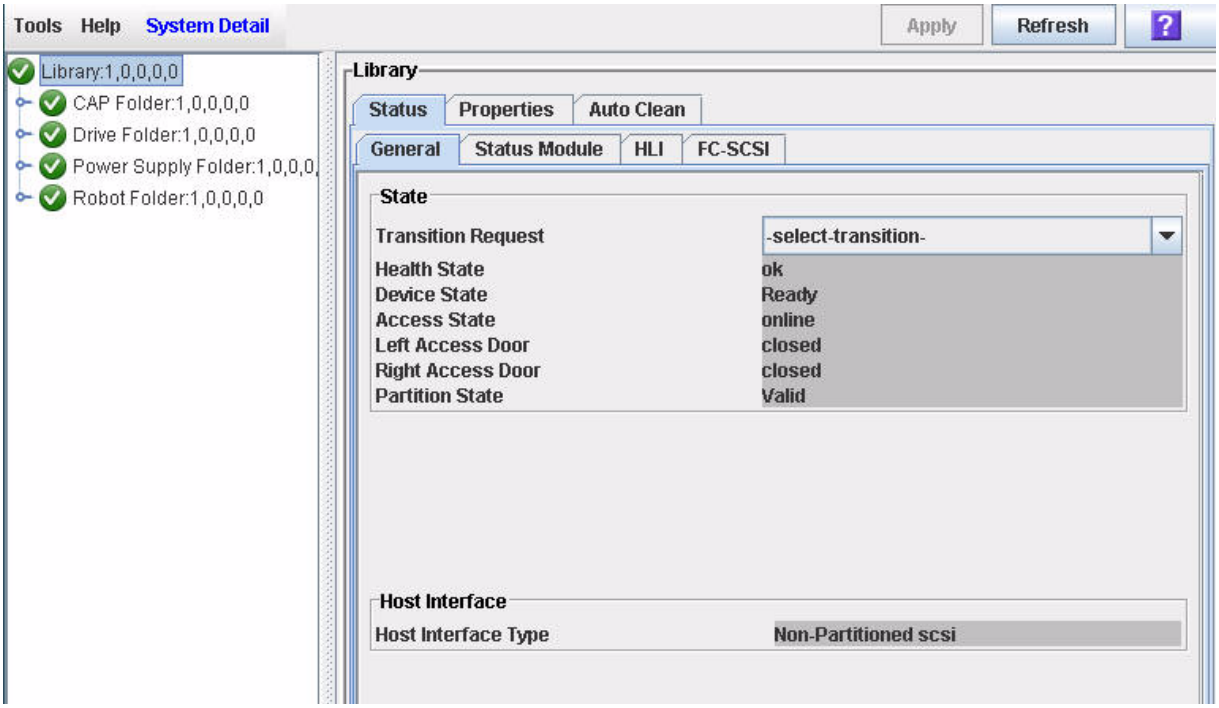
Task Purpose

Use this procedure to list result codes and their descriptions.

Task Steps

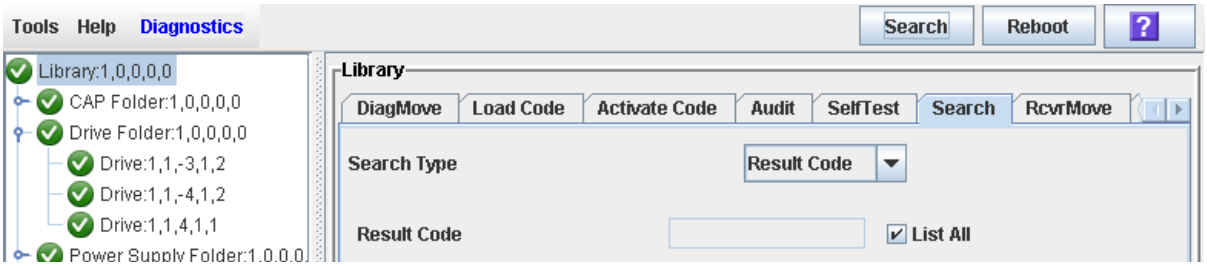
1. **Select Tools > Diagnostics.**
2. **Click the Library folder in the navigation tree.**

   The **Library** page appears.



3. **Click the Search tab.**

   The **Search** page appears.



4. **In the Search Type list, select Result Code.**

5. **Complete the Result Code field, as follows:**

   - To search for a code, enter the complete code. Wildcards or partial codes are not accepted.
   - To list all codes, click th e **List All** check box.

Library Utility Tasks

▼ Download Code to the Library Controller

Task Tool

This task can be performed at any of the following:

- Local operator panel
- Standalone SL Console
- Web-launched SL Console

Task Purpose

Use this procedure to download and unpack library firmware upgrades on the library controller.

After completing this procedure, you can choose a convenient time to activate the code on the library. See "Activate Code on the Library Controller" on page 513 for detailed instructions.

Note – This procedure is not used for downloading drive firmware updates.

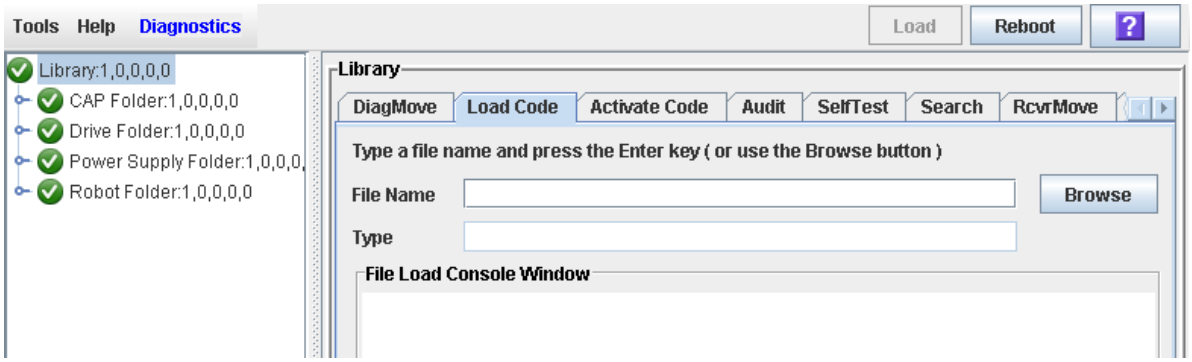
Note – You can perform this procedure from the standalone SL Console or Web-launched SL Console only. It is not available at the local operator panel.

Note –

Task Steps

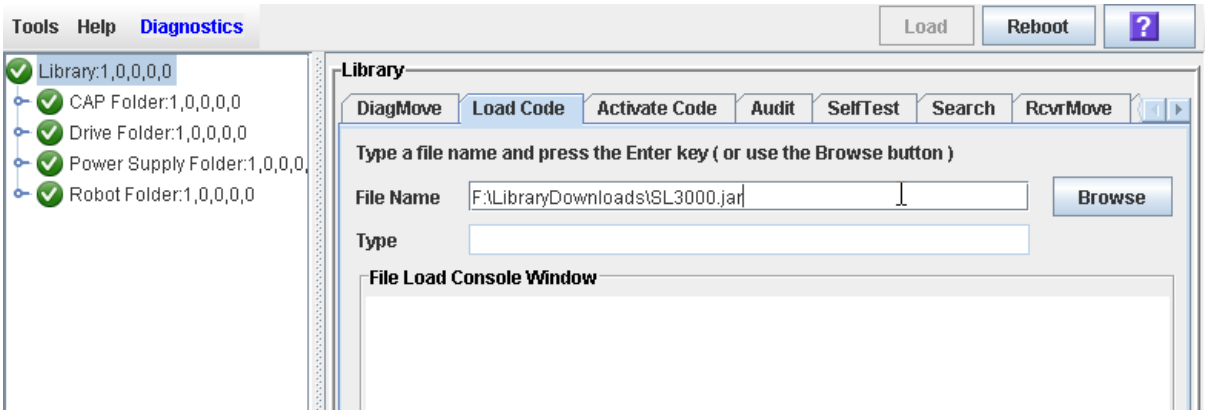
1. **Locate the firmware upgrade package (`.jar` file) on the Oracle download site. See "Firmware Download Site" on page 486.**
2. **Download the code to a folder on your local PC or workstation.**
3. **Log into the SL Console.**
4. **Select Tools > Diagnostics, and click the Library folder.**
5. **Click the Load Code tab.**

   The **Load Code** page appears.

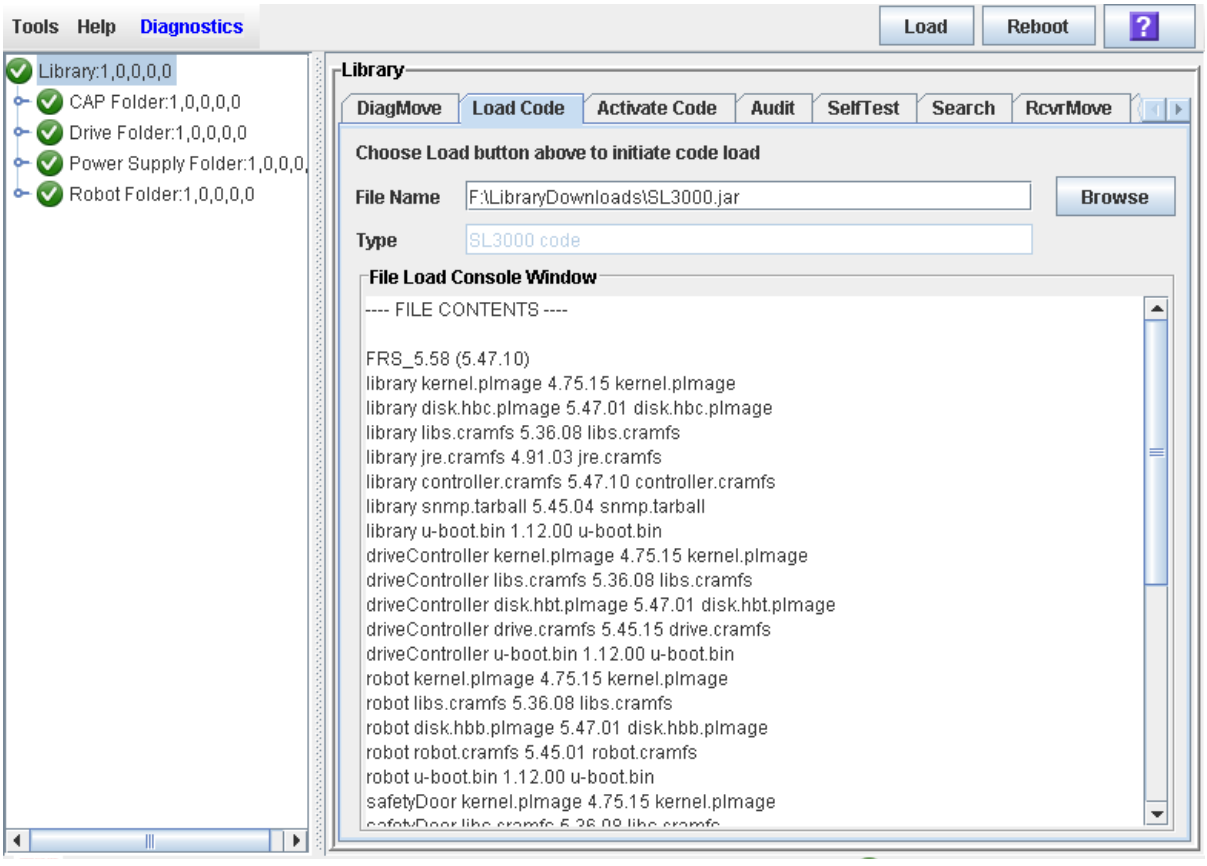


6. **In the File Name field, enter the full path of the firmware package you want to download, and press Enter. Optionally, you can click Browse and navigate to the file location on your local PC or workstation.**

   The SL3000 library firmware package is a `.jar` (Java Archive) file.

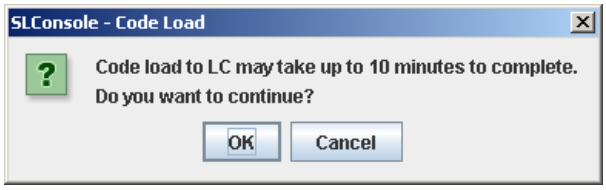


7. **The contents of the file display. Review the contents and file name to verify that you have specified the correct firmware package.**



8. **Click the Load button in the upper right corner.**

   The **Code Load** confirmation message appears.

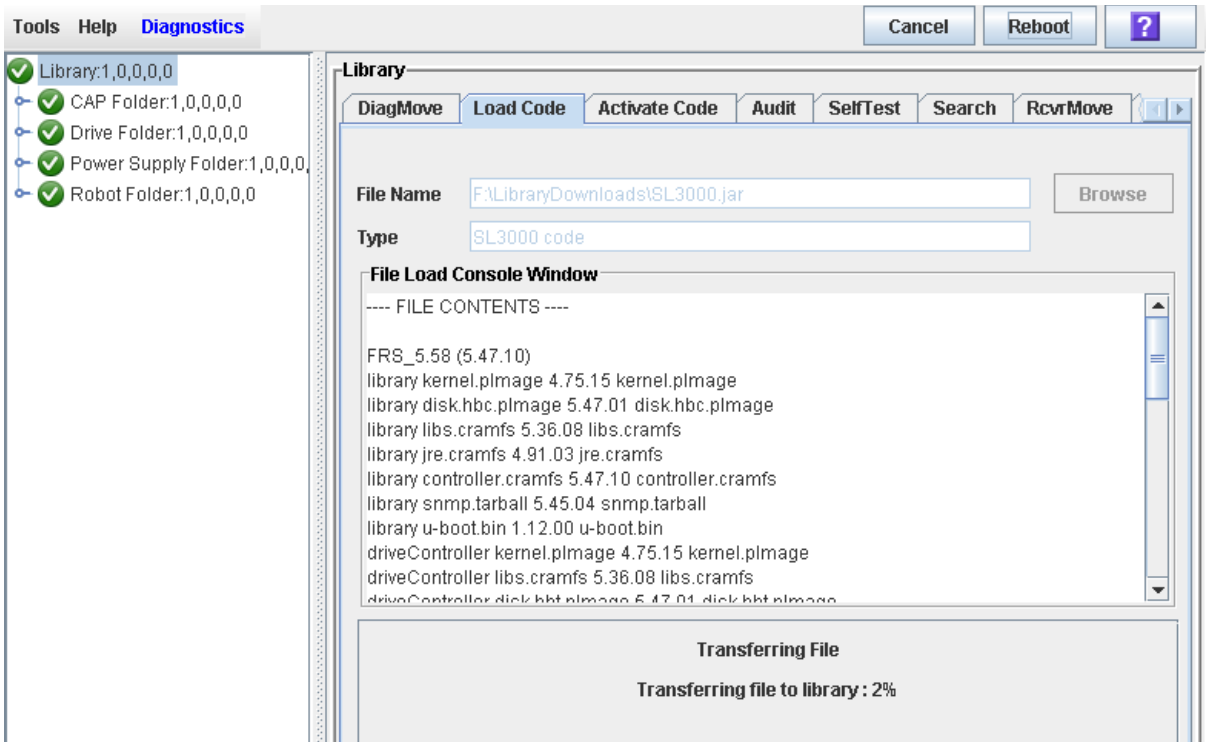


9. **Click OK to confirm the download.**

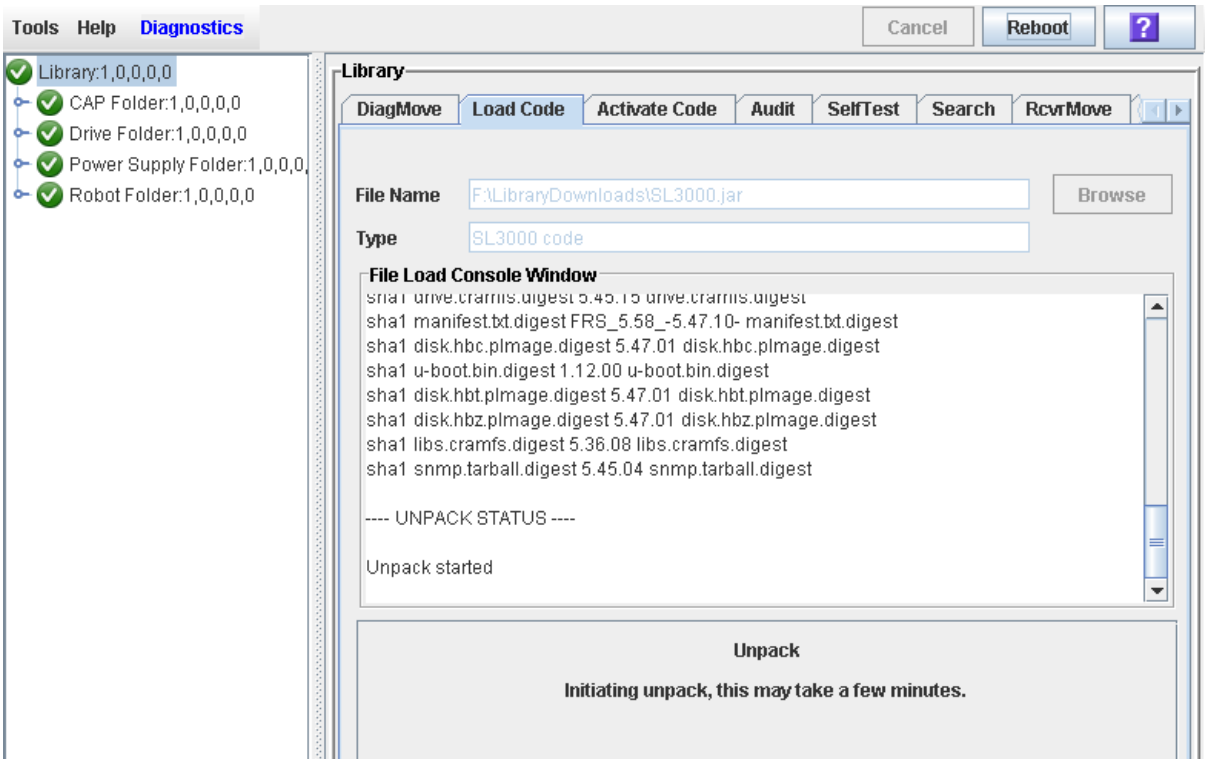
   Note – The download process could take up to ten minutes.

   The system begins downloading the code to the librar y controller.

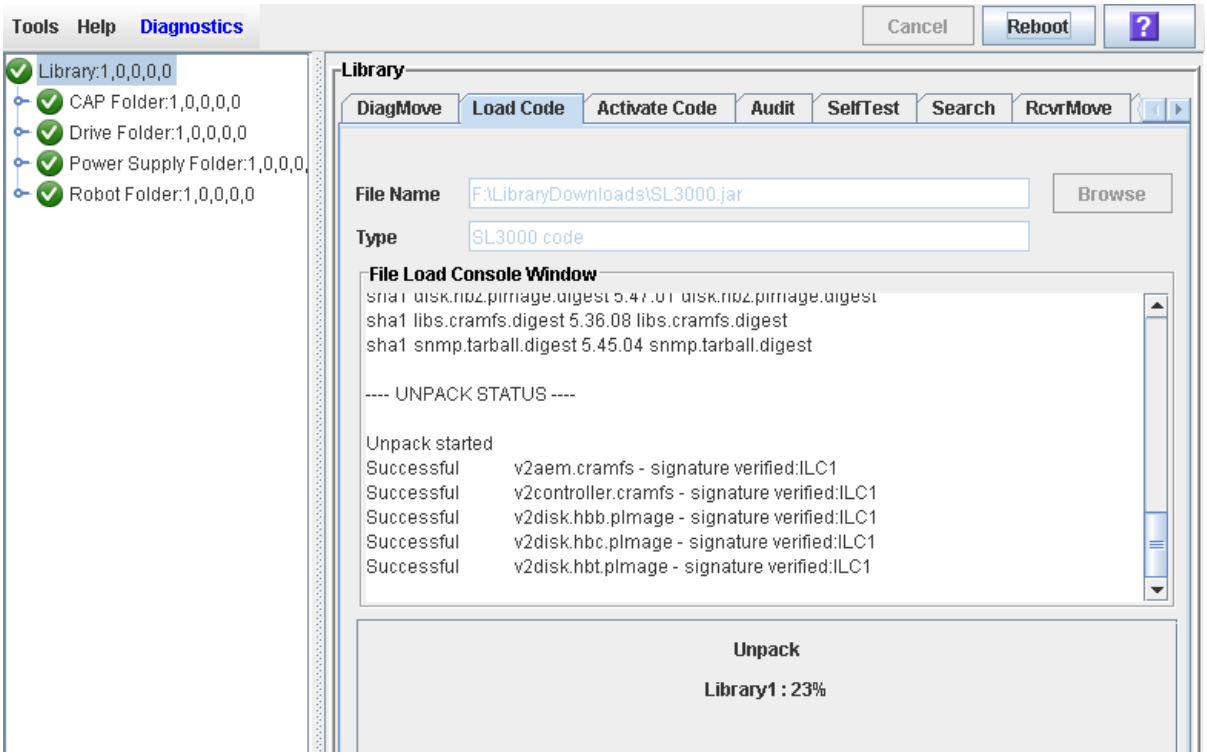
   The **File Load Console Window** section of the page indicates the progress of the file transfer.



When the code is fully transferred to the library controller, the code unpack process begins.

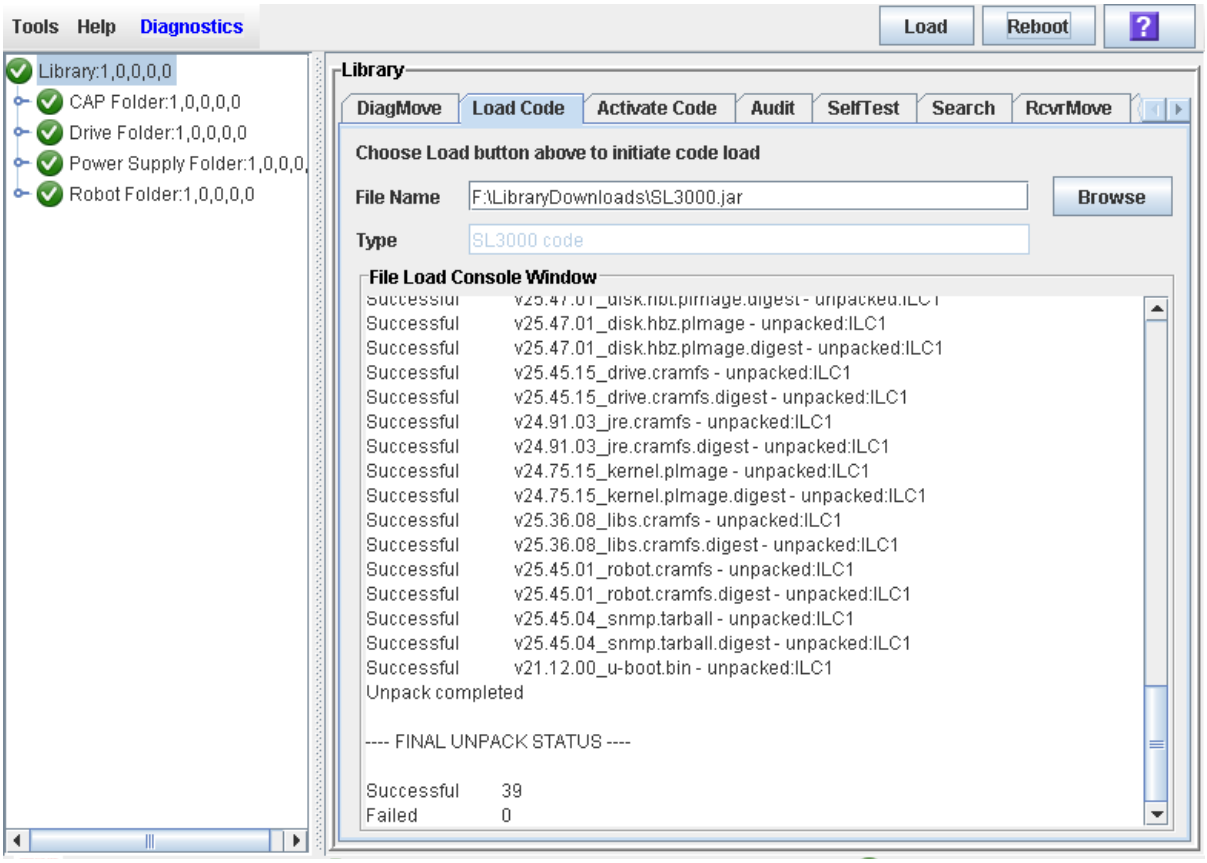


The page indicates the progress of the unpack.



The screen indicates when the unpack process is complete.

Next to the **Failed** label, you should see 0. If there are any failures indicated, contact your Oracle support representative for assistance.



10. **After the package is successfully unpacked, you can activate the code immediately or wait until a later time. See "Activate Code on the Library Controller" on page 513 for detailed instructions.**

▼ Activate Code on the Library Controller

Task Tool

This task can be performed at any of the following:

- Local operator panel
- Standalone SL Console
- Web-launched SL Console

Task Purpose

Use this procedure to activate a version of library firmware currently residing in the library controller flash memory. Up to two versions of firmware can be resident in memory at one time, but only one can be active. The active version is identified as "running."

Prior to performing this procedure you must download and unpack the code you want to activate. See "Download Code to the Library Controller" on page 508 for detailed instructions.

This procedure involves a reboot of the library. Schedule the process for a time that is convenient for users.

You can restore the earlier firmware version if required.

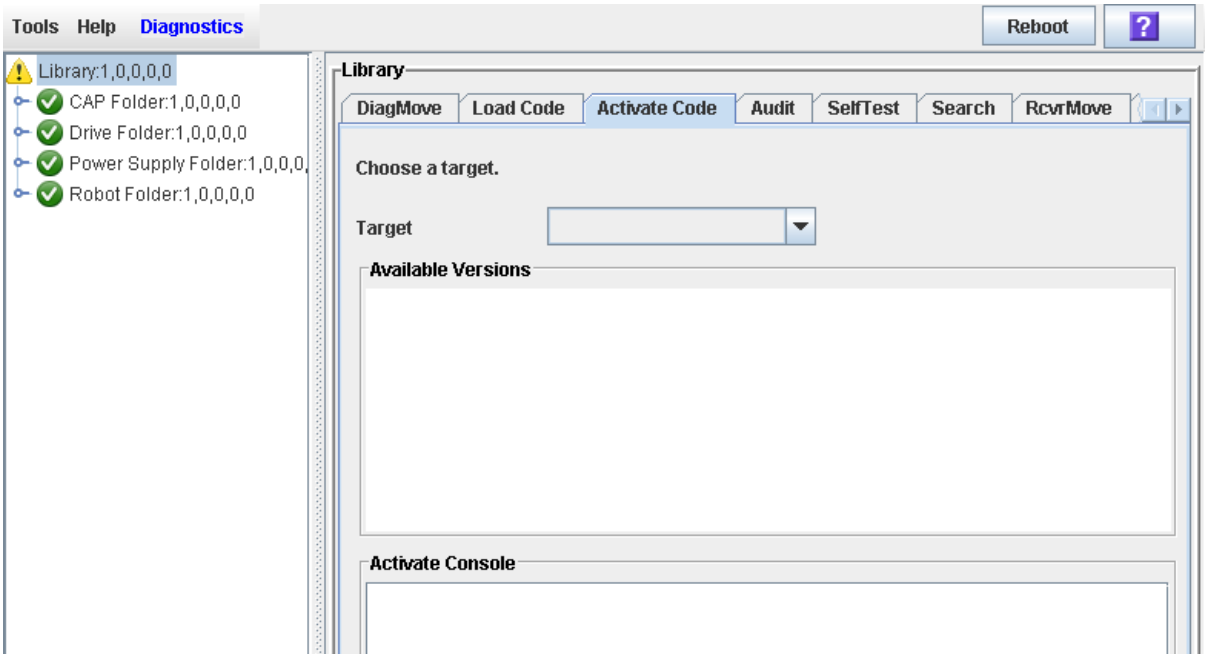
> **Note –** You can perform this procedure from either the standalone SL Console or Web-launched SL Console only. It is not available at the local operator panel.

Task Steps

1. **Select Tools > Diagnostics, and click the Library folder.**

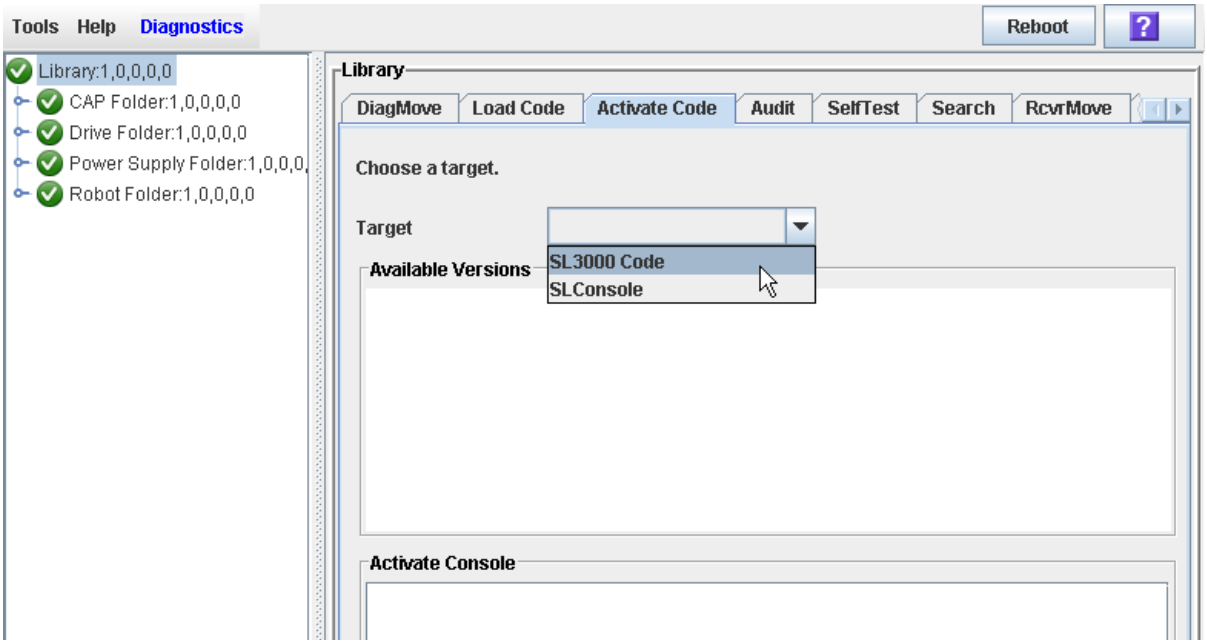
2. **Click the Activate Code tab.**

   The **Activate Code** page appears.

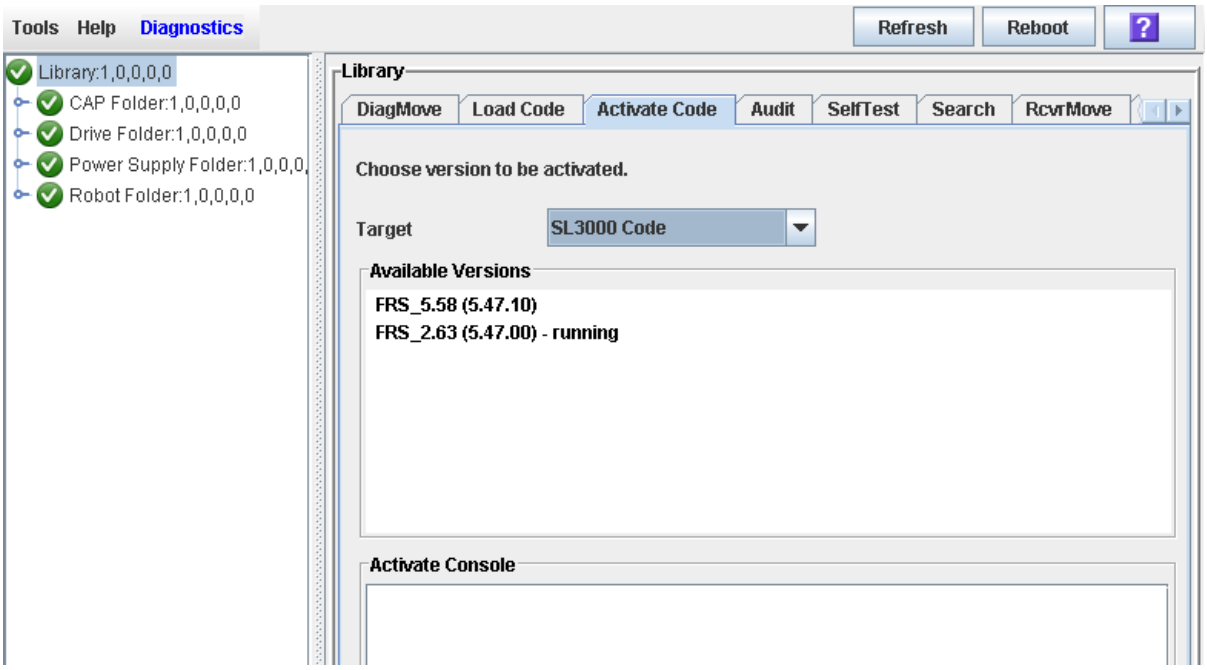


3. **In the Target list, select the code package you want to activate.**

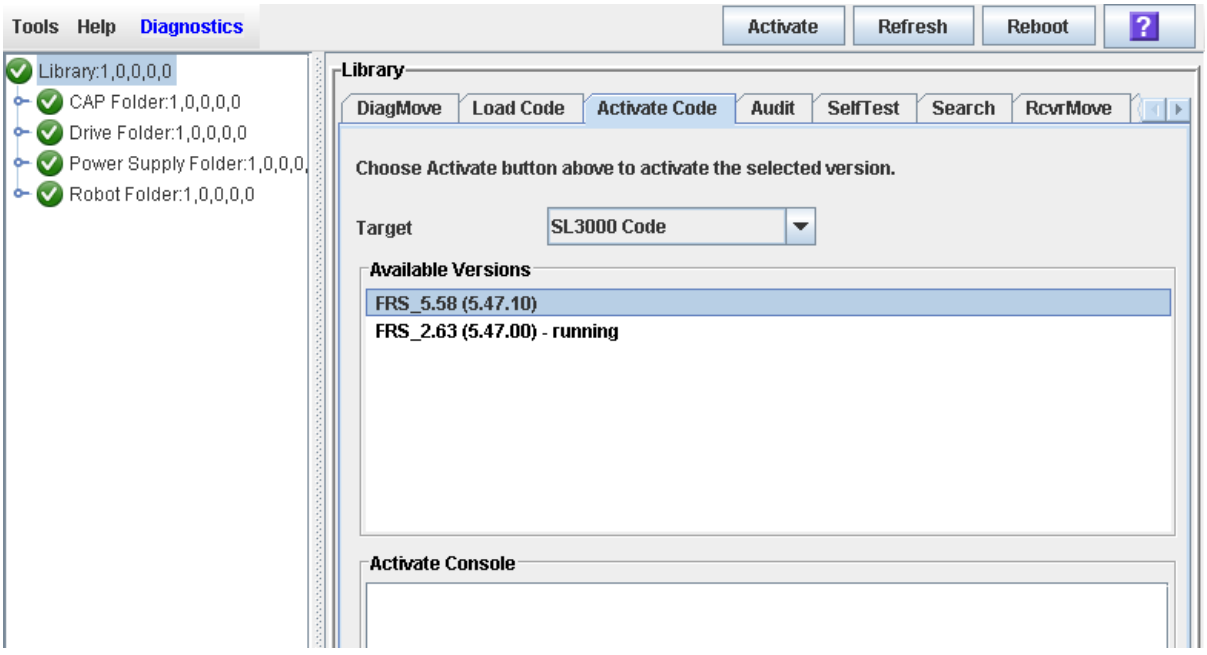
   The list may display a library firmware package and an SL Console package. For this procedure, select the firmware package (**SL3000 Code**).



The **Available Versions** section of the page displays th e versions currently residing in flash memory. The version identified as “running” is the currently active code. You cannot select this version again to activate.

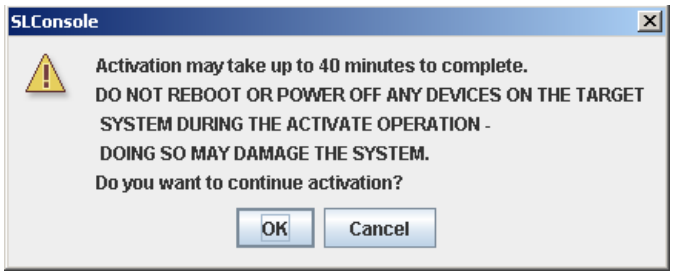


4. **Select the code version you want to activate.**



5. **Click the Activate button in the upper right corner.**

   The **Activation Confirmation** message appears, asking whether you want to continue with the process.

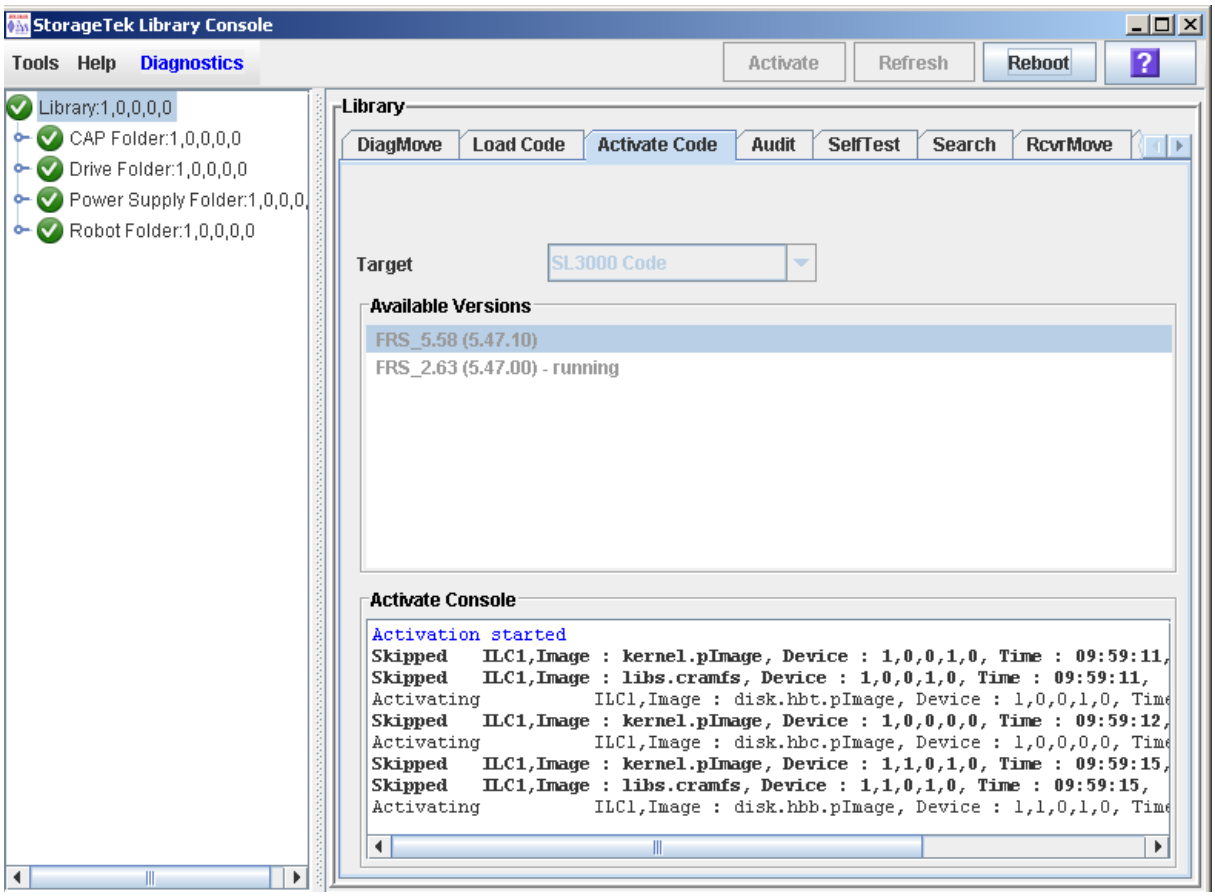


6. **Click OK to begin the activation.**

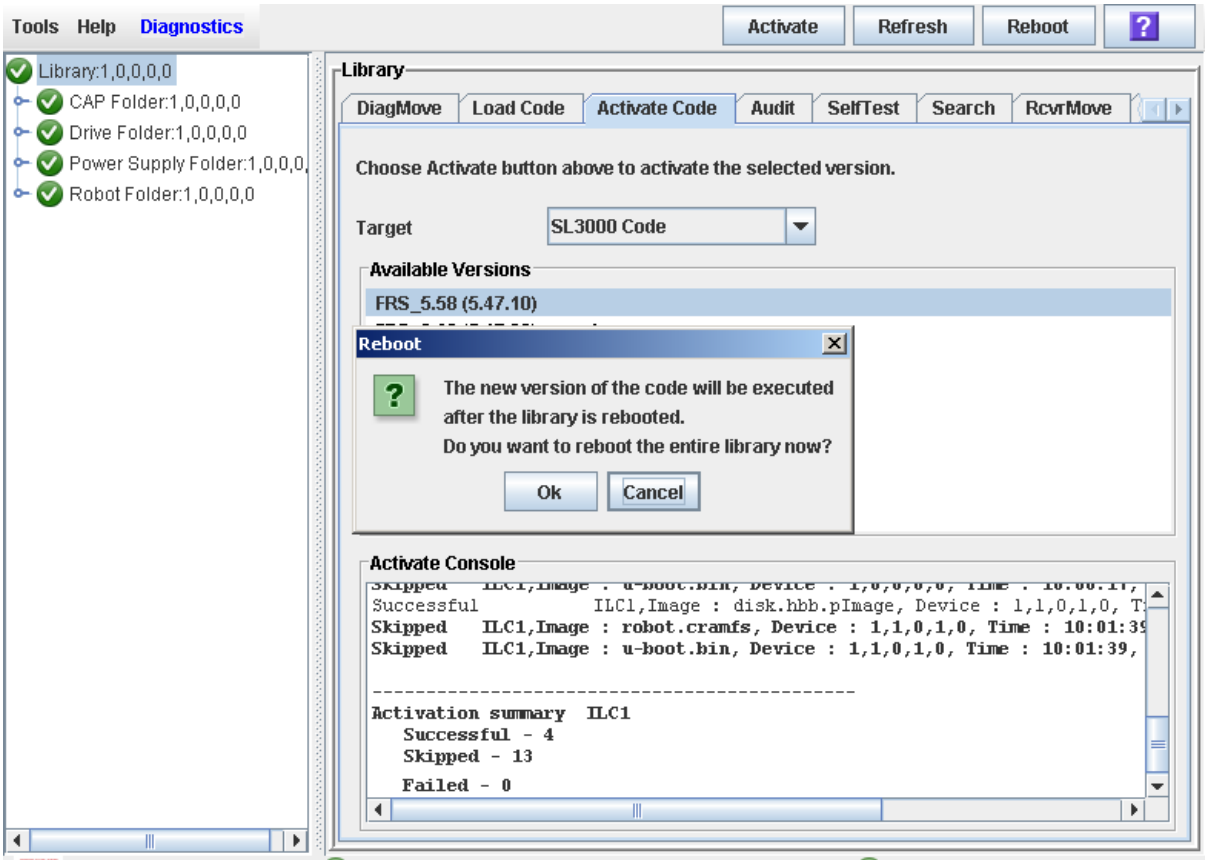
   If you click **Cancel**, the process terminates and returns to Step 4.

   The code activation process begins, and the **Activate Console** section of the screen displays the status of the process.

   Caution – *POTENTIAL INTERNAL FILE CORRUPTION.* Do not reboot any devices in the library or execute any operations on the library while code is being activated.



7. **When the activation process finishes, a dialog appears, prompting you to reboot the library.**



8. **Click OK to reboot the library.**

   If you click **Cancel**, the process terminates, and you must reboot the library at a later time. See "Download Code to the Library Controller" on page 508 for detailed instructions.

   The reboot process begins, and a message appears indicating that your SL Console session is terminating.

9. **Click OK to terminate the SL Console session.**

   The system logs you off the library.

10. **When the library initialization has completed, you can log in again to the library through the SL Console login screen.**

    The SL Console gets all library configuration data from the library controller. Therefore, be careful when logging in to the SL Console before the library has fully initialized. You may see warnings that configuration data is not yet available. In such a case, you must exit

and log in again at a later time. Additionally , if a library audit is performed as part of initialization, until the audit is complete, any configuration data displayed may not be completely up to date and accurate.

▼ Reboot the Library

Task Tool

This task can be performed at any of the following:

- Local operator panel
- Standalone SL Console
- Web-launched SL Console

Task Purpose

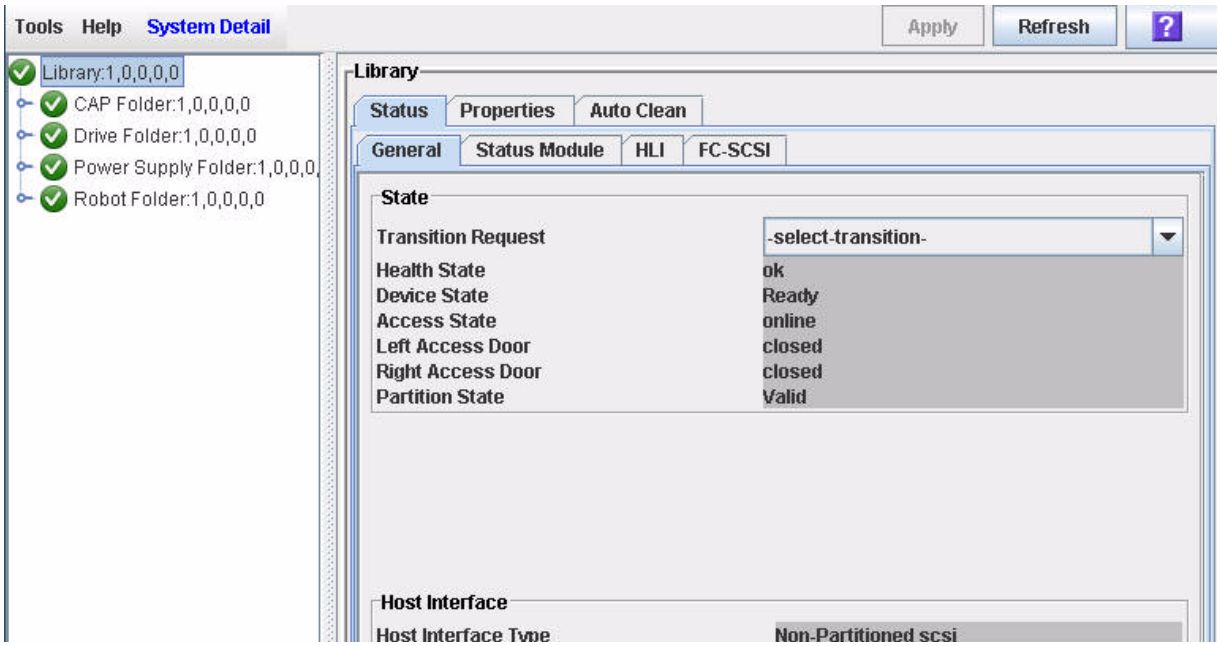
Use this procedure to reboot the library. This process involves reloading the firmware from flash memory and restarting the library controller.

Note –

Task Steps

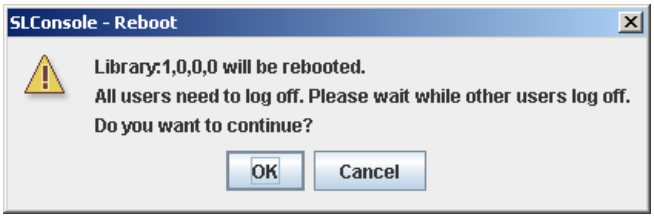
1. **Select Tools > Diagnostics.**
2. **Click the Library folder on the navigation tree.**

   The **Library** page appears.



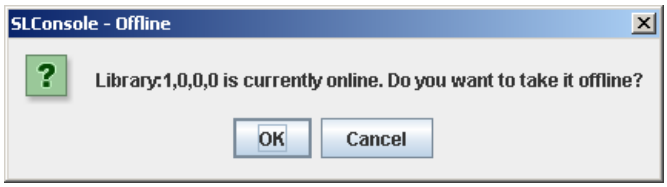
3. **Click Reboot in the upper right corner.**

   The **Reboot** confirmation message appears.



4. **Click OK to continue.**

   If the library is online, th e **Offline** confirmation message appears.



5. **Click OK to take the library offline.**

   The **Reboot** confirmation message appears.

6. **Click OK to continue.**

   The SL Console termin ation message appears.

7. **Click OK to terminate this SL Console session.**

   You are logged off the SL Console. The library controller reboots the library . This could take several minutes.

   Note – You cannot log back in to the SL Console until the library has fully initialized.

▼ Transfer the Library MIB File

Task Tool

This task can be performed at any of the following:

- Local operator panel
- Standalone SL Console
- Web-launched SL Console

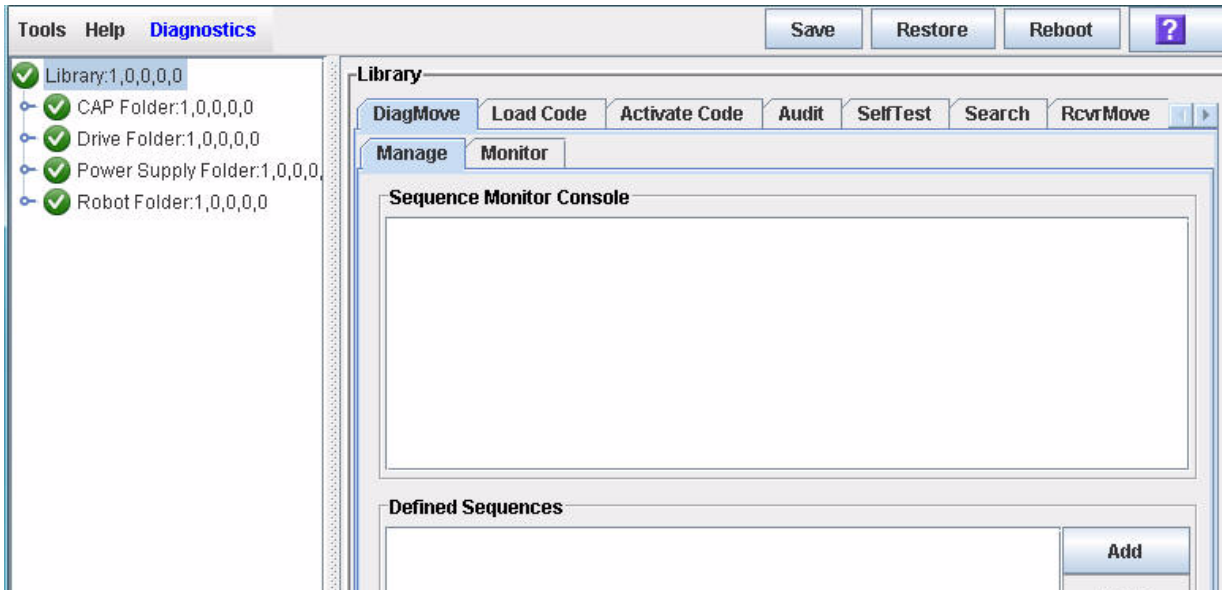
Task Purpose

Use this procedure to transfer (save) the public SNMP management information base (MIB) file to a specified location on your local PC or workstation. The file is saved as a text file. E-mail the file to your Oracle support representative to help diagnose problems with the library.

Task Steps

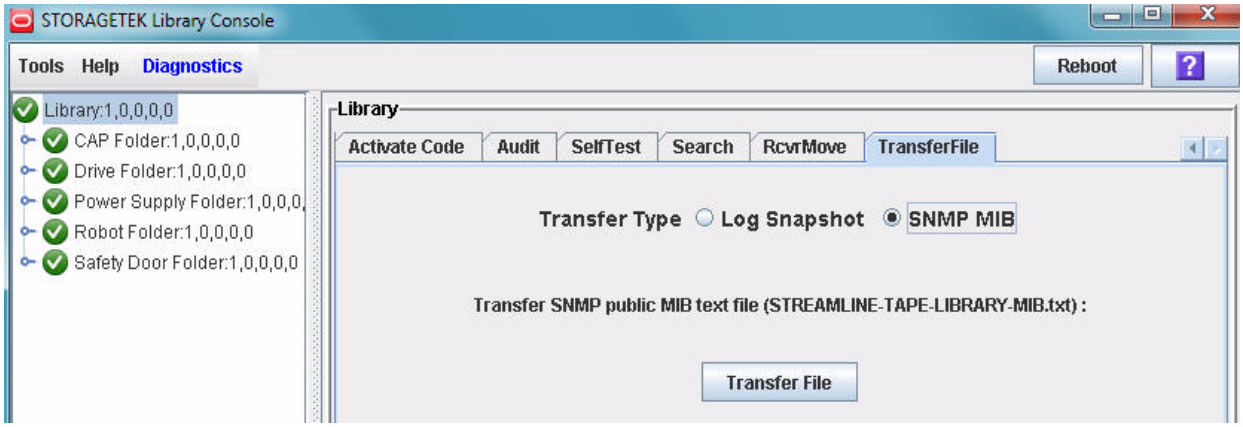
1. **Select Tools > Diagnostics.**
2. **Click the Library folder on the navigation tree.**

   The **Library** page appears.



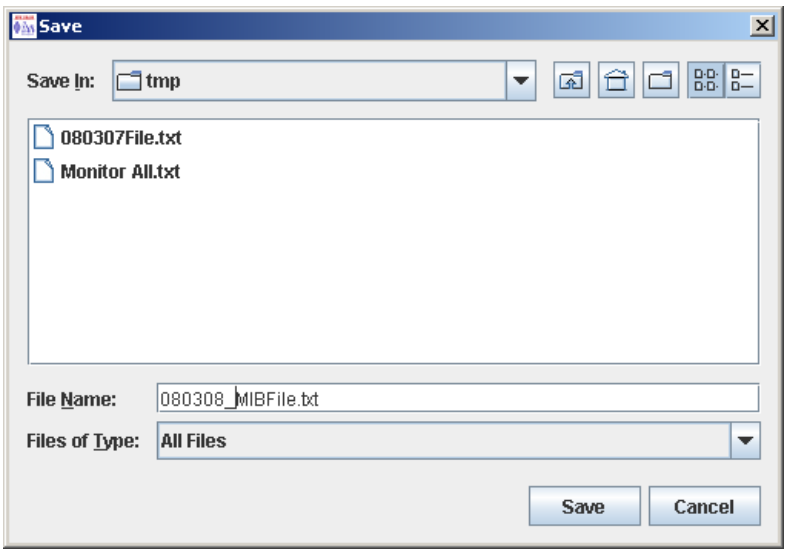
3. **Click the TransferFile tab.**

   The Library **TransferFile** page appears. Select **SNMP MIB**.



4. **Click Transfer File.**

   The **Save** dialog box appears.



5. **Browse to the directory where you want to save the file, and enter the file name in the File Name field. Be sure to give it a `.txt` suffix.**

6. **Click Save.**

   The data is saved to the specified file, and the **Transferred Successful** message appears.

   The following is a partial sample of the MIB file output.

```
-- ****************************************************************
--          STREAMLINE-TAPE-LIBRARY-MIB (1.3.6.1.4.1.1211.1.15)
--
-- Copyright (c) 2005, 2010, Oracle and/or its affiliates. All rights
reserved.
--
-- ****************************************************************

STREAMLINE-TAPE-LIBRARY-MIB DEFINITIONS ::= BEGIN
IMPORTS
    enterprises, Counter32, Integer32 FROM SNMPv2-SMI
    --OBJECT-TYPE FROM RFC-1212
    OBJECT-GROUP, NOTIFICATION-GROUP, MODULE-COMPLIANCE FROM SNMPv2-CONF
    TEXTUAL-CONVENTION FROM SNMPv2-TC
    OBJECT-TYPE, MODULE-IDENTITY, NOTIFICATION-TYPE FROM SNMPv2-SMI;

streamlineTapeLibrary MODULE-IDENTITY
    LAST-UPDATED "201010280000Z" -- Oct 28, 2010
    ORGANIZATION "Oracle"
    CONTACT-INFO "Please contact Oracle/Sun Support:
                    http://www.sun.com/contact/support.jsp"
    DESCRIPTION  "The MIB module for StreamLine Tape Library.
                  Copyright (c) 2005-2010,
                  Oracle. All Rights Reserved."
...
-- ****************************************************************
--
-- Generic traps: 1-10
--
-- ****************************************************************

slTrapError  NOTIFICATION-TYPE
    OBJECTS
    {
        slTrapLibrarySerialNumber,
        slTrapDeviceId,
        slTrapDeviceTime,
        slTrapDeviceAddress,
        slTrapDeviceUserName,
        slTrapDeviceInterfaceName,
        slTrapDeviceActivity,
        slTrapDeviceRequestId,
        slTrapDeviceSeverity,
        slTrapDeviceResultCode,
        slTrapDeviceFreeFormText
    }
    STATUS current
    DESCRIPTION "An error trap - a device condition which is critical to
machine operation was encountered"
::= { slSnmpNotifications 1 }
```

▼ Generate and Transfer the Library Log Snapshot File

Task Tool

This task can be performed at any of the following:

- Local operator panel
- Standalone SL Console
- Web-launched SL Console

Task Purpose

Use this procedure to generate and transfer (save) the library log snapshot file to a specified location on your local PC or workstation. The system saves the file in an encrypted format, which means you cannot view or edit it. After generating and transfering the snapshot file, e-mail it to your Oracle support representative who will use it to diagnose problems with the library.

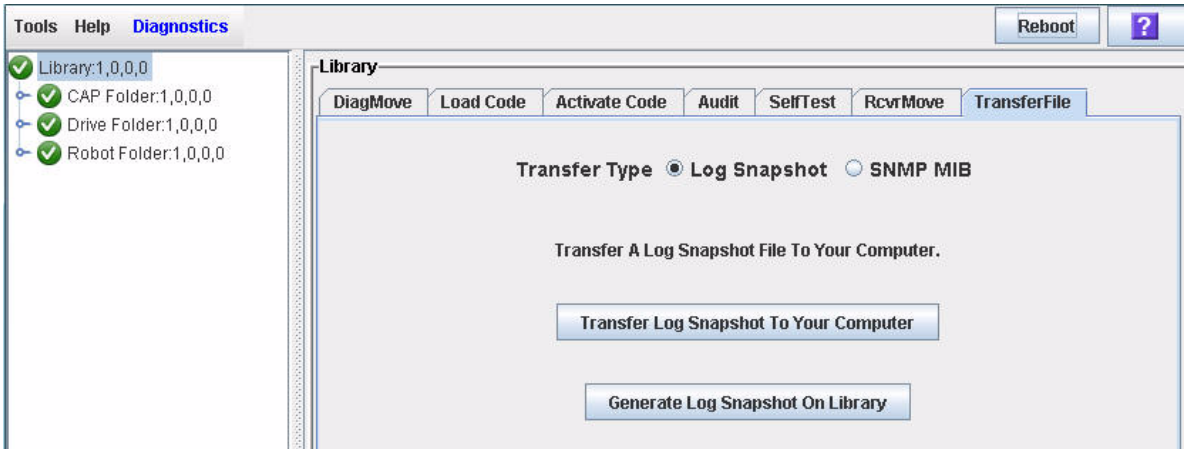
Note – The feature to generate a log snapshot is available starting with SL3000 firmware version FRS_3.60 and SL Console version FRS_5.60.

Note – Use this procedure only under the direction of your Oracle support representative. You must transfer the library log snapshot file within 15 minutes after it is generated. After 15 minutes, the generated snapshot is no longer available, and you must generate another file.

Task Steps

1. **Select Tools > Diagnostics.**
2. **Click the Library folder on the navigation tree.**

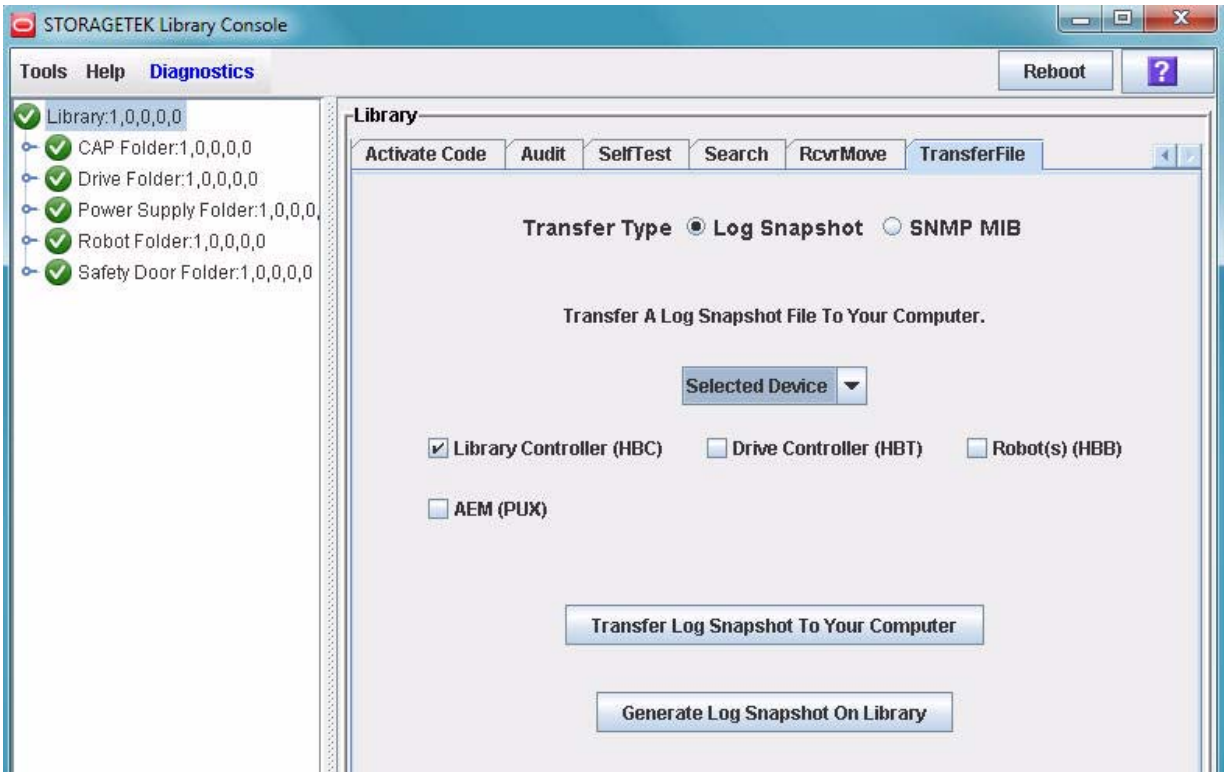
   The **Library** screen appears.
3. **Click the TransferFile tab.**



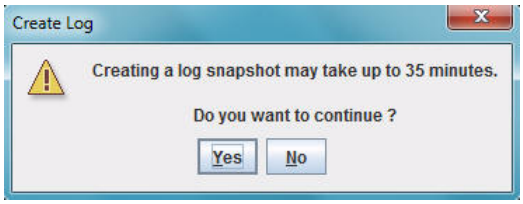
   The **TransferFile** page appears.
4. **Select the Log Snapshot radio button if it is not already selected.**
5. **At the list, select either All Devices or Selected Device.**

6. **If you chose Selected Device, select the device for which you want to generate a log snapshot.**

7. **Click the button labeled Generate Log Snapshot On Library.**

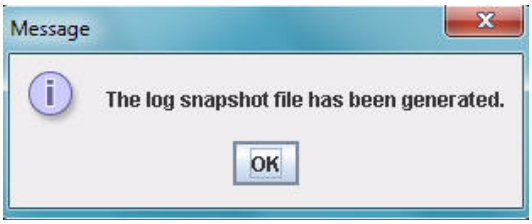


The **Create Log** confirmation message appears.



8. **Click Yes to continue creating the log snapshot.**

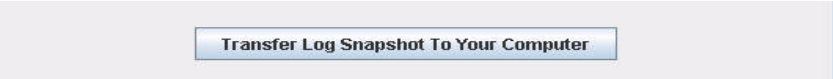
9. **Click OK when the confirmation message displays.**



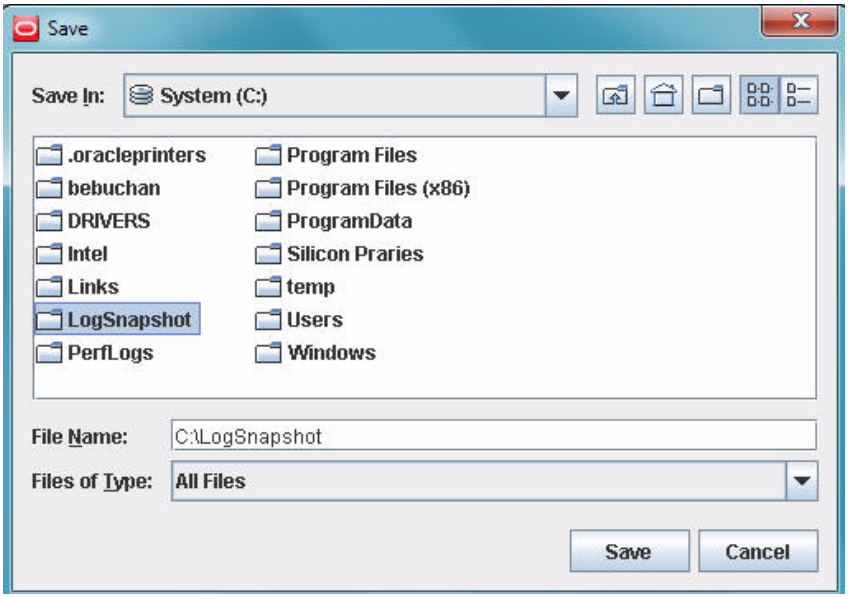
10. **Save the snapshot within 15 minutes after generating the snapshot.**

If you do not save within this 15-minute window, you cannot save the currently generated log snapshot file. In this case, you must generate another log snapshot file.

Click Transfer Log Snapshot To Your Computer.



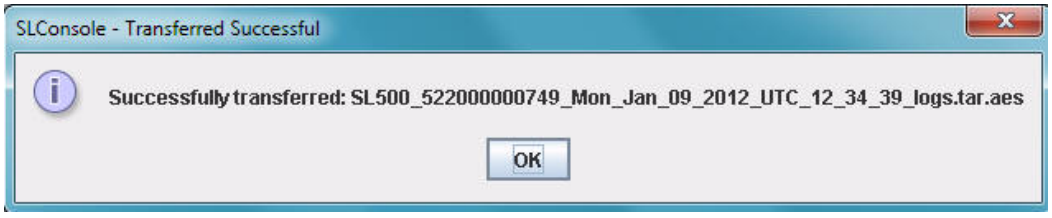
The **Save** dialog box appears.



11. **If you have already created the directory where you want to save the file, browse to that directory and click Save.**
12. **If the directory you want does not exist, enter the name of the directory in the File Name field and click Save.**

    The Directory Create message appears. Click OK to accept the directory creation and dismiss the message. Then click Save at the Save dialog box.

The data is saved in the specified directory, and the **Transferred Successful** message appears.



13. **Click OK to dismiss the message. The library automatically names the file. You cannot view the file because it is encrypted.**

▼ Perform a Non-Disruptive Library Self-Test

Task Tool

This task can be performed at any of the following:

- Local operator panel
- Standalone SL Console
- Web-launched SL Console

Task Purpose

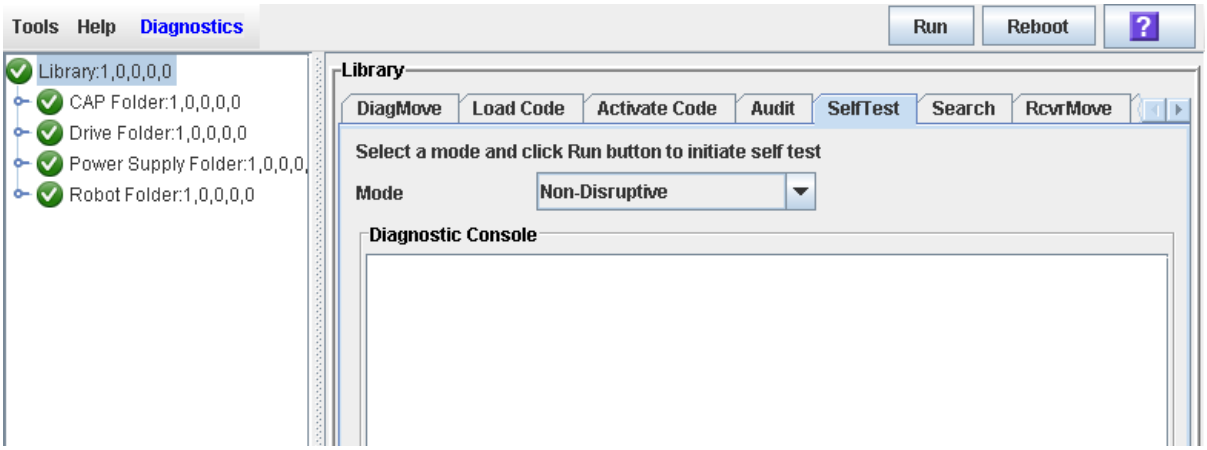
Use this procedure to perform a non-disruptive library self-test, which can be used to help diagnose operational problems with the library.

For the test to run completely, make sure the proper diagnostic cartridges for library drives are in the library. To verify this, see "List Library Cartridges" on page 434.

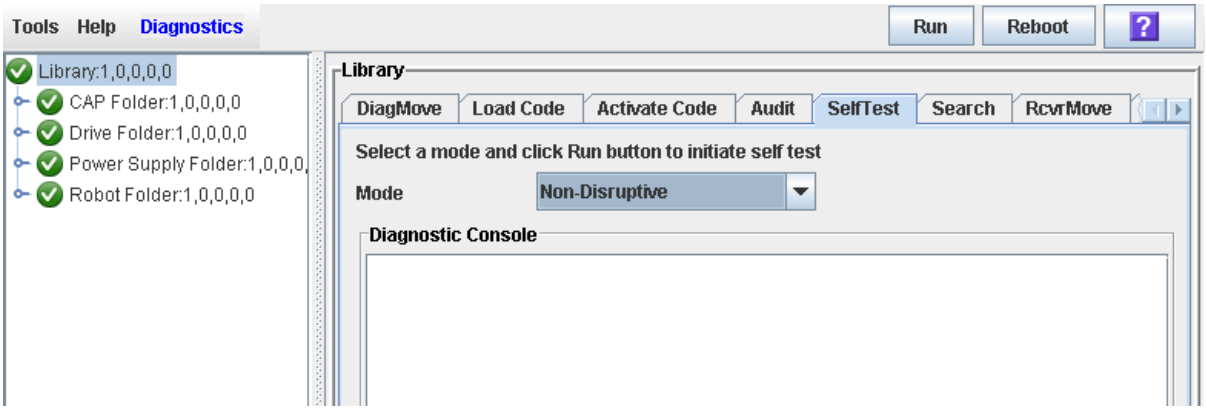
Task Steps

1. **Select Tools > Diagnostics, and click the Library folder.**
2. **Click the SelfTest tab.**

   The **Self Test** page appears.

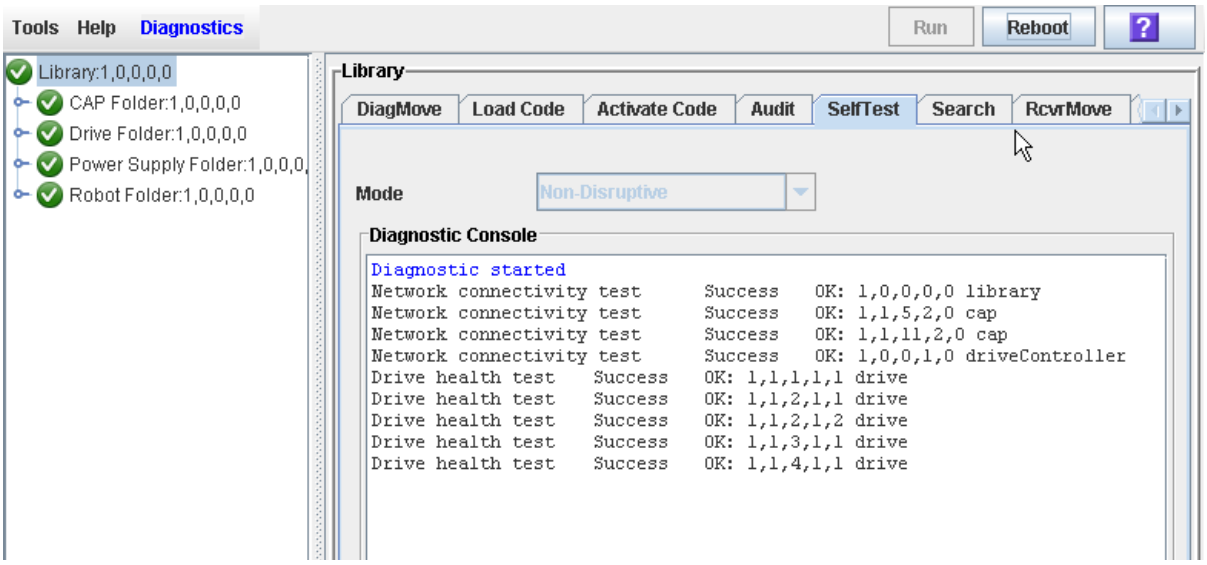


3. **In the Mode list, select Non-Disruptive.**

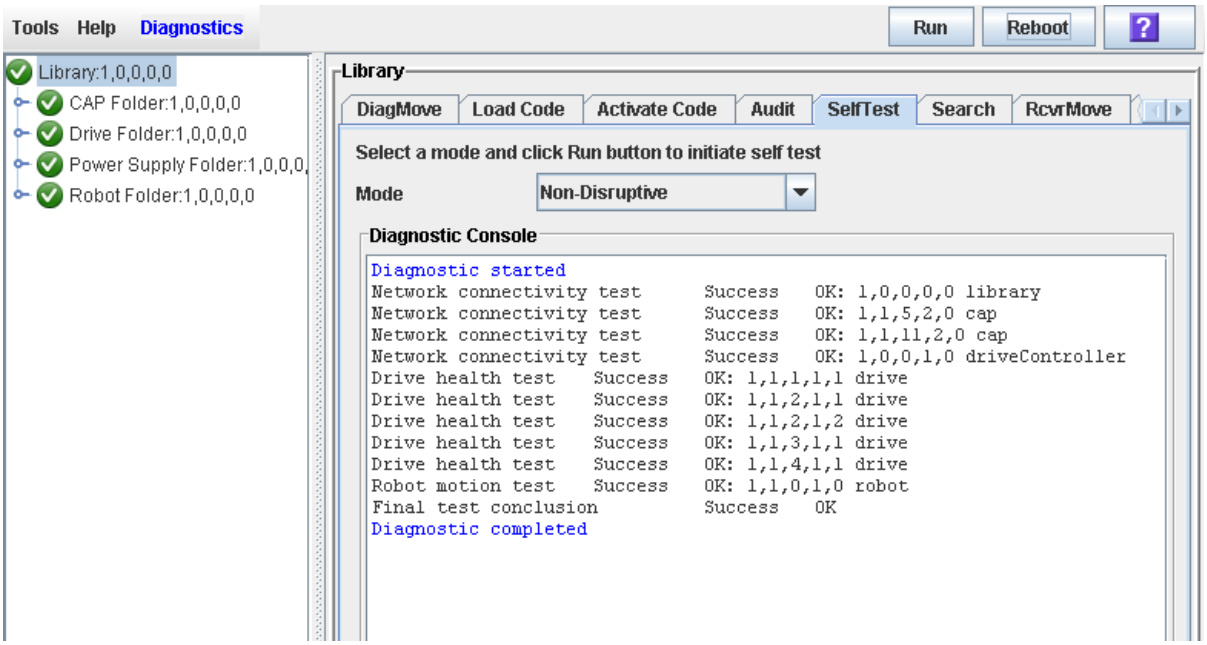


4. **Click Run to start the test.**

The test begins. The **Diagnostic Console** section of the page displays the status of the various diagnostic tests as they are performed.



When the test completes, the results of the test display in the Diagnostic Console.



▼ Perform a Disruptive Library Self-Test

Task Tool

This task can be performed at any of the following:

- Local operator panel
- Standalone SL Console
- Web-launched SL Console

Task Purpose

Use this procedure to perform a disruptive library self-test, which can be used to help diagnose operational problems with the library.

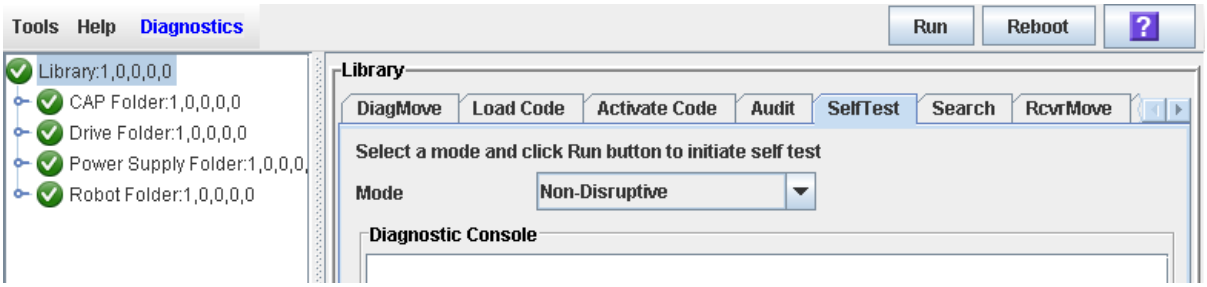
In order for the test to run completely, make sure the proper diagnostic cartridges for library drives are present in the library. To verify this, see "List Library Cartridges" on page 434.

Prior to performing this procedure, the library must be taken offline to all hosts. See "Take the Library Offline" on page 591 for detailed instructions.

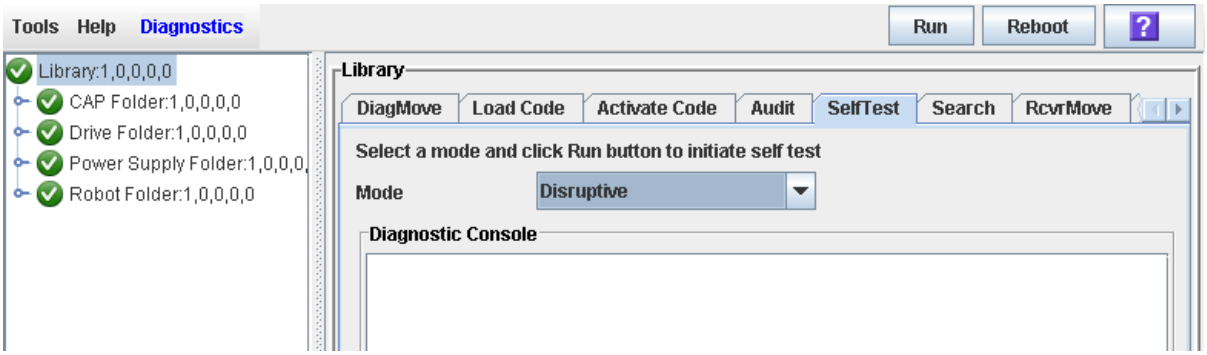
Task Steps

1. **Select Tools > Diagnostics, and click the Library folder.**
2. **Click the Self Test tab.**

   The **Self Test** page appears.

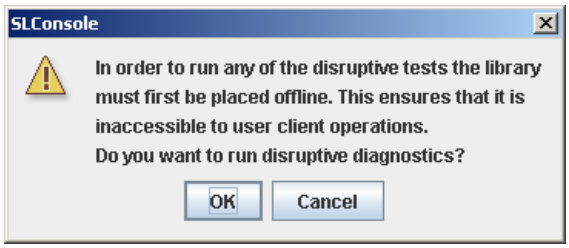


3. **In the Mode list, select Disruptive.**



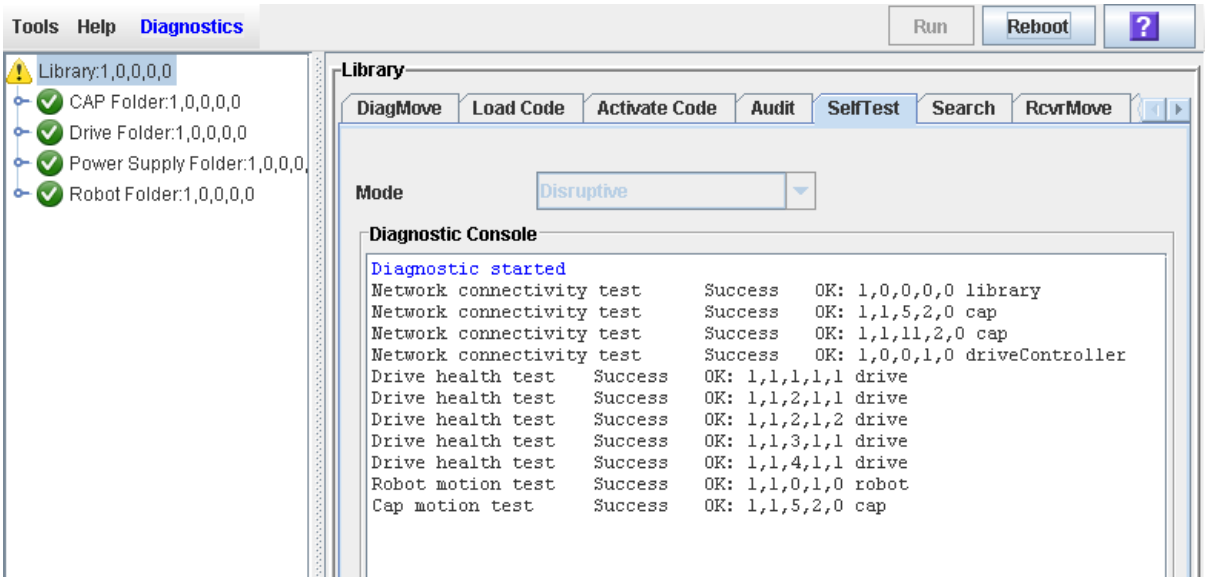
4. **Click Run.**

A list appears to confirm that you have already taken the library offline to all hosts.

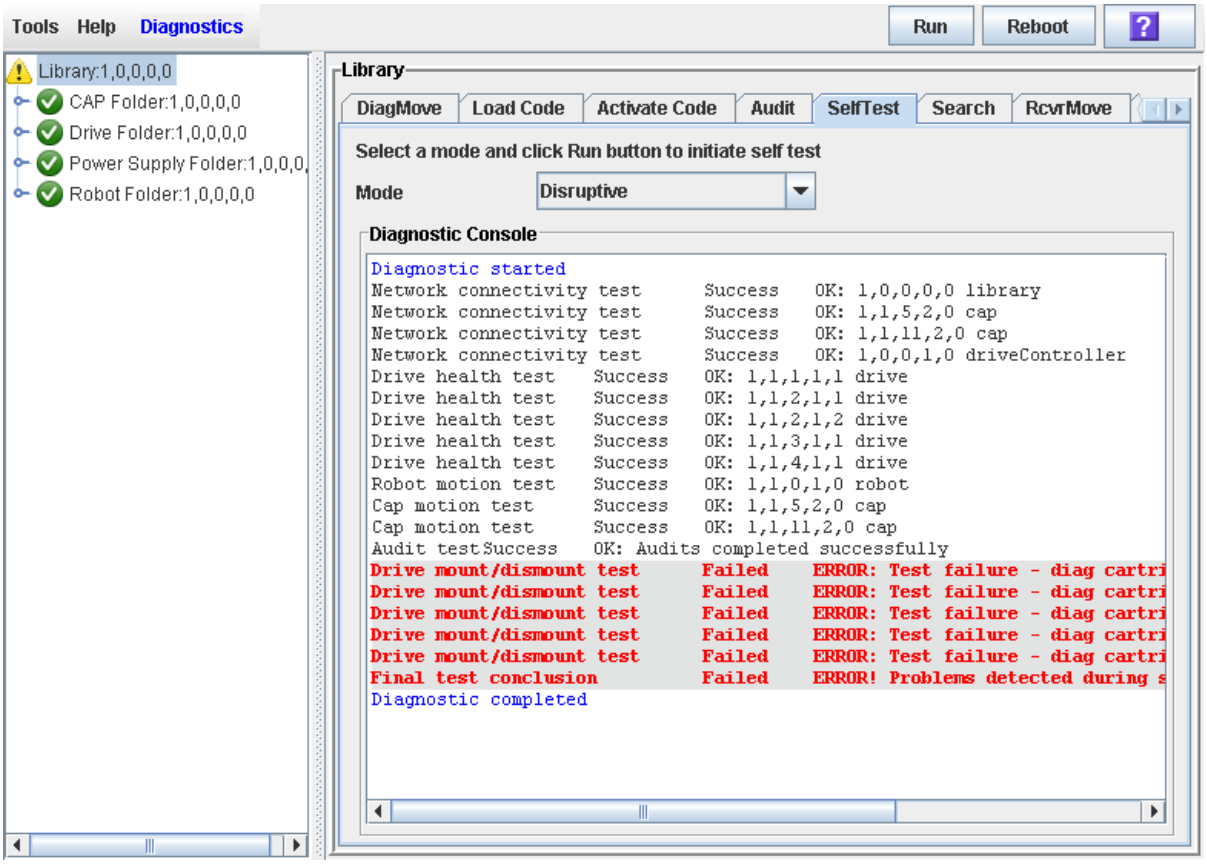


5. Click OK to begin the test.

The test begins, and the **Diagnostic Console** section of the page displays the status of the various diagnostic tests as they occur.



When the test completes, the results of the test display in the **Diagnostic Console** section.



6. **Bring the library online to resume normal operations.**

   See "Bring the Library Online" on page 593 for detailed instructions.

Diagnostic Cartridge Management Tasks

▼ Import Diagnostic Cartridges

Task Tool

This task can be performed at either of the following:

- Local operator panel
- Standalone SL Console
- Web-launched SL Console

Task Purpose

Use this procedure to enter diagnostic cartridges into the library through a specified CAP. The library controller reserves the CAP for the entire operation. The diagnostic cartridges are distributed as evenly as possible in reserved system cells. The system can peform only one diagnostic or cleaning cartridge import or export operation at a time.

> **Note –** You can also import cleaning cartridges with the diagnostic cartridges. See "Import Cleaning Cartridges" on page 457 for details about importing cleaning cartridges.

> **Note –** Only rotational CAPs, not AEM CAPs, can be used for this procedure.

Before beginning this procedure, verify that the following conditions are met:

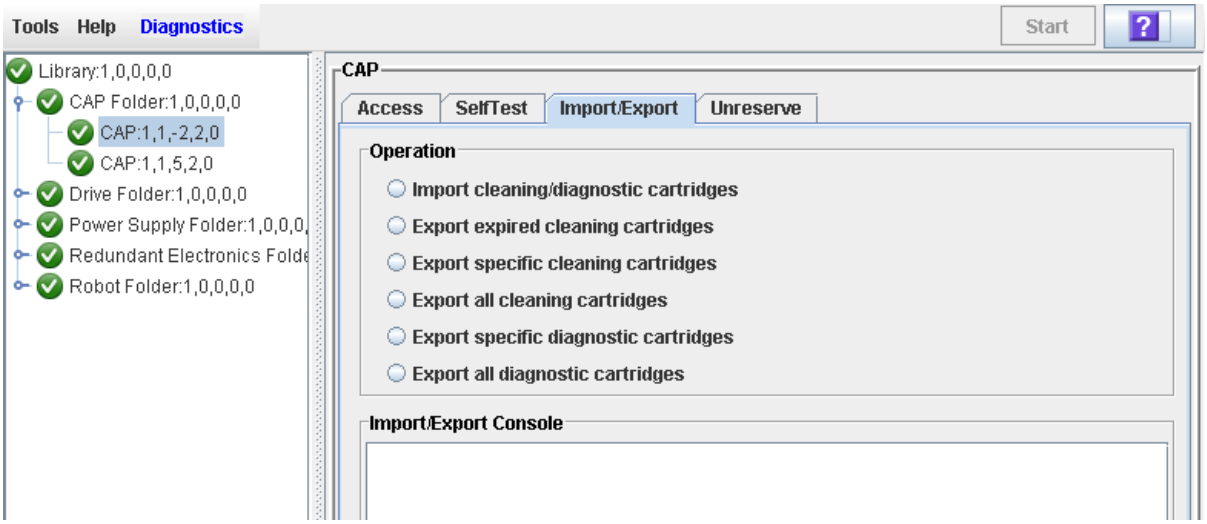
- The CAP is empty, available for use (not reserved by a host), and closed and locked.
- The library has enough empty reserved system cells to store the diagnostic cartridges you want to import. At least one system cell on each side of the library must be left open for robot recovery or library initialization.

Task Steps

1. **Select Tools > Diagnostics.**

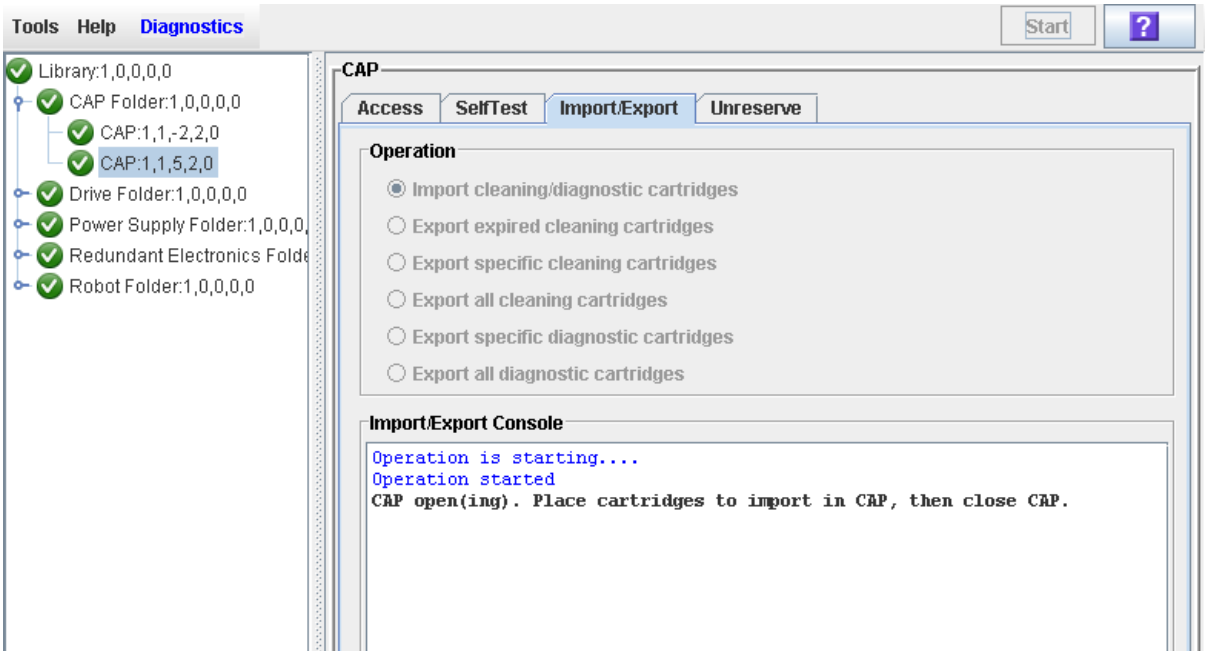
2. **Expand the CAP Folder, highlight the CAP you want to use, and then click the Import/Export tab.**

   The **Import/Export** page appears.



3. **Select Import Cleaning/Diagnostic cartridges, and then click Start.**

   The import operation begins, and the **Import/Export** page displays the ongoing status.



   The library controller reserves the CAP, and unlocks and opens the CAP doo r.

   If the library is par titioned and the CAP is associated with an FC-SCSI partition, the library controller associates the CAP to the `default` requestor for the duration of the import operation.

4. **Load the diagnostic cartridges into the CAP.**

   For detailed instructions, see "Enter Cartridges Through a Rotational CAP" on page 418.

After you close the door, the diagnostic cartridges are moved to available system cells. The system ignores any data cartridges or diagnostic cartridges with invalid labels and leaves them in the CAP.

When all diagnostic cartridges have been moved from the CAP, the library controller proceeds as follows:

- If the CAP is empty, the library controller releases the CAP reservation and re-associates the CAP to the original FC-SCSI partition, if applicable.
- If cartridges remain in the CAP, the CAP door opens, and the **Import/Export** page displays a message that the cartridges must be removed.

▼ Export Diagnostic Cartridges

Task Tool

This task can be performed at either of the following:

- Local operator panel
- Standalone SL Console
- Web-launched SL Console

Task Purpose

Use this procedure to export diagnostic cartridges from the library through a specified CAP. The library controller reserves the CAP for the entire operation. The diagnostic cartridges are retrieved from reserved system cells and placed in the CAP for removal. The system can perform only one diagnostic cartridge import or export operation at a time.

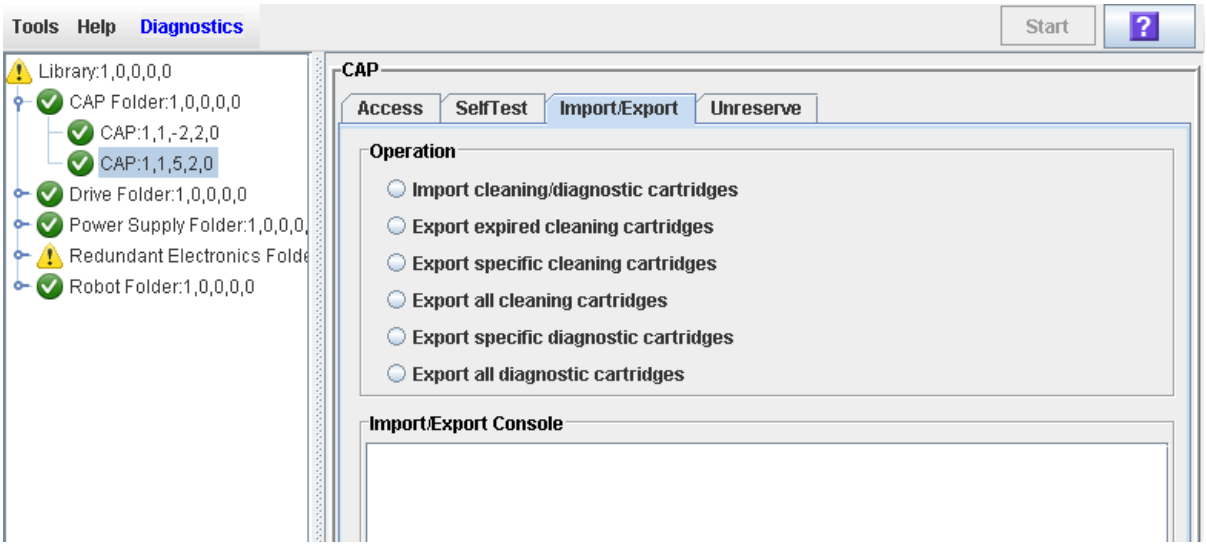
> **Note –** Only rotational CAPs, not AEM CAPs, can be used for this procedure.

Before beginning this procedure, verify the CAP is empty, available for use (not reserved by a host), closed, and locked.

Task Steps

1. **Select Tools > Diagnostics.**
2. **Expand the CAP Folder, highlight the CAP you want to use, and then click the Import/Export tab.**

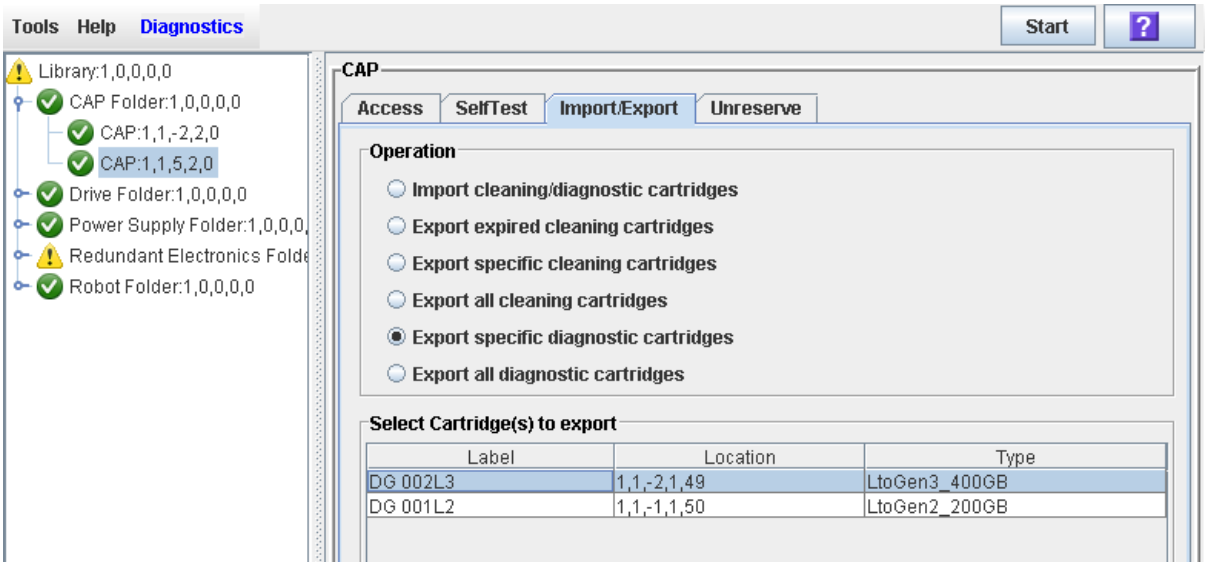
   The **Import/Export** page appears.



3. **Select the type of export operation you want to perform. You have the following options:**

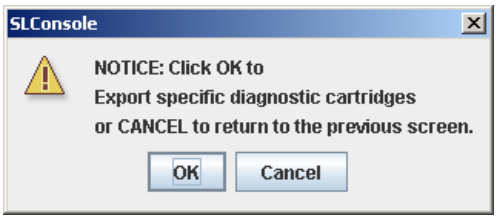
   - **Export specific diagnostic cartridges**: Enables you to specify the diagnostic cartridges you want to eject. The page displays a list of all diagnostic cartridges in the library, and you can select one or more for export.

- **Export all diagnostic cartridges**: Exports all diagnostic cartridges from the library.



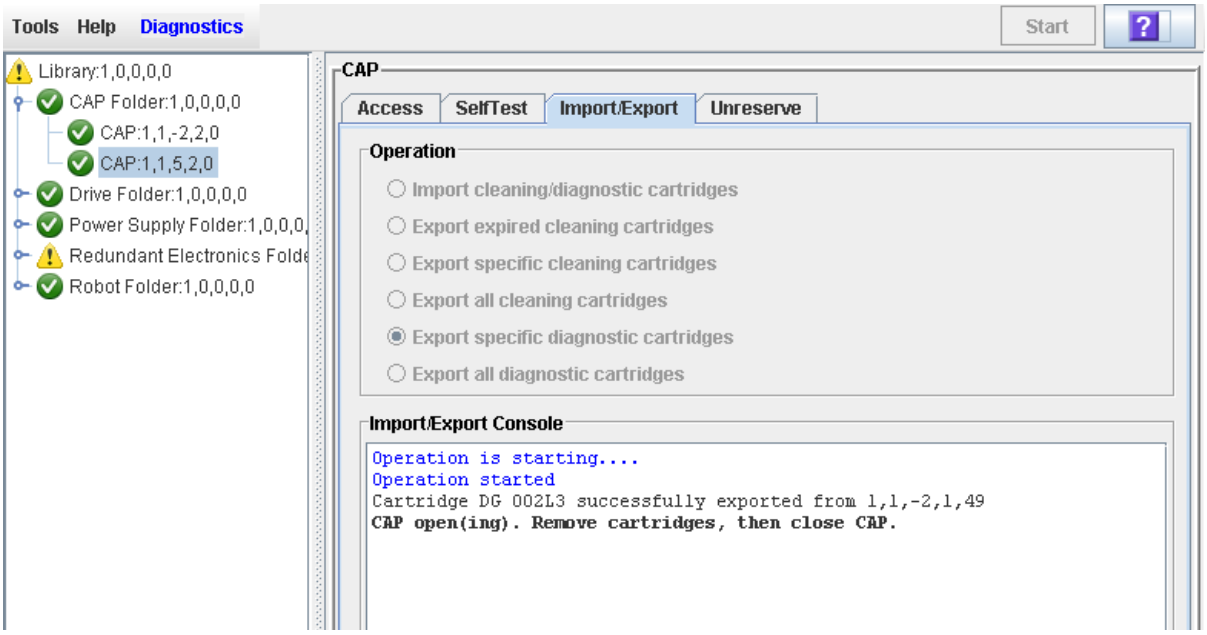
4. **Click Start.**

   A confirmation message appears.



5. **Click OK to continue.**

   The export operation begins, and the **Import/Export** page displays the ongoing status.



The export operation proceeds as follows:

- If the library is partitioned and the CAP is associated with an FC-SCSI partition, the library controller associates the CAP to the `default` requestor for the duration of the export operation.
- The library controller reserves the CAP.
- The diagnostic cartridges are moved to the CAP, according to your request.
- The Import/Export page displays a message when the CAP is ready to be unloaded.

6. **Remove the cartridges from the CAP.**

   For detailed instructions, see "Eject Cartridges Through a Rotational CAP" on page 420.

7. **Close the CAP door and the library controller proceeds as follows:**

   - If the CAP is empty, the library controller releases the CAP reservation and re-associates the CAP to the original FC-SCSI partition, if applicable.
   - If cartridges are left in the CAP, the CAP door is opened, and the **Import/Export** page displays a message that the cartridges need to be removed.

▼ Display Diagnostic Cartridge Information

Task Tool

This task can be performed at either of the following :

- Local operator panel
- Standalone SL Console
- Web-launched SL Console

Task Purpose

You can use any of the following SL Console reports and searches to display information about diagnostic cartridges:

- “Cartridge Table Report” on page 539
- “Cartridge Summary” on page 539
- “Cartridge Search by VOLID” on page 540

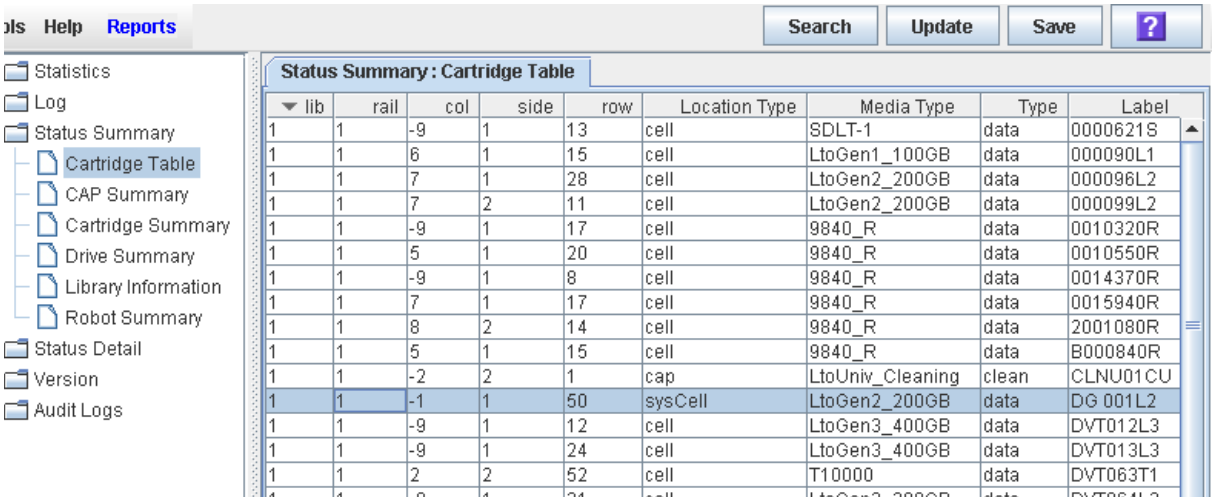
Cartridge Table Report

- **Select Tools> >Reports >Status Summary > Cartridge Table**

  See “Display Library Cartridge Information in Tabular Format” on page 430 for the full procedure.

  The **Cartridge Table** report displays detailed information about all library cartridges in a sortable, tabular format. By default, this report is sorted in cartridge volume ID (VOLI D or volser) order. You can scroll directly to the cartridges that begin with “DG” to see detail about all diagnostic cartridges.

  The following is a sample:



lib	rail	col	side	row	Location Type	Media Type	Type	Label
1	1	-9	1	13	cell	SDLT-1	data	0000621S
1	1	6	1	15	cell	LtoGen1_100GB	data	000090L1
1	1	7	1	28	cell	LtoGen2_200GB	data	000096L2
1	1	7	2	11	cell	LtoGen2_200GB	data	000099L2
1	1	-9	1	17	cell	9840_R	data	0010320R
1	1	5	1	20	cell	9840_R	data	0010550R
1	1	-9	1	8	cell	9840_R	data	0014370R
1	1	7	1	17	cell	9840_R	data	0015940R
1	1	8	2	14	cell	9840_R	data	2001080R
1	1	5	1	15	cell	9840_R	data	B000840R
1	1	-2	2	1	cap	LtoUniv_Cleaning	clean	CLNU01CU
1	1	-1	1	50	sysCell	LtoGen2_200GB	data	DG 001L2
1	1	-9	1	12	cell	LtoGen3_400GB	data	DVT012L3
1	1	-9	1	24	cell	LtoGen3_400GB	data	DVT013L3
1	1	2	2	52	cell	T10000	data	DVT063T1

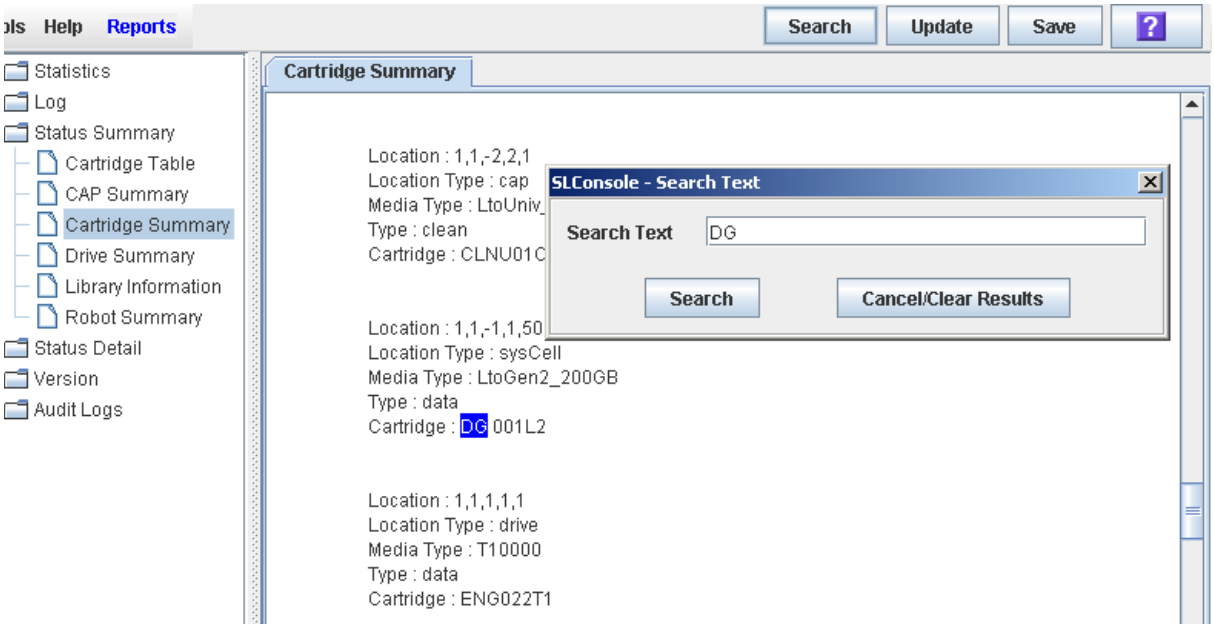
Cartridge Summary

- **Select Tools> >Reports >Status Summary > Cartridge Summary**

  See “List Library Cartridges” on page 434 for the full procedure.

The **Cartridge Summary** displays detailed information about all library cartridges in a text format. By default, this report is sorted in location order. You can search for cartridges that begin with “DG” to see detail about diagnostic cartridges.

Following is a sample:



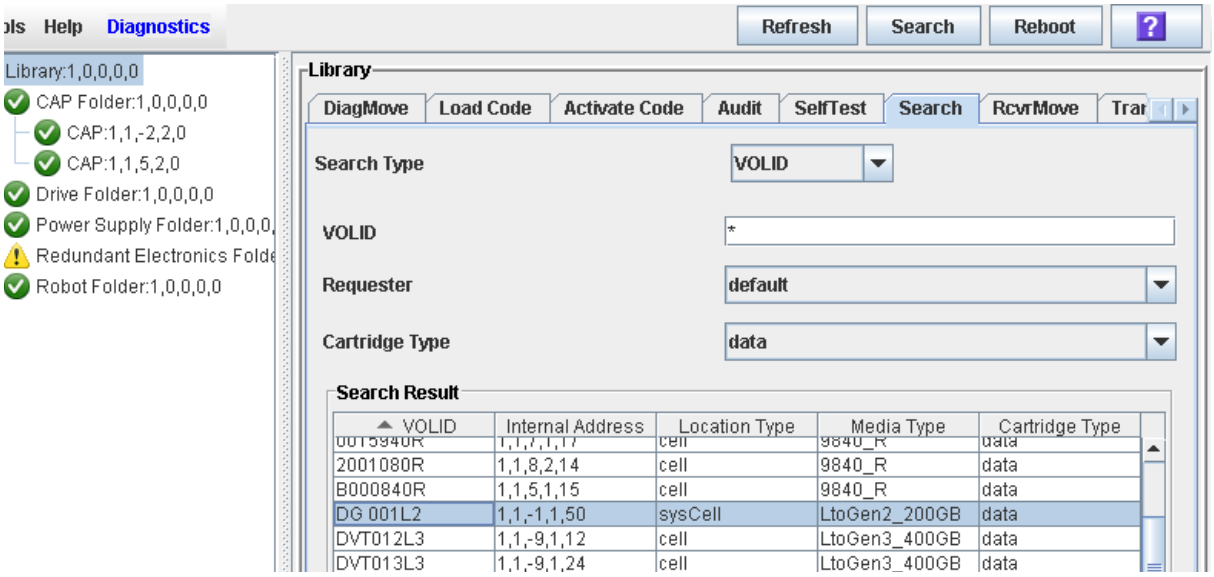
Cartridge Search by VOLID

- **Select Tools> >Diagnostics > Library > Search.**

  See “Locate a Cartridge by VOLID” on page 437 for the full procedure.

  Search by VOLID displays detailed information about all library cartridges. By default the results are sorted in location order. You can change the sort order to VOLID and then scroll directly to the cartridges that begin with “DG” to see detail about all diagnostic cartridges.

The following is a sample:



Audit Tasks

▼ Audit the Entire Library

Task Tool

This task can be performed at any of the following:

- Local operator panel
- Standalone SL Console
- Web-launched SL Console

Task Purpose

During this audit, the robot visits all the storage cells, catalogs the VOLIDs and locations, and updates the library controller database.

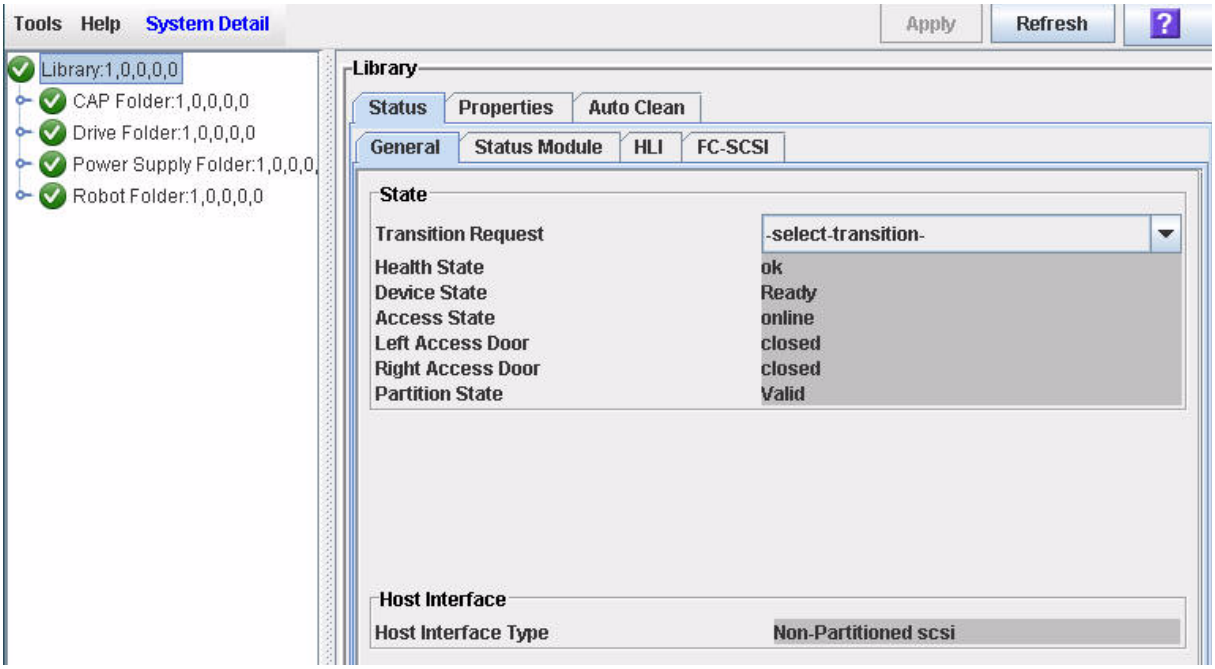
Note – Although this audit is a background process and does not interrupt library operations, it does require sharing of robot resources. Therefore, it is not recommended that you run this audit during peak activity periods.

Note – You cannot stop this audit after it has initiated. The audit takes approximately 1/2 second per cartridge slot.

Task Steps

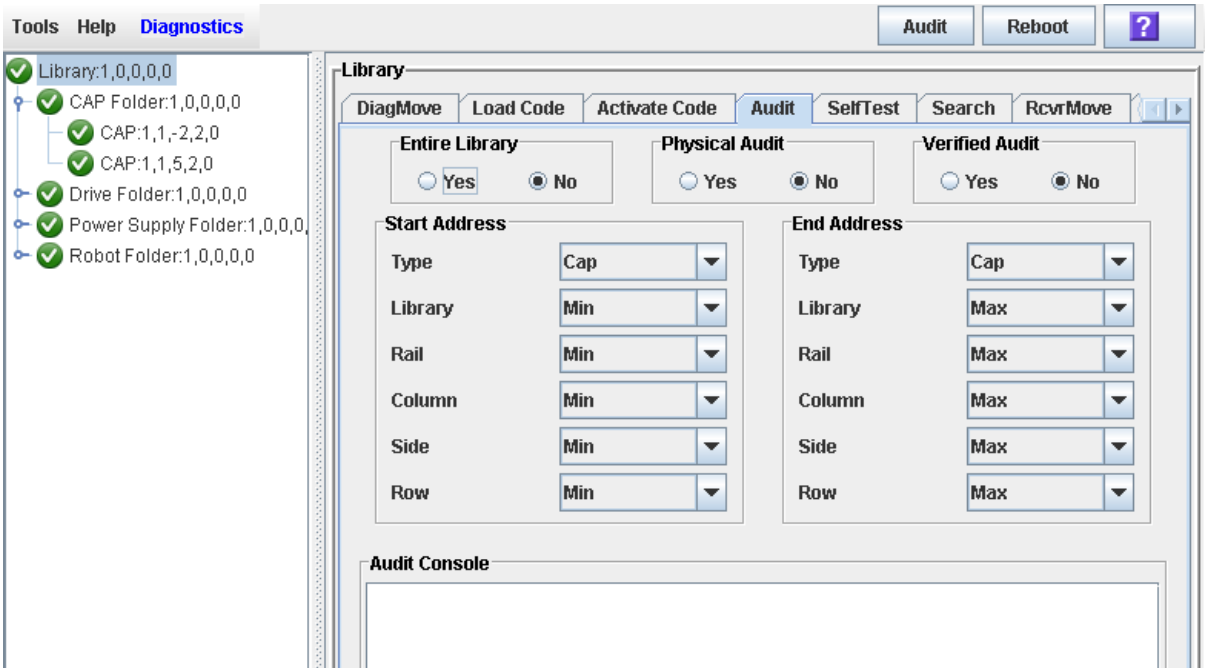
1. **Select Tools > Diagnostics.**
2. **Click the Library folder on the navigation tree.**

   The **Library** page appears.



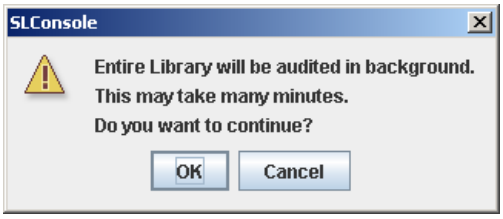
3. **Click the Audit tab.**

   The **Audit** page appears.



4. **In the Entire Library section, click the Yes radio button. Then click the Audit button in the upper right corner.**

   A confirmation message appears.



5. **Click OK to perform the audit as a background process or Cancel to cancel the audit.**

   Note – After you click **OK**, you cannot stop the audit. It runs until completion.

   You can view the Cartridge S ummary report after a few hours for the latest car tridge locations and VOLIDs. See “Display a Library Report” on page 90 for details.

▼ Audit a Range of Cells

Task Tool

This task can be performed at any of the following:

- Local operator panel
- Standalone SL Console
- Web-launched SL Console

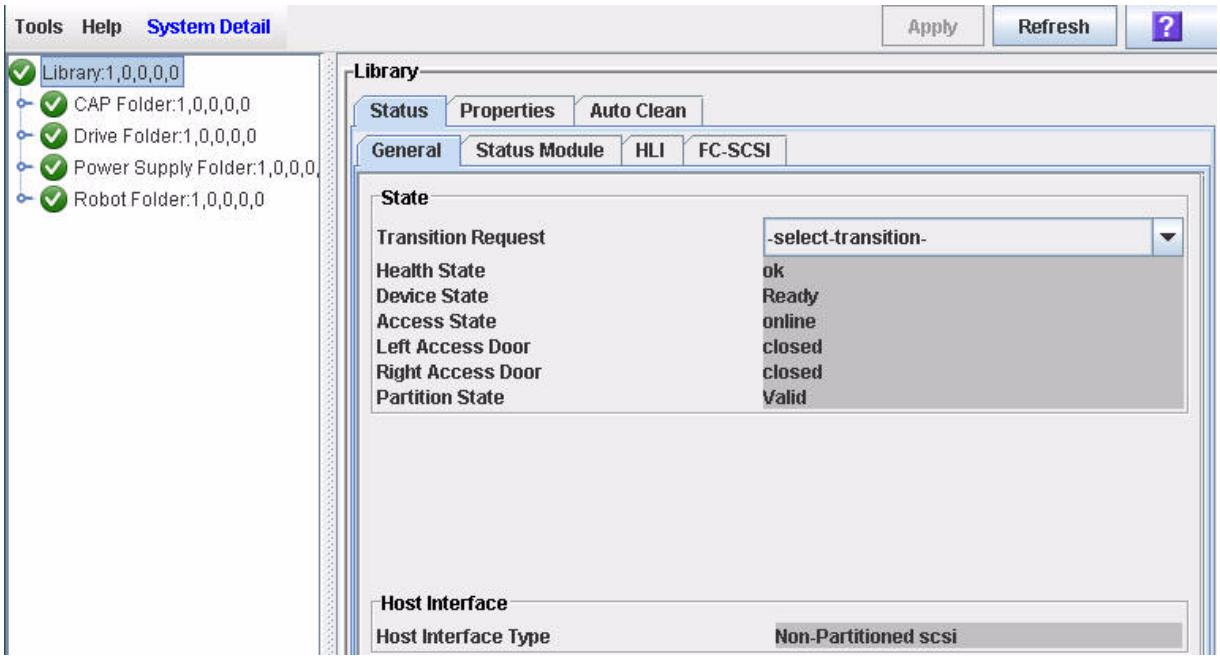
Task Purpose

During this audit, the robot visits only a specific range of storage cells (including the cap and drives) and updates the library controller database.

Task Steps

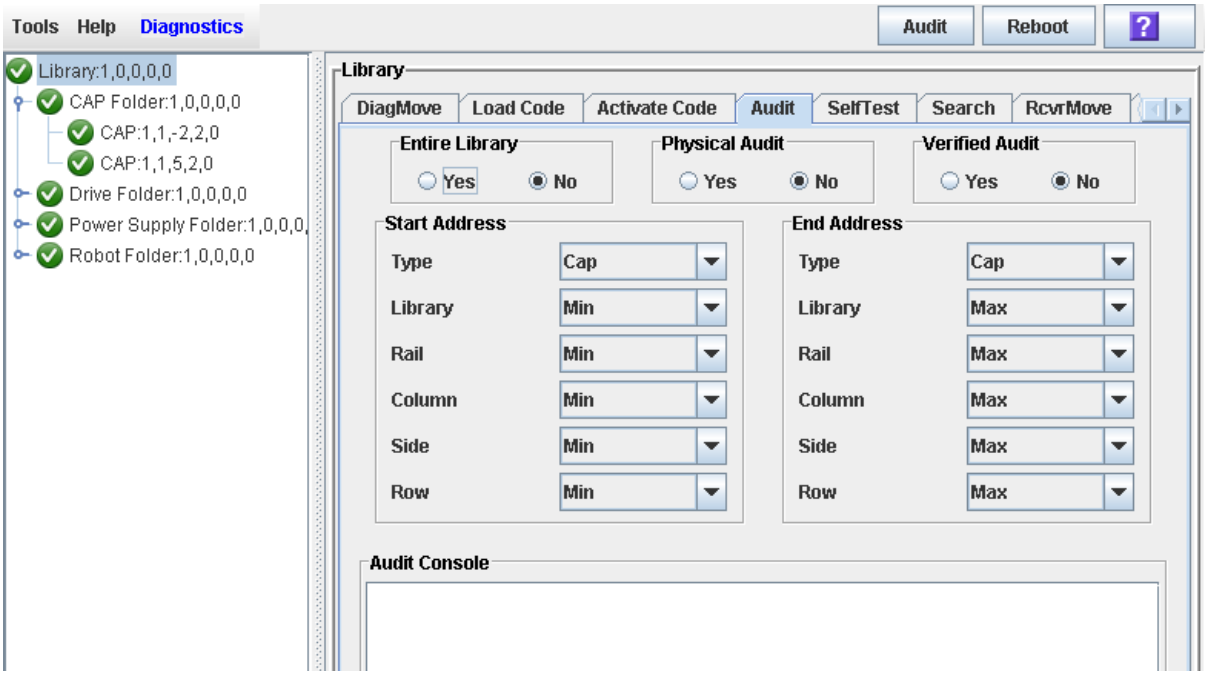
1. **Select Tools > Diagnostics.**
2. **Click the Library folder on the navigation tree.**

   The **Library** page appears.



3. **Click the Audit tab.**

   The **Audit** page appears.

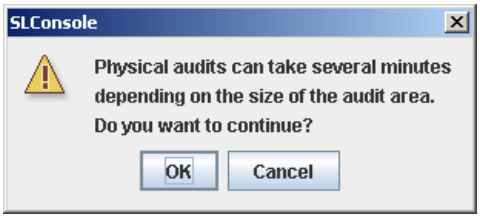


4. **In the Entire Library section, click the No radio button. In the Physical Audit section, select Yes. In the Verified Audit section, select No.**

5. **In the Start Address and End Address sections, select the device types you want to audit and the starting and ending library internal address locations. See "Library Internal Address" on page 602 for a detailed explanation of this address format.**

6. **Click the Audit button in the upper right corner.**

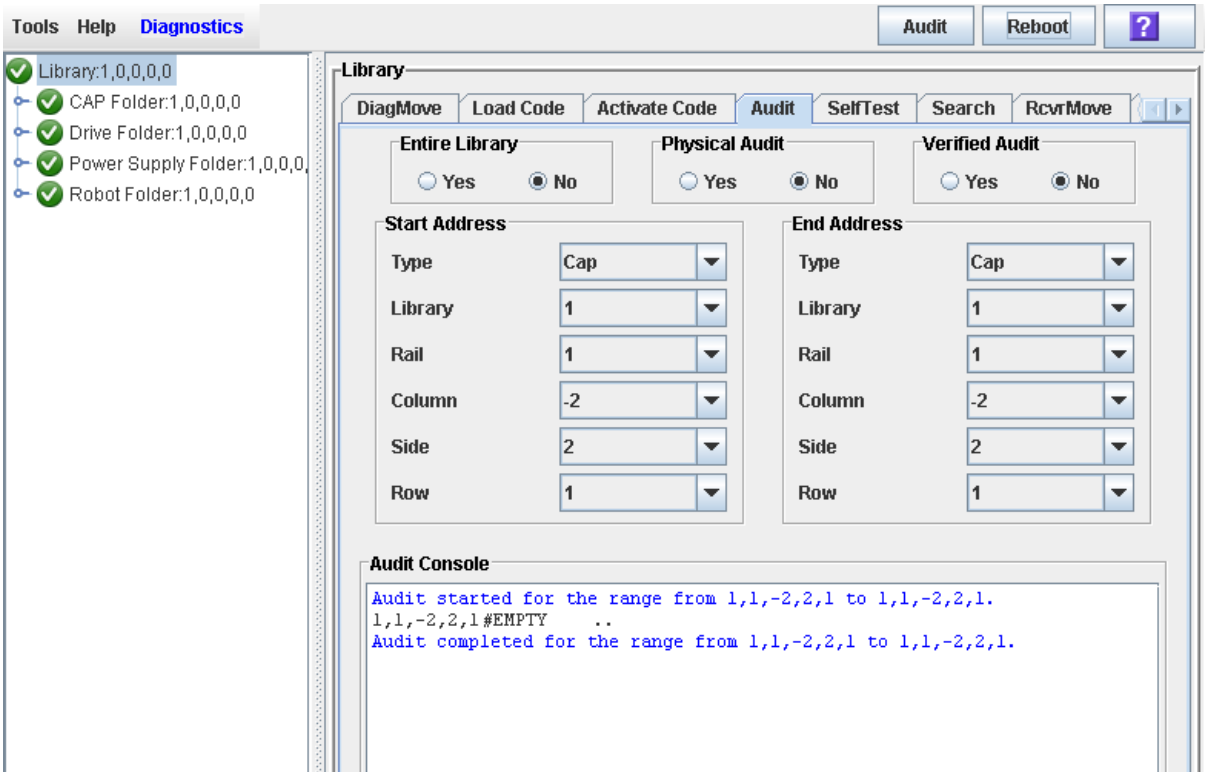
   A confirmation message appears.



7. **Click OK to perform the audit as a background process, or Cancel to cancel the audit.**

   Note – After you click **OK**, you cannot stop the audit. It runs until completion.

The **Audit Console** section displays the progress of the audit.



Note – You can also view the Cartridge Summary report for the latest cartridge locations and VOLIDs. See "Display a Library Report" on page 90 for details.

▼ Perform a Verified Audit

Task Tool

This task can be performed at any of the following:

- Local operator panel
- Standalone SL Console
- Web-launched SL Console

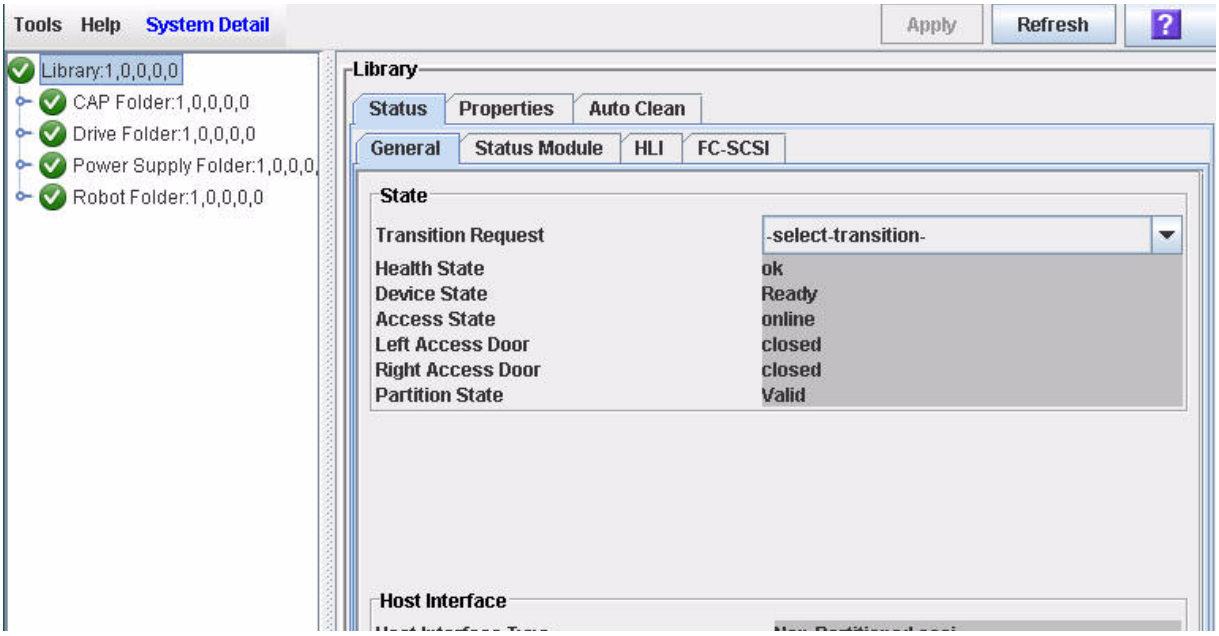
Task Purpose

A verified audit validates the status of a specific cartridge location or a range of locations (including rotational and AEM CAPs and drives) in the library controller database. If a cartridge address has a verified status of "false," the system performs a physical audit of that location and updates the library controller database.

Task Steps

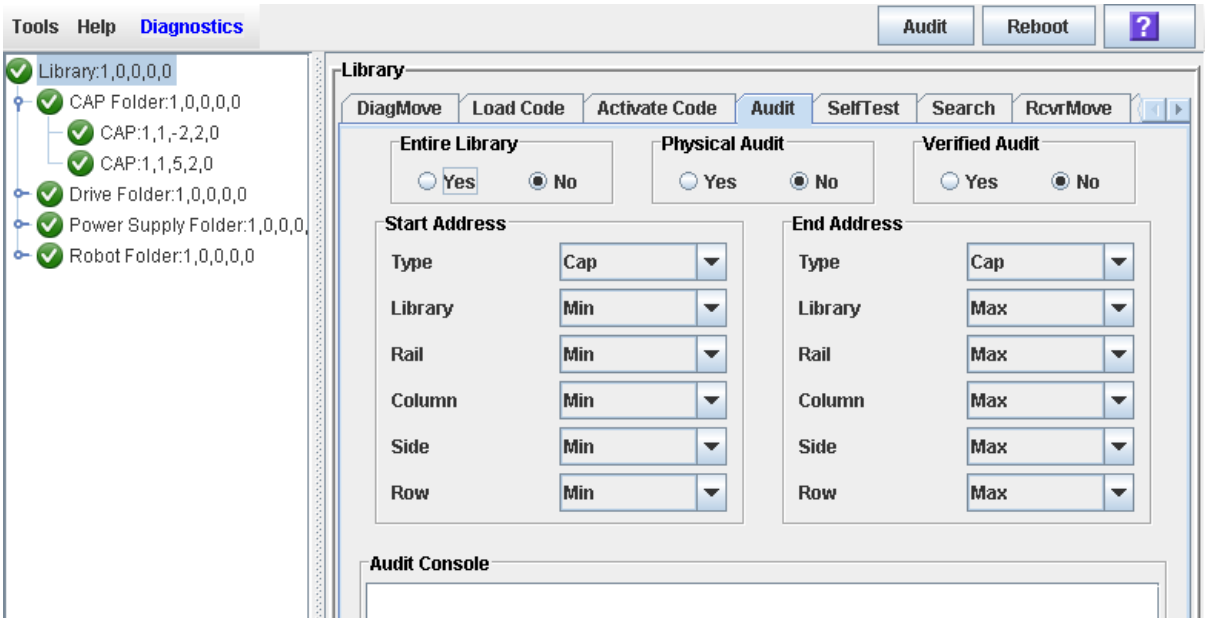
1. **Select Tools > Diagnostics.**
2. **Click the Library folder on the navigation tree.**

   The **Library** page appears.



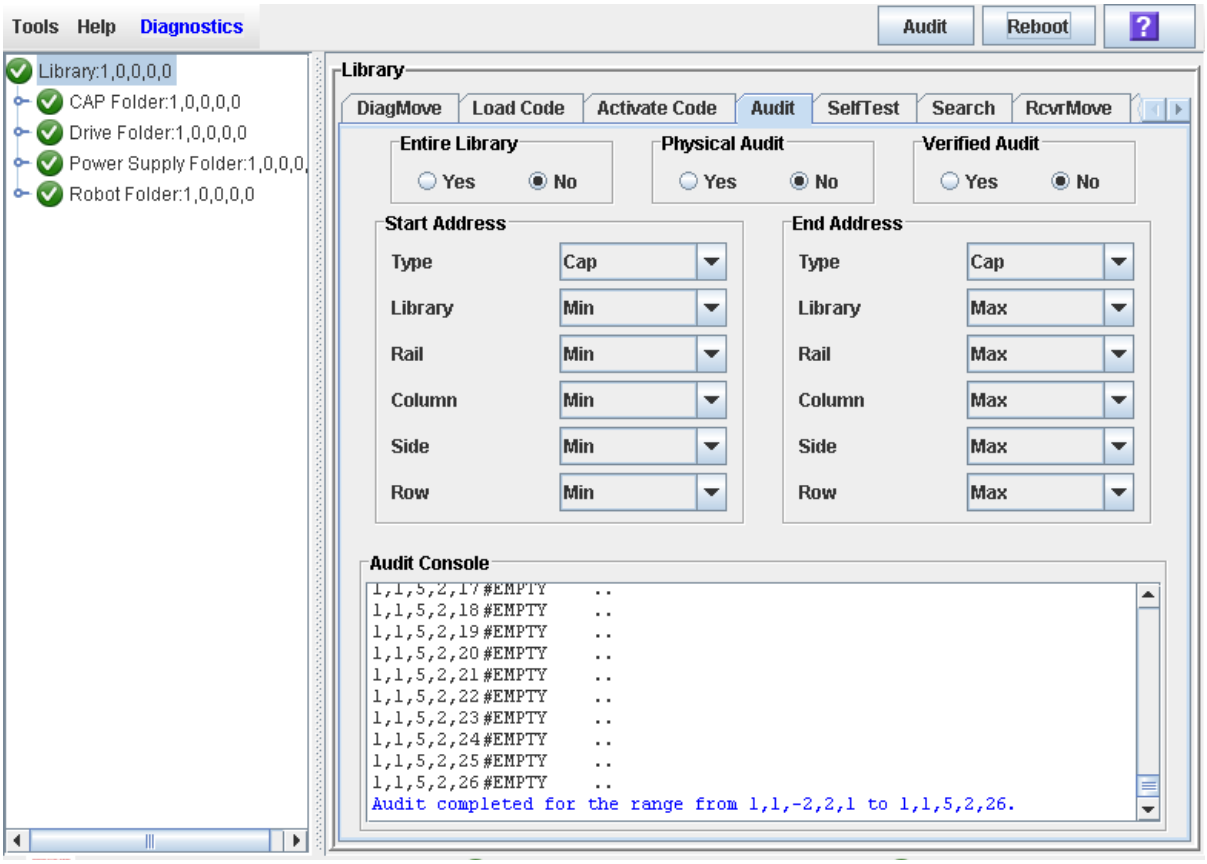
3. **Click the Audit tab.**

The **Audit** page appears.



4. **In the Entire Library section, select No. In the Physical Audit section, select No. In the Verified Audit section, select Yes.**
5. **In the Start Address and End Address sections, select the device types you want to audit and the starting and ending library internal address locations. See** "Library Internal Address" on page 602 **for a detailed explanation of this address format.**
6. **Click the Audit button in the upper right area of the page.**

The **Audit Console** section displays the progress of the audit.



Rotational and AEM CAP Utility Tasks

▼ Perform a Self Test on a Rotational or AEM CAP

Task Tool

This task can be performed at any of the following:

- Local operator panel
- Standalone SL Console
- Web-launched SL Console

Task Purpose

Use this procedure to perform a self test on a rotational or AEM CAP .

> **Note –** At present, the CAP self-tests perform the same routines as the library self-test. Specific rotational and AEM CAP self-tests will be available at a later date.

Task Steps

1. **Select Tools > Diagnostics.**
2. **Expand the CAP folder, and click the CAP you want to test.**

   > **Note –** AEM CAPs are identified as follows: column “–31” for a left AEM CAP, and column “31” for a right AEM CAP .

3. **Click the SelfTest tab.**
4. **In the Mode list, select Non-Disruptive.**
5. **Click the Run button in the upper right corner.**

   Status messages are displayed as the self-test is run. When the test finishes, the system displays a message indicating the diagnostic test is complete.

▼ Take a Rotational or AEM CAP Offline

Task Tool

This task can be performed at any of the following:

- Local operator panel
- Standalone SL Console
- Web-launched SL Console

Task Purpose

Use this procedure to take a rotational or AEM CAP offline through the SL Console.

> **Note –** Use this procedure only if you are not using ACSLS or ELS tape management software, or if their servers are unable to communicate with the library. ACSLS and ELS are not notified when the state of the library or its components are changed through the SL Console, which could possibly lead to disruption in library operations. For instructions on changing the state of the library and its components through ACSLS or ELS, see the appropriate tape management software documentation.

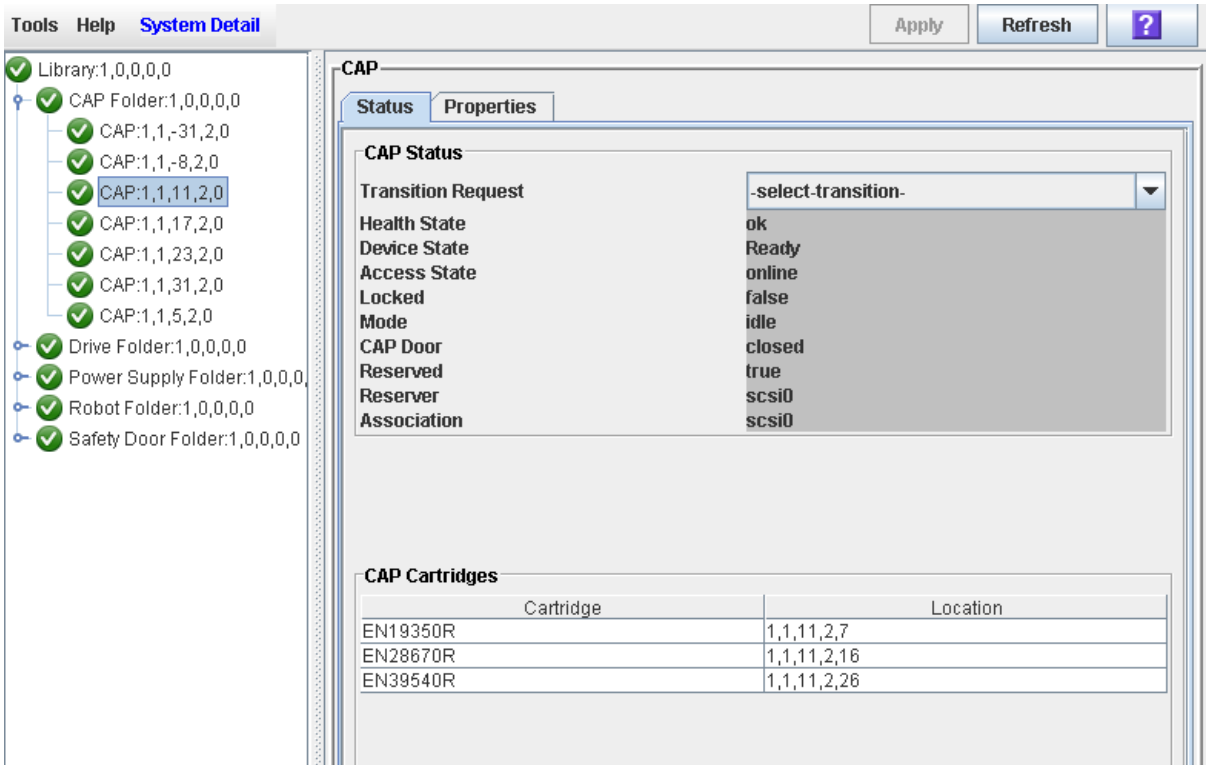
Task Steps

1. **Select Tools > System Detail.**
2. **Expand the CAP Folder, and click the CAP you want to modify.**

   > **Note –** AEM CAPs are identified as follows: column "–31" for a left AEM CAP, and column "31" for a right AEM CAP .

3. **Click the Status tab.**

   The page displays the current status of the CAP.



4. **In the Transition Request list, select Take Offline. Click Apply.**

   All outstanding jobs for the CAP complete. Then the CAP status changes, as follows:

   - **Health State**: Warn.
   - **Device State**: Not accessible (HLI host connections). Not ready (SCSI host connections).
   - **Access State**: Offline.

▼ Bring a Rotational or AEM CAP Online

Task Tool

This task can be performed at any of the following:

- Local operator panel
- Standalone SL Console
- Web-launched SL Console

Task Purpose

Use this procedure to bring a rotational or AEM CAP online through the SL Console.

> **Note –** Library devices that are offline in an error state cannot go online. The error condition must be cleared first.

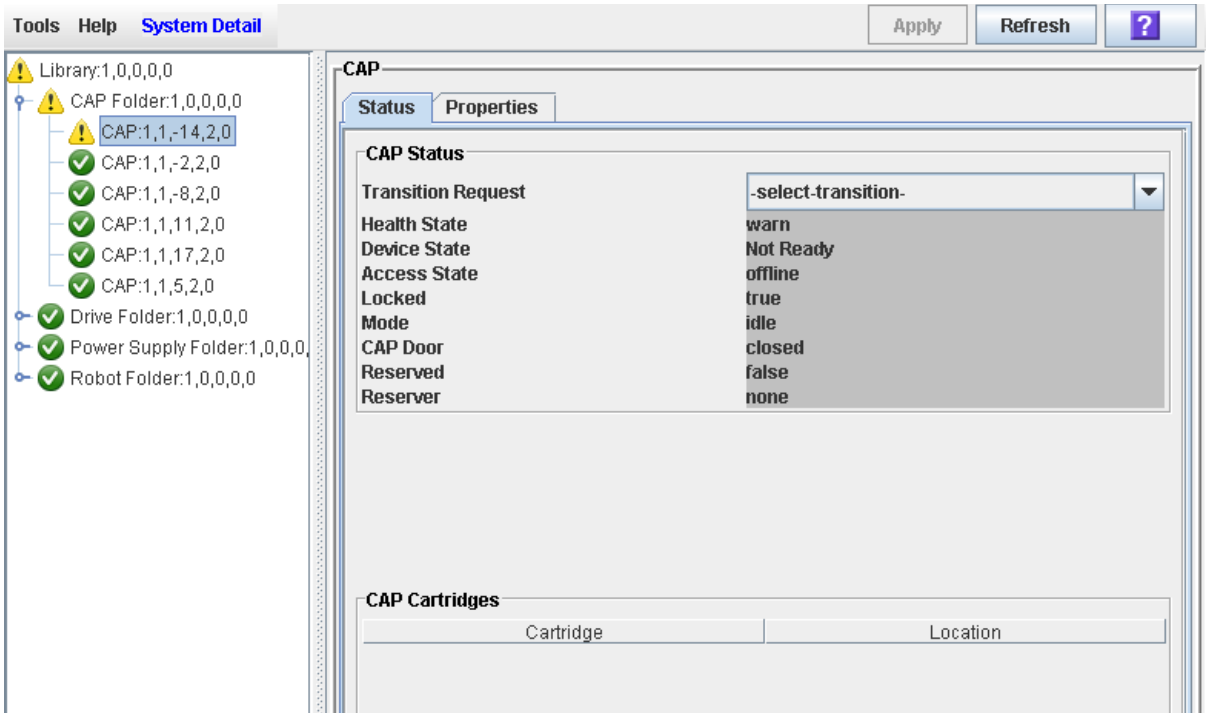
Task Steps

1. **Select Tools > System Detail.**
2. **Expand the CAP Folder, and click the CAP you want to modify.**

   > **Note –** AEM CAPs are identified as follows: column "–31" for a left AEM CAP, and column "31" for a right AEM CAP .

3. **Click the Status tab.**

   The page displays the current status of the CAP.



4. **In the Transition Request list, select Bring online. Click Apply.**

   The CAP status updates, as follows:

- Health State: ok
- Device State: Ready
- Access State: Online

Drive Utility Tasks

▼ Perform a Drive Self Test

Task Tool

This task can be performed at any of the following:

- Local operator panel
- Standalone SL Console
- Web-launched SL Console

Task Purpose

Use this procedure to perform a self test on a drive.

Task Steps

1. **Select Tools > Diagnostics.**
2. **Expand the Drive Folder, and click the drive you want to test.**
3. **Click the SelfTest tab.**
4. **In the Mode list, select Non-Disruptive.**
5. **Click Run in the upper right area of the screen.**

   Status messages display as the self-test runs. After the test finishes, the system displays a message indicating the diagnostic test is complete.

▼ Take a Drive Offline

Task Tool

This task can be performed at any of the following:

- Local operator panel
- Standalone SL Console
- Web-launched SL Console

Task Purpose

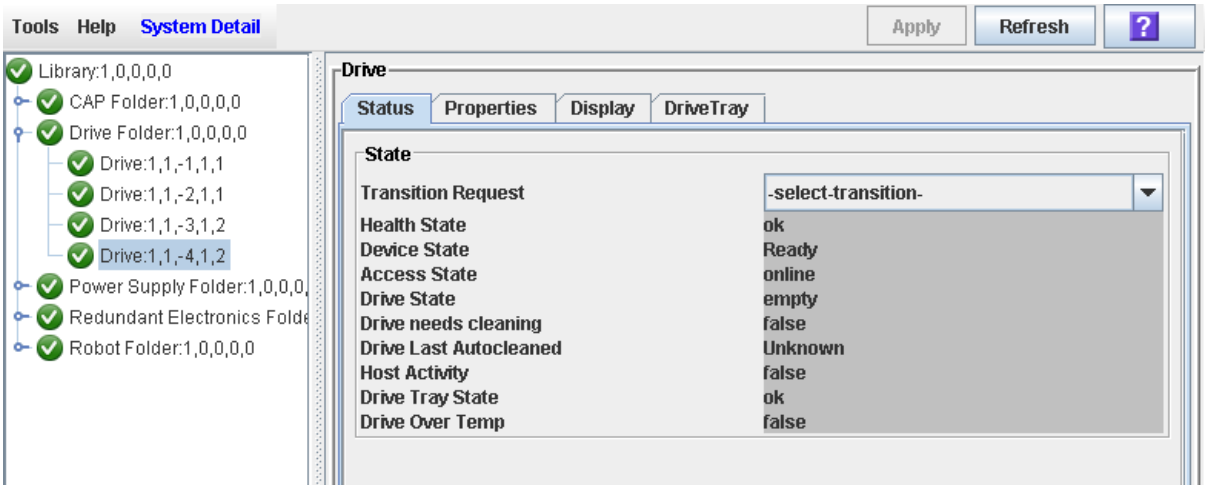
Use this procedure to take a drive offline through the SL Console.

> **Note –** Use this procedure only if you are not using ACSLS or ELS tape management software, or if their servers are unable to communicate with the library. ACSLS and ELS are not notified when the state of the library or its components are changed through the SL Console, which could possibly lead to disruption in library operations. For instructions on changing the state of the library and its components through ACSLS or ELS, see the appropriate tape management software documentation.

Task Steps

1. **Select Tools > System Detail.**
2. **Expand the Drive Folder, and click the drive you want to modify.**
3. **Click the Status tab.**

   The page displays the current status of the drive.



4. **In the Transition Request field, click Take Offline. Click Apply.**

   The system completes all outstanding jobs for the drive. Then the drive status changes as follows:

   - Health State: Warn.

- Device State: Not accessible (HLI host connections). Not ready (SCSI host connections).
- Access State: Offline.

▼ Bring a Drive Online

Task Tool

This task can be performed at any of the following:

- Local operator panel
- Standalone SL Console
- Web-launched SL Console

Task Purpose

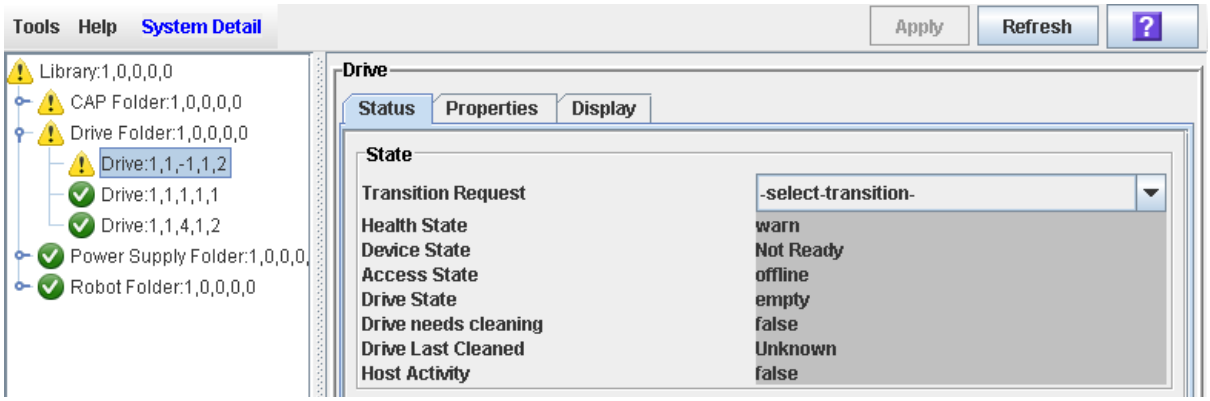
Use this procedure to bring a drive online through the SL Console.

Note – Library devices that are offline in an error state cannot go online. The error condition must be cleared first.

Task Steps

1. **Select Tools > System Detail.**
2. **Expand the Drive Folder, and click the drive you want to modify.**
3. **Click the Status tab.**

   The page displays the current status of the drive.



4. **In the Transition Request list, select Bring online. Click Apply.**

   The drive status updates as follows:

   - Health State: ok
   - Device State: Ready
   - Access State: Online

Robot Utility Tasks

▼ Perform a Robot Self-Test

Task Tool

This task can be performed at any of the following:

- Local operator panel
- Standalone SL Console
- Web-launched SL Console

Task Purpose

Perform a self test on a robot.

> **Note –** To perform a robot self-test, diagnostic cartridges must be available in the library.

Task Steps

1. **Select Tools > Diagnostics.**
2. **Expand the Robot Folder, and click the robot you want to test.**
3. **Click the SelfTest tab.**
4. **In the Mode list, select Non-Disruptive.**
5. **Click the Run button in the uppper right corner.**

   Status messages display as the self-test runs. After the test finishes, the system displays a message indicating the diagnostic test is complete.

▼ Take a Robot Offline

Task Tool

This task can be performed at any of the following:

- Local operator panel
- Standalone SL Console
- Web-launched SL Console

Task Purpose

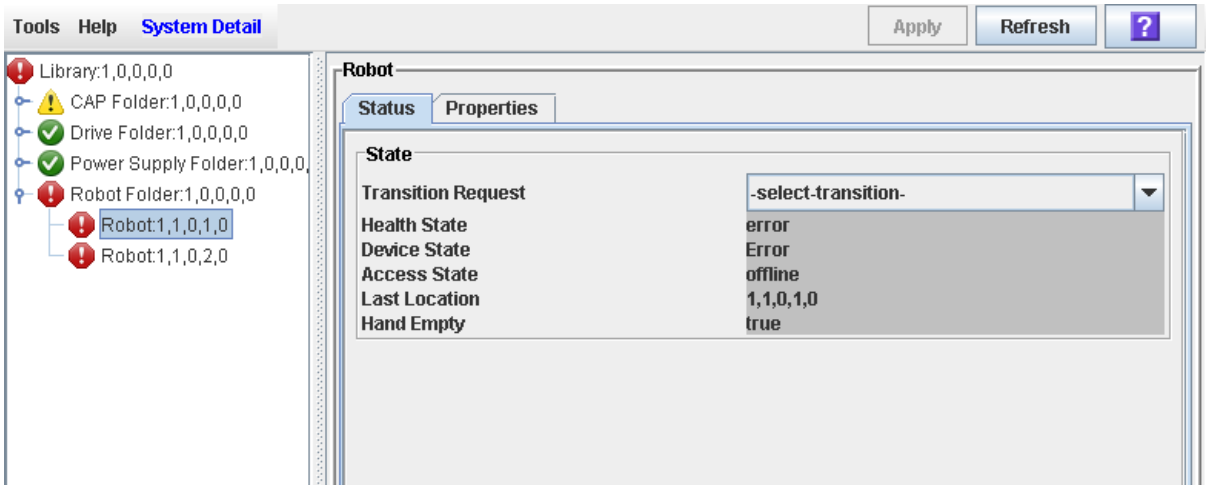
Use this procedure to take a robot offline through the SL Console.

> **Note –** Use this procedure only if you are not using ACSLS or ELS tape management software, or if their servers are unable to communicate with the library. ACSLS and ELS are not notified when the state of the library or its components are changed through the SL Console, which could possibly lead to disruption in library operations. For instructions on changing the state of the library and its components through ACSLS or ELS, see the appropriate tape management software documentation.

Task Steps

1. **Select Tools > System Detail.**
2. **Expand the Robot Folder, and click the robot you want to modify.**
3. **Click the Status tab.**

   The page displays the current status of the robot.



4. **In the Transition Request field, select Take Offline. Click Apply.**

   All outstanding jobs for the robot are complete. Then the robot status is changed as follows:

   - Health State: Warn.

- Device State: Not accessible (HLI host connections). Not ready (SCSI host connections).
- Access State: Offline.

5. **The robot moves to the end of the rail, and the library cannot use it. If the library is using the redundant robot feature, the second robot will take all requests.**

▼ Bring a Robot Online

Task Tool

This task can be performed at any of the following:

- Local operator panel
- Standalone SL Console
- Web-launched SL Console

Task Purpose

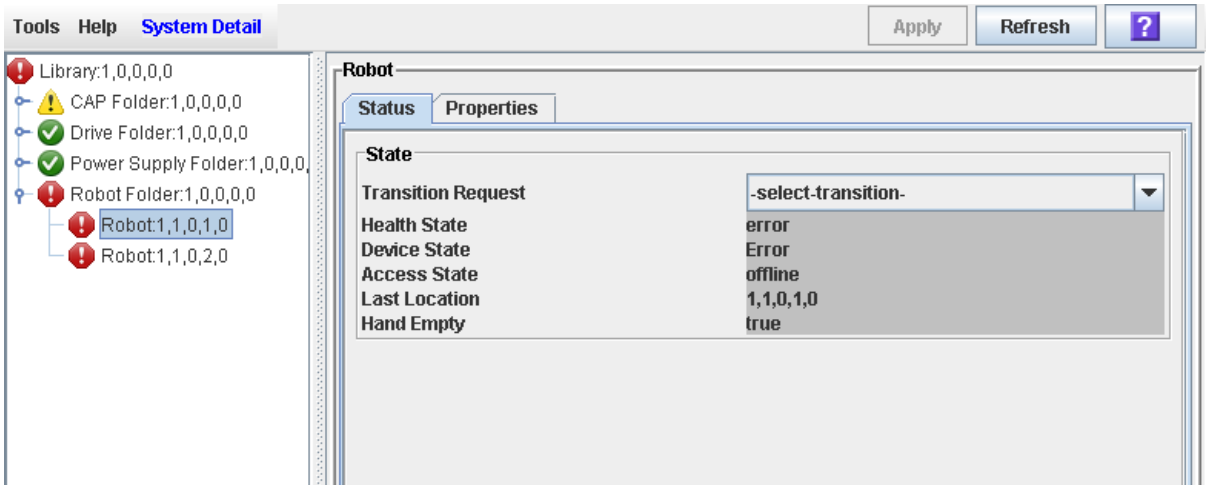
Use this procedure to bring a robot online through the SL Console.

> **Note –** Library devices that are offline in an error state cannot go online. The error condition must be cleared first.

Task Steps

1. **Select Tools > System Detail.**
2. **Expand the Robot Folder, and click the robot you want to modify.**
3. **Click the Status tab.**

   The page displays the current status of the robot.



4. **In the Transition Request list, select Bring Online. Click Apply.**

   The robot status updates as follows:

   - Health State: ok
   - Device State: Ready
   - Access State: Online

▼ Define a Diagnostic Move

Task Tool

This task can be performed at any of the following:

- Local operator panel
- Standalone SL Console
- Web-launched SL Console

Task Purpose

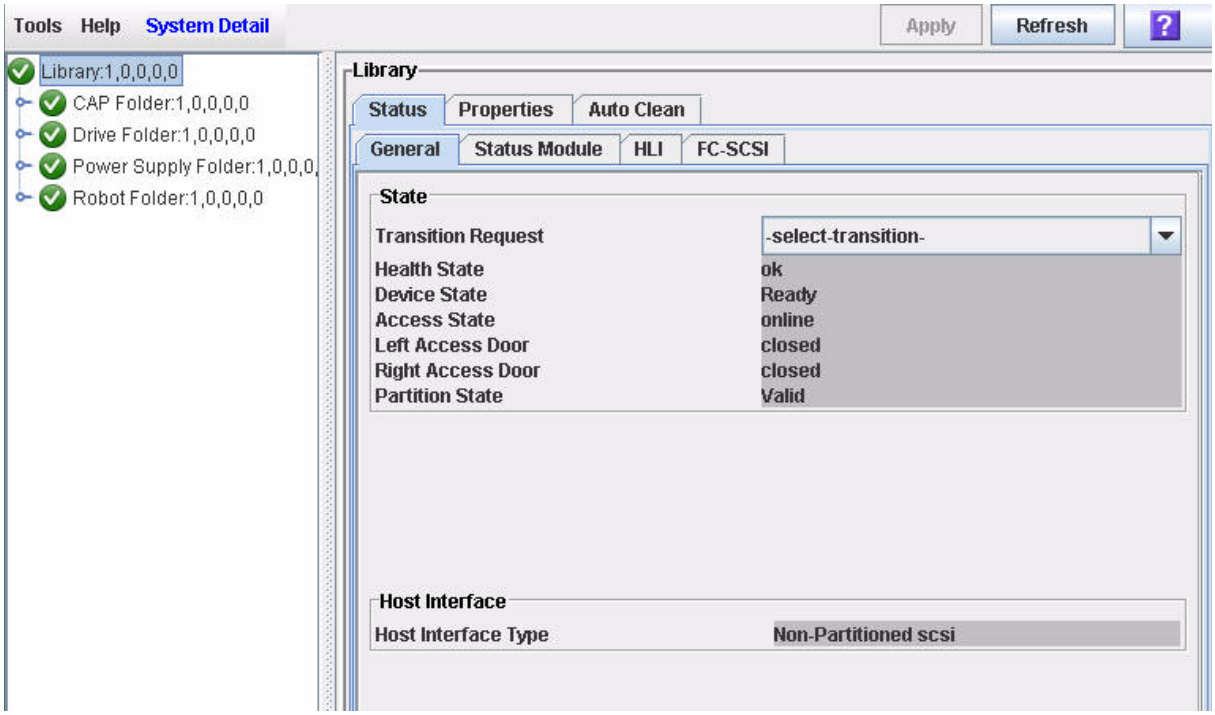
You can set up and run multiple diagnostic move routines simultaneously, as long as the target and pool address ranges do not overlap.

> **Note –** This procedure requires sharing of robot resources. Therefore, it is not recommended that you run it during peak activity periods.

Task Steps

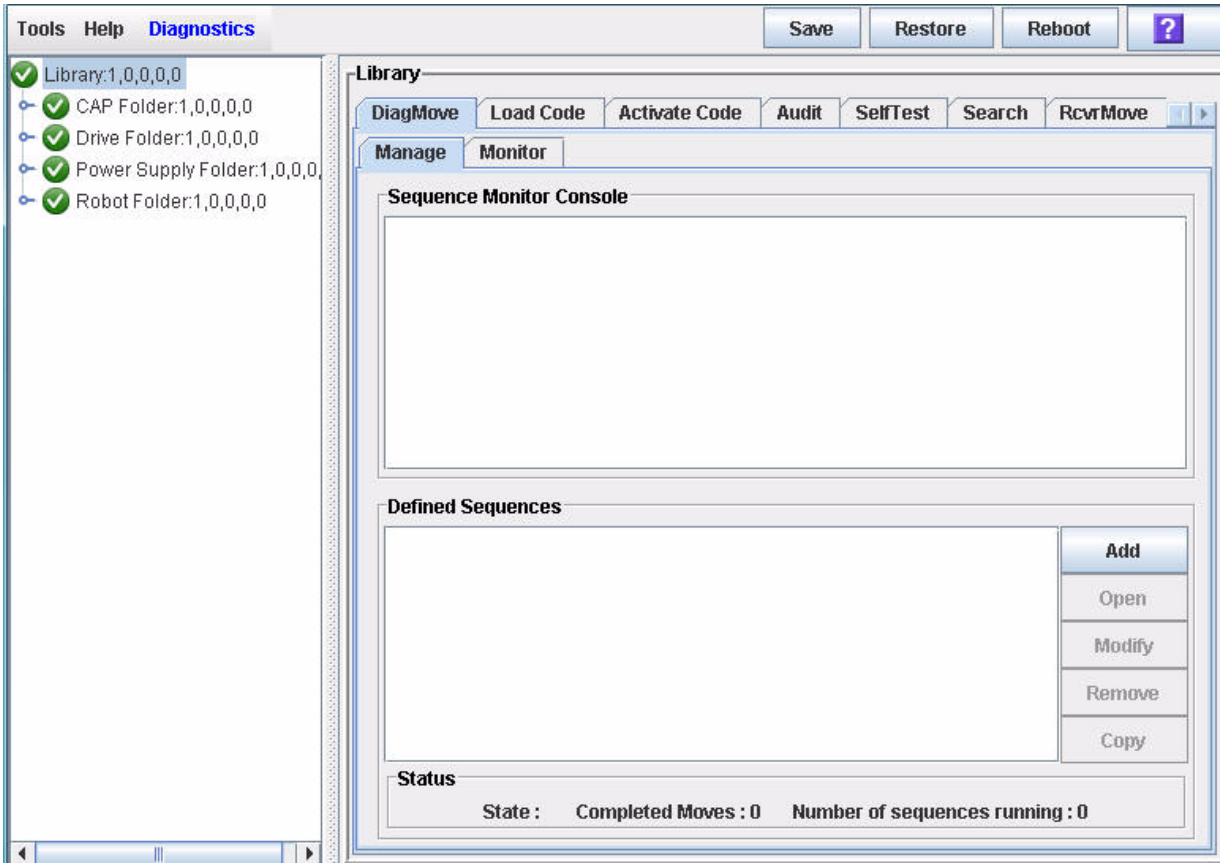
1. **Select Tools > Diagnostics.**
2. **Click the Library folder in the navigation tree.**

   The **Library** page appears.



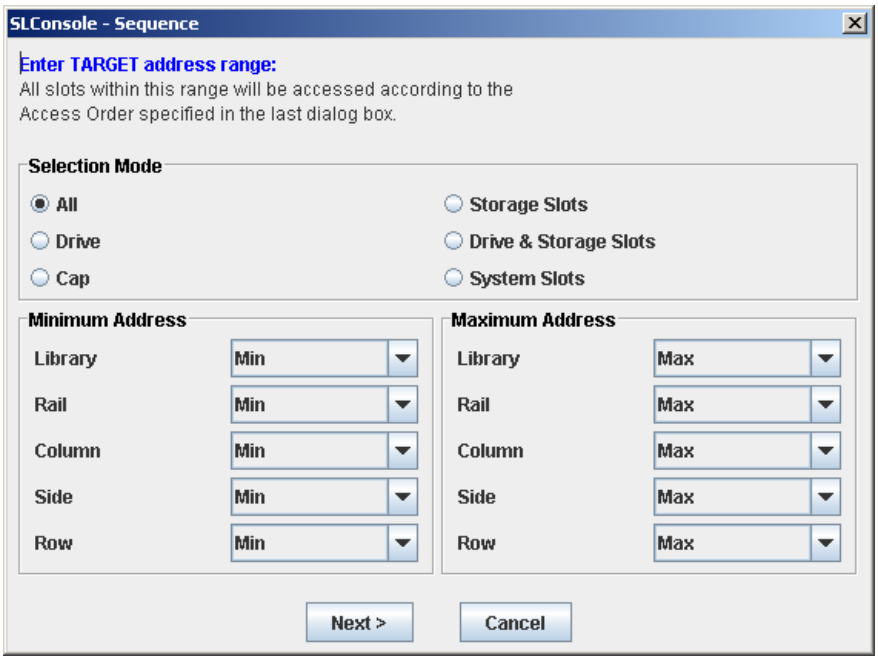
3. **Click the DiagMove tab, and then the Manage tab.**

   The **Manage** page appears.



4. **In the Defined Sequence section, click Add.**

   The **TARGET** dialog box appears.

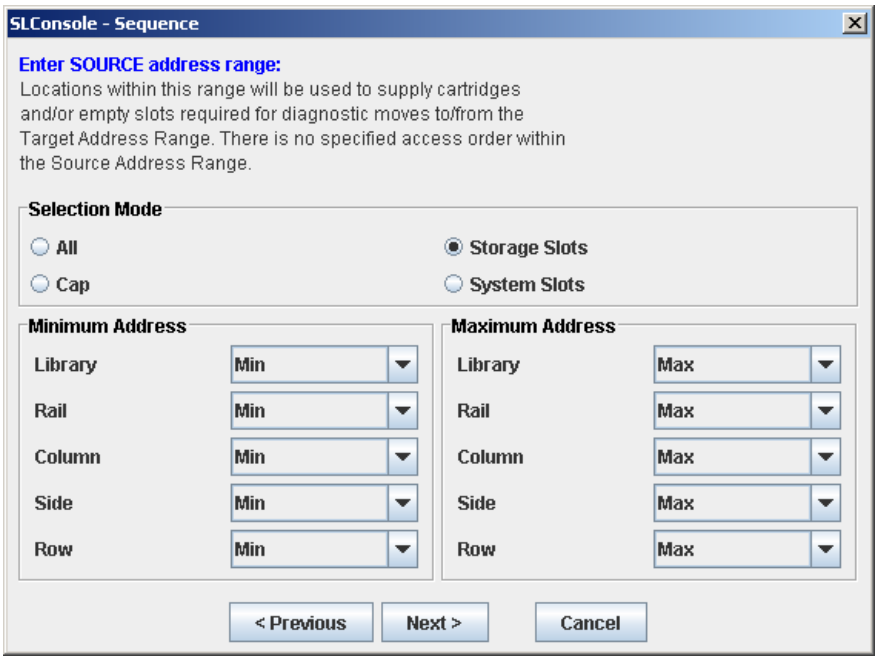


5. **Complete the Sequence screen as follows. See "Target Address Range" on page 492 for details.**

   - In the **Selection Mode** section, select the type of cells you want to diagnose.
   - In the **Minimum Address** and **Maximum Address** sections, select the library internal address of the starting and ending locations of the cells you want to diagnose.

6. **Click Next.**

   The **SOURCE** dialog box appears.

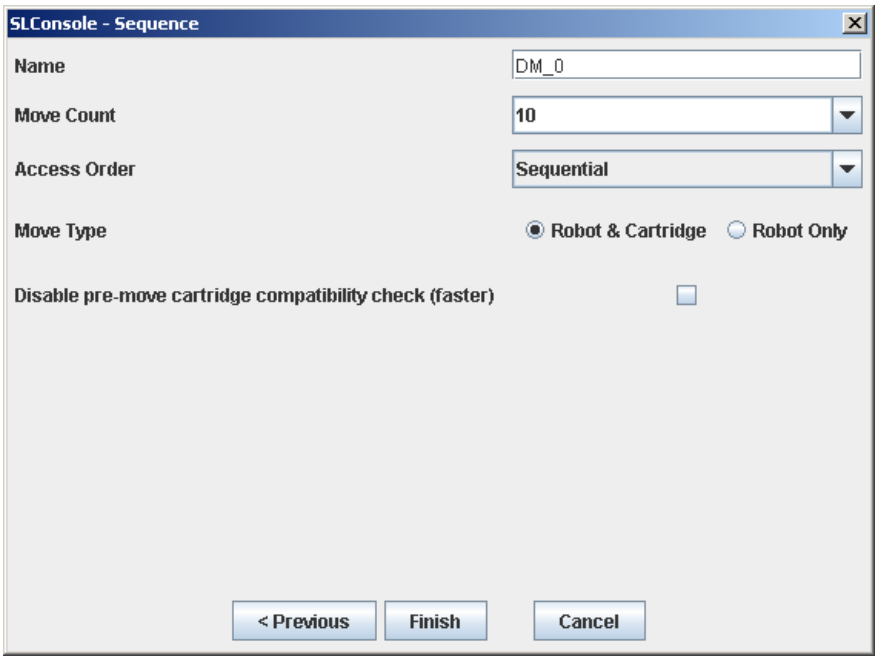


7. **Complete the SOURCE screen as follows. See "Pool Address Range" on page 492 for details.**

   - In the **Selection Mode** sections, select the appropriate cartridge pool address type.
   - In the **Minimum Address** and **Maximum Address** sections, select the library internal addresses of the starting and ending locations of the cartridge pool you want to use.

8. **Click Next.**

   The **Sequence** dialog box appears.

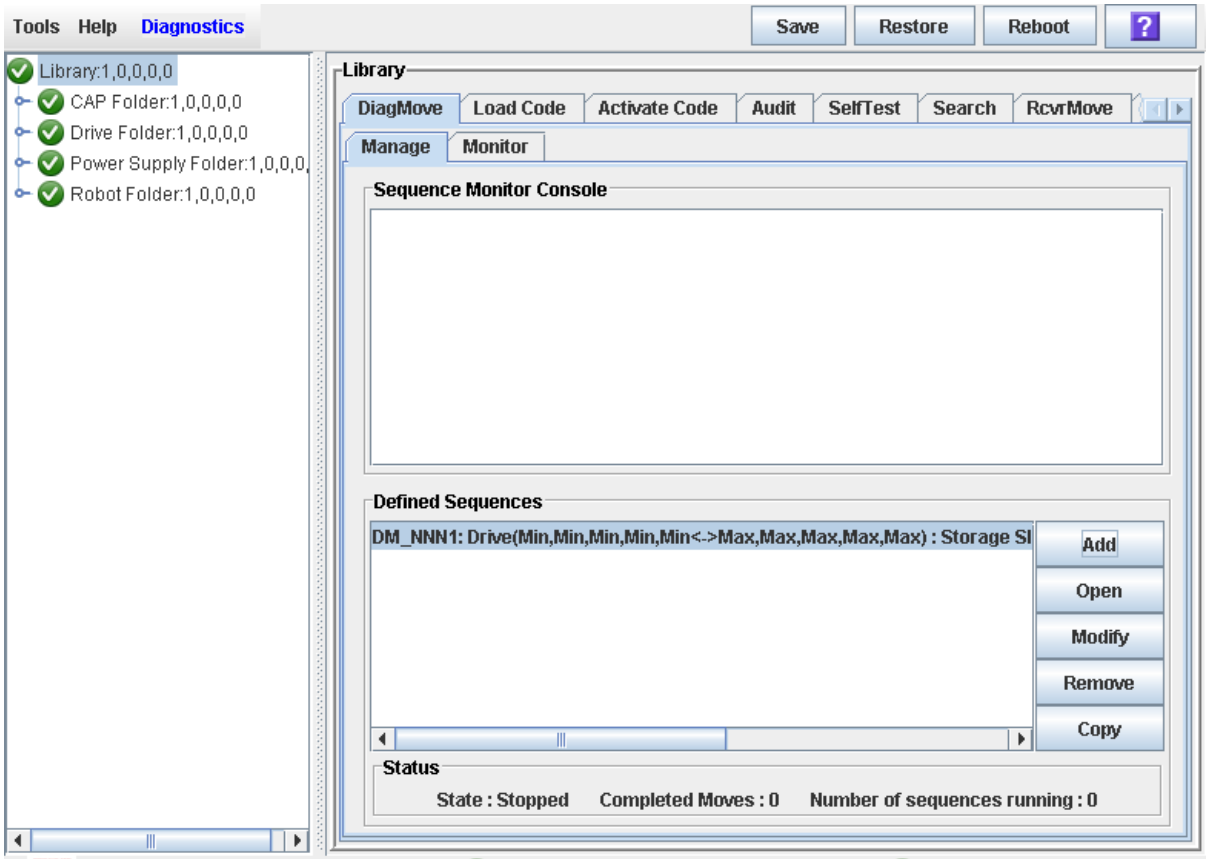


9. **Complete the Sequence screen as follows. See "Move Access Order" on page 493 for details.**

   - Name of the diagnostic m ove.
   - Move Count: Specify a number between 1 and 5000.
   - Access order: Sequential or Random.
   - Move Type: Robot and Cartridge or Ro bot Only.
   - Disable pre-move cartridge compatibility check.

10. **Click Finish to complete the setup.**

    The **Diagnostic Move Manage** screen appears. The diagnostic sequence you have just defined is listed in the **Defined Sequences** section.



▼ Manage Diagnostic Move Definitions

Task Tool

This task can be performed at any of the following:

- Local operator panel
- Standalone SL Console
- Web-launched SL Console

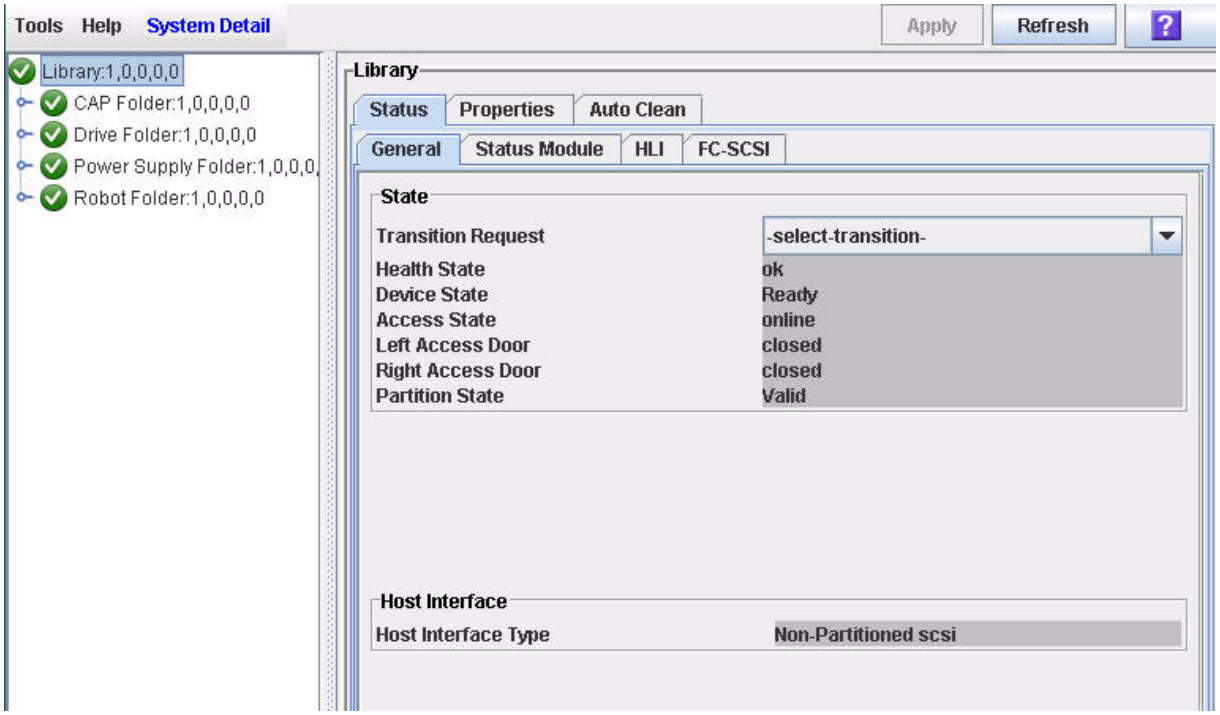
Task Purpose

Use this procedure to manage diagnostic move sequence definitions.

Task Steps

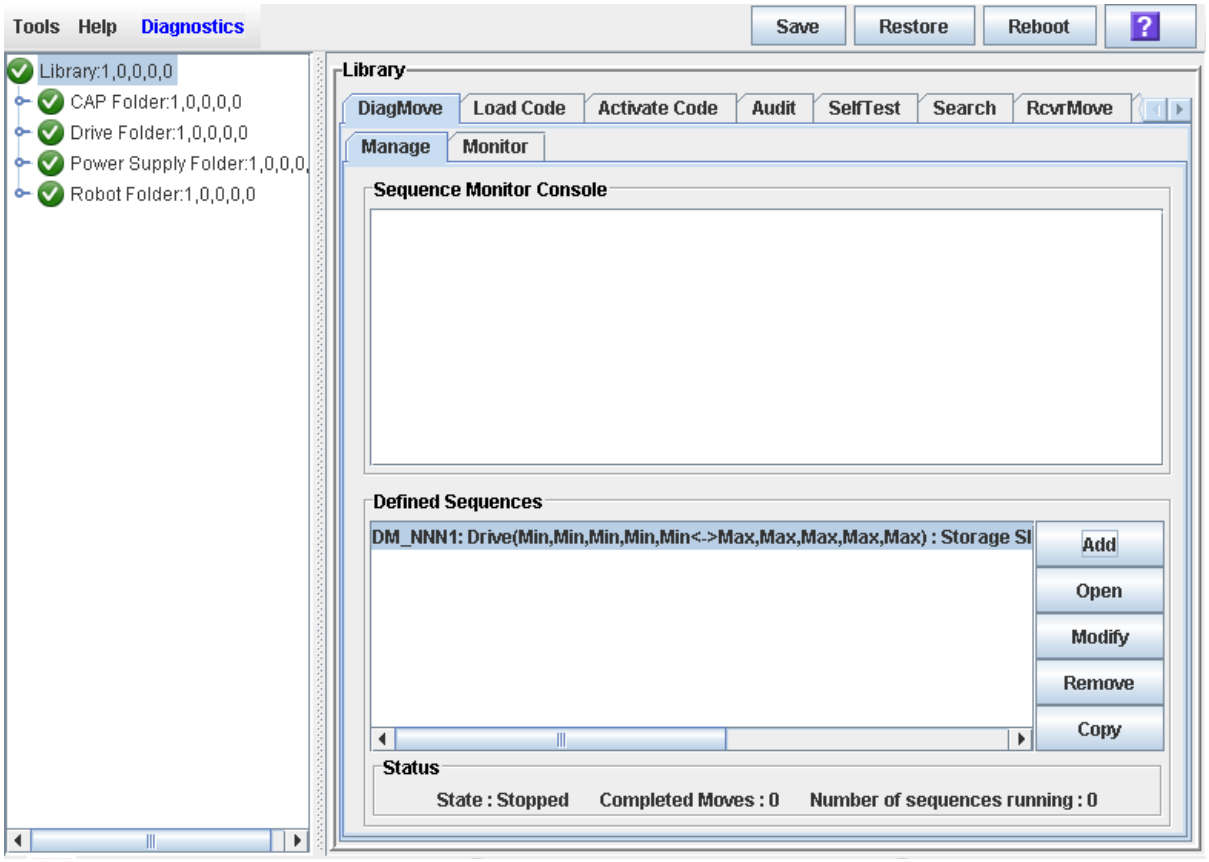
1. **Select Tools > Diagnostics.**
2. **Click the Library folder on the navigation tree.**

   The **Library** page appears.



3. **Click the DiagMove tab, and then the Manage tab.**

   The **Manage** page appears.



4. **From the Defined Sequences section, select any of the following options listed in the following TABLE 13-6.**

TABLE 13-6 Options for Defining Diagnostic Moves

To	Select Option	Notes
Define a diagnostic move	Add	
Start a diagnostic move	Open	Multiple diagnostic moves may be open at a time, so long as the target and pool address ranges setup for the moves do not overlap.
Modify options for a diagnostic move	Modify	This diagnostic move routine must not be open or if open must be in a "Stopped" state.
Remove a diagnostic move	Remove	This diagnostic move routine must not be open.
Copy an existing diagnostic move	Copy	Copy a diagnostic move definition, make changes if necessary, and assign a different name.

5. **To manage the diagnostic moves currently open, see "Monitor and Control Open Diagnostic Moves" on page 580.**

▼ Save a Diagnostic Move to a File

Task Tool

This task can be performed at any of the following:

- Local operator panel
- Standalone SL Console
- Web-launched SL Console

Task Purpose

Use this procedure to save a defined diagnostic move to a local file on your workstation or PC. The file is saved as a JavaBean component represented as an XML 1.0 document (`.xml`).

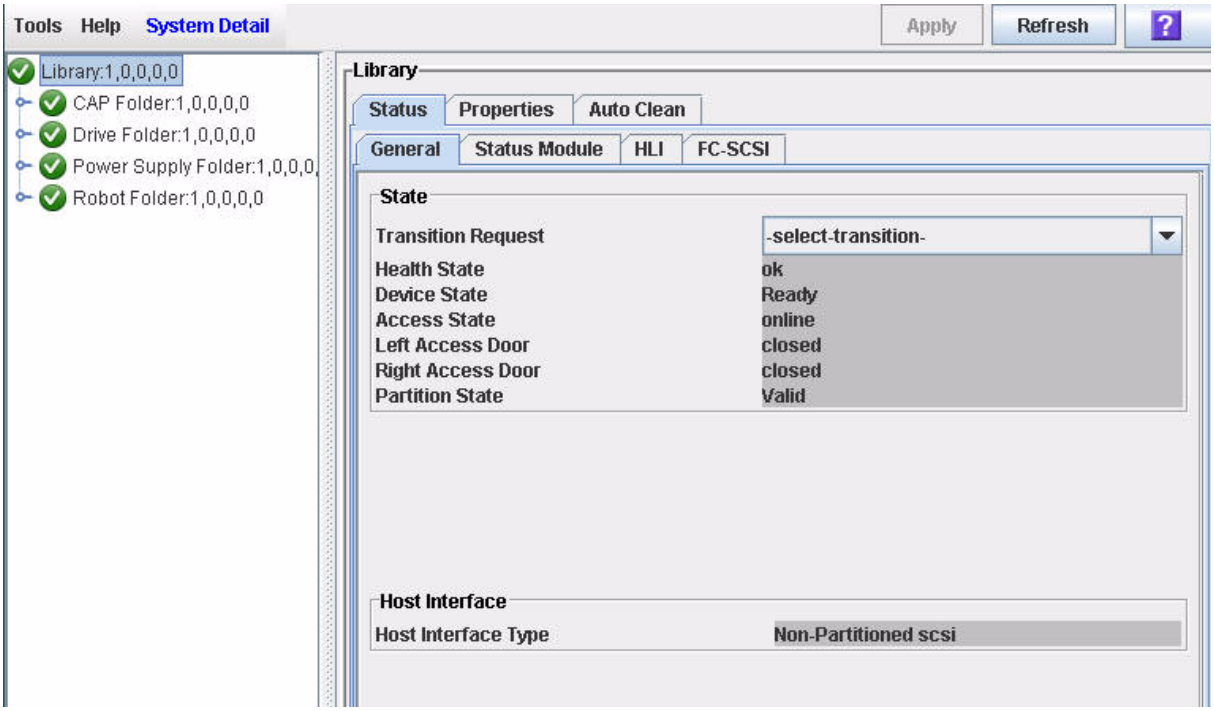
You can use the saved file to:

- Restore a move that has been deleted from the library.
- Copy it to a different library for use there.

Task Steps

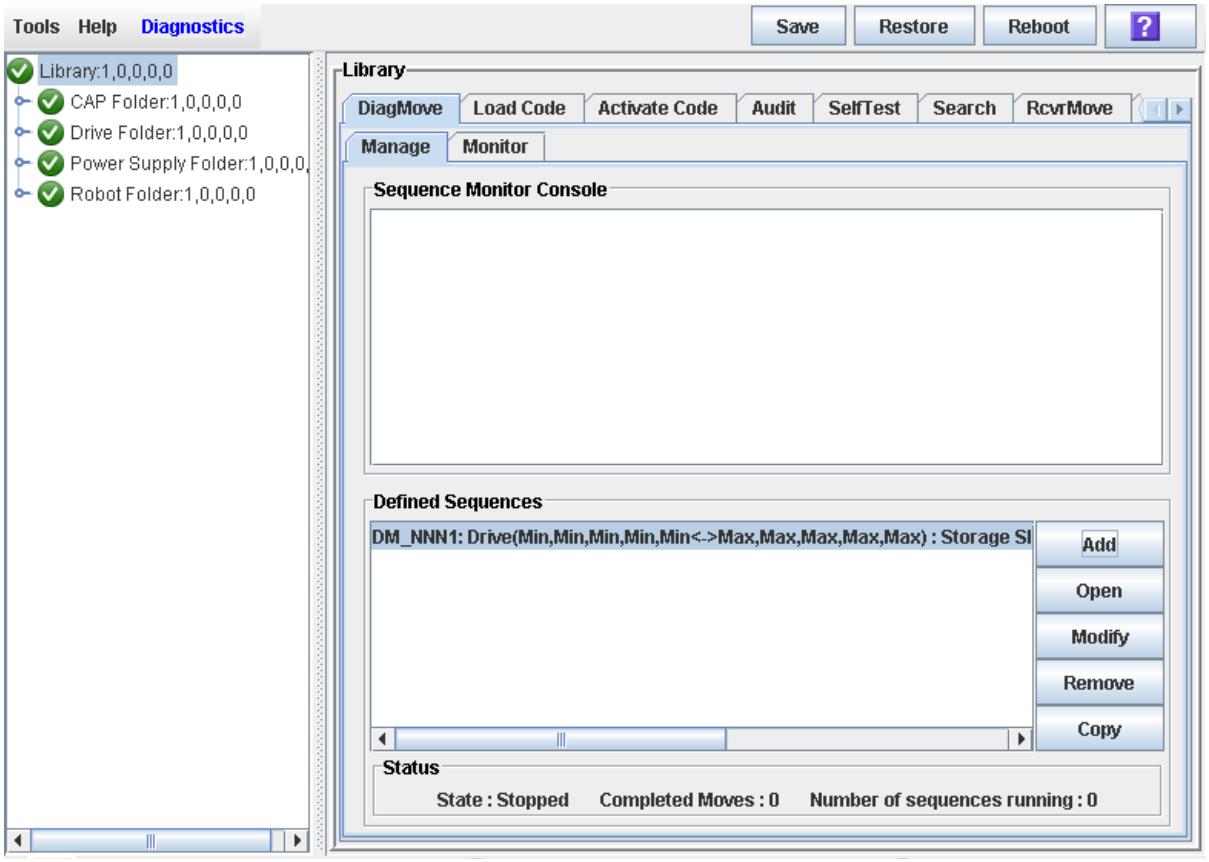
1. **Select Tools > Diagnostics.**
2. **Click the Library folder on the navigation tree.**

   The **Library** page appears.



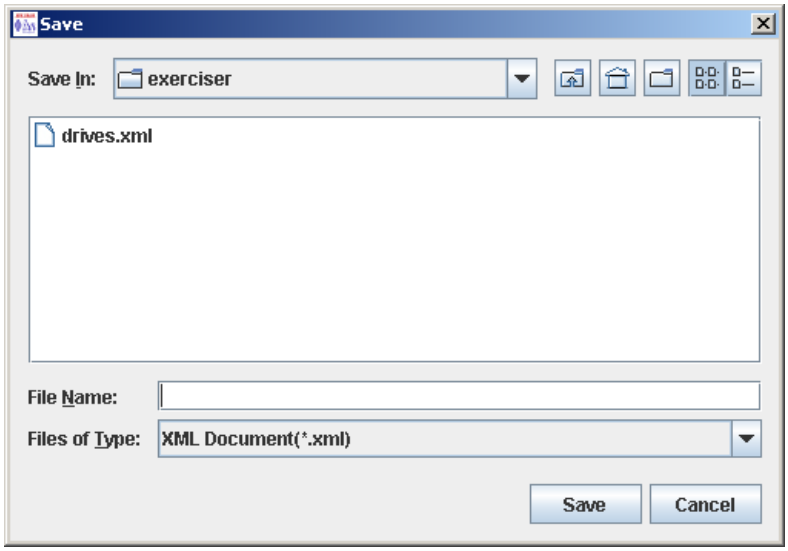
3. **Click the DiagMove tab, and then the Manage tab.**

   The **Manage** page appears.



4. **Click the diagnostic move you want to save, and then click the Save button in the upper right area of the screen.**

   The **Save** dialog box appears.



5. **Browse to the directory where you want to save the file. In the File Name field, enter the file name.**

6. **Click Save.**

The data is saved to the specified file. The following is a sample excer pt:

```
<?xml version="1.0" encoding="UTF-8"?>
<java version="1.5.0_11" class="java.beans.XMLDecoder">
 <object class=
"com.stortek.ats.elib.opel.model.SequenceBeanList">
  <string>FRS_4.10</string>
  <string>SL500</string>
  <void method="add">
   <object class=
"com.stortek.ats.elib.opel.model.SequenceBeanList$SequenceBean">
    <void property="accessOrder">
     <string>Sequential</string>
    </void>
    <void property="moveCartridge">
     <boolean>true</boolean>
    </void>
    <void property="moveCount">
     <int>10</int>
    </void>
    <void property="name">
     <string>DriveDiagMove1</string>
    </void>
    . . .
    <void property="targetType">
     <string>Drive</string>
    </void>
   </object>
  </void>
 </object>
</java>
```

▼ Start a Diagnostic Move

Task Tool

This task can be performed at any of the following:

- Local operator panel
- Standalone SL Console
- Web-launched SL Console

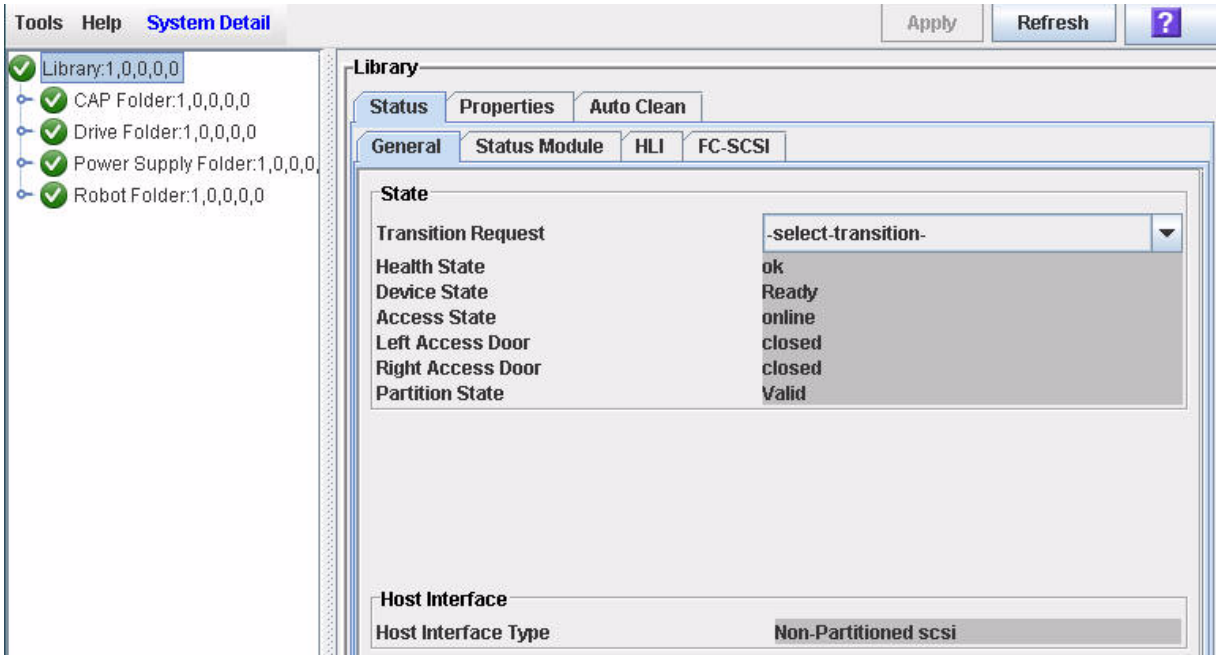
Task Purpose

Use this procedure to begin a diagnostic move.

Task Steps

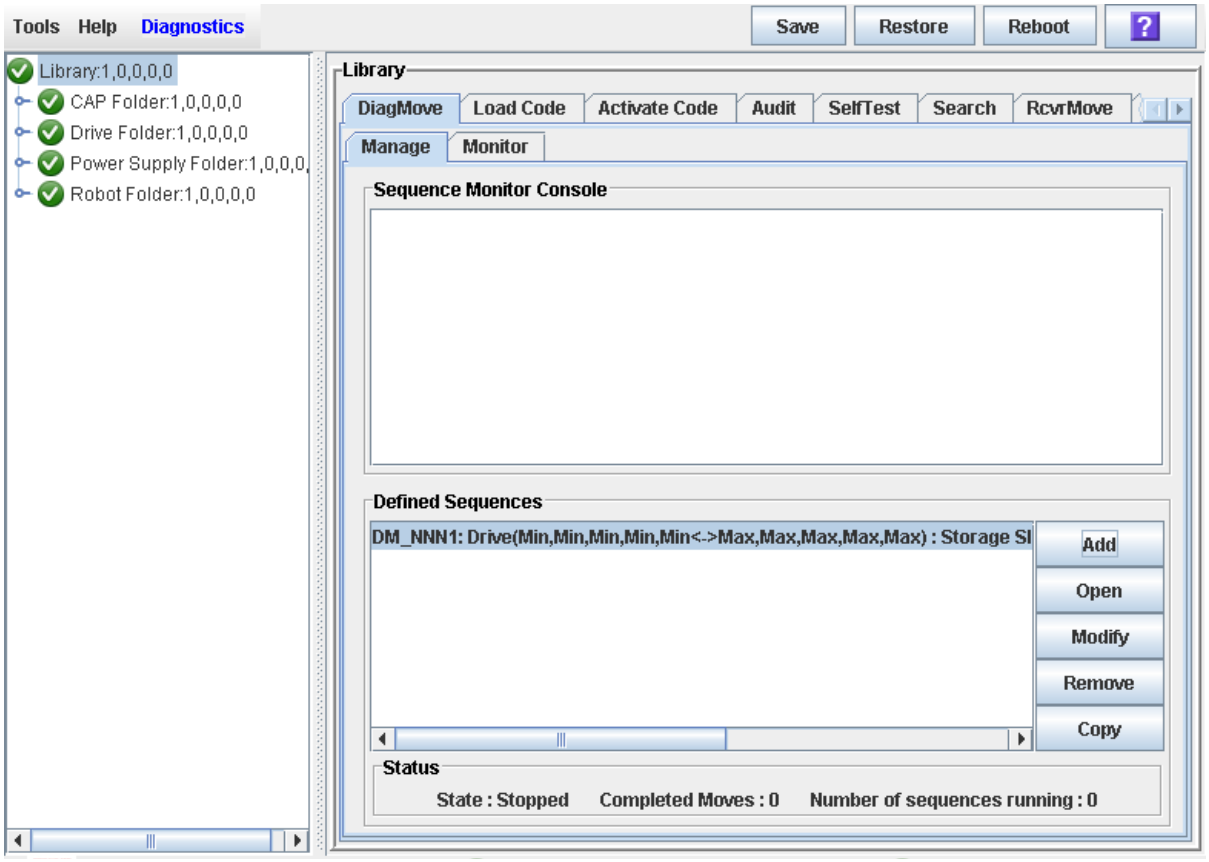
1. **Select Tools > Diagnostics.**
2. **Click the Library folder on the navigation tree.**

   The **Library** page appears.



3. **Click the DiagMove tab, and then the Manage tab.**

   The **Manage** page appears.



4. **From the Defined Sequences section, click a diagnostic move, and then click Open.**

   The **Monitor** window activates.

   You can repeat this step to open multiple moves, as long as the target and pool address ranges for the moves do not overlap.

   A monitor window displays for each move you open.

5. **From each monitor window, select File > Start Sequence to start the move.**

▼ Monitor and Control Open Diagnostic Moves

Task Tool

This task can be performed at any of the following:

- Local operator panel
- Standalone SL Console
- Web-launched SL Console

Task Purpose

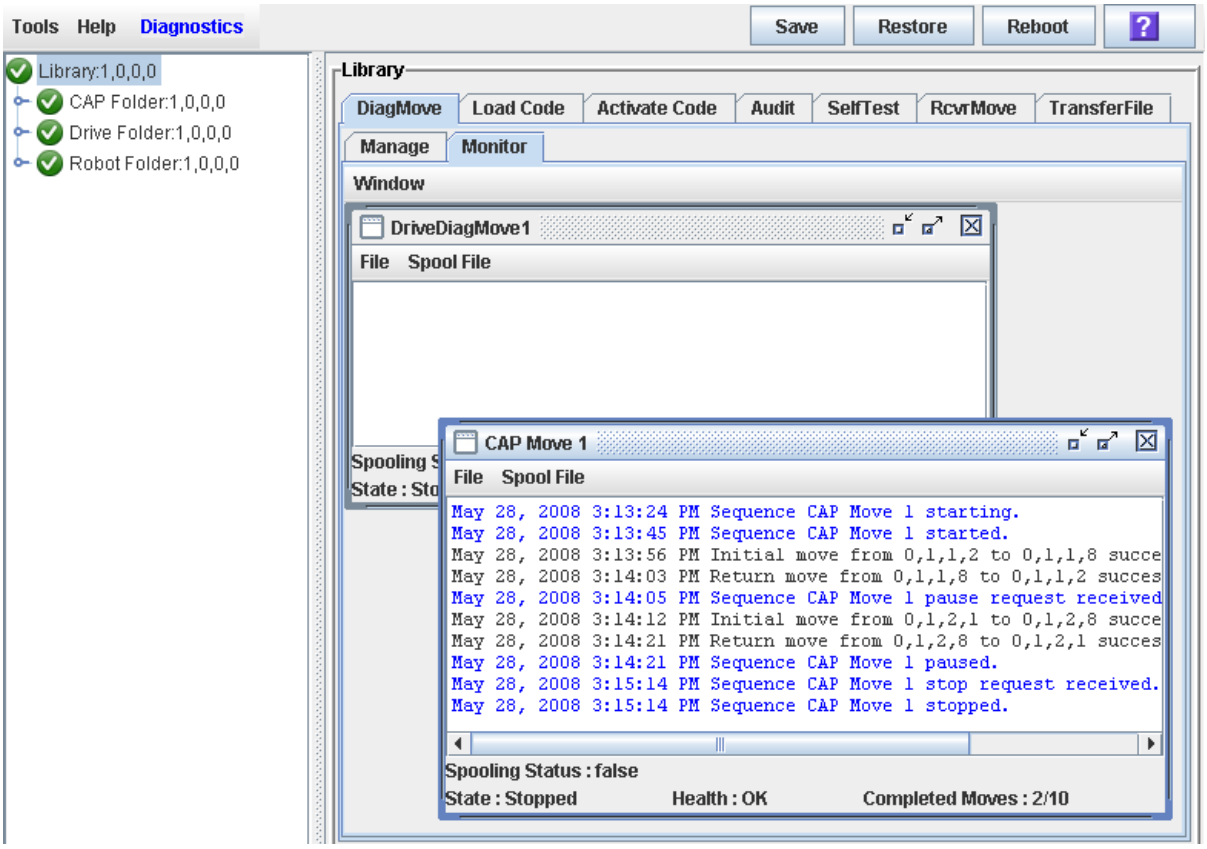
Use this procedure to control and monitor the status of one or more open diagnostic moves.

Task Steps

1. **See “Start a Diagnostic Move” on page 578 for instructions on starting one or more diagnostic moves.**

2. **Click the Monitor tab.**

   The **Monitor** page appears, with one monitor window for each open move.



Each monitor window has the following status indicators listed in the following TABLE 13-7.

TABLE 13-7 Diagnostic Status Indicators of Monitor Windows

Status Indicators	Description	Valid Values
Spooling Status	Indicates if the move output is being spooled to a file	True, False
State	Current execution state of the move	Running, pausing, paused, stopping, stopped
Health	Current health state of the move	OK, warning, error
Completed moves	Number of moves completed in the requested move count	

3. **Use the File menu in each Monitor window to perform any of the functions listed in the following TABLE 13-8.**

TABLE 13-8 Functions Available in Diagnostic Monitor Windows

Select Option	To	Notes
File > Start Sequence	Start	
File > Pause Sequence	Pause	Stops all diagnostic moves, but maintains the current location in the access order.
File > Stop Sequence	Stop	Stops a running or paused move.
File > Start Sequence	Resume	Resumes a paused move starting with the last known location in the target address range.
File > Clear Output Window	Clear the messages displayed in the monitor window	Erases the previous message lines and continues to fill the screen with new messages.
Spool File > Start Spooling	Spool	Directs the move output to a file.
Spool File > Stop Spooling	Stop spooling the move output to a file	Stops directing the move output to the spool file.

AEM Safety Door Utility Tasks

▼ Reboot an AEM Safety Door

Task Tool

This task can be performed at any of the following:

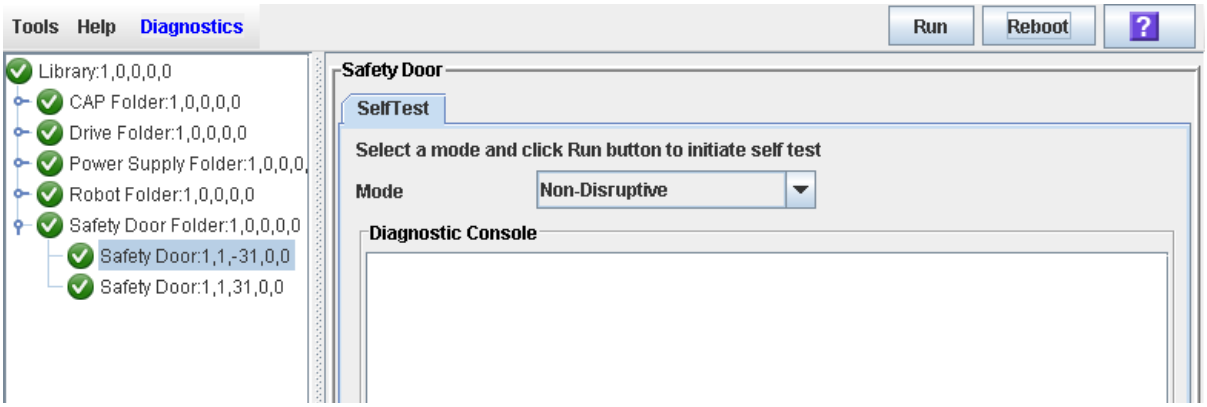
- Local operator panel
- Standalone SL Console
- Web-launched SL Console

Task Purpose

Use this procedure to reboot an AEM safety door. You may need to do this to clear errors if the AEM safety door has experienced an abnormal condition.

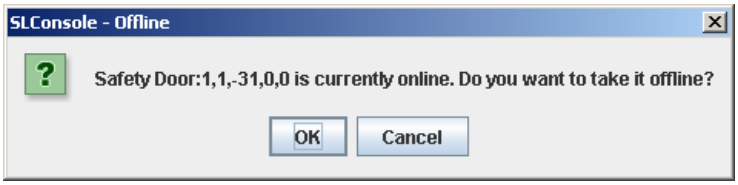
Task Steps

1. **Select Tools > Diagnostics.**
2. **Expand the Safety Door Folder, and select the AEM safety door you want to reboot.**



3. **Click Reboot in the upper right corner of the screen.**

   If the safety door is online, the **Offline Confirm** message appears.



4. **Click OK to take the safety door offline.**

   The **Reboot Confirm** message appears.

5. **Click OK.**

   The library controller reboots the safety door. The safety door re-initializes, and the robot audits the AEM CAP.

   The **Reboot Success** message appears.

6. **Click OK to dismiss the message.**

14

Manual Operations

When in manual mode of operation, the library is unavailable for host access. This may be because the library has experienced an unrecoverable error or a library component requires service or installation. When the library is in this mode, cartridge mounts and dismounts require human intervention.

Library Safety

Thoroughly review the safety precautions in this section before attempting to enter the library. It is essential that you follow proper safety procedures at all times.

General Safety Precautions

Warning – To prevent accidental closure of the access door while someone is in the library, it is recommended that when you unlock the access door, you lock it open and retain the key on your person.

Before entering the library, be sure you:

- Know the location of the emergency door unlocking mechanisms. See "SL3000 Door Interlocks" on page 588.
- Leave the access door open whenever working inside the library. There is a switch on each door frame that disconnects DC power and signal lines to the library's motors when an access door is opened. See "SL3000 Servo Power Interrupt" on page 588.
- Know the location of the mechanical door releases. See "Mechanical Door Releases" on page 588.
- Know the physical restrictions. See "Physical Restrictions" on page 589.

SL3000 Door Interlocks

Door safety interlocks are located behind the front access doors of the base module and DEM. To open either access door, an access key is required.

Door safety interlocks are constantly monitored by the library controller. If an access door is opened during normal operation, an Emergency Robotics Stop condition is initiated and all library motors are immediately disabled. This prevents motors from operating while a library door is open. If the library is varied offline, opening the access door disconnects DC voltages to the rails and the power bus.

The door switches are also monitored when the library is powered off. A battery supplies power for the circuitry to detect a door opening/closing event while the library is powered off.

When a base module and DEM are connected together, opening an access door to either module automatically suspends operations within the entire library (the two door switches are connected in series).

SL3000 Servo Power Interrupt

An additional safety feature is the servo power interrupt (SPI). If the library controller detects that a library motor is out-of-range, it will generate an SPI to turn off drive voltage to the faulty motor. This prevents a servo runaway condition until the cause of the problem can be determined.

Mechanical Door Releases

Each lock handle on the access doors of the base module and DEM includes a mechanical release which is painted yellow (see FIGURE 14-1.) This release serves as a safeguard in case a person is inside the library and the access door is accidentally closed and locked. When you push the release, it unlocks and opens the door .

FIGURE 14-1 Mechanical Door Release

Interior Lighting

The interior of the library is always illuminated by white LEDs on the ceiling.

Physical Restrictions

The library does not allow much free room for movement. Be aware of the restricted space at all times. Follow these guidelines:

- Be careful not to snag your clothing on the plastic arrays that house the cartridges (only 0.4 m [18 in.] of aisle clearance).
- Be careful not to bump your head or body against the arrays.
- To gain access to a cartridge, you might need to move a robot, in which case you must avoid damaging the robot's electronic components.
- If you are loading or unloading a cartridge manually, your hands must remain clear of the drive's mechanical and electronic load components.

Manual Operation Tasks

▼ Take the Library Offline

Use this procedure to take the library offline through the SL Console.

> **Note –** Use this procedure only if you are not using ACSLS or ELS tape management software, or if their servers are unable to communicate with the library. ACSLS and ELS are not notified when the state of the library or its components are changed through the SL Console, which could possibly lead to disruption in library operations. For instructions on changing the state of the library and its components through ACSLS or ELS, see the appropriate tape management software documentation.

You may need to use this procedure at the following times:

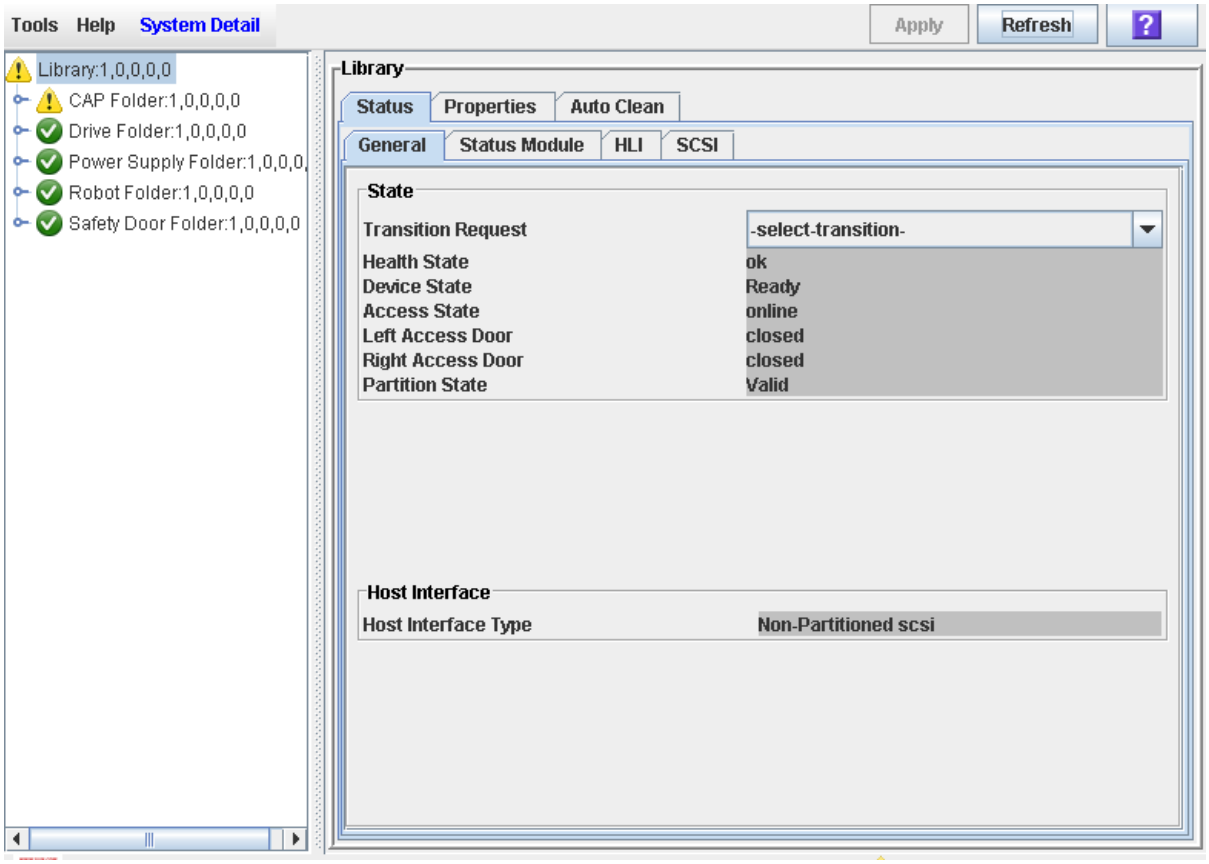
- Before powering down the library
- Before opening a library access door
- When the library is inoperative and requires maintenance

1. **Take all library drives offline.**

   See "Take a Drive Offline" on page 559 for details.

2. **Select Tools > System Detail.**
3. **Click the Library folder on the device tree.**
4. **Click the Status tab, and then the General tab.**

   The current status of the library displays.



5. **In the Transition Request field, click Vary offline, and then click Apply.**

   All outstanding library jobs are co mpleted, and then the library status is changed, as follows:

   - Health State: Warn
   - Device State: Not accessible (HLI host connections); Not ready (S CSI host connections)
   - Access State: Offline

▼ Bring the Library Online

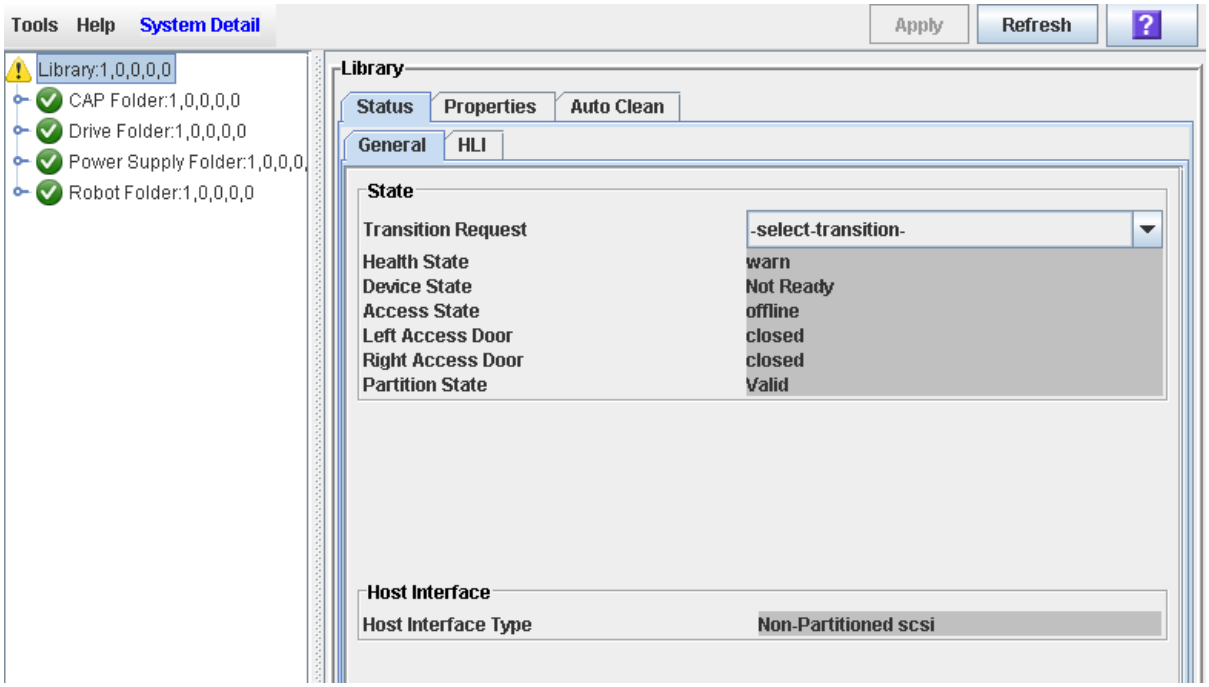
Use this procedure to bring the library online through the SL Console.

Note – Use this procedure only if you are not using ACSLS or ELS tape management software, or if their servers are unable to communicate with the library. ACSLS and ELS are not notified when the state of the library or its components are changed through the SL Console, which could possibly lead to disruption in library operations. For instructions on changing the state of the library and its components through ACSLS or ELS, see the appropriate tape management software documentation.

Note – LTO Ultrium drives are automatically brought online when you bring the library online.

1. **Select Tools > System Detail.**
2. **Click the Library folder on the device tree.**
3. **Click the Status tab, and then the General tab.**

   The screen displays the current status of the library.



4. **In the Transition Request field, click Bring online.**
5. **Click Apply.**

   The library status is updated, as follows:

   - Health State: ok
   - Device State: Ready
   - Access State: Online

6. **If applicable, bring the library online to ACSLS and ELS hosts. See the ACSLS and ELS documentation for detailed procedures.**

▼ Power Down the Library

Use this procedure to power down the library.

1. **Take all library drives offline.**

   See "Take a Drive Offline" on page 559 for details.

2. **Take the library offline.**

   See "Take the Library Offline" on page 591 for details.

3. **Open the rear doors of the Base Module and DEM (if present).**
4. **Turn off the power enable switches.**
5. **If necessary, turn off the circuit breakers on the PDUs.**

▼ Power Up the Library

Use this procedure to power up the library. If the access doors have been opened and closed, a full audit of the library will be performed.

1. **Open the rear doors of the Base Module and DEM (if present).**
2. **If necessary, turn on the circuit breakers on the PDUs.**
3. **Turn on the power enable switches.**
4. **The library goes through the initialization sequence, as follows:**

1. Library controller code is activated.
2. The library controller performs electronic discovery of library components, as follows:
   a. Determines the AC power configuration (N+1 or 2N)
   b. Verifies tape drive controller function
   c. Checks optional functions (for example, a local operator panel)
   d. Establishes communication and configuration of the robot controller
   e. Polls all tape drives and determines their locations
   f. Queries all rotational and AEM CAPs:
      - If a CAP door is fully open, the door will be left open.
      - If the state of a CAP door is undetermined, it is updated to closed and locked.
3. The robot performs the physical discovery process.
   a. The robot sweeps the entire library to determine the library size.
   b. The robot scans the module identification block in each module.
   c. Depending on this information, the library is auto configured.
4. If one of the access doors was opened and closed, a library audit will begin, as follows:
   a. The TallBot targets on each column of arrays (from the top, down).
   b. The robot scans up each column, recording the VOLIDs of all cartridges.
   c. The location of each VOLID is recorded in the library controller database.
   d. Storage cells without cartridges are flagged as empty .
   e. If a cartridge is found in a rotational or AEM CAP, the CAP is closed and locked.

      Note – This audit does not update the host cartridge databases. See the appropriate tape management software documentation for details about updating the host databases.

   f. The library comes to a Ready state.

5. **Bring the library online.**

   See "Bring the Library Online" on page 593 for detailed instructions.

The SL Console gets all library configuration data from the library controller. Therefore, be careful when logging in to the SL Console before the library has fully initialized. You may see warnings that configuration data is not yet available. In such a case, you must exit and log

in again at a later time. Additionally, if a library audit is performed as part of initialization, until the audit is complete, any configuration data displayed may not be completely up to date and accurate.

▼ Open the Library Main Access Door

Use this procedure to open the main doors of the library.

> **Warning – To prevent accidental closure of the access door while someone is in the library, it is recommended that when you unlock the access door, you lock it open and retain the key on your person.**

1. **Take all library drives offline.**

   See "Take a Drive Offline" on page 559 for details.

2. **Take the library offline.**

   See "Take the Library Offline" on page 591 for details.

3. **Insert the key into the door lock, and turn the key to unlock the door.**

4. **Pull up on the door latch to release it, and open the door.**

5. **Turn the key in the lock, to lock the door open, and then remove the key from the lock and keep it with you. This will prevent the door from being closed while you are in the library.**

6. **Enter the library.**

   > **Note –** When you close the main access door, the library begins an audit. You will see an audit indicator spinning at the bottom of the SL Console during the audit.

▼ Close and Lock the Library Main Access Door

Use this procedure to close and lock the m ain doors of the library.

1. **Verify that there are no loose items in the library.**
2. **If the access doors were locked open, insert the key into the door lock, and turn the key, to unlock the door.**
3. **Push the door closed and make sure it latches securely.**
4. **Turn the key in the lock, to lock the door closed.**
5. **Remove the key from the lock and keep it in a safe place.**
6. **If the library has been powered down, power it up.**

   See "Power Up the Library" on page 595 for details.

   Note – Because the access doors have been opened, the library will perform a full audit.

▼ Perform an AEM “Fast Access”

Use this procedure to gain emergency access to the AEM.

> **Caution –** This procedure has the same effects on library operations as opening the main library access door. It causes an abrupt interruption of library activity and should be used only in exceptional circumstances, such as an AEM component failure. This procedure does not lower the internal AEM safety door.
>
> **Note –** When the AEM access door is closed, a full audit of the library is initiated. See “Close the AEM Access Door After a “Fast Access”” on page 600.

1. **Insert the library access door key in the Deadbolt Override lock, and unlock the door by turning the key clockwise.**

   > **Note –** The key cannot be removed from the lock while it is in the unlocked position.

2. **Lift the AEM access door latch, and open the door.**

   > **Caution –** *Possible equipment damage*. DO NOT force the AEM access door to open or close.

   All power to the rails is killed, and the robots are stopped immediately.

   All in-process jobs are stopped abruptly, and the robots and AEM CAPs are brought offline.

   > **Caution –** The AEM safety door is not lowered.

▼ Close the AEM Access Door After a “Fast Access”

Use this procedure to close the AEM access door and re-initialize the library after performing an AEM “fast access.”

Note – This procedure initiates a full audit o f the library.

1. **Close and latch the AEM access door.**

   Caution – *Possible Equipment Damage*. DO NOT force the AEM access door to open or close.

2. **Lock the door by turning the key counter-clockwise in the Deadbolt Override lock.**

   - The library re-initializes.
   - The robots go through their initialization sequence.
   - A full audit of the library is condu cted.
   - The AEM CAP is brought online and returned to its default state.

A

Library Resource Addresses

This appendix describes the following library addressing schemes:

- Library Internal Address: Used by the library controller
- HLI-PRC Locations: Used by hosts with TCP/IP connections to the library
- FC-SCSI Element Locations: Used by hosts with FC-SCSI connections to the library
- Drive Hardware Numbers: Physical array slot into which a drive is installed
- Drive Dynamic World-Wide Names: Automatically generated by the library controller for installed drives

These schemes are used to locate all library resources, including:

- Cartridge storage cells
- Tape drive slots
- Installed drives
- Reserved system cells
- Rotational and AEM CAP cells

CenterLine Technology

The SL3000 modular design uses CenterLine technology to help balance the work load and improve performance of the library. The left side of the Base Module, which is the only required module, serves as the centerline. You can add other modules to the left and right of the Base Module. Columns to the right of the centerline have positive (+) numbers, while columns to the left have negative (–) numbers, as shown in TABLE A-1.

TABLE A-1 Centerline and Column Addressing

Items	Negative Numbered Columns		Positive Numbered Columns
Drives		-4, -3, -2, -1	1, 2, 3, 4
Cartridges	-12, -11, -10, -9, -8, -7	-6, -5, -4, -3, -2, -1	1, 2, 3, 4, 5, 6 7, 8, 9, 10, 11, 12

Library Internal Address

Storage Cells

There are five components to the SL3000 library internal addressing scheme:

1. **Library number:** always “1.”
2. **Rail number:** always “1.”
3. **Column number:** the horizontal location. Column numbering starts from the left edge of the back wall of the Base Module, as viewed from the front of the library. Columns to the right of this edge, whether within the Base Module itself or in modules connected to the right, are numbered positively (+), from left to right, starting with +1. Columns in modules connected to the left of the Base Module are numbered negatively (–), from right to left, starting with –1.
4. **Side**: the back wall = 1, the front wall = 2.
5. **Row:** the vertical position. Row numbering runs from top to bottom and can range from 1 to 52.

> **Note –** For any library, the actual numbering of columns and rows depends on the modules installed and the configuration of drives vs. storage cells. See TABLE A-2 on page 603 for details.

Library Internal Address Example – Base Module

As an example of using the library internal addressing scheme (refer to 0 the following TABLE A-2 on page 603), drive hardware number 13 would be 1, 1, +4, 1, 4 , as follows:

1. Library number = 1
2. Rail number = 1
3. Column number = +4
4. Side = 1
5. Row = 4

TABLE A-2 Base Module – Rear Wall Locations (viewed from front of library)

Row	1		+2	+3		+4
+1	Drive 4		Drive 3	Drive 2		Drive 1
+2	Drive 8		Drive 7	Drive 6		Drive 5
+3	Drive 12		Drive 11	Drive 10		Drive 9
+4	Drive 16		Drive 15	Drive 14		Drive 13
	+1	+2	+3	+4	+5	+6
+24 ~ +35	Storage cells	Storage cells	Storage cells	Storage cells	Storage cells	Storage cells
+36 ~ +48	Storage cells	Storage cells	Storage cells	Storage cells	Storage cells	Storage cells
+49 ~ +52	No array	Top two = Drop off Bottom = Swap	4-cell Diagnostic/ Cleaning	4-cell ID	4-cell Diagnostic/ Cleaning	4-cell Diagnostic/ Cleaning

Note – Perspective is from the front of the library .

As a second example, the location for the two drop-off cells on this wall are:

1. Library number = 1
2. Rail number = 1
3. Column number = +2
4. Side = 1
5. Rows = 49 and 50

These translate to 1, 1, +2, 1, 49 and 1, 1, +2, 1 , 50.

Library Internal Address Example – DEM

See the following TABLE A-3 on page 605 for drive hardware number 27. As an example of using the library internal addressing scheme, this drive location would be:

1. Library number = 1
2. Rail number = 1
3. Column number = -3
4. Side = 1
5. Row = 1

These translate to 1, 1, -3, 1, 1.

As a second example, the location for the four-cell array that can contain diagnostic cartridges on this wall are:

1. Library number = 1
2. Rail number = 1
3. Column number = -4
4. Side = 1
5. Rows = 49 through 52

These translate to 1, 1, -4, 1, 49 through 1, 1, -4, 1, 52.

TABLE A-3 Drive Expansion Module – Rear Wall Locations (viewed from front of library)

-4		-3	-2		-1	Row
Drive 28		Drive 27	Drive 26		Drive 25	1
Drive 32		Drive 31	Drive 30		Drive 29	2

-6	-5	-4	-3	-2	-1	
Storage cells	Storage cells	Storage cells	Storage cells	Storage cells	Storage cells	13 ~ 23
Storage cells	Storage cells	Storage cells	Storage cells	Storage cells	Storage cells	24 ~ 35
Storage cells	Storage cells	Storage cells	Storage cells	Storage cells	Storage cells	36 ~ 48
No array	Top 2 = Drop off Bottom = Swap	4-cell Diagnostic/ Cleaning	4-cell ID	4-cell Diagnostic/ Cleaning	4-cell Diagnostic/ Cleaning	49 ~ 52

Note – Perspective is from the front of the library .

Reserved System Cells

A total of two cells are reserved within the Base Module only for drop-off locations, and one cell is reserved as a swap cell. All remaining system cells can be used for diagnostic or cleaning cartridges. These are listed in TABLE A-4 on page 606.

There are a total of 12 cells for diagnostic or cleaning cartridges in the Base Module; there are a total of 12 or 15 cells for diagnostic or cleaning cartridges in the DEM. These are also listed in the following TABLE A-4 on page 606.

There are no system cells in a CEM or PEM .

TABLE A-4 Reserved System Cells

Cell Locations	Module Type	Use	Location
1, 1, 2, 1, 49 – 50	Base module	Drop off cells (Reserved)	Back wall of the Base Module
1, 1, -4, 1, 49 – 50	DEM	Cleaning/Diagnostics Cartridges	Back wall of the DEM
1, 1, 2, 1, 51	Base module	Swap cell (Reserved)	Back wall of the Base Module
1, 1, -5, 1, 51	DEM	Cleaning/Diagnostics Cartridges	Back wall of the DEM
1, 1, 5, 1, 49 – 52 1, 1, 6, 1, 49 – 52	Base module	Cleaning/Diagnostics Cartridges	Back wall of the Base Module
1, 1, -1, 1, 49 – 52 1, 1, -2, 1, 49 – 52	DEM	Cleaning/Diagnostics Cartridges	Back wall of the DEM

Note – Do not place data cartridges in a system cell. These cells are masked from the customer's database (that is, an online TallBot will never go to these cells) .

CAP Cells

Cell locations within the CAPs follow a similar notation scheme as other locations within the library:

1. **Library number:** (always "1")
2. **Rail number**: (always "1")
3. **Column number:** the horizontal location. This is referenced from the left edge (as you face the inside front) of the Base Module. From this point, columns are numbered as positive (+), consecutively, from left-to-right, throughout all modules connected to the right side of the Base Module.

   Conversely, if a module is attached to the left of the Base Module, column locations are numbered as minus (-), consecutively, from right to left, throughout all modules.
4. **Side**: (always "2" [front wall]).
5. **Row:** the vertical position, as referenced from the top cell in the column. Cells are numbered from 1 to 13 for the top magazine and 14 to 26 for the lower magazine. Magazine handles are located at the tops of each CAP magazine.

   Note – The magazine handle is not counted as a cell.

Library Internal Address Examples for CAP Cells

The fourth CAP cell down in a Base Modu le would be:

1. Library number = 1
2. Rail number = 1
3. Column number = +5
4. Side = 2
5. Row = 4

These translate to 1, 1, + 5, 2, 4.

The sixth CAP cell down in a DEM would be:

1. Library number = 1
2. Rail number = 1
3. Column number = -2
4. Side = 2
5. Row = 6

These translate to 1, 1, -2, 2, 6.

HLI-PRC Locations

Storage Cells

The host library interface-panel, row, column (HLI-PRC) location (address) is an eight-digit, comma-separated value (LL, PP, RR, CC) representing **L**SM, **P**anel, **R**ow, **C**olumn. This addressing scheme is used by HLI clients, including ACSLS and ELS, to represent cartridge storage cells accessible to those HLI clients.

> **Note –** The SL3000 library internal address identifies the physical location of the cartridge in the library and the HLI-PRC refers to the address assigned by the host software.

The cell location appears in the following format:

L	L	P	P	R	R	C	C

where,

- *LL:* LSM number (always “00”)
- *PP:* Panel (relative to the Base Module – descending numbers on the left and ascending numbers to the right; even numbers = rear walls, odd numbers = front walls)
  - Base Module = panels 12 & 13
  - DEM added to the left = panels 10 & 11
  - Exception: If a CEM is added to the left of a Base Module instead of a DEM, that module’s panel numbering will be 8 & 9 (see “HLI-PRC Storage Cell Locations, Example Three” on page 610). This allows for a DEM to be installed at a later date without the necessity of re-numbering the modules.
  - Module added to the right = panels 14 & 15

    > **Note –** *RR:* Row in the panel (a number from 0 – 51)
    > Note the difference here. Library internal address rows begin with “1” and HLI-PRC rows begin with “0.”

- *CC:* Column in the row (numbered left to right, from the front of the module)

  > **Note –** CC: Columns in the panel (a number from 0 – 5.
  > Note the difference here. Library internal address columns begin with “1” and HLI-PRC rows begin with “0.”

HLI-PRC Storage Cell Locations, Example One

For an example of how this numbering schem e is formulated, refer to the following TABLE A-5.

TABLE A-5 Host Library Interface Cell Locations – Example One

Drive Expansion Module						Base Module					
Rear Wall = Panel 10						**Rear Wall = Panel 12**					
Cartridge Column Numbers →						Cartridge Column Numbers →					
0	1	2	3	4	5	0	1	2	3	4	5
0	1	2	3	4	5	0	1	2	3	4	5
Cartridge Column Numbers →						Cartridge Column Numbers →					
Front Wall = Panel 11						**Front Wall = Panel 13**					

Note – Perspective is from the front of the library.

In example one, the library is composed of two modules. The cell location of a cartridge o n the rear wall of the Base Module at Column 5, Row 24, would translate to the following:

LL = 00, PP = 12, RR = 24, CC = 05; or 00, 12, 24, 05

HLI-PRC Storage Cell Locations, Example Two

Adding a module to the left of the library described in Example One illustrates the "left descending" numbering scheme. Refer to the following TABLE A-6 to see how this wor ks.

TABLE A-6 Host Library Interface Cell Locations – Example Two

Cartridge Expansion Module						Drive Expansion Module						Base Module					
Rear Wall = Panel 8						**Rear Wall = Panel 10**						**Rear Wall = Panel 12**					
Cartridge Column Numbers →						Cartridge Column Numbers →						Cartridge Column Numbers →					
0	1	2	3	4	5	0	1	2	3	4	5	0	1	2	3	4	5
0	1	2	3	4	5	0	1	2	3	4	5	0	1	2	3	4	5
Cartridge Column Numbers →						Cartridge Column Numbers →						Cartridge Column Numbers →					
Front Wall = Panel 9						**Front Wall = Panel 11**						**Front Wall = Panel 13**					

Note – Perspective is from the front of the library .

In this example, a CEM has been added to the left of the DEM. Its panels are now numbered 8 and 9. Add another module to the left of this library and its panels become 6 & 7.

Conversely, adding a module to the right of the base module would make that module's panel numbers 14 & 15, and so forth.

HLI-PRC Storage Cell Locations, Example Three

For an exception to continuous panel numbering, a third example is presented in the following TABLE A-7. In this library, two CEMs have been added to the left of a Base Module. Notice that, without a DEM, panel numbering to the left of the Base Module is now 8 & 9, instead of 10 & 11.

This illustrates:

- The one exception to the consecutive panel numbering scheme
- That if a DEM is installed in the future, no panel numbering will change for the existing modules

TABLE A-7 Host Library Interface Cell Locations – Example Three

Cartridge Expansion Module						Cartridge Expansion Module						Base Module					
Rear Wall = Panel 6						**Rear Wall = Panel 8**						**Rear Wall = Panel 12**					
Cartridge Column Numbers →						Cartridge Column Numbers →						Cartridge Column Numbers →					
0	1	2	3	4	5	0	1	2	3	4	5	0	1	2	3	4	5
0	1	2	3	4	5	0	1	2	3	4	5	0	1	2	3	4	5
Cartridge Column Numbers →						Cartridge Column Numbers →						Cartridge Column Numbers →					
Front Wall = Panel 7						**Front Wall = Panel 9**						**Front Wall = Panel 13**					

Note – Perspective is from the front of the library .

> **Note –** This numbering scheme benefits customers greatly since adding a module does not require any change to their existing panel configurations.

Although the host tape management software follows a five-digit numbering scheme like that in the SL3000 address, there are significant differences in cell designations, rotational and AEM CAP behavior, and other operational considerations as described below.

If you need to locate a cartridge's HLI-PRC location, see "Locate a Cartridge by VOLID" on page 437. This procedure displays the cartridge information in both library internal address and HLI-PRC address formats.

Drive Slots

For the drives, HLI-PRC locations are different from the notation you will see with cartridge storage cells. The following TABLE A-8 illustrates how this numbering scheme works, as viewed from the rear of the library.

TABLE A-8 Host Library Interface Tape Drive Locations

Base Module				Drive Expansion Module			
Rear Panel =12				Rear Panel = 10			
1**3**	2**2**	3**1**	4**0**	25**3**	26**2**	7**1**	28**0**
5**7**	6**6**	7**5**	8**4**	29**7**	30**6**	31**5**	32**4**
9**11**	10**10**	11**9**	12**8**	33**11**	34**10**	35**9**	36**8**
13**15**	14**14**	15**13**	16**12**	37**15**	38**14**	39**13**	40**12**
17**19**	18**18**	19**17**	20**16**	41**19**	42**18**	43**17**	44**16**
21**23**	22**22**	23**21**	24**20**	45**23**	46**22**	7**21**	48**20**
				49**27**	50**26**	51**25**	52**24**
				53**31**	54**30**	55**29**	56**28**

Note –

Perspective is from the rear of the library.

The superscript numbers (in bold) represent the HLI-PRC locations (which translate into the Row number).

The standard number notation represents the drive hardware number.

The numbering scheme for drive slots is as follows:

- The standard numbers correspond with the physical numbering of the drives.
- The superscript numbers (in bold) correspond with the HLI-PRC (Row) locations.
- HLI-PRC numbering is sequential from right-to-left (from 0 to 3) for the first (top) row of the first module.
- HLI-PRC sequential numbering scheme restarts, right-to-left (from 0 to 3) in the next module.
- The Column number is always 0.

HLI-PRC Drive Locations, Example One

Drives use drive numbers in place of row and column locations. The drive number is assigned to the position taken by a cell's row, and the position taken by a cell's column is always "00". For example, tape drive hardware number 20 is equivalent to this HLI-PRC location:

Library = 00

Panel = 12

Drive = 16

Column = 00

HLI-PRC Drive Locations, Example Two

As a second example, going from an HLI-PRC loca tion to a hardware location, tape drive 00, 10, 25, 00 is equivalent to ta pe drive hardware number 51.

CAP Cells

CAP HLI-PRC locations are different from the notation used for cartridge storage cells. CAPs use CAP numbers in place of pan el numbers.

Rotational CAPs

- Library = always 00
- CAPs = 01–10, as follows:
  - Left side CEMs = 01 – 04, from left to right
  - DEM = 05
  - Base Module = 06
  - Right side CEMs = 06 – 10, from left to right
- Rows = 00–25
- Column = always 00

AEM CAPs

- Library = always 00
- AEM CAPs = 00 or 1 1, as follows:
  - Left side AEM = 00
  - Right side AEM = 11
- Rows = 00–38
- Columns = 00–05

FC-SCSI Element Locations

Since the SL3000 offers a Fibre Channel SCSI (FC-SCSI) control interface, you must be aware of SCSI element numbering for storage cells, CAPs, and installed drives. SCSI element numbers are assigned according to the following scheme:

- For storage elements: Numbering runs top-to-bottom, left-to-right, beginning at the back wall (as viewed from the front of the library, numbered 2000) and continuing with the same scheme at the front walls (also viewed from the front).
- For rotational CAP elements (import/export elements): Numbering runs top-to-bottom, left-to-right, beginning with element number 10 at the left-most module's CAP.
- Tape drives (data transfer elements): Numbering runs top-to-bottom, left-to-right, as viewed from the front of the library. Only installed drives are included in the numbering sequence; vacant slots are skipped. Numbering starts in the Base Module, at the top-left installed drive and runs to the bottom -right. It moves to the top-left slot in the DEM and runs to the bottom-right slot.
- If additional storage modules are added to the library, all element numbers are reassigned. If a module is added to the left of the existing library modules, numbering would restart with the left-most rear cell. If a module is added to the right of existing modules, the top, left, front cell would increment by the number of additional cells in the new module.

The following cells are not assigned SCSI storage element IDs. As such, they are never seen by the host as storage cells. Customer cartridges must never be placed in these cells:

- The bottom four rows on the rear wall of the base module
- The bottom four rows on the rear wall of the DEM
- All CAPs; CAPs are assigned CAP element IDs
- In single TallBot library, the front and rear left-most columns
- In a dual TallBot library with PEMs, the three front and rear left-most columns and three front and rear right-most columns
- All module identification label cells

FIGURE A-1 and FIGURE A-2 on page 614 illustrate SCSI element numbering for a sample SL3000 library with the following configuration:

- Four modules
- 166 activated cartridge storage cells
- 36 tape drives

FIGURE A-1 represents the back walls of the library, and FIGURE A-2 represents the front walls.

> **Note –** The library in these examples is not partitioned. For details about SCSI element numbering for partitions, see "Host SCSI Element Address" on page 209.

FIGURE A-1 FC-SCSI Element Locations – Back Walls (as viewed from the front))

Cartridge Expansion Module		Drive Expansion Module (Center Line) →				Base Module (Center Line) ←				Cartridge Expansion Module	
2000	2010	1022	1023	1024	1025	1000	1001	1002	1003	2060	2070
2001	2011	1026	Empty	1027	1028	1004	1005	1006	1007	2061	2071
2002	2012	1029	1030	Empty	1031	1008	1009	1010	1011	2062	2072
2003	2013	1032	1033	1034	1035	1012	1013	1014	1015	2063	2073
2004	2014	2020	2026	2032	2038	1016	Empty	1017	1018	2064	2074
2005	2015	2021	2027	2033	2039	1019	1020	1021	Empty	2065	2075
2006	2016	2022	2028	2034	2040	2044	2048	2052	2056	2066	2076
2007	2017	2023	2029	2035	2041	2045	2049	2053	2057	2067	2077
2008	2018	2024	2030	2036	2042	2046	2050	2054	2058	2068	2078
2009	2019	2025	2031	2037	2043	2047	2051	2055	2059	2069	2079

Note – Tape drives begin numbering from the center line (left wall of the Base Module) .
Empty tape drive slots are not counted.

FIGURE A-2 FC-SCSI Element Locations – Front Walls (as viewed from the front)

Cartridge Expansion Module		Drive Expansion Module (Center Line) →				Base Module (Center Line) ←				Cartridge Expansion Module	
2080	2090	2100	2107	(CAP) 10		2123	2130	(CAP) 36		2146	2156
2081	2091	2101	2108			2124	2131			2147	2157
2082	2092	2102	2109			2125	2132			2148	2158
2083	2093	2103	2110	~		2126	2133	~		2149	2159
2084	2094	2104	2111			2127	2134			2150	2160
2085	2095	Door Latch	2112			Door Latch	2135			2151	2161
2086	2096		2113	35			2136	51		2152	2162
2087	2097		2114	2117	2120		2137	2140	2143	2153	2163
2088	2098	2105	2115	2118	2121	2128	2138	2141	2144	2154	2164
2089	2099	2106	2116	2119	2122	2129	2139	2142	2155	2155	2165

Note – Perspective is looking through the front of the li brary.
Cartridge storage cell locations are consecutiv e, skipping locations for the door latches.

CAP cells are unique and sequential, from the left-to-right, as viewed through the front of the library

Drive Hardware Numbers

The hardware number of a drive is strictly internal to the library and defined by the electrical wiring to the drive slot. These numbers are printed on decals on the interior of the rear doors of the library modules.

The following TABLE A-9 illustrates this numbering scheme for the Base Module, as viewed from the rear of the module.

TABLE A-9 Base Module Tape Drive Numbering – Hardware

Array Number	**Drive Trays**			
1	Drive 1	Drive 2	Drive 3	Drive 4
	Drive 5	Drive 6	Drive 7	Drive 8
Array Number	Drive Trays			
2	Drive 9	Drive 10	Drive 11	Drive 12
	Drive 13	Drive 14	Drive 15	Drive 16
Array Number	Drive Trays			
3	Drive 17	Drive 18	Drive 19	Drive 20
	Drive 21	Drive 22	Drive 23	Drive 24

Note – Numbers shown are referenced from the rear of the Base Module.

The following TABLE A-10 on page 616 illustrates the numbering for the DEM.

TABLE A-10 Drive Expansion Module Tape Drive Numbering – Hardware

Array Number	Drive Trays			
1	Drive 25	Drive 26	Drive 27	Drive 28
	Drive 29	Drive 30	Drive 31	Drive 32
Array Number	Drive Trays			
2	Drive 33	Drive 34	Drive 35	Drive 36
	Drive 37	Drive 38	Drive 39	Drive 40
Array Number	Drive Trays			
3	Drive 41	Drive 42	Drive 43	Drive 44
	Drive 45	Drive 46	Drive 47	Drive 48
Array Number	Drive Trays			
4	Drive 49	Drive 50	Drive 51	Drive 52
	Drive 53	Drive 54	Drive 55	Drive 56

Note – Numbers shown are referenced from the rear of the D EM.

Drive Dynamic World-Wide Names

Drive dynamic World-Wide Names (dWWN), or Fibre Channel addresses, are automatically generated by the library controller during library initialization. dWWNs are assigned to library drive slots rather than devices. If a drive is replaced, the new drive receives the same name as the one it replaced, thereby eliminating the need for system re-configuration There are three World Wide Names reserved for each drive slot: Node, Port A, and Port B.

> **Note –** The dWWN feature is usually enabled at installation time. The library and tape drives all must have firmware that supports the dynamic World Wide Naming feature. When dWWN is enabled, all drives must be at the proper firmware level. If a drive has down-level firmware, it remains in the “configuring” state and is unavailable for host use.

B

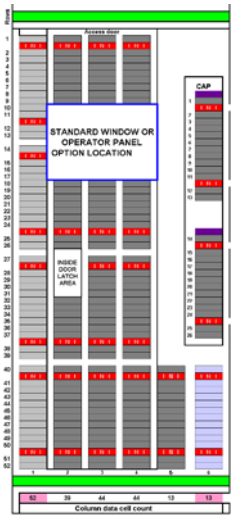
Wall Diagrams

This appendix provides diagrams and tables detailing the following:

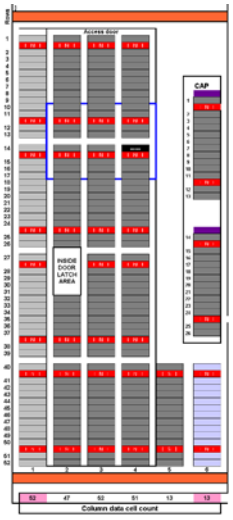
FIGURE B-1 Base Module Walls

Base Module

Front Wall

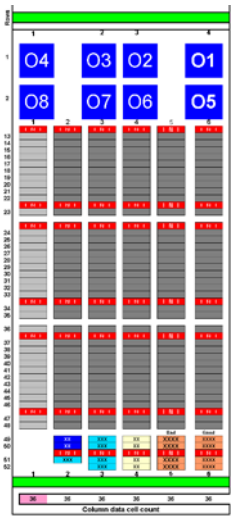


- 140 data cartridge cells
- With 26-cell rotational CAP
- With operator panel or window

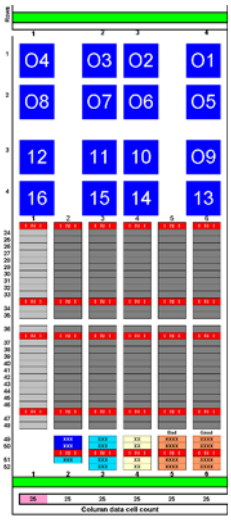


- 163 data cartridge cells
- With 26-cell rotational CAP
- With window cartridge array

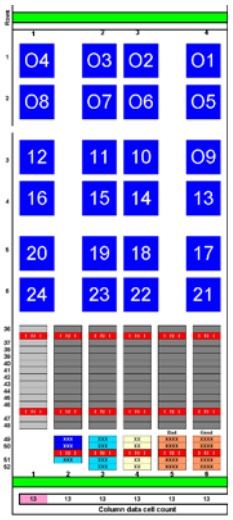
Rear Wall



- 8 tape drive slots
- 180 data cartridges



- 16 tape drive slots
- 125 data cartridges



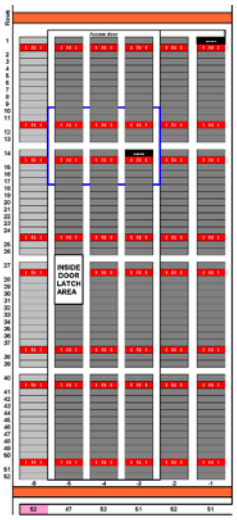
- 24 tape drive slots
- 65 data cartridges

Note – The light gray cells are not accessible unless an adjacent module is installed on that side.

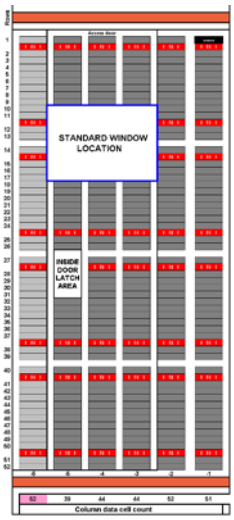
FIGURE B-2 Drive Expansion Module Walls

Drive Expansion Module

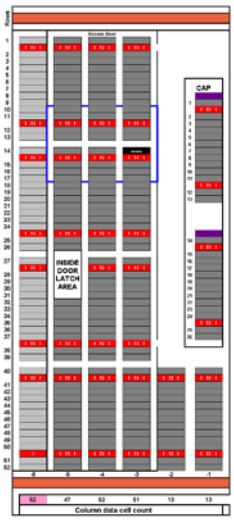
Front Wall



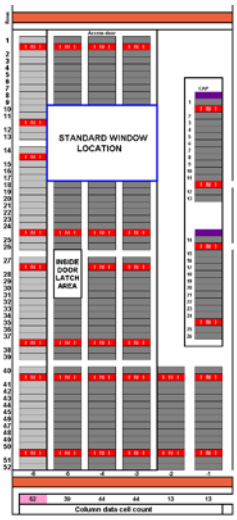
- 253 cartridge cells
- With window cartridge array
- No rotational CAP



- 230 cartridge cells
- With operator panel or window
- No rotational CAP

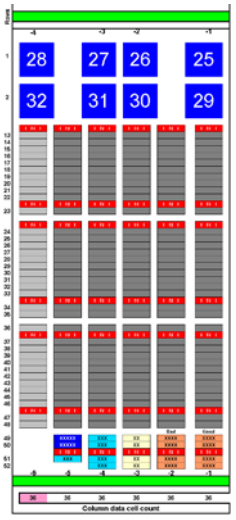


- 176 cartridge cells
- With 26-cell rotational CAP
- With window cartridge array

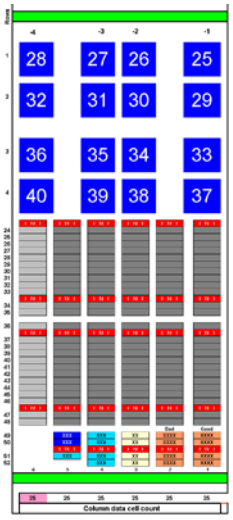


- 153 cartridge cells
- With 26-cell rotational CAP
- With operator panel or window

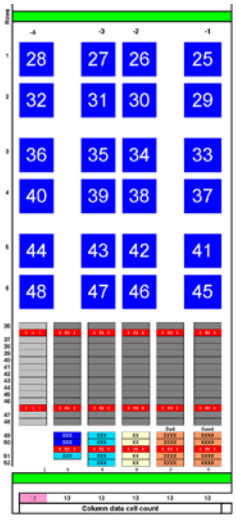
Rear Wall



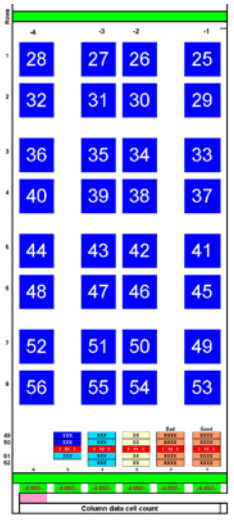
- 8 tape drive slots
- 180 data cartridges



- 16 tape drive slots
- 125 data cartridges



- 24 tape drive slots
- 65 data cartridges

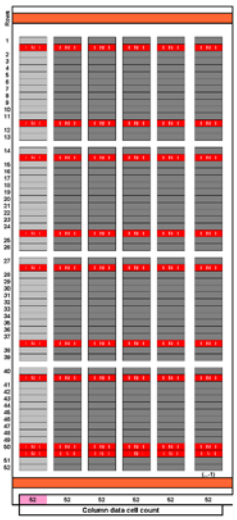


- 32 tape drive slots
- 0 data cartridges

Note – The light gray cells are not accessible unless an adjacent module is installed on that side.

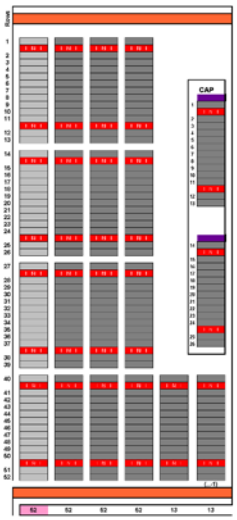
FIGURE B-3 Cartridge Expansion Module Walls

Left Cartridge Expansion Module



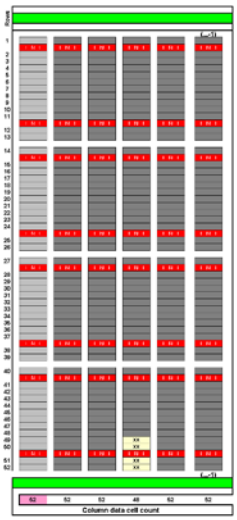
Front Wall

- 260 cartridge cells



Front Wall

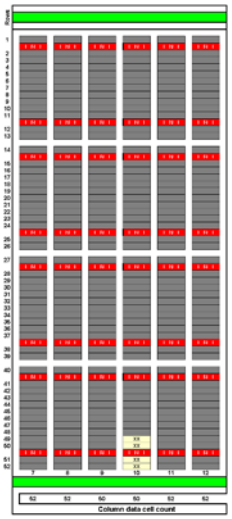
- 182 cartridge cells
- With 26-cell rot. CAP



Rear Wall

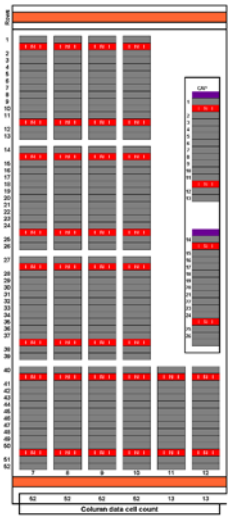
- 256 cartridge cells

Right Cartridge Expansion Module



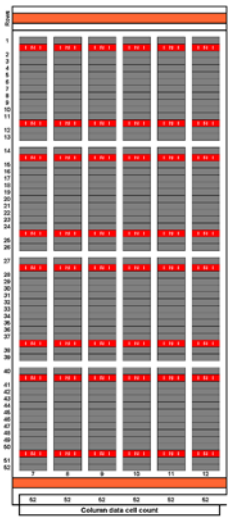
Rear Wall

- 308 cartridge cells



Front Wall

- 234 cartridge cells
- With 26-cell rot CAP



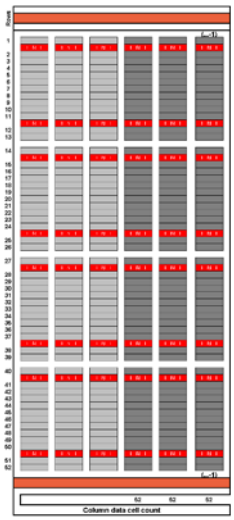
Front Wall

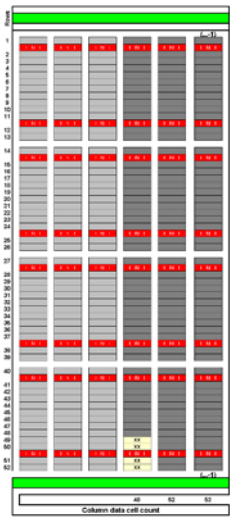
- 312 cartridge cells

Note – The light gray cells are not accessible unless an adjacent module is installed on that side.

FIGURE B-4 Parking Expansion Module Walls

Left Parking Expansion Module





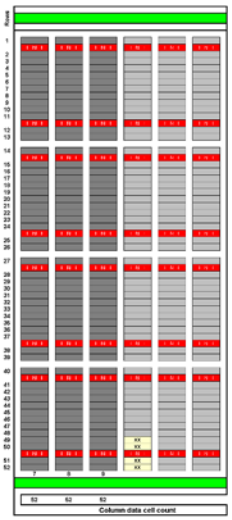
Front Wall

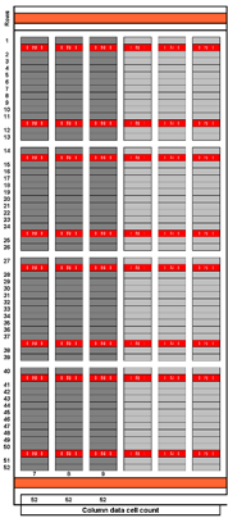
- 156 cartridge cells

Rear Wall

- 152 cartridge cells

Right Parking Expansion Module





Rear Wall

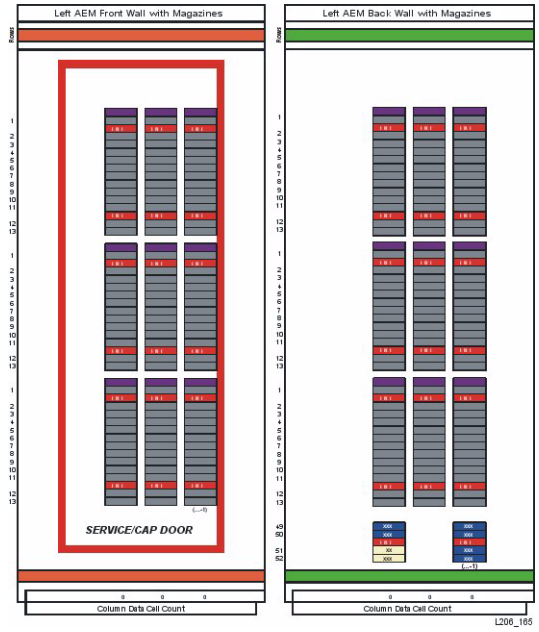
- 156 cartridge cells

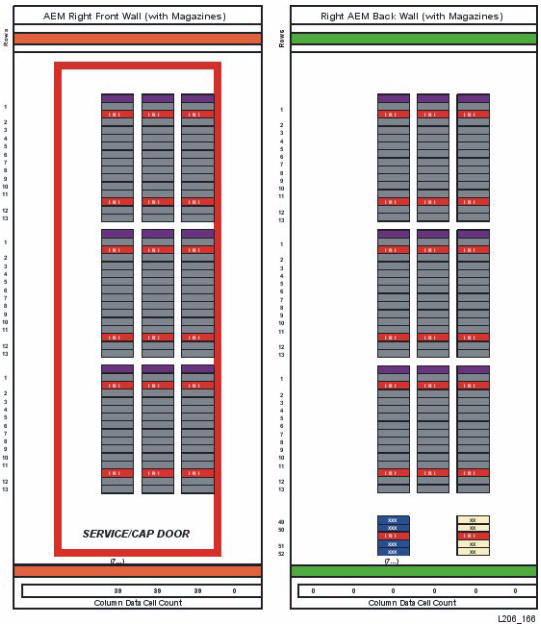
Front Wall

- 156 cartridge cells

Note – Six columns of arrays (three rear-wall and three front-wall) on both the left and right sides are not accessible to allow for a de fective robotics unit.

TABLE B-1 Access Expansion Module Walls

Left Access Expansion Module	
	
Front Wall	**Rear Wall**
• 117 AEM CAP cells	• 117 AEM CAP cells

Right Access Expansion Module	
	
Rear Wall	**Front Wall**
• 117 AEM CAP cells	• 117 AEM CAP cells

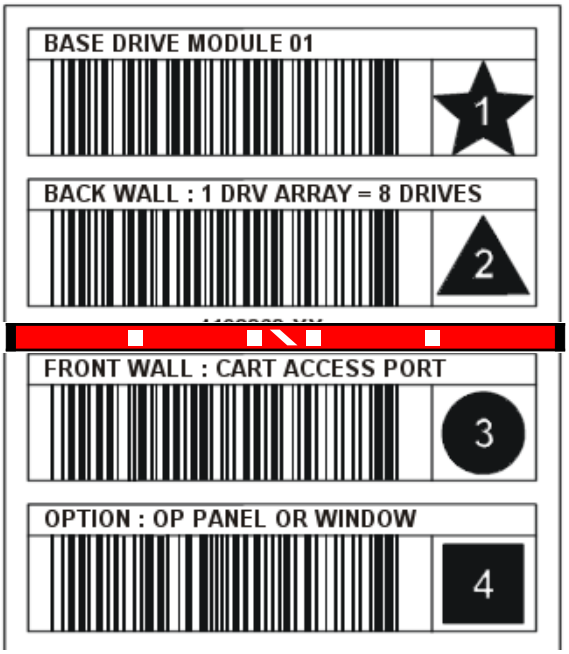
Configuration Block

Each module in the SL3000 library has a configuration block on the lower rear wall in column 4, rows 49, 50, 51, and 52. This block identifies the:

- Type of module
- Back wall configuration
- Front wall configuration
- Options for that module

During library initialization, the robotic assembly visits this configuration block to determine the configuration of the module.

FIGURE B-5 Configuration Block



Module types:

- Base Module
- DEM
- CEM
- PEM
- AEM

Back wall configuration:

Target

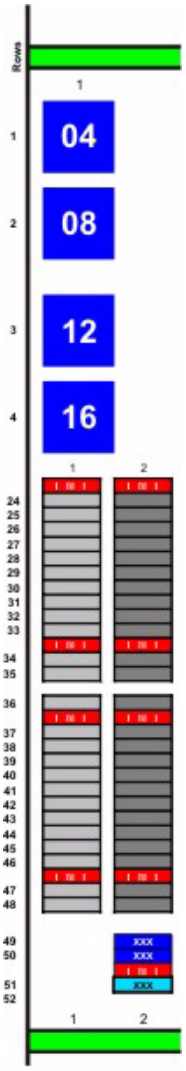
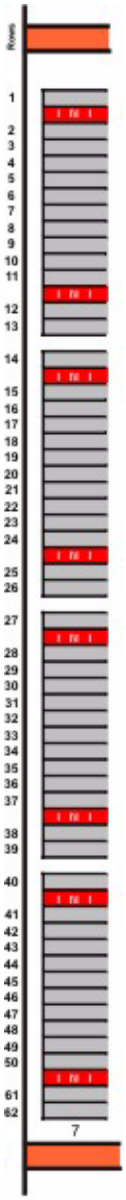
Front wall configuration:

Options:

- Local operator panel
- Window
- Cartridge arrays

Row Numbering

FIGURE B-6 Row Numbering

Example 1 Base Module	Example 2 CEM	
		Rows indicate the vertical location of a cartridge or tape drive. Rows are always positive numbers. Storage cell rows are numbered from the top (1) to bottom (52).
L206_239	L206_238	

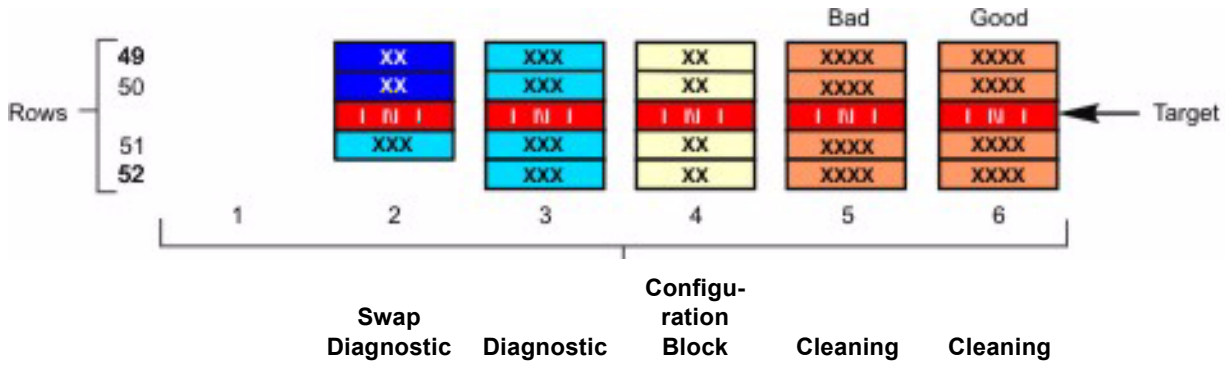
Reserved System Cells

Both the Base Module and the Drive Expansion Module have reserved system cells on the lower rear wall. These cells provide special functions for the library and tape drives.

FIGURE B-7 shows an example of these cells:

1. Swap cells (2) in column 2, rows 49 and 50.
2. Diagnostic cell (1) in column 2, row 51 .
3. Diagnostic cell (4) in column 3, rows 49, 50, 51, and 52.
4. Configuration block in column 4, rows 49, 50, 51, and 52.
5. Cleaning cartridges (4) in column 5, rows 49, 50, 51, and 52.
6. Cleaning cartridges (4) in column 6, rows 49, 50, 51, and 52.

FIGURE B-7 Reserved System Cells



C

Cartridge Handling

This chapter provides information on labeling and handling tape cartridges used in Oracle StorageTek libraries, and covers the following topics:

Library cartridges must meet specifications defined in *American National Standard Magnetic Tape and Cartridge for Information Interchange*.

For more information on cartridges and labels, see:

- The drive vendor's publication and Web site for cartridge requirements and specifications
- The *System Assurance Guide* for the SL3000 library.

Software Support for Cartridges

For the SL3000 library, the appropriate software microcode level needed is required for various tape drives. For this microcode information, see the System Assurance Guide for the SL3000 library.

Barcode Label Standard

The SL3000 library uses labels based on the Code 39 barcode standard. This standard uses discrete barcodes, which means that a fixed pattern of bars represents a single character. Code 39 barcode standard supports the following characters:

- 36 unique alpha-numeric characters: Letters A through Z and the numbers 0 through 9
- Special characters, which are not part of the customer label: - . $ / + % *

When multiple characters are arranged together as a label or volume serial number (VOLSER), a single, narrow white bar is placed between the individual character barcodes (called the inter-character gap).

Cartridge Types

The SL3000 library uses the following types of cartridges:

- Data cartridges store data written to them.
- Cleaning cartridges clean the tape path and read/write heads of the tape drives.
- Diagnostic cartridges are for service representatives to run read and write tests on the tape drive. In general, these tapes are standard data cartridges with a special diagnostic label.

Cartridge labels include a media domain and media ID together provide to the library a cartridge's type of media and use. These IDs enable you to mix tape drive types and media types in a single library or library complex. The media ID label corresponds to the tape drive or transport capable of using the cartridge. The media domain indicates whether the cartridge is for data, cleaning, or diagnostic use.

Cleaning and Diagnostic Cartridges

Cleaning and diagnostic cartridges require different labels to distinguish them from data cartridges. As the name implies, cleaning cartridges clean the tape path and read/write heads of the tape drives.

Diagnostic cartridges are for service representatives to run read and write tests on the tape drive. In general, these tapes are standard data cartridges with a special diagnostic label.

The first alphanumeric characters in the label sequence determine the type of cartridge being used. The VOLID (volume serial number or VOLID) contains:

- CLN for cleaning cartridges
- DG for diagnostic cartridges

Each cleaning and diagnostic kit includes one labeled cleaning cartridge and one labeled diagnostic cartridge. Each of these are labeled with a volume ID of 0. Extra cleaning and diagnostic labels are sent with each library.

You cannot use cleaning and diagnostic cartridges as scratch cartridges, and software utilities cannot initialize them.

> **Caution –** *Procedure error:* When you enter a cleaning cartridge, the software considers it to be new, and sets the usage counter to zero. DO NOT RE-ENTER A CLEANING CARTRIDGE THAT THE LIBRARY EJECTS THROUGH THE CAP.

Supported Labels

Barcode labels must match the drive type. The following labels are appropriate for the corresponding drive.

- T9840: 1/2-inch labels supplied by Trioptic (Engineered Data Products/Colorflex) or Tricode (American Eagle/Writeline). Version C and D labels require a six-plus-one character label. The separate character is a separate media ID. See TABLE C-1 for more details.
- T10000: Labels with eight characters. The last two characters are the required media ID domain and the media ID type characters. See TABLE C-1 for more details.

- LTO drives: Labels with eight characters. This label includes a six character customer defined volume serial number or the cartridge's function, such as diagnostic or cleaning. The other two characters identify the media domain or tape technology, and the media ID or version of that particular technology. See TABLE C-2 for more details.
- DLT drives: Labels with seven characters. The seventh character is a small identifier below the sixth character for the media ID or version. See TABLE C-3 for more details.

For more information on labels, see the *System Assurance Guide* for the SL3000 library.

Labels for Oracle StorageTek Tape Cartridges

The media ID characters for Oracle StorageTek T9840 (models C and D) and T10000 drive labels are listed in TABLE C-1. These tape drives also support encryption.

TABLE C-1 Labels for StorageTek T9840 and T10000 Tape Cartridges

Beginning Characters of Label	Media ID	Cartridge Type	Drive Type
VOLID	R	Data	T9840
VOLID (Green background)	R	VolSafe Data	T9840C
VOLID (Purple background)	R	VolSafe Data	T9840D
VOLID	T1	Data	T10000 A/B
VOLID	T2	Data	T10000 C
VOLID	TS	Sport Data	T10000 A/B
DG (blank space) VOLID	R	Diagnostic	T9840
DG (blank space) VOLID	T1	Diagnostic	T10000 A/B
DG (blank space) VOLID	T2	Diagnostic	T10000 C
DG (blank space) VOLID	TS	Sport Diagnostic	T10000 A/B
CLN (blank space) VOLID	CC	Cleaning	T10000 C
CLN (blank space) VOLID	CL	Cleaning	T10000 A/B/C
CLN (blank space) VOLID	CT	Sport Cleaning	T10000 A/B
CLN (blank space) VOLID	U	Cleaning	T9840 (all except T9840D)
CLN (blank space) VOLID	Y	Cleaning	T9840D

Labels for LTO Cartridges

LTO technology was initially developed by IBM, Hewlett-Packard, and Quantum. LTO is an open format technology, meaning users have muliple sources of product and media.

LTO cartridge labels have eight characters. The last two characters are the media ID (L3, L4, L5, LT, LU, or LV). CLN or DG are the first characters on the cleaning or diagnostic labels. LTO4 and LTO5 tape drives also support encryption.

Note – Check availability for LTO Gen 4 drives and media. Library firmware must be Version 1126 or later to support LTO Gen 4 drives and media.

TABLE C-2 Labels for LTO Cartridges

Media ID	Cartridge Type	Drive Type or Additional Information
L1	Data	Generation 1
L2	Data	Generation 2
L3	Data	400 GB, Generation 3
L4	Data	800 GB, Generation 4
L5	Data	1.5 TB, Generation 5
LT	Data	400 GB, Gen 3 only. Write once read many times (WORM).
LU	Data	800 GB, Gen 4 drive only (WORM).
LV	Data	1500 GB, Gen 5 drive only (WORM).
CU	Cleaning	Beginning characters are CLN (blank space) + VOLID. Oracle recommends using the CLN + CU universal label instead of a vendor-unique label (CLN + C1 for Hewlett-Packard or CLN + C2 for IBM).
DG	Diagnostic	Beginning characters are DG (blank space) + VOLID. You can apply a DG label to a blank data cartridge to use the cartridge for library diagnostic tests.

Labels for DLT and SDLT Cartridges

Media IDs for DLT and SDLT cartridges do not indicate the type of cartridge (data, cleaning or diagnostic). Instead, cleaning cartridges begin with CL (space), and diagnostic cartridges begin with DG (space).

TABLE C-3 Labels for DLT and SDLT Cartridges

Media ID	Cartridge Type	Additional Information
B	Data	DLT1
C	Data	DLTtape III
D	Data	DLTtape IV
E	Data	DLTtape III-XT
S	Data	SDLT 220/320 cartridge
2	Data	SDLT 600
4 or S4	Data	DLT-S4

TABLE C-3 Labels for DLT and SDLT Cartridges

Media ID	Cartridge Type	Additional Information
CLN + S	Cleaning	1500 GB, Gen 5 drive only (WORM)
DG + 2	Diagnostic	Beginning characters are CLN (blank space) + VOLID. Oracle recommends using the CLN + CU universal label instead of a vendor-unique label (CLN + C1 for Hewlett-Packard or CLN + C2 for IBM).
DG + 4	Diagnostic	Beginning characters are DG (blank space) + VOLID. You can apply a DG label to a blank data cartridge to use the cartridge for library diagnostic tests.

Handling Cartridges

When cartridges are improperly handled, loss of data or damage to a library component can occur. To handle a cartridge correctly:

- Keep cartridges clean.
- Inspect a cartridge before each use and never put a damaged cartridge into a drive or library.
- Never open a cartridge.
- Do not handle tape that is outside the cartridge; the tape edge might be damaged.
- Do not expose the tape or cartridge to direct sunlight or moisture.
- Do not expose a recorded cartridge to magnetic fields; this might destroy data on the tape.

Inspecting a Cartridge

A defective or dirty cartridge can damage a tape drive. Always inspect a cartridge before you insert it into a tape drive or a library. Look for:

- Cracked or broken cartridge
- Damaged write-protect switch
- Liquid in the cartridge
- Labels not firmly or neatly attached or extending over the cartridge edge
- Any other obvious damage

Inserting a Cartridge in a Drive or Cell

A defective or dirty cartridge can damage a drive. Always inspect a cartridge before you insert it into a drive or into a tape library. Look for:

- Cracked or broken cartridge
- Broken tape access door
- Damaged file-protect selector or write-protect switch
- Liquid in the cartridge

- Labels not firmly attached or extending over the cartridge edge
- Any other obvious damage

Insert a cartridge in a storage cell, rotational or AEM CAP cell, or drive with the bar code on the bottom, and the VOLID readable from right to left. The cartridge hub must always be down.

Cleaning the Cartridge Exterior

Keep your tape cartridges in good condition. A defective or dirty cartridge can damage a tape drive see "Inspecting a Cartridge" on page 631.

> **Caution –** *Potential damage to cartridges.* Do not use certain solvents to remove labels or to clean cartridges because they can damage the cartridges. Do not use acetone, trichloroethane, toluene, xylene, benzene, ketone, methylethyl ketone, methylene chloride, ethyldichloride, esters, ethyl acetate, or similar chemicals.

To clean a cartridge exterior:

- Wipe all dust, dirt, and moisture from the cartridge with a lint-free cloth.
- Use Oracle StorageTek Tape Cleaner Wipes to clean the cartridges. These wipes are saturated with isopropyl alcohol. Do not let any solution touch the tape or get inside the cartridge.

Storing Cartridges

- Do not take a cartridge out of its protective wrapping until you are ready to use it. Use the tear string, not a sharp instrument, to remove the wrapping.
- Store cartridges in a clean environment that duplicates the conditions of the room in which they are used.
- Before using a cartridge, make sure that it has been in its operating environment for at least 24 hours. See the user manual for the drive for details.

▼ Apply a Label to a Cartridge

Cartridge labels indicate the type of cartridge media and usage. If your cartridges were not ordered with pre-applied labels, you must apply them yourself. Correctly label all cartridges for library use. Use labels that do not leave a residue when they are removed.

> **Caution –** *Possible misread of volume number label.* Make sure the edges of the labels do not curl. A curled label causes the cartridge to become jammed in the tape drive loader, and the robot misreads the label.

1. **Make sure the cartridge has been at room temperature for at least 24 hours.**
2. **Clean the surface where the label will be placed. Use Oracle StorageTek Tape Cleaner Wipes to clean the cartridges.**

   > **Caution –** *Potential damage to cartridges.* Do not use certain solvents to remove labels or to clean cartridges because they can damage the cartridges. Do not use acetone, trichloroethane, toluene, xylene, benzene, ketone, methylethyl ketone, methylene chloride, ethyldichloride, esters, ethyl acetate, or similar chemicals.

3. **Locate the type of label you need. Make sure the label contains a VOLID.**
4. **Peel the backing from the cartridge label.**
5. **For an LTO cartridge, hold the cartridge so that the write-protect switch is toward you. For a 9840 or 9940 label, hold the cartridge so that the two recessed areas are toward you.**
6. **Attach the label to the cartridge. Press it into place.**

   > **Note –** On LTO Ultrium cartridge labels, the alphanumeric characters can be either vertical or horizontal.

   > **Note –** The label must be within the indented (recessed) area of the cartridge so that the edges of the label are parallel to the edges of the cartridge. The label should be close to the inside edge of the indented area, but must *never* overlap the edge of this area.

7. **If the cartridge has a customer label, place the label in the area and press it into place.**
8. **For 9840 and 9940 drives, repeat Step 2 through Step 7 for the media ID label. Make sure the left side of both labels are aligned with each other.**

D

Web-launched SL Console Server

Oracle's Web-launched SL Console server, which is a standard feature of the SL3000, enables the SL Console to be installed on a centralized Web server. Individual clients can use a supported Web browser to download and log in to the Web-launched SL Console server.

You download the server from the Oracle Software Delivery Cloud. It is distributed as a Java WebARchive (`.war`) file. After you have downloaded the file, you can deploy it on the Web server of your choice. See your Web server documentation for specific deployment instructions and requirements.

Security Considerations

The customer is responsible for implementing all appropriate security systems, including firewalls, user access, etc.

Updating the Web-launched SL Console Server

You can update the Web-launched SL Console server while it is running. Updates are automatically propagated to the clients when they retrieve the Web-launched SL Console application from the server.

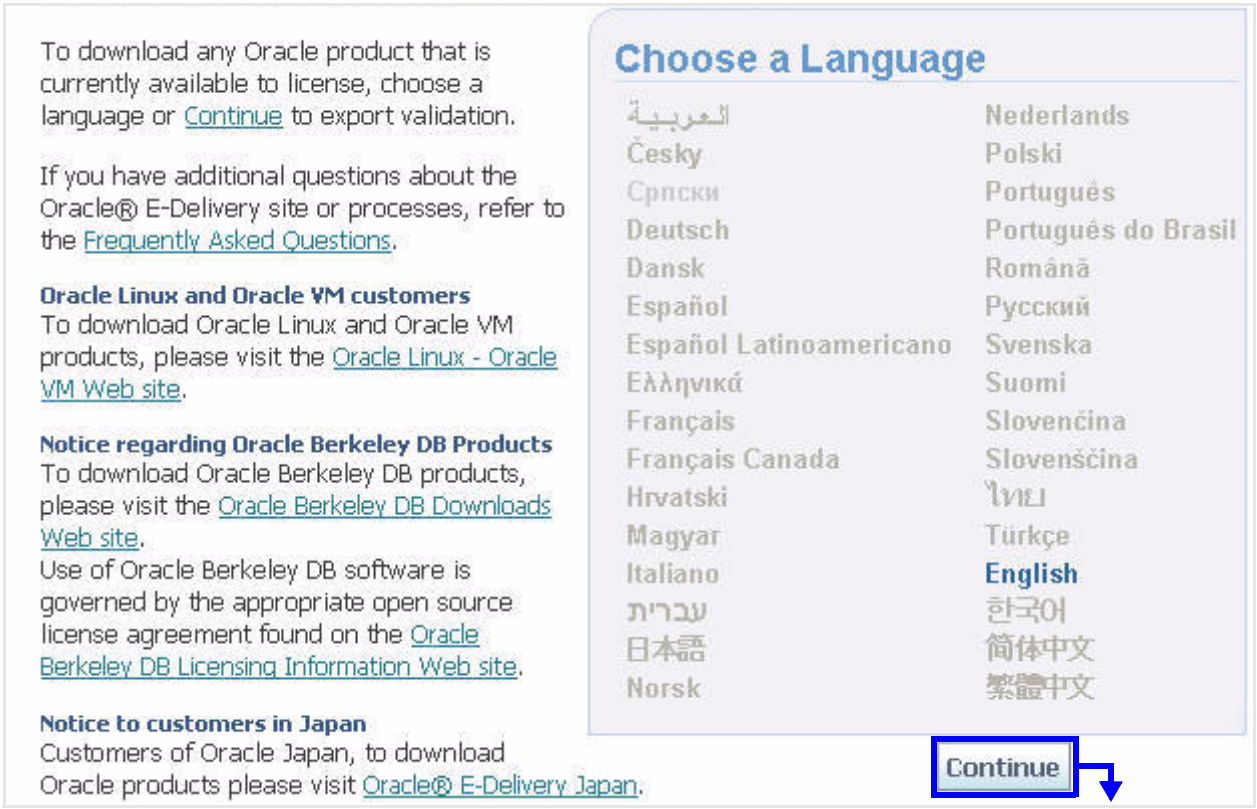
▼ Download the SL Console Media Pack

Use this procedure to download and extract the current SL Console Media Pack from the Oracle Software Delivery Cloud. The Media Pack includes the Web-launched SL Console server, as well as the Web-launched SL Console client and the standalone SL Console.

After you complete this procedure, you can deploy the Web-launched SL Console server on the Web server of your choice. See your Web server documentation for specific deployment instructions and requirements.

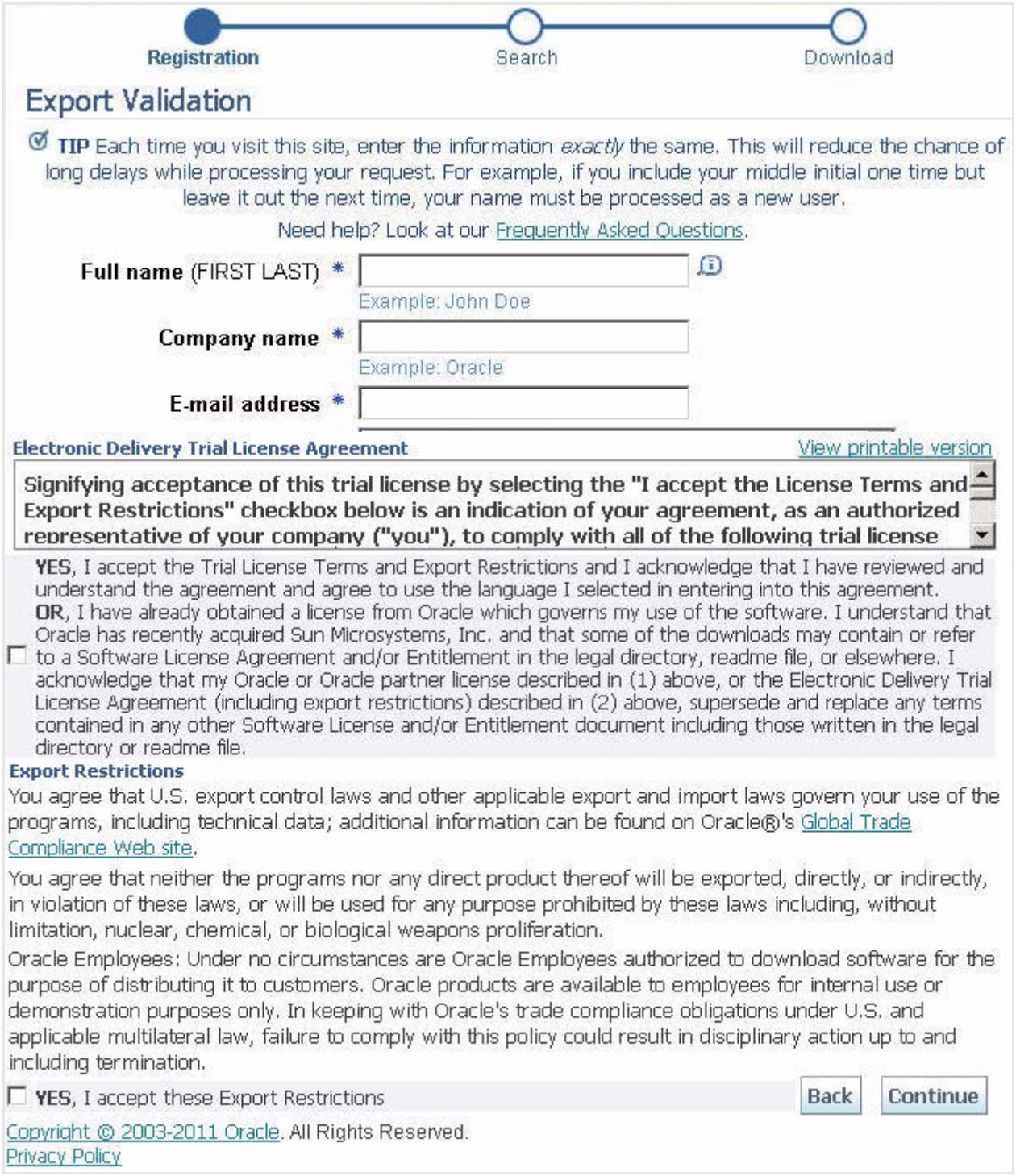
1. **Start a Web browser on your PC or workstation, and navigate to the Oracle Software Delivery Cloud at the following URL:**

   http://edelivery.oracle.com/



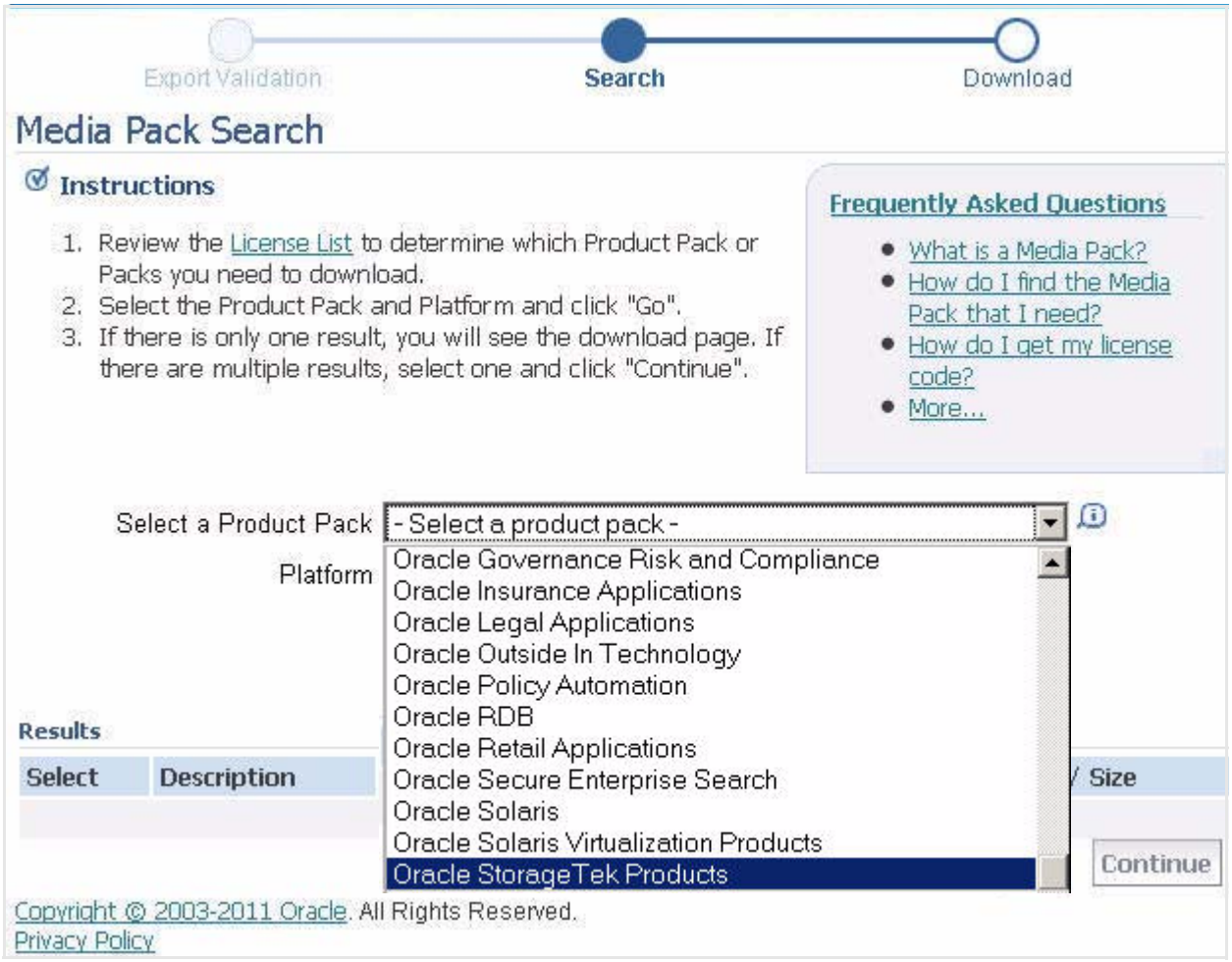
2. **Click Continue.**

3. **On the Export Validation screen, enter your contact information, read the License Agreement and Export Restrictions, and click the check boxes to accept.**

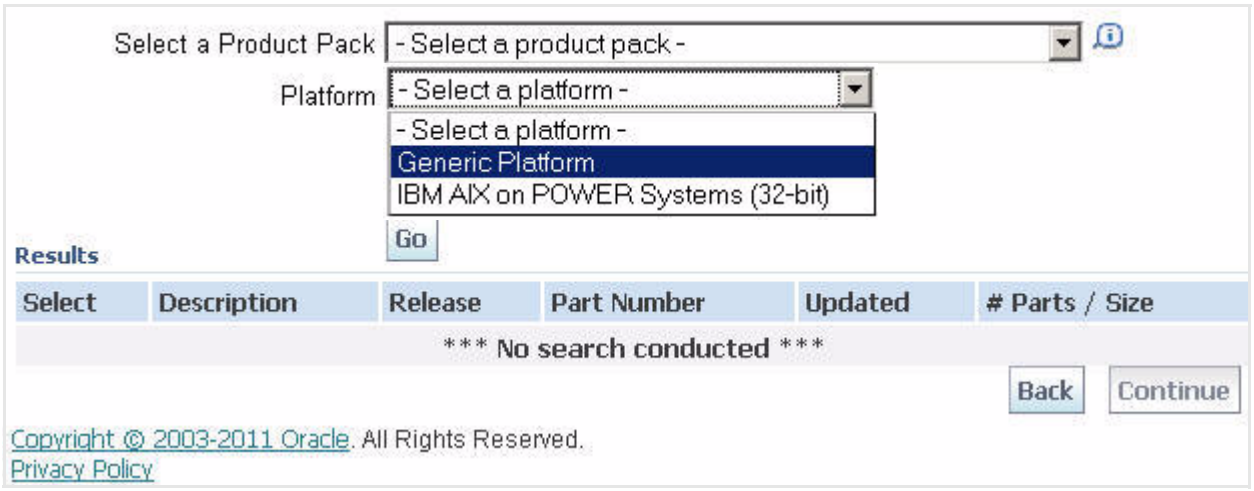


4. **Click Continue to open the Media Pack screen.**

5. **In the Select a Product Pack list of the Media Pack Search screen, select Oracle StorageTek Products.**



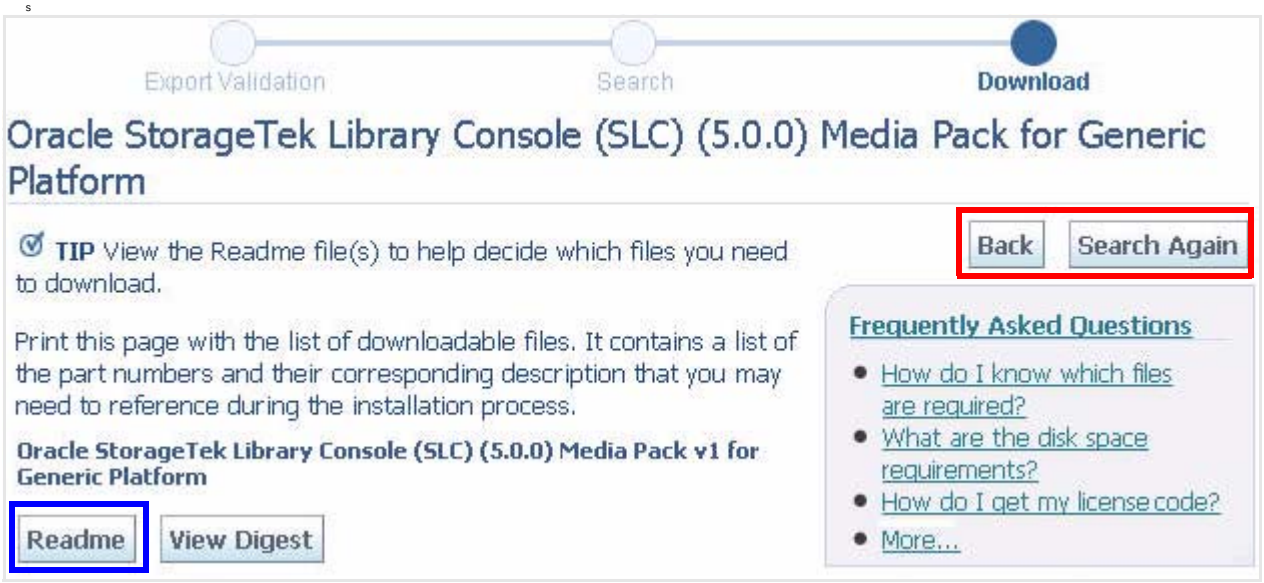
6. **In the Select a Product Pack list of the Media Pack Search screen, use the Platform list, and select Generic Platform.**



7. **Click Go.**

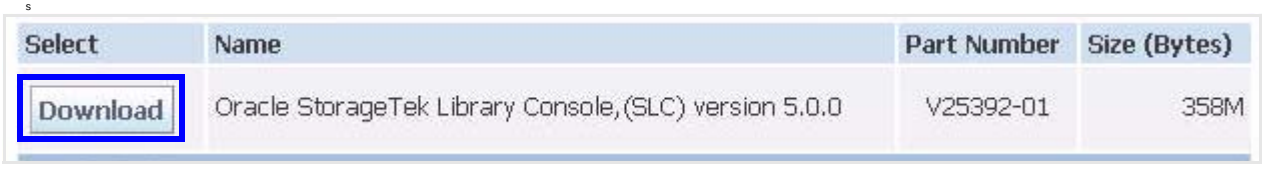
   All media packs meeting your selection criteria are displayed in the Results section of the screen.

8. **Click the Select radio button that corresponds to the media pack for the SL Console version that you want to download. Click Continue. When the download screen for the selected media pack appears, review the information to verify that you have selected the correct media pack. Click the Readme button to review the readme file, if desired. Use the View Digest button to verify the MD5 and/or SHA-1 digests of the download files.**

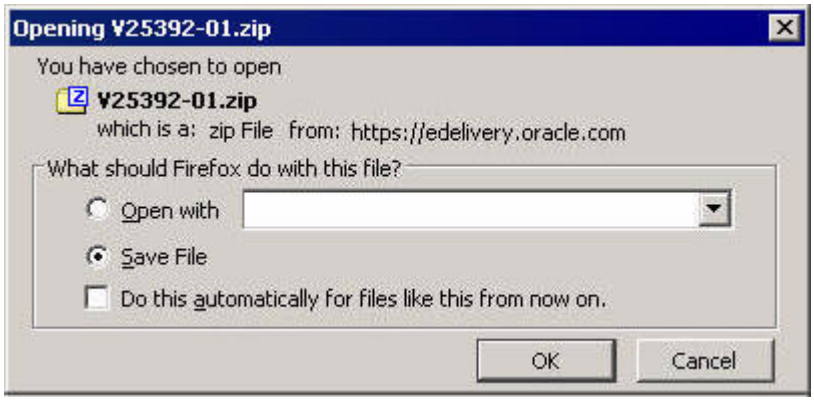


9. **If this is not the correct software, use the Back and/or Search Again buttons.**

10. **If the software is correct, click the Download.**



11. **When the download dialog appears, click Save File, and press the OK.**



12. **When the Enter name of file to save to dialog appears, browse to the local directory that will hold the download file, and press Save.**

    The file is large and may take some time to download, depending on your connection speed.

13. **Use the appropriate extraction utility (for example, `gunzip`, `pkunzip`) to extract the media pack to the location of your choice.**

    The Web-launched SL Console server filename is `opel.war`, located in the `Weblaunch` directory.

Glossary

Numerics

2N
A PDU that supplies power to the redundant AC power grid and the third and fourth accessory racks. *See also* N+1 and 2N+1.

2N+1
Two PDUs for AC redundancy. Each PDU has extra DC power supplies for N+1 redundancy for each PDU.

A

ACSLS
See Automated Cartridge System Library Software (ACSLS).

ADI
Automation drive interface.

AEM
See access expansion module.

access expansion module
Essentially a very large CAP, with all the characteristics of a CAP, such as online/offline state, ability to be shared by partitions, etc. The cartridge slots in the AEM cannot be used for long-term cartridge storage.

access door
A door on either side of the front facade through which service personnel can enter the library. Optional CAPs are attached to the right access door.

activated capacity
The number of storage cells the library is activated to use. This cannot exceed the installed capacity.

Automated Cartridge System Library Software (ACSLS)
An open systems software package that manages library contents and controls library hardware to mount and dismount cartridges on tape drives. This application also provides library management services such as cartridge tracking, pooling, reports, and library control.

audit
An inventory of cartridge locations in all areas of the library, including the slots in the storage and reserved areas. Audits occur when:

- The library initializes at power-on.
- After either one or both access doors are opened and closed without activating the service safety door.
- A physical audit request is made through SL Console.

Also see host audit, physical audit, security audit, verified audit and virtual audit.

B

base module
Provides the entry level offering for an SL3000 library. Consists of a single frame and centralizes the infrastructure for all other modules in the library. This module includes the power supplies, robotic units, electronics control module, cartridge access port, storage slots, tape drives, and operator controls.

bar code line scan camera
A component of the robot that is used for cartridge identification and position calibration.

bulk load
Manually loading cartridges into the library, for example, during library installation.

C

CAP
See cartridge access port (CAP).

CDS
Control data set.

CEM
See cartridge expansion module.

CLI
Command line interface.

capacity
The storage capacity of the library. *See also* activated capacity and installed capacity.

cartridge
A container holding magnetic tape that can be processed without separating the tape from the container. The library uses data, diagnostic, and cleaning cartridges.

cartridge access port (CAP)
A bi-directional port built into the door panel of the library which provides for the manual entry or automatic ejection of data or cleaning cartridges. *Same as* import/export mail slot in SCSI and open system libraries.

cartridge bias
Left or right justification of a cartridge within a storage cell, CAP, or tape drive.

cartridge expansion module
An optional module for the library that provides additional cartridge slot capacity and growth.

cartridge proximity detector
A component that determines if a cell is empty or contains an unlabeled cartridge during a label reading error recovery procedure. *Same as* empty cell detector.

cell
The location in the library in which a tape cartridge is stored. *Same as* slot.

cell array
An array that holds multiple cartridges when not in use.

cleaning cartridge
A tape cartridge that contains special material to clean the tape path in a transport or drive.

cold swap
To remove and replace a system component (typically one such as a logic board that has no redundant backup) after system operations have been stopped and system power has been disabled. *Contrast with* hot swap.

control data set
Data set used by the host software to contro l the functions of the automated library . Also called a library database.

customer interface module
The front module of the library at which you has access to the touch screen operator panel and service personnel have access to the library and service bay.

D

DEM
See drive expansion module (DEM).

dWWN
See dynamic WWN.

data cartridge
A term used to distinguish a cartridge onto which a tape drive may write data from a cartridge used for cleaning or diagnostic purposes.

diagnostic cartridge
A data cartridge used for diagnostic routines.

data path
The path where data is transferred between the host and tape drives.

drive and electronics module
The module in an library that houses the electronics control module, power distribution units (PDUs), power supplies, accessory racks and equipment, and tape drives for the library.

drive array assembly
An array that is installed in the drive and electronics module for mounting tape drive tray assemblies. The drive and electronics module holds up to four array assemblies, and each array holds up to 16 tape drive tray assemblies.

drive bay
A partitioned section of the tape drive array assembly that holds one tape drive tray assembly.

drive bay address
A two-digit integer (01–64) that represents th e physical locations into which drive tray assemblies are inserted.

drive expansion module (DEM)
A module that allows further expansion of tape drives.

drop-off cells
Cells used to hold a cartridge in the event of a robot failure that occurs while a cartridge is in the robot hand.

Dual TCP/IP
Provides two separate host connections between the host software (ACSLS or HSC) and the library controller.

dynamic WWN
When enabled, dWWN assigns names to library drive slots rather than devices. When a drive is replaced, the new drive receives the same name as the one it replaced, thereby eliminating the need for system re-configuration. dWWN as signs names to individual tape drive slots rather than devices

E

ECM
See electronics control module.

ELS
See Enterprise Library Software (ELS).

ESCON
See Enterprise Systems Connection (ESCON).

EPO
See emergency power-off (EPO).

eject
See export.

electronics control module
A module that includes the HBK card, HBC card and HBT card. The assembly that:

- Processes commands from a host system
- Coordinates the activities of robots, elevators, pass-thru ports, and tape drives
- Monitors status inputs from sensors and switches

emergency power-off (EPO)
(1) A safety scheme that allows a “power down” of a subsystem or a system as a whole instead of powering it down component-by-component.

(2) A safety switch on a machine or in a data center that allows a user to immediately power down a machine or a data center power supply by cutting off the external source power.

enter
See import.

Enterprise Library Software
The software products that automate tape operations for mainframe users.

Enterprise Systems Connection (ESCON)
An optical fiber serial interface which supports half duplex data transfers.

environmental monitors
A collective term for the sensors that track temperatures, fan speeds, and the status of various other mechanism within a library.

Ethernet
A local-area, packet-switched network technology. Ethernet is a 10- or 100-megabytes-per-second LAN.

export
The action in which the library places a cartridge into the cartridge access port so that the operator can remove the cartridge from the library. *Same as* eject.

F

FCP
See Fiber Channel Protocol (FCP).

FICON
See fibre connection (FICON).

FRU
Field replaceable unit.

failover
The act of moving to a secondary or redundant path when the primary path fails. Also, in ACSLS HA, failing over to the alternate ACSLS server.

Fibre Channel
A bidirectional, full-duplex, point-to-point, serial data channel structured for high performance capacity. The Fibre Channel is an interconnection of multiple communication ports, called N_Ports. These N_Ports are interconnected by a switching network, called a fabric, to a point-to-point link, or an arbitrated loop.
Fibre Channel is a generalized transport mechanism with no protocol of its own. A Fibre Channel does not have a native input/output command set, but can transport existing Upper Level Protocols (ULP) such as SCSI and IPI.
Fibre Channel operates at speeds of 100 MB per second (full speed), 50 MB per second (half speed), 25 MB (quarter speed), or 12.5 MB (eighth speed). Fibre Channel operates over distances of up to 100 m over copper media or up to 10 km over optical links.

Fiber Channel Protocol (FCP)
A transport protocol (similar to TCP used in IP networks) which predominantly transports SCSI commands over Fibre Channel networks.

fibre connection (FICON)
An IBM FC 4 protocol that extends the capabilities of ESCON. Used to map either ESCON or parallel channel-to-control-unit cabling infrastructure and protocol onto standard FC services and infrastructure.S/390-based channel architecture that provides up to 256 channels in a single connection, each having a capacity of 100 MB per second.

front controller module
The module that houses the controller for the elevators, CAPs, turntables, and safety barrier.

front facade
The external portion of the customer interface module, between the access doors, that holds the:

- Membrane keypad
- Product logos

- Optional touch screen operator control panel

G

get
An activity in which a robot obtains a cartridge from a cell or drive.

gripper
(1) The portion of the hand assembly that grasps the cartridge.

(2) The part of the hand assembly that grasps and holds a cartridge during transport.

H

HLI/PRC
Host Library Interface/Panel Row Column

hand assembly
A part of the library robot whose function is to grasp cartridges and move them between storage cells and drives. A camera on the hand assembly reads cartridge volume labels.

See also bar code line scan camera.

The home library supplys power and communication to the PTP .**host audit**
The process of updating the cartridge VOLIDs and locations (collected by a security audit) in a host CDS. This audit is initiated by a host command.

hot swap
Removal and replacement of a system component while system power remains on and system operations continue. *Contrast with* cold swap. *Contrast with* hot-pluggable. *Same as* online servicing.

hot-pluggable
The capability that allows an Oracle service representative to replace a system component while power to the system is maintained. This feature allows hardware maintenance actions and hardware upgrades to proceed without disrupting subsystem availability. *Contrast with* hot swap.

I

import
The process of placing a cartridge into the cartridge access port so that the library can insert it into a storage cell.

installed capacity
The number of storage cells physi cally present in the library.

interlock switch
A switch that disconnects power to library mechanisms, excluding tape drives, when the front door is opened.

K

keypad interface
See membrane keypad.

L

LCM
See Library Content Manager (LCM).

LTO
See linear tape open format (LTO).

LUN
See logical unit number.

library controller (LC)
The HBC card within the library that controls operations and communicates with the operator panel.

Library Content Manager (LCM)
Software that provides content management for mainframe automated tape environments. Works in conjunction with host software component, virtual storage manager and your tape management system.

library operator panel
See touch screen operator control panel.

linear tape open format (LTO)
A set of tape data form at standards created to enable data interchange among different LTO Ultrium tape drive vendors. These standard s allow data cartrid ges to be shared.

logical library
A virtual representation of a physical library. *Same as* virtual library partition.

logical unit number
A unique identifier for a physical storage allocation. A LUN could reference an entire RAID set, a single hard disk or partition, or multiple disks or partitions. Unlike a physical LUN, the virtual LUN does not map to a specific device or allocation of storage space but a virtualized space that can be created in excess of the actual physical space available.

M

magazine
A removable array that holds cartridges and is placed into the cartridge access port (CAP).

membrane keypad
A keypad mounted on the front facade used to monitor the status of the library and to operate the CAPs.

N

N+1
A power configuration that provides AC power and redundant DC power by adding a second DC power supply to each DC bus. See also 2N.

O

online replacement
Replacement or service of a module while the library remains operational. The service person may be required to power off the module before removing or replacing it. *Same as* hot swap.

operator panel
See touch screen operator control panel.

orphaned cartridge
A cartridge in a partitioned library that is located in an unallocated cell or drive (that is, a cell or drive not allocated to any defined par tition). Cartridges may become orphaned when partition boundaries are chan ged, partitions are de leted, or cartridges are manually moved to unallocated or inaccessible cells.

P

PDU
See power distribution unit (PDU).

PEM
See parking expansion module.

PLI
See primary library interface (PLI).

parking expansion module
An additional module available for the SL3000 library that allows a red undant robot to be parked in it.

physical audit
Physical audits occur when the robots:

- Scan the cartridge locations in the librar y
- Verify the volumes
- Update the library control card invento ry
- Set the status of the cartridge location to true

physical library
A physically present library as opposed to a logical library.

power distribution unit (PDU)
A device for the distribution of AC line power from one inlet to multiple outlets. Multiple PDUs provide higher availability because the power continues if one PDU (or its alternating current source if the PDUs use separate AC sources) loses power.

primary library interface (PLI)
The communication path between the operator panel and the library controller.

put
An activity in which a robot places a cartridge into a cell or drive.

R

RE
See Redundant Electronics (RE).

RTD
See real tape drive (RTD).

rail
(1) That portion of the upper robot track assembly that provides power and communication to the robot. (2) All of the cartridge slots and drives accessible through a rail.

rail assembly
The mechanism on which the robot travels between cartridge arrays and tape drives.

reach mechanism
A component of the robot that moves the gripper to get or put a cartridge at a designated location.

real tape drive (RTD)
The physical transport attached to the LSM. The transport has a data path to a VTSS and may also have a data path to MVS or to another VTSS.

Redundant Electronics (RE)
A feature that provides failover protection in enterprise libraries. RE uses a two sets of library controller cards. At any given time, one set is active and the other set is standby. The active library controller can failover to the standby in response to a command from ACSLS or the SL Console. Automatic failover can be initiated by the library in the event of a library card failure.

remote operator console
The customer's operator panel that interfaces with the PLI. *See also* security software layer.

Between the drive expansion module and another module, an extender card/cable connector that connects the RLM to the RLE card in the drive expansion module.**robot**
A mechanism that moves horizontally along a track to transport tape cartridges to and from other locations in the library.

S

SSL
See Secure Sockets Layer (SSL).

security audit
The process of reading and storing in library memory the VOLIDs and locations of all cartridges in the library. *See also* host audit.

Secure Sockets Layer (SSL)
A cryptographic protocol that provides communication security. The communication path between the PLI and the remote operator console occurs through SSL.

service area
An area between the access doors of the customer interface module and the safety barrier. In the service area, a redundant or inoperable robot can be stored for service and other mechanisms can be repaired or replaced.

service safety door
A motor-driven barrier that lowers and raises. This door separates the service areas of the front interface assembly from the rest of the library. The SSD allows service personnel to safely repair

or replace library mechanisms while the front access door is opened and closed., without interference with most library operations.

slot
Same as cell.

T

TTI
See tape transport interface (TTI).

tape cartridge
A container holding magnetic tape that can be processed without separating the tape from the container. The library uses data, diagnostic, and cleaning cartridges. These cartridges are not interchangeable.

tape drive
An electromechanical device that moves magnetic tape and includes mechanisms for writing and reading data to and from the tape.

tape drive tray assembly
The mechanical structure that houses a tape drive, fan assembly, power and logic cards, cables, and connectors for data and logic cables. *Same as* drive tray assembly.

tape storage area
The area in the library where cartridges are stored.

tape transport interface (TTI)
An interface to control and monitor tape movement.

touch screen operator control panel
A flat-panel display with a touch screen interface and a panel mount computer. This feature is attached to the front of the library.

track
The horizontal path upon which a robot travels.

track drive mechanism
The component that moves the robot along the track between the cell arrays, CAPs, and tape drives.

V

VOLID
Volume ID assigned to a cartridge. Same as VOLSER.

VOLSER
Volume serial number. Same as VOLID.

VSM
See virtual storage manager (VSM).

VTCS
See virtual tape control system (VTCS).

VTD
See virtual tape drive (VTD).

VTSS
See virtual tape storage subsystem (VTSS).

vacancy plate
A plate that covers an unused bay, such as a drive bay or power supply bay.

verified audit
Verified audits are invoked from the SL Console and actually validate the status of a specific cartridge slot or range of slots.

virtual audit
Virtual audits are invoked from the SL Console and only display the cartridge inventory in the console screen (either local or remote).

virtual storage manager (VSM)
A storage solution that virtualizes volumes and transports in the buffer of a virtual tape storage subsystem to improve media and transport use.

virtual tape control system (VTCS)
The primary host code that controls activity and information about VTSSs, VTVs, RTDs, and MVCs.

virtual tape drive (VTD)
An emulation of a physical transport in the VTSS that looks like a physical tape transport to MVS. The data written to a VTD is really being written to DASD. The VTSS has 64 VTDs that do virtual mounts of VTVs.

virtual tape storage subsystem (VTSS)
The DASD buffer containing virtual volumes (VTVs) and virtual drives (VTDs). The VTSS is a STK RAID 6 hardware device with microcode that enables transport emulation. The RAID device can read and write "tape" data from/to disk, and can read and write the data from/to an RTD.

virtual tape volume (VTV)
A portion of the DASD buffer that appears to the operating system as a real tape volume. Data is written to and read from the VTV, and the VTV can be migrated to and recalled from real tape.

W

WWN
World Wide Name.

wrist
A mechanism in the robot assembly that allows the robot to access the outer and inner storage walls.

World Wide Name
A 64-bit address that uniquely identifies each individual device and vendor, much like the MAC address of an Ethernet interface. Each port on a Fibre Channel network must have a its own WWN. The WWN is not just a physical hardware address. It also serves as the logical address of a node on the SAN. This means that the SAN configuration changes if any of the attached hardware changes. If a device fails and is replaced, the WWN of the node changes, forcing reconfiguration of the SAN. There are three World wide Names reserved for each drive bay: Node, Port A, and Port B.

W

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