

StorageTek Tape Analytics

Data Reference Guide

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Summary of Changes

v1.0.2, December 2012

Updates were made for the following new features and changes. Updates are marked with change bars in the margin.

- SL150 library support
- Ability to define the SNMP v2c User Community and Trap Recipient Community in the SNMP Client Settings dialog. See [“STA and SNMP” on page 22](#) and [“Define SNMP Client Settings” on page 223](#).
- Requirement to update the library engine ID when upgrading library firmware extended to SL3000 FRS 4.0 and SL500 FRS1468. See [“Update the Library Engine ID After a Library Firmware Upgrade” on page 51](#).
- Various new displayed attributes. See [Chapter 3, “Attribute Cross-Reference” on page 55](#).

v1.0.1, July 2012

Updates were made for the following new features and changes.

- New sections in Chapter 1, “Understanding STA Analytics”, on page 11.
 - “STA Data Store” on page 12 — Describes the STA data store and data retention.
 - “Removed Drives and Media” on page 13 — New system preferences for displaying removed drives and media.
 - “Removed Libraries” on page 17 — Describes how STA handles data for removed library connections.
 - ““Missing” Media” on page 18 — Describes how STA handles media in “transient” locations.
 - “Duplicate Volume Serial Numbers” on page 19 — New “duplicate detected” flag on exchanges.
- Enhanced information about data collections. See the following:
 - “Data Collections and Library Performance” on page 26

- “When to Perform Manual Data Collections” on page 27
- For SL8500 libraries, new requirement to update the library engine ID when upgrading to FRS 8.0. See “Update the Library Engine ID After a Library Firmware Upgrade” on page 51.
- Multiple new and modified screen attributes. See Chapter 3, “Attribute Cross-Reference” on page 55.
- Addition of HLI address to the Drive, Media, and Exchange Overview screens for SL8500 libraries. See Chapter 3, “Attribute Cross-Reference” on page 55.

Note – This feature requires SL8500 FRS 7.80 or above.

- New table page number field on Exchanges, Cleaning Activities, and Notifications screens. See “List View Table Toolbar” on page 187.
- Changes to dialog boxes:
 - New dialog box for setting display preferences for removed drives and media. See “Data Handling” on page 198.
 - New default screen refresh interval. See “Refresh Settings” on page 200.
 - New ability to change the automatic session timeout interval. See “Refresh Settings” on page 200.

v1.0.0, April 2012

Initial release.

Preface

This document provides information about using and interpreting the data displayed by Oracle's StorageTek Tape Analytics (STA). It provides definitions for all library, drive, and media data fields displayed by STA. It also provides reference information for all STA toolbars and data input fields.

STA Documentation

Document Title	Description
<i>StorageTek Tape Analytics Release Notes</i>	Read this document before installing and using STA. It contains important release information, including known issues.
<i>StorageTek Tape Analytics Planning and Installation Guide</i>	Use this book to plan for installation of STA, install the Linux platform, and install the STA software.
<i>StorageTek Tape Analytics Configuration Guide</i>	After installing the STA software, use this book to configure libraries, SNMP, email notification, services, identity management, and certificates.
<i>StorageTek Tape Analytics Administration Reference Guide</i>	Use this book to learn about STA administrative tasks, including server, services, and password administration.
<i>StorageTek Tape Analytics User Interface Guide</i>	Use this book to learn about the STA user interface. It describes the layout of screens and provides step-by-step instructions for modifying their display so you can tailor them to your needs.
<i>StorageTek Tape Analytics Data Reference Guide</i>	Use this book to learn about using and interpreting the data displayed by STA. It provides definitions for all library, drive, and media data fields displayed by STA. It also provides reference information for all STA toolbars and data input fields.
<i>StorageTek Tape Analytics Security Guide</i>	Read this document for important STA security information, including requirements, recommendations, and general security principles.

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Understanding STA Analytics

This section provides concepts and tasks to help you interpret and use the data provided by STA. It assumes a basic understanding of STA features and functions. The following topics are included:

- [“STA Data Store” on page 12](#)
- [“Removed Drives and Media” on page 13](#)
- [“Removed Libraries” on page 17](#)
- [““Missing” Media” on page 18](#)
- [“Duplicate Volume Serial Numbers” on page 19](#)
- [“Mapping Host and STA Drive Identifiers” on page 20](#)

STA Data Store

Following is a summary of the types of data included in the data store.

- Library configuration model – A hierarchical view of the library and device configurations, properties, and statuses. To retrieve this information, STA initiates data collections through a series of SNMP requests sent to the library.
- Exchange records – Detailed information about all drive and media exchanges, including cleaning activities. The library sends this data to STA through asynchronous SNMP traps.
- Errors and events – Records of significant library errors and events. The library sends this data to STA through asynchronous SNMP traps.

See [Chapter 2, “Managing Library SNMP Connections” on page 21](#) for details on how STA receives this data from the libraries.

Data Retention

Data in the STA data store is retained indefinitely as a historical record and never deleted. However, data for removed resources — libraries, drives, and media — may be hidden from the STA data screens, depending on the Data Handling settings for your username. See [“Removed Drives and Media” on page 13](#) and [“Removed Libraries” on page 17](#) for details.

When STA first begins tracking a library, drive, or media, that resource is assigned an STA Start Tracking timestamp. If the resource is later removed from the library environment, an STA Stop Tracking timestamp is assigned. And then if the resource is later re-added, the STA Start Tracking attribute reflects the original timestamp assigned when STA first began tracking the resource.

Removed Drives and Media

By default, drives and media that have been removed from the library environment do not appear on the STA screens — they are not listed on the Overview screens, and they are not included in aggregations on the Analysis screens.

You can, however, selectively turn on the display of removed drives, removed media, or both through the Data Settings preferences for your username. Your selections take effect immediately, so depending on your needs, you can selectively show or hide removed drives and media throughout your login session. See “Getting Started” in the *STA User Interface Guide* for instructions on changing these display settings. See [“Removed Drives Screen Examples” on page 13](#) for detailed examples of the display changes.

Even if you choose not to display removed drives and media, their associated data continues to be used in calculating rolling 30-day summaries and the current day’s daily summaries. See [“Impact to Summaries” on page 16](#) for details.

Data for removed drives and media is never removed from the STA data store. See [“Data Retention” on page 12](#) for details.

Identifying Removed Drives and Media

If you choose to display removed drives or media, they are identified by the following attribute values:

- The STA Stop Tracking date indicates the date and time when STA determined the drive or media no longer exists in any of the monitored libraries. Because there may be a lag between the time when a drive or media is removed and when the library notifies STA of the change, this value may differ slightly from the time when the item was physically removed.
- The Library Number attribute is set to “-1”.
- The following attributes are set to “REMOVED”:
 - Library Complex Name
 - Library Model
 - Partition Type
 - Partition Name
 - Physical Address

Removed Drives Screen Examples

This section provides examples of the impact of the “Show Removed Drives” settings on the following screens:

- [“Drives Overview Screen” on page 14](#)
- [“Drives Analysis Screen” on page 15](#)
- [“Exchanges and Cleaning Activities Screens” on page 15](#)

Note – While these examples are restricted to removed drives, the same principles and screen display characteristics apply to removed media and the “Show Removed Media” settings.

Note – These examples include four removed 9840A drives, and the screen displays are filtered and arranged to highlight these drives.

Drives Overview Screen

In [EXAMPLE 1-1](#), the “Show Removed Drives” setting is selected. Removed drives are listed on the **Drives – Overview** screen, and the total number of records includes the removed drives.

EXAMPLE 1-1 Drives – Overview Screen, Show Removed Drives Setting “On”

Drive Serial Number	Library Complex Name	Drive Library Number	STA Stop Tracking	Drive Type	Drive Health Indicator
331002023994	REMOVED	-1	2012-05-14 15:50:39	Stk9840a	?
331001011359	REMOVED	-1	2012-05-12 18:08:09	Stk9840a	?
331002043768	REMOVED	-1	2012-05-15 12:47:17	Stk9840a	?
331000011806	REMOVED	-1	2012-05-14 15:45:54	Stk9840a	?
331000055411	SL8500_12	1		Stk9840a	?
331002015401	SL8500_12	1		Stk9840a	?
331002026614	SL8500_12	1		Stk9840a	?

Columns Hidden: 66, Columns Frozen: 1, Displaying 191 record(s)

In [EXAMPLE 1-2](#), the “Show Removed Drives” setting is deselected. Removed drives are not shown on the screen. The total number of records does not include the removed drives, and a sort by “Drive Library Number” shows no drives in library “-1”.

EXAMPLE 1-2 Drives – Overview Screen, Show Removed Drives Setting “Off”

Drive Serial Number	Library Complex Name	Drive Library Number	STA Stop Tracking	Drive Type	Drive Health Indicator
331000055411	SL8500_12	1		Stk9840a	?
331002015401	SL8500_12	1		Stk9840a	?
331002026614	SL8500_12	1		Stk9840a	?
331002015905	SL8500_7	1		Stk9840a	?
331002011373	SL8500_12	1		Stk9840a	?

Columns Hidden: 66, Columns Frozen: 1, Displaying 187 record(s)

Drives Analysis Screen

In [EXAMPLE 1-4](#), the “Show Removed Drives” setting is selected. Aggregated data for removed drives are included under the headings Library Complex Name “REMOVED” and Drive Library Number “-1”.

EXAMPLE 1-3 Drives – Analysis Screen, Show Removed Drives Setting “On”

Drives - Analysis

Applied Filter: Drive Type=Stk9840a

		Stk9840a	Stk9840.
SL8500_12	1	52	
	10	2	
	2	51	
	3	39	
	4	8	
	5	12	
	6	9	
	8	4	
	9	3	
	Drive Library Number Total	180	
SL8500_7	1	7	
	Drive Library Number Total	7	
REMOVED	-1	4	
	Drive Library Number Total	4	
Library Complex Name Total		191	

In [EXAMPLE 1-4](#), the “Show Removed Drives” setting is deselected. Aggregated data for removed drives are not included in the table. There are no headings for Library Complex Name “REMOVED” and Drive Library Name “-1”.

EXAMPLE 1-4 Drives – Analysis Screen, Show Removed Drives Setting “Off”

Drives - Analysis

Applied Filter: Drive Type=Stk9840a

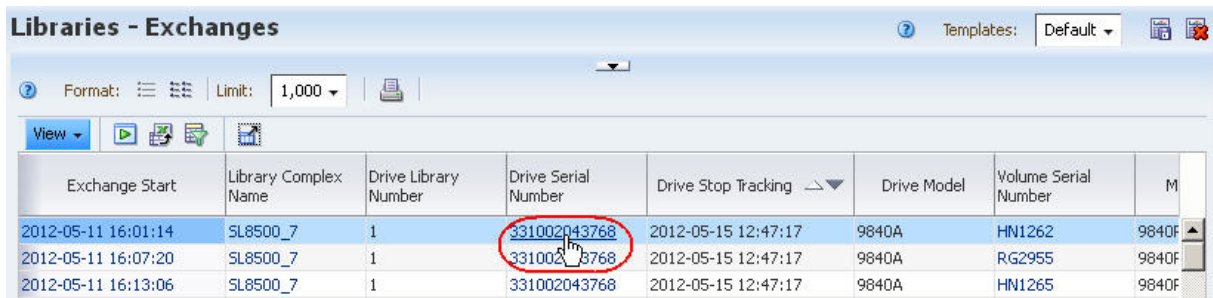
		Stk9840a	Stk9840.
SL8500_12	1	52	
	10	2	
	2	51	
	3	39	
	4	8	
	5	12	
	6	9	
	8	4	
	9	3	
	Drive Library Number Total	180	
SL8500_7	1	7	
	Drive Library Number Total	7	
Library Complex Name Total		187	

Exchanges and Cleaning Activities Screens

The **Libraries – Exchanges** and **Drives – Cleaning Activities** screens always show exchanges involving removed drives, regardless of how the “Show Removed Drives” option is set. All screen attributes indicate the values at the time of the exchange.

In [EXAMPLE 1-5](#), the “Show Removed Drives” setting is selected. The “Drive Serial Number” entries for removed drives are active links to the **Drives – Overview, Detail View** screen.

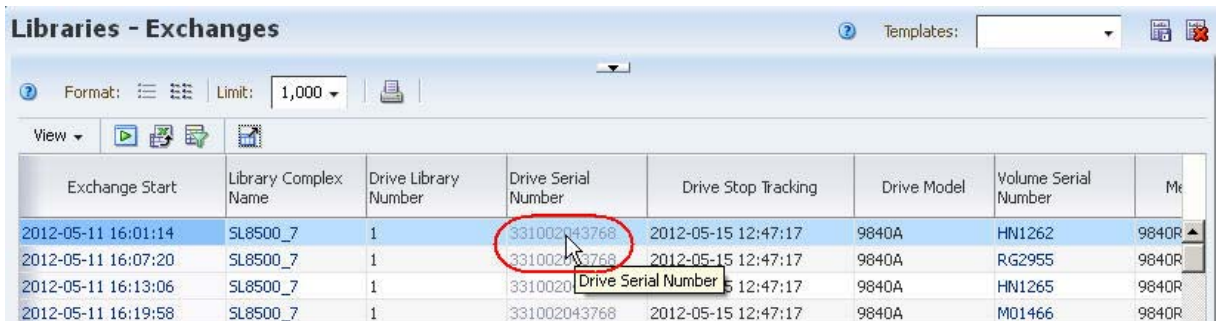
EXAMPLE 1-5 Libraries – Exchanges Screen, Show Removed Drives Setting “On”



Exchange Start	Library Complex Name	Drive Library Number	Drive Serial Number	Drive Stop Tracking	Drive Model	Volume Serial Number	M
2012-05-11 16:01:14	SL8500_7	1	331002043768	2012-05-15 12:47:17	9840A	HN1262	9840F
2012-05-11 16:07:20	SL8500_7	1	331002043768	2012-05-15 12:47:17	9840A	RG2955	9840F
2012-05-11 16:13:06	SL8500_7	1	331002043768	2012-05-15 12:47:17	9840A	HN1265	9840F

In [EXAMPLE 1-6](#), the “Show Removed Drives” setting is deselected. The “Drive Serial Number” entries for removed drives are dimmed and are not active links.

EXAMPLE 1-6 Libraries – Exchanges Screen, Removed Drives Setting “Off”



Exchange Start	Library Complex Name	Drive Library Number	Drive Serial Number	Drive Stop Tracking	Drive Model	Volume Serial Number	M
2012-05-11 16:01:14	SL8500_7	1	331002043768	2012-05-15 12:47:17	9840A	HN1262	9840R
2012-05-11 16:07:20	SL8500_7	1	331002043768	2012-05-15 12:47:17	9840A	RG2955	9840R
2012-05-11 16:13:06	SL8500_7	1	331002043768	2012-05-15 12:47:17	9840A	HN1265	9840R
2012-05-11 16:19:58	SL8500_7	1	331002043768	2012-05-15 12:47:17	9840A	M01466	9840R

Impact to Summaries

If you remove a drive or media from a library, the data collected for that resource continues to contribute to the daily and rolling 30-day summaries displayed on the STA screens. There are a wide variety of summary attributes calculated by STA, such as megabytes read, written, sent, and received; number of drive errors and drive cleans; and percent drive utilization.

For example, removing a drive from a monitored library at 17:00 on April 15 will have the following impacts:

- Daily summaries — The drive’s activity for April 15 before 17:00 is included in the day’s daily summaries. Because the drive has been removed, it will not have any activity to include in daily summaries for April 16 and beyond.
- 30-day summaries — The drive’s activity is included in all 30-day summaries for April 15 and the next 30 days, although the number of days’ activity included will be reduced with each succeeding day, as the 30-day window moves forward. The 30-day summary on May 15 will be the first one that does not include any activity for the drive.

Removed Libraries

If you remove a library from the tape library environment, the following updates are made immediately to the STA screens:

- STA no longer collects data from the library, and you can delete the STA server trap recipient from the library SNMP configuration.
- The library is removed from the Libraries Overview and Complexes screens.
- The drives and media included in the library are removed from the Drives and Media screens.
- All exchanges and cleaning activities that have occurred in the library are removed from Exchanges and Cleaning Activities screens.
- All notifications for the library or its drives or media are removed from the Notifications screens.

See [“Remove a Library Connection” on page 45](#) for detailed instructions on removing a library connection.

Although the library data is removed from the user interface screens, it is never removed from the STA data store. If you later re-establish a connection to the library, all existing library data is made available on the STA screens again. See [“Data Retention” on page 12](#).

"Missing" Media

Media must be in a library storage cell or drive at the time of a data collection in order for it to be detected (see ["Collecting Library Configuration Data" on page 25](#) for a description of the data collection process). Media in a "transient" location is not detected by a data collection. Transient locations are defined as any of the following:

- Robot hand
- Elevator — SL8500 libraries only
- Pass-thru port (PTP) — SL8500 complexes only
- Drive, at the time of library initialization; that is, the library was re-initialized while the media was left in the drive.

The STA application includes logic to handle these transient movements — media that has unexpectedly "disappeared" is kept on the STA screens in anticipation of detecting it again within a specific short period of time. STA removes the media from the screens only if it still does not detect the media within that time period. Although this is a rare occurrence, you are most likely to observe it in an SL8500 complex, where media cartridges are frequently transferred from one library to another through pass-thru ports (PTPs).

If you cannot find a volume serial number (VSN or volser) that you expect to see on the **Media – Overview** screen, it is recommended that you do the following:

1. Verify that you have the correct volser.
2. Filter the **Media – Overview** screen for that volser, to be sure it is really missing from the list.
3. Verify that the media has not been ejected from the library environment through a CAP or access expansion module (AEM) (SL3000 libraries), or mailslot (SL150 libraries).
4. Initiate a manual data collection on the library in which you expect the media to be located. See ["Perform a Manual Data Collection" on page 41](#).

Duplicate Volume Serial Numbers

In the STA data store, media history is retained by volume serial number (VSN or volser). That is, all history for a particular piece of media is tied to its volser. For this reason, it is recommended that you avoid duplicate volume serial numbers (VSNs or volsers) in the tape environment monitored by STA. Volsers should be unique across all monitored libraries. Duplicate volsers will result in co-mingling of data for different pieces of media.

Volsers are considered to be duplicates only if the media with the same volser also have the same domain and type. Domain identifies the media format, and type identifies the version, as illustrated in the following examples:

- LTO4 – “LTO” is the domain and “4” is the type.
- T10000C – “T10000” is the domain and “C” is the type.

The same volser used on two different LTO4 cartridges would be considered duplicate, while the same volser on an LTO4 cartridge and an LTO5 or T10000C cartridge would not.

Duplicate volsers may occur for a variety of reasons, such as:

- In the case of cleaning media, there are only 999 globally available volsers. Large tape environments with 1,000 or more cleaning cartridges will of necessity have duplicate volsers.
- Various tape management applications may allow duplicate volsers. This is the case only for libraries with SCSI host connections — SL150, SL500, and some SL3000 libraries. Libraries with Host Library Interface (HLI) host connections — SL8500 and some SL3000 libraries — use Oracle’s StorageTek Enterprise Library Software (ELS) or Oracle’s StorageTek Automated Cartridge System Library Software (ACSL), which do not allow duplicates.

“Duplicate Detected” Flag on Exchanges

The Duplicate Detected flag appears on the **Libraries – Exchanges** screen and indicates that the volser involved in the exchange is a duplicate — the media has the same volser as another media of the same domain and type but with a different media serial number (MSN). If you find exchanges with this flag, you should investigate and determine whether to assign a different volser to one of the media, as the data for the two will be co-mingled. See [Chapter 6, “Exchanges Screen” on page 81](#) for additional information.

Note – Only some drive types and firmware levels report MSNs; therefore, with some drive types, STA may not receive all the information necessary to detect duplicate volsers.

Mapping Host and STA Drive Identifiers

In STA, tape drives can be identified by drive serial number, World Wide Name (WWN), or physical location within the library. However STA does not know, and cannot display, the logical device ID that a host uses to identify a drive. If you want to map the host drive identifiers to the STA identifiers, you must do this manually.

Mainframe Identifiers

Mainframe hosts use a four-digit hexadecimal drive ID (0000–FFFF) to identify a drive. To map the host identifiers to the STA identifiers, you can use Oracle's Enterprise Library Software (ELS) `Display DRives` command on the mainframe host. The `IDENTITY` option lists the mainframe hexadecimal ID, serial number, and WWN for each drive. Following is an example of the command output.

DISPLAY DRIVES IDENTITY

.SLS4633I Display Drives Command 994

DRIVE	LOCATION	MODEL	WORLD WIDE NAME	SERIAL NUMBER
0A10	00:02:01:08	T9840D	50:01:04:F0:00:79:18:CD	5700GU008737
0A11	00:02:01:09	T9840D	50:01:04:F0:00:79:18:C1	5700GU006080
0B04	01:01:01:14	T9940B	50:01:04:F0:00:89:A7:74	479000025047
0B05	01:02:01:14	T9940B	50:01:04:F0:00:89:A7:44	479000026693
0B06	01:02:01:15	T1B35	50:01:04:F0:00:89:A7:68	572004003720
0B07	01:02:01:11	T1B35	50:01:04:F0:00:89:A7:68	572004003720

You can issue this command from a variety of locations on the mainframe host, including the operator console or an SMCUUUI utility batch job. Optionally, you can save the output of the command to a `.csv` or `.xml` file. See the *ELS Command, Control Statement, and Utility Reference* manual for complete details about usage, syntax, and options.

Open Systems Identifiers

On open systems hosts (Linux and Solaris), logical device names for tape drives are found in the `/dev/rmt` directory. To map the host logical names to the STA identifiers, you can do a long listing (`ls -l`) of this directory. The command output shows the logical device name and the pointer to the raw device file, which includes the WWN for the drive. Following is an example of the output on Linux; the logical device name and WWN for each drive are highlighted in **bold** type.

```
# ls -l /dev/rmt
```

```
lrwxrwxrwx 1 root root      86 Jan 31 16:31 /dev/rmt/0cbn ->../devices/
pci@79,0/pci10de,377@a/pci1077,171@0/fp@0,0/tape@w500104f000b8050e,0:cbn
lrwxrwxrwx 1 root root      86 Jan 31 16:31 /dev/rmt/1cbn ->../devices/
pci@79,0/pci10de,377@a/pci1077,171@0/fp@0,0/tape@w500104f000b80511,0:cbn
#
```

Managing Library SNMP Connections

This section provides concepts and procedures for managing the SNMP connections between STA and the libraries. It assumes a basic understanding of the Simple Network Management Protocol (SNMP) protocol. The following topics are included:

- [“STA and SNMP” on page 22](#)
- [“Testing Library SNMP Connections” on page 24](#)
- [“Collecting Library Configuration Data” on page 25](#)
 - [“Building the STA Library Configuration Model” on page 25](#)
 - [“Keeping the STA Library Configuration Model Up-to-Date” on page 25](#)
 - [“Data Collections and Library Performance” on page 26](#)
- [“When to Perform Manual Data Collections” on page 27](#)
- [“Library Connection Status Information” on page 29](#)
- [“STA and Redundant Electronics” on page 30](#)
- [“SNMP Connection Management Tasks” on page 31](#)

Note – For general information about the libraries and SNMP, see the *StorageTek Simple Management Network Protocol Guide* for your library model.

STA and SNMP

Communication between STA and the libraries is done through the SNMP interface. In SNMP terms, STA is a client agent and each library is a server agent.

SNMP v3 is the recommended protocol for SNMP communications between STA and the monitored libraries. The authentication, encryption, and message integrity features in SNMP v3 provide a secure mechanism for sending library data. You can, however, optionally choose to use SNMP v2c for one or more libraries. In addition, depending on library firmware level, some libraries may require an SNMP v2c user name for establishing the initial communication handshake with STA, even though they use SNMP v3 for traps and get functions. See “Configuring the Libraries for STA” in the *STA Configuration Guide* for details.

To set up SNMP connections between the STA server and the libraries, you must configure an SNMP user and an SNMP trap recipient on both STA and each monitored library. The values of each must match, which means all libraries must use the same SNMP user and trap recipient for STA.

Caution – Oracle’s Service Delivery Platform (SDP) also uses SNMP. When defining SNMP user names for STA, be careful not to make changes to the library SNMP configuration that would conflict with SDP’s requirements. Please see your Oracle support representative for assistance.

Configuring STA Connections With the Libraries

To configure the connections, you must perform some procedures on the libraries and some on the STA server. For complete instructions, see the following chapters in the *STA Configuration Guide*:

- “Configuring the Libraries for STA”. This chapter provides details about the following topics:
 - Use of SNMP v2c and v3 protocols
 - Configuring SNMP v3 user and trap recipient on the library
 - SNMP engine IDs for STA and the libraries
- “Configuring SNMP on the STA Server”
- “Configuring SNMP v2c Mode”

UDP Considerations

SNMP uses the UDP (User Datagram Protocol) network protocol. UDP is connectionless, which presents certain advantages and disadvantages. One advantage is low overhead on the network interface. One disadvantage is that messages can arrive out of order or be lost — when an agent sends an SNMP trap, it receives no acknowledgment from the client that the trap has been received.

Because STA is an analytics application that provides statistical assessments based on trends over time, occasional lost traps do not affect the overall quality of the data. However, there are some concepts and best practices that an STA user or administrator can use to avoid excessive amounts of lost or unavailable data. These are described in this section.

Testing Library SNMP Connections

A library connection test establishes, or re-establishes, the SNMP handshake between STA and the library. An STA user or administrator can perform a connection test at any time, as needed. It typically takes less than a second to test a library connection, but during this time no traps will be received from any libraries. Only one library connection can be tested at a time. See [“Test a Library SNMP Connection” on page 39](#) for detailed instructions.

When to Perform Connection Tests

It is recommended that you perform a library connection test whenever you perform any of the activities described below. These activities may cause the SNMP connection with the affected library to be dropped, and STA will not be able to receive SNMP data from the library until after the completion of the next scheduled data collection (see [“Scheduled Data Collections” on page 25](#) for details). Performing a connection test minimizes the amount of time that the library SNMP connection is dropped and prevents the loss of large amounts of SNMP data.

- After modifying any settings for the STA SNMP client (see [“Change SNMP Settings for the STA Client” on page 32](#) for details). These settings include the SNMP user name and the connection authorization and privacy passwords. If you modify any of these settings, you need to test the connections of all monitored libraries.
- After modifying any SNMP settings for a monitored library (see [“Change SNMP Connection Details for a Monitored Library” on page 34](#) for details). Whenever you modify these settings, the Library Engine ID field is blanked out to indicate that the SNMP connection with the library has been dropped. To restore the proper connections, you only need to test the connection of the affected library.
- After a monitored library has been rebooted. You should wait until the library is fully operational before initiating the connection test. If more than one library is rebooted, you only need to test the connection for one of them, but you should wait for all libraries to be fully operational before doing so.
- After a Redundant Electronics switch has taken place on a monitored library. You should wait until the switch has completed and the library is fully operational before initiating the connection test. See [“STA and Redundant Electronics” on page 30](#) for details.
- Anytime you suspect loss of SNMP data from one or more libraries.

Collecting Library Configuration Data

As soon as an SNMP connection is successfully established with a library, STA begins receiving SNMP traps from the library and stores this data in the STA data store (see [“STA Data Store” on page 12](#) for a description of the types of data). However, this data will not be displayed in the user interface until the STA library configuration model has been built.

Building the STA Library Configuration Model

For STA to build the initial library configuration model for a library, a manual data collection should be initiated by the user or administrator as soon as the STA library connection is established (see [“Manual Data Collections” on page 26](#) for details). During this data collection, STA retrieves from the library all information about the library configuration, including the following:

- Locations of activated storage cells
- Partition information
- Drive types, identifiers, and locations
- Media types, volume serial numbers (VSNs or volsers), and locations

Depending on the size and activity level of the library, the initial data collection may take anywhere from several minutes to over an hour. The STA user interface will not show a complete picture of the library environment and exchange activity until the data collection completes. In fact, while the initial data collection is in process, you may see fluctuations in various analytic and summary data; this is entirely normal. Once the data collection completes successfully, the user interface will display a complete picture of the library configuration, as well as ongoing exchange activity.

Keeping the STA Library Configuration Model Up-to-Date

After the initial data collection, the STA library configuration model is updated through regular data collections. Only one data collection can be performed on a particular library at a time, and only five data collections can be running simultaneously.

Data collections are performed in the following ways:

- [Scheduled Data Collections](#)
- [Triggered Data Collections](#)
- [Manual Data Collections](#)

Scheduled Data Collections

Scheduled data collections occur automatically every 24 hours, at a time defined by an STA user or administrator. This is a full collection of all library configuration data and should be scheduled at a time when there are typically lower levels of library activity. See [“Change the Scheduled Data Collection Time” on page 36](#) for details.

Triggered Data Collections

STA initiates triggered data collections automatically whenever it detects significant changes in the library state or configuration, such as the addition of a drive or media cartridge, or a change in partition configurations. This is a partial data collection that updates only the parts of the library configuration affected by the change. For example, in the case of a data collection triggered by the addition of a new media cartridge, only the media configuration information will be updated. Triggered data collections take a short amount of time.

Manual Data Collections

An STA user or administrator can initiate data collections manually as needed. This is a full data collection of all library configuration data.

Note – You can only perform a manual data collection on a library with an active connection. See [“Testing Library SNMP Connections” on page 24](#) for details.

See [“When to Perform Manual Data Collections” on page 27](#) for required and recommended times for performing manual data collections.

Data Collections and Library Performance

The libraries process SNMP activity, and therefore data collections, at a lower priority than regular library operations, so data collections have very little impact on library performance. However, performing a data collection during periods of heavy library activity can cause the data collection itself to take longer to complete. It is recommended that scheduled and manual data collections be performed during periods of lower library activity.

When to Perform Manual Data Collections

This section describes times when manual data collections are required or recommended. See [“Perform a Manual Data Collection” on page 41](#) for detailed instructions.

Required Times

You must perform a manual data collection at the following times, in order for STA to be able to receive data from a library.

- When a new library connection is configured. This will build the initial STA library configuration model.
- After modifying existing SNMP connection settings so that the settings now specify a different library (see [“Change SNMP Connection Details for a Monitored Library” on page 34](#) for details).
- Whenever SNMP settings are modified on a library, such as SNMP users or trap recipients are added, changed, or deleted. See [“Configuring the Libraries for STA”](#) in the *STA Configuration Guide* for details on these types of changes.

Recommended Times

It is recommended that you perform a manual data collection at the following times, in order for STA to be notified as soon as possible of changes in the library environment.

- When a large number of media cartridges are entered or ejected from a library, such as through an SL3000 access expansion module (AEM). STA initiates a triggered data collection as soon as the library notifies it of any enters and ejects, but notifications of large-scale changes may take some time to complete.
- When a drive is added, removed, or swapped. This is especially important for drive swaps, where a drive is installed in a slot that previously had a different drive. There may be a lag between the time when the old drive is removed, the new drive is installed, and the library notifies STA of the changes. During this time, any exchanges that use the new drive could result in co-mingling of data between the new and old drives. Initiate the data collection according to the following guidelines:
 - For an added or swapped drive, wait 15 minutes after the drive has initialized.
 - For a removed drive, wait about one minute after the removal.
- When a Redundant Electronics switch occurs, or the library active storage regions or partitions are modified. Although STA initiates a triggered data collection as soon as the library notifies it of these types of changes, it is recommended that you initiate a manual data collection because these modifications can have a significant impact on the STA library configuration model. Initiate the data collection according to the following guidelines:
 - For changes to the library active storage regions or partitions, wait 15 minutes after the library controller database has been updated.

- For a Redundant Electronics switch, wait 15 minutes after the newly active card has fully initialized.
- Anytime you suspect library configuration data is out of sync on STA. See [““Missing” Media” on page 18](#) and [“Duplicate Volume Serial Numbers” on page 19](#) for additional information.

Library Connection Status Information

The connection status fields in the Monitored Libraries table of the **Settings – SNMP Connections** screen display the status of the most recent library connection test or data collection — scheduled, triggered, or manual. Following is a sample screen.

Library Complex	Library IP Address(es)	STA IP Address	Library Engine ID	Automated Daily Data Refresh Time	Time Zone	Last Successful Connection	Last Connection Attempt	Last Connection Status	Last Connection Failure Detail
3000_5710000	10.80.93.31	10.80.175.121	0x80001f888007d	14:40:00	US/Mountain	2012-03-08 14:40	2012-03-08 14:45	FAILED	Failure to create SNMP Session. Possible

TABLE 2-1 describes the connection status fields.

TABLE 2-1 Connection Status Fields in the Monitored Libraries Table

Field	Description
Last Successful Connection	Date and time of the most recent successful connection test or data collection.
Last Connection Attempt	Date and time when the most recent connection test or data collection was attempted. If the attempt failed, then this date and time are more recent than the “Last Successful Connection”.
Last Connection Status	<p>Status of the most recent connection test or data collection. In a data collection, the status is updated throughout the process, according to the screen refresh rate defined for your STA username (for example, if your screen refresh rate is set to the default 480 seconds, then the status is updated every 480 seconds). Possible statuses are as follows:</p> <ul style="list-style-type: none"> • In progress – A data collection is underway. • Success – The connection test or data collection completed successfully. • Failed – The connection test or data collection failed; possible reasons are listed in the “Last Connection Failure Detail” field. • Rejected – The data collection request was rejected, possibly because the library is busy or unavailable. • Duplicate – The data collection request was rejected because another one is already in progress.
Last Connection Failure Detail	If the connection test or data collection failed or was rejected, possible causes are listed in this field.

STA and Redundant Electronics

Note – This topic applies to SL3000 and SL8500 libraries only.

STA is capable of maintaining SNMP connections with up to two library IP addresses at a time. This enables you to configure STA to support the Redundant Electronics feature on monitored libraries. Complete configuration instructions are provided in the *STA Configuration Guide*; see “Configuring the Libraries for STA” in that guide.

In short, the following IP address configuration is recommended to configure STA to support Redundant Electronics:

- Primary library IP address – 2B port on the active controller card
- Secondary library IP address – 2B port on the standby controller card

Using this configuration, in the event of a controller card switch, STA will maintain SNMP communications with the library through the port specified as the secondary library IP address. However, you must also take the following manual actions after the switch completes:

- Perform a connection test and a data collection to verify the library SNMP connection and retrieve current library configuration data. See [“Test a Library SNMP Connection” on page 39](#) and [“Perform a Manual Data Collection” on page 41](#) for instructions.
- If a controller card is replaced after the Redundant Electronics switch, the IP address configuration for the library will change, so you will need to re-enter the SNMP connection information. See [“Change SNMP Connection Details for a Monitored Library” on page 34](#) for instructions.

SNMP Connection Management Tasks

This section includes procedures to use in the maintenance and monitoring of existing STA library connections. For complete instructions on adding a new library connection to STA, see the following chapters in the *STA Configuration Guide*:

- “Configuring the Libraries for STA”
- “Configuring SNMP on the STA Server”

Task	Page
Change SNMP Settings for the STA Client	32
Change SNMP Connection Details for a Monitored Library	34
Change the Scheduled Data Collection Time	36
Test a Library SNMP Connection	39
Perform a Manual Data Collection	41
Export SNMP Connection Settings to a Text File	43
Remove a Library Connection	45
Re-establish SNMP Connectivity After Changing the STA Server IP Address	47
Update the Library Engine ID After a Library Firmware Upgrade	51

▼ Change SNMP Settings for the STA Client

Use this procedure to modify existing connection settings for STA, which in the SNMP model is the client or network management system (NMS). You can modify any of the following settings:

- For SNMP v3 connections:
 - User name
 - Connection authorization password
 - Privacy password
- For SNMP v2c connections:
 - User community name
 - Trap recipient name

Caution – These settings are also defined on each monitored library, and for the SNMP connection to be successful, the values specified in this procedure must match the ones on the library. See “Configuring the Libraries for STA” in the *STA Configuration Guide* for instructions on modifying these settings on the library.

Caution – After performing this procedure, you must test connections for all monitored libraries. Failure to do so could result in dropped library connections and lost SNMP traps. See “[Test a Library SNMP Connection](#)” on page 39 for details.

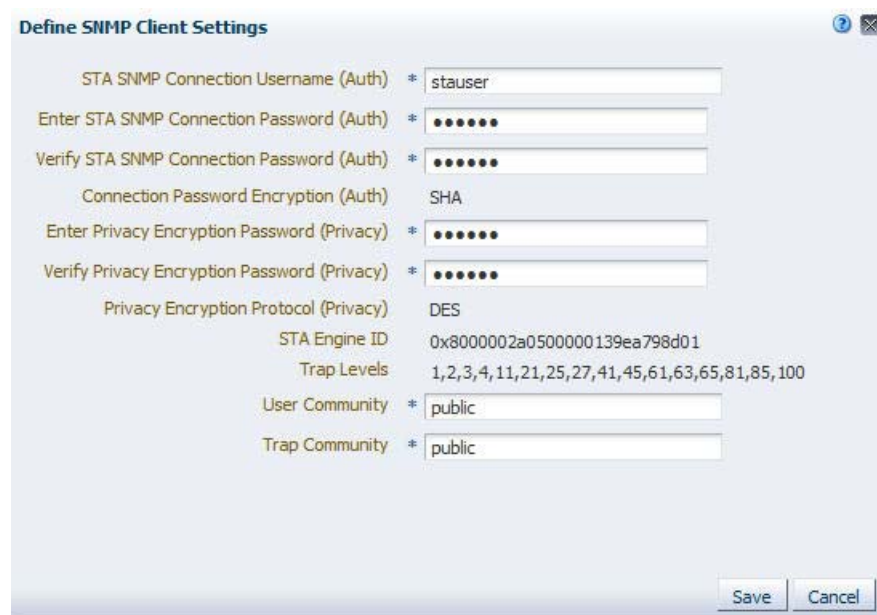
1. In the Navigation Bar, select Settings > SNMP Connections.



2. In the Client Attributes table, select the table row, and then click Edit.



The **Define SNMP Client Settings** dialog box appears.



The dialog box titled "Define SNMP Client Settings" contains the following fields and values:

- STA SNMP Connection Username (Auth): * stauser
- Enter STA SNMP Connection Password (Auth): * [masked]
- Verify STA SNMP Connection Password (Auth): * [masked]
- Connection Password Encryption (Auth): SHA
- Enter Privacy Encryption Password (Privacy): * [masked]
- Verify Privacy Encryption Password (Privacy): * [masked]
- Privacy Encryption Protocol (Privacy): DES
- STA Engine ID: 0x8000002a0500000139ea798d01
- Trap Levels: 1,2,3,4,11,21,25,27,41,45,61,63,65,81,85,100
- User Community: * public
- Trap Community: * public

Buttons: Save, Cancel

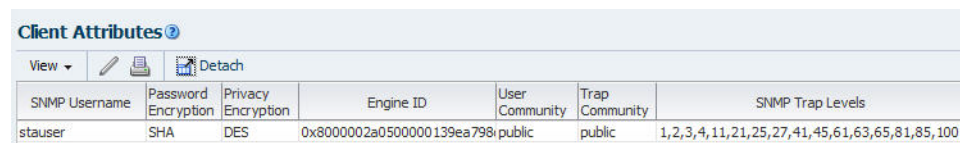
3. Enter the changes you want to make, and click **Save**.

An information message appears, reminding you that a library connection test is required whenever you add or modify library connections.



4. Click **OK** to dismiss the dialog box.

The Client Attributes table is updated with your changes.



The "Client Attributes" table shows the updated configuration for the client 'stauser'.

SNMP Username	Password Encryption	Privacy Encryption	Engine ID	User Community	Trap Community	SNMP Trap Levels
stauser	SHA	DES	0x8000002a0500000139ea798d01	public	public	1,2,3,4,11,21,25,27,41,45,61,63,65,81,85,100

5. Proceed to **"Test a Library SNMP Connection" on page 39** to re-establish the SNMP handshake with each monitored library.

▼ Change SNMP Connection Details for a Monitored Library

Use this procedure to modify the SNMP connection settings for an existing library connection. Connection details include the following:

- Library primary and secondary IP addresses
- STA IP address
- Library engine ID

Caution – These settings are also defined on each monitored library, and for the SNMP connection to be successful, the values specified in this procedure must match the ones on the library. See “Configuring the Libraries for STA” in the *STA Configuration Guide* for instructions on modifying these settings on the library.

Caution – Changes to these settings cause the SNMP connection with the library to be dropped. Immediately after using this procedure, you must perform a connection test to re-establish the SNMP handshake with the library. Failure to do so will result in lost SNMP traps from the library until the completion of the next scheduled data collection, which may not be for several hours. See “Testing Library SNMP Connections” on page 24 for additional information.

Note – For instructions on changing the scheduled data collection time or the library name, see “Change the Scheduled Data Collection Time” on page 36.

1. In the Navigation Bar, select Settings > SNMP Connections.

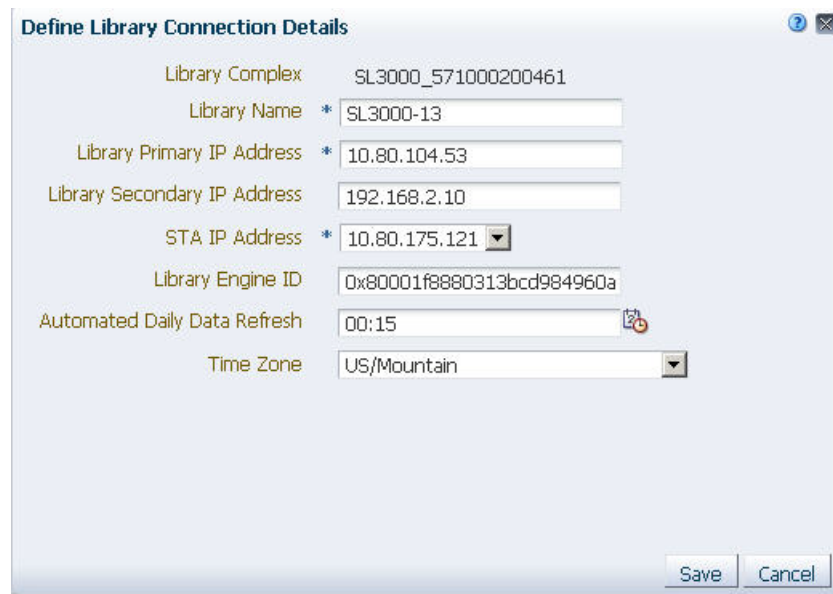


2. In the Monitored Libraries table, select the library you want to modify, and click Edit.

Monitored Libraries ?

Library Name	Library Index	Library IP Address(es)	STA IP Address	Library Engine ID	Automated Daily Data Refresh Time	Time Zone	Last Successful Connection
SL3000-13	SL3000_57100020	10.80.104.53 192.168.2.10	10.80.175.121	0x80001f8880313	00:15:00	US/Mountain	2012-03-14

The **Define Library Connection Details** dialog box appears.



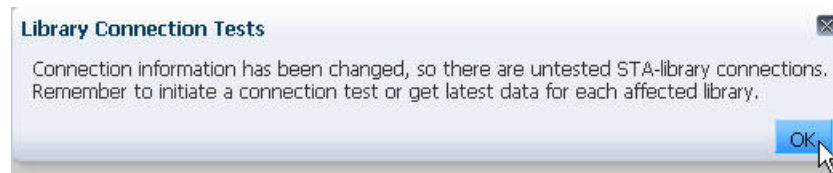
The dialog box titled "Define Library Connection Details" contains the following fields:

- Library Complex: SL3000_571000200461
- Library Name: * SL3000-13
- Library Primary IP Address: * 10.80.104.53
- Library Secondary IP Address: 192.168.2.10
- STA IP Address: * 10.80.175.121
- Library Engine ID: 0x80001f8880313bcd984960a
- Automated Daily Data Refresh: 00:15
- Time Zone: US/Mountain

Buttons at the bottom: Save, Cancel.

3. Enter the connection changes you want to make, and click **Save**.

An information message appears, reminding you that a library connection test is required whenever you modify library connections.



The dialog box titled "Library Connection Tests" contains the following text:

Connection information has been changed, so there are untested STA-library connections. Remember to initiate a connection test or get latest data for each affected library.

Button: OK

4. Click **OK** to dismiss the dialog box.

The Monitored Libraries table is updated with your changes.

Caution – Note that the Library Engine ID field in the table is now blank. This happens automatically whenever you change library connection settings and is an indication that the SNMP connection with the library has been dropped. You must next perform a connection test to re-establish the connection.

Library Name	Library Complex	Library IP Address(es)	STA IP Address	Library Engine ID	Automated Daily Data Refresh Time	Time Zone	Last Successful Connection
SL3000-31	SL3000_571000200461	10.80.104.53 192.168.2.10	10.80.175.121		00:15:00	US/Mountain	2012-03-14

5. Proceed to **"Test a Library SNMP Connection"** on page 39 to re-establish the SNMP connection with each monitored library.

▼ Change the Scheduled Data Collection Time

Use this procedure to change the time when the scheduled daily library configuration data collection will be run. You can also use this procedure to change the library name that is displayed in the STA user interface.

Note – For instructions on changing library connection settings, see [“Change SNMP Connection Details for a Monitored Library” on page 34](#).

1. In the Navigation Bar, select Settings > SNMP Connections.



2. In the Monitored Libraries table, select the library you want to modify, and click Edit.

Monitored Libraries ?

View ▾ [Icons: Checkmark, Copy, Add, Edit, Delete, Print, Refresh]

Library Name	Library Index	Library IP Address(es)	STA IP Address	Library Engine ID	Automated Daily Data Refresh Time	Time Zone	Last Success Connection
SL3000-13	SL3000_5710002	10.80.104.53 192.168.2.10	10.80.175.121	0x80001f8880313	00:15:00	US/Mountain	2012-03-14

The Define Library Connection Details dialog box appears.

Note – The currently defined data collection time is displayed in the “Automated Daily Data Refresh” and “Time Zone” fields.

The dialog box titled "Define Library Connection Details" contains the following fields and values:

Field	Value
Library Complex	SL3000_571000200461
Library Name *	SL3000-13
Library Primary IP Address *	10.80.104.53
Library Secondary IP Address	192.168.2.10
STA IP Address *	10.80.175.121
Library Engine ID	0x80001f8880313bcd984960a
Automated Daily Data Refresh	00:15
Time Zone	US/Mountain

Buttons: Save, Cancel

3. Modify the scheduled data collection time as follows:

- In the “Automated Daily Data Refresh” field, enter the time in 24-hour hh:mm format. You can either type directly into the field or you can click the date-time icon on the right to display the date-time editor.
- In the Time Zone menu, select the library’s time zone.
- Click **Save**.








The dialog box titled "Define Library Connection Details" contains the following fields and values:

Field	Value
Library Complex	SL3000_571000200461
Library Name *	SL3000-13
Library Primary IP Address *	10.80.104.53
Library Secondary IP Address	192.168.2.10
STA IP Address *	10.80.175.121
Library Engine ID	0x80001f8880313bcd984960a
Automated Daily Data Refresh	02:00
Time Zone	GMT

Buttons: Save, Cancel

A red circle highlights the "Automated Daily Data Refresh" field (02:00) and the "Time Zone" field (GMT).

The Monitored Libraries table is updated with your changes. STA will initiate the next scheduled data collection at the time you have specified.

Monitored Libraries ?							
View ▾       							
Library Name	Library Complex	Library IP Address(es)	STA IP Address ▾	Library Engine ID	Automated Daily Data Refresh Time	Time Zone	Last Success Connection
SL3000-13	SL3000_57100020	10.80.104.53 192.168.2.10	10.80.175.121		02:00:00	GMT	2012-03-14

▼ Test a Library SNMP Connection







Use this procedure to re-establish the SNMP handshake and test the connection between STA and a selected library. You can test only one library connection at a time.

See [“When to Perform Connection Tests” on page 24](#) for recommendations on when you should use this procedure.

1. In the STA Navigation Bar, select **Settings > SNMP Connections**.



2. In the Monitored Libraries table, select the library you want to test, and then click Check/Test Connection.

View      										
Library Name	Check / Test Connection	Library IP Address(es)	STA IP Address	Library Engine ID	Automated Daily Data Refresh Time	Time Zone	Last Successful Connection	Last Connection Attempt	Last Connection Status	L F
SL3000-13	SL3000_57100020	10.80.104.53 192.168.2.10	10.80.175.121		02:00:00	GMT	2012-03-14 16:50	2012-03-14 16:50	SUCCESS	

The test is initiated immediately. Depending on the results, one of the following messages appears:

- If the test is successful, an information message appears.



- If the test is not successful, an error message appears.



3. Click OK to dismiss the message.

The connection status fields in the Monitored Libraries table are updated with information about the test. See [“Library Connection Status Information” on page 29](#) for details.

- Example from a successful test.

Libraries

Library Complex	Library IP Address(es)	STA IP Address	Library Engine ID	Automated Daily Data Refresh Time	Time Zone	Last Successful Connection	Last Connection Attempt	Last Connection Status	Last Connection Failure Detail
SL3000_5710002C	10.80.104.53 192.168.2.10	10.80.175.121	0x80001f8880313	02:00:00	GMT	2012-03-14 17:05	2012-03-14 17:05	SUCCESS	

- Example from an unsuccessful test.

Libraries

Library Complex	Library IP Address(es)	STA IP Address	Library Engine ID	Automated Daily Data Refresh Time	Time Zone	Last Successful Connection	Last Connection Attempt	Last Connection Status	Last Connection Failure Detail
SL3000_5710002C	10.80.104.54 192.168.2.10	10.80.175.121	0x80001f888077b	02:00:00	GMT	2012-03-14 17:05	2012-03-14 17:22	FAILED	Failure to create SNMP

▼ Perform a Manual Data Collection

Use this procedure to initiate a manual data collection to update the configuration data for a selected library. Automatic data collections are performed periodically by STA, but this procedure allows you to initiate the process manually whenever you need to. Only one data collection can be performed on a particular library at a time, and only five data collections can be running simultaneously.

See [“When to Perform Manual Data Collections” on page 27](#) for recommendations on when you should use this procedure.

Note – Before performing this procedure, you should verify that the connection with the library is operational. See [“Test a Library SNMP Connection” on page 39](#) for instructions.

1. In the STA Navigation Bar, select **Settings > SNMP Connections**.



2. In the Monitored Libraries table, select the library you want to update, and then click **Get latest data**.

Note – If there is no active connection with the library, the **Get latest data** button will not activate. You must first perform a connection test to re-establish the SNMP handshake with the library. See [“Test a Library SNMP Connection” on page 39](#) for instructions.

Monitored Libraries

View

Library Name	Get latest data	Library IP Address(es)	STA IP Address	Library Engine ID	Automated Daily Data Refresh Time	Time Zone	Last Successful Connection	Last Connection Attempt	Last Connection Status	Last Failure
SL3000-13		10.80.104.53 192.168.2.10	10.80.175.121	0x80001f8880313	02:00:00	GMT	2012-03-14 18:00	2012-03-14 18:00	SUCCESS	






The data collection is initiated, and an information message appears.



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

The data collection may take anywhere from several minutes to over an hour, depending on the size and current activity level of the library. The Last Connection status field in the Monitored Libraries table indicates “IN PROGRESS” while the process is underway.

Monitored Libraries

View      											
Library Name	Library Complex	Library IP Address(es)	STA IP Address		Library Engine ID	Automated Daily Data Refresh Time	Time Zone	Last Successful Connection	Last Connection Attempt	Last Connection Status	Last Connection Failure Detail
SL3000-13	SL3000_5710002C	10.80.104.53 192.168.2.10	10.80.175.121		0x80001f8880313	02:00:00	GMT	2012-03-14 18:03	2012-03-14 18:03	IN PROGRESS	

- When the process completes, the connection status fields in the Monitored Libraries table are updated to reflect the results. See [“Library Connection Status Information” on page 29](#) for details.

- Example from a successful data collection.

Libraries

    									
Library Complex	Library IP Address(es)	STA IP Address	Library Engine ID	Automated Daily Data Refresh Time	Time Zone	Last Successful Connection	Last Connection Attempt	Last Connection Status	Last Connection Failure Detail
SL3000_5710002C	10.80.104.53 192.168.2.10	10.80.175.121	0x80001f8880313	02:00:00	GMT	2012-03-14 18:04	2012-03-14 18:03	SUCCESS	

- Example from an unsuccessful data collection.

    									
Library Complex	Library IP Address(es)	STA IP Address	Library Engine ID	Automated Daily Data Refresh Time	Time Zone	Last Successful Connection	Last Connection Attempt	Last Connection Status	Last Connection Failure Detail
SL3000_5710002C	10.80.104.53 192.168.2.10	10.80.175.121	0x80001f8880313	02:00:00	GMT	2012-03-14 18:13	2012-03-14 18:16	FAILED	Failure to create SNMP

▼ Export SNMP Connection Settings to a Text File

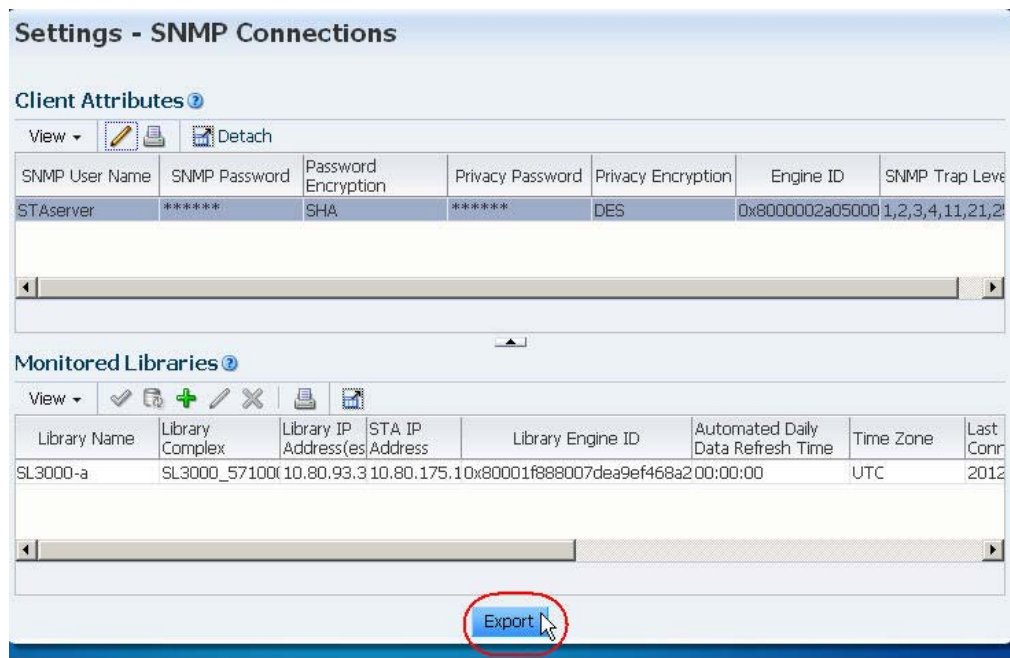
Use this procedure to export all the information that appears on the **Settings – SNMP Connections** screen to a text file. This file serves as a useful record in case you ever need to troubleshoot connection issues or re-enter connection information at some time.

Note – Passwords are not included in the file; they are masked with asterisks (*).

1. In the STA Navigation Bar, select **Settings > SNMP Connections**.

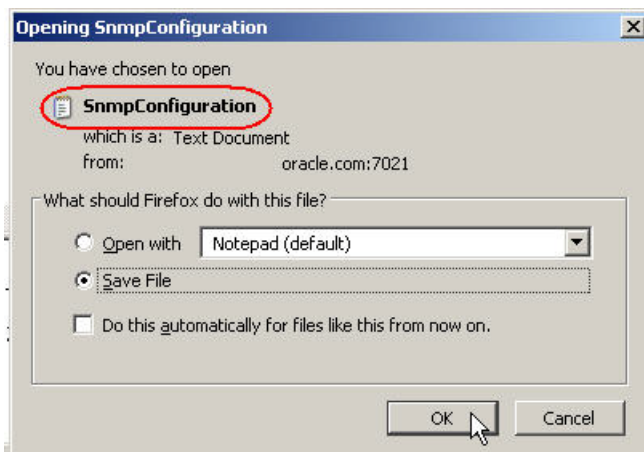


2. At the bottom of the screen, click the **Export** button.



The file is downloaded to your computer according to your browser settings. See your browser documentation for details. The file will be saved as a text file with the name `SnmConfiguration`.

Following is an example of a dialog box from a Windows computer.



Following is a sample file.

Define SNMP Client Settings

Client Attributes

```
STA Engine ID = 0x80000002a0500000139ea798d01
STA SNMP Connection Username (Auth) = stauser
STA SNMP Connection User Password (Auth) = *****
Connection Password Encryption (Auth) = SHA
Privacy Encryption Password (Privacy) = *****
Privacy Encryption Protocol (Privacy) = DES
TrapCommunity = public
UserCommunity = public
SNMP Trap Levels = 1,2,3,4,11,21,25,27,41,45,61,63,65,81,85,100
V2C Fallback = 0
V2cFallbackStr = No
```

Monitored Libraries

```
STA IP Address = 10.80.175.1
Library Name = SL3000-a
Library Complex Name = SL3000_571000200073
Library Primary IP = 10.80.93.3
Library Secondary IP = Not Specified
Library Engine ID = 0x80001f888007dea9ef468a20303332
Request MIB Walk Time = 00:00:00
Library Serial Number = 571000200073
Time Zone = UTC
Last Connection Status = SUCCESS
Last Connection Failure Detail = Not Specified
Last Connection Attempt = 2012-09-30 18:33:01
Last Successful Connection = 2012-09-30 18:36:21
```

▼ Remove a Library Connection

Use this procedure to remove a library SNMP connection. The library will no longer be monitored by STA. All existing data for the library will be removed from the STA screens; however, the data will be retained in the STA data store as a historical record. See [“Removed Libraries” on page 17](#) for details about the impact of this procedure..

After performing this procedure, you can delete the STA SNMP trap recipient from the library. See [“Configuring the Libraries for STA”](#) in the *STA Configuration Guide* for instructions.

1. In the STA Navigation Bar, select **Settings > SNMP Connections**.



2. In the Monitored Libraries table, select the library you want to remove from STA monitoring, and click Delete.

View ▾							
Library Name	Library Com	Library IP Address(es)	STA IP Address	Library Engine ID	Automated Daily Data Refresh Time	Time Zone	Last Successful Connection
crimson-acsls1	SL3000_5710000C	10.80.93.30	10.80.175.121	0x80001f888007d	00:00:00	US/Mountain	2012-03-05 00
A-SL500		10.80.105.254	10.80.175.121		00:00:00	UTC	Never

A confirmation dialog box appears.










3. Verify that this the library you want to delete, and click OK.

The library is removed from the Monitored Libraries table, and all associated data for the library is removed from the STA screens.

SNMP Connection Management Tasks

Monitored Libraries [?](#)

View ▾       							
Library Name	Library Complex	Library IP Address(es)	STA IP Address	Library Engine ID	Automated Daily Data Refresh Time	Time Zone	Last Successful Connection
crimson-acsls1	SL3000_5710000C	10.80.93.30	10.80.175.121	0x80001f888007d	00:00:00	US/Mountain	2012-03-05 00

▼ Re-establish SNMP Connectivity After Changing the STA Server IP Address

Use this procedure to ensure SNMP connectivity between STA and all monitored libraries after the IP address of the STA server has been changed. You must perform the entire procedure in the order shown. The procedure is divided into the following parts:

- [“Confirm Network and SNMP Connectivity on the STA Server”](#), below
- [“Update SNMP Settings on the Library”](#) on page 48
- [“Update SNMP Settings in the STA Application”](#) on page 50

▼ Confirm Network and SNMP Connectivity on the STA Server

Log in to the Linux command prompt on the STA server and perform these steps for each monitored library.

Note – If you have configured STA to support Redundant Electronics or Dual TCP/IP on an SL3000 or SL8500 library, perform each of these steps twice: once for the primary library IP address and once for the secondary IP address.

1. Test the v3 SNMP connection.

```
# snmpget -v3 -u SNMP_user -a SHA -A auth_pwd -x DES -X priv_pwd
-l authPriv library_IP_addr 1.3.6.1.4.1.1211.1.15.3.1.0
```

Where:

- *SNMP_user* is the SNMP v3 user.
- *SHA* indicates the authentication protocol.
- *auth_password* is the authorization password.
- *DES* indicates the privacy protocol.
- *priv_password* is the privacy password.
- *authPriv* indicates that privacy is performed on the command.
- *library_IP_addr* is the IP address of the public port on the library.

2. Test the v2c SNMP connection.

```
# snmpget -v2c -c public -l authPriv library_IP_addr
```

Where:

- *library_IP_addr* is the IP address of the public port on the library.

3. Confirm packet routing from the STA server to the library.

```
# traceroute -I library_IP_addr
```

Where:

- *-I* indicates to use Internet Control Message Protocol (ICMP) echo request packets instead of User Datagram Protocol (UDP) datagrams.
- *library_IP_addr* is the IP address of the public port on the library.

4. Monitor TCP/IP packets sent between the STA server and the library.

```
# tcpdump -v host library_IP_addr > /var/tmp/file_name &
```

Where:

- `-v` indicates verbose output.
- `host` indicates to collect packets to or from the indicated host only (in this case, the library).
- `library_IP_addr` is the IP address of the public port on the library.
- `file_name` is the name of the file to which you want to save the output.

▼ Update SNMP Settings on the Library

On each monitored library, log in to the library CLI and perform these steps to update the SNMP trap recipient settings.

Note – See “Configuring the Libraries for STA” in the *STA Configuration Guide* for complete details about the referenced commands.

1. Display all SNMP trap recipients.

Note the index number of the STA trap recipient in the displayed output.

```
snmp listTrapRecipients
```

Example Command:

```
ADMIN> snmp listTrapRecipients
```

```
requestId
requestId      1
Attributes    Auth      SHA
AuthPass      *****
Engine Id     0x80001f88807ad87e39453f
Host          10.80.123.92
Index         1
Name          STAuser
Port          162
Priv          DES
Priv Pass     *****
Trap Level    1,2,3,4,11,21,25,27,41,45,61,63,65,81,85,100
Version       v3
Object        Snmp      snmp
Done
Failure Count 0
Success Count 1
COMPLETED
```

2. Delete the STA trap recipient.

```
snmp deleteTrapRecipient id index
```

Where:

- `index` is the index number of the trap recipient to be deleted.

Example Command:

```
ADMIN> snmp deleteTrapRecipient id 1

requestId      1
requestId      2
Device         1,0,0,0
Success        true
Done
Failure Count  0
Success Count  1
COMPLETED
```

3. Add the new STA trap recipient.

a. To create an SNMP v3 trap recipient:

```
snmp addTrapRecipient trapLevel 1,2,3,4,11,21,25,27,41,45,
61,63,65,81,85,100 host STA_server_IP version v3 name
recipient_name auth SHA authPass auth_password priv DES privPass
priv_password engineId library_engineID
```

Where:

- *STA_server_IP* is the IP address of the STA server.
- *recipient_name* is the SNMP user name for the STA server.
- *auth_password* is the authorization password.
- *priv_password* is the privacy password.
- *library_engineID* is the library engine ID.

Note – You must include the 0x prefix.

Example Command:

```
ADMIN> snmp addTrapRecipient trapLevel
1,2,3,4,11,21,25,27,41,45,61,63,65,81,85,100 host
10.80.125.23 version v3 name STAuser auth SHA authPass
authpwd1 priv DES privPass privpwd1 engineId
0x81031f88804b7e542f49701753

requestId
requestId 12345
Device 1,0,0,0
Success true
Done
Failure Count 0
Success Count 1
COMPLETED
```

b. To create an SNMP v2c recipient:

```
snmp addTrapRecipient trapLevel 1,2,3,4,11,21,25,27,41,45,
61,63,65,81,85,100 host STA_server_IP version v2c community
public
```

Where:

- *STA_server_IP* is the IP address of the STA server.

Example Command:

```
ADMIN> snmp addTrapRecipient trapLevel
1,2,3,11,21,25,27,41,45,61,63,65,81,85,100 host
10.80.125.23 version v2c community public

requestId
requestId 12345
Device 1,0,0,0,0
Success true
Done
Failure Count 0
Success Count 1
COMPLETED
```

▼ Update SNMP Settings in the STA Application

Log in to the STA user interface and perform these steps for each monitored library.

1. Update the STA IP Address in the SNMP connection settings. See [“Change SNMP Connection Details for a Monitored Library” on page 34](#) for instructions.
2. Re-establish the SNMP connection with each monitored library. See [“Test a Library SNMP Connection” on page 39](#) for instructions.
3. If drive or media configuration changes have occurred on a monitored library, update the library configuration data. See [“Perform a Manual Data Collection” on page 41](#) for instructions.

▼ Update the Library Engine ID After a Library Firmware Upgrade

Use this procedure to update the library and STA SNMP configurations after upgrading to one of the following library firmware versions or higher from any earlier version:

- SL500 – FRS 1468
- SL3000 – FRS 4.0
- SL8500 – FRS 8.0

Starting with these firmware versions, the library engine ID is generated with a new 32-bit value. If you do not perform this procedure, STA will be unable to receive SNMP traps from the library.

Note – This procedure does not apply to SL150 libraries, nor to SL500, SL3000, and SL8500 upgrades to earlier firmware versions.

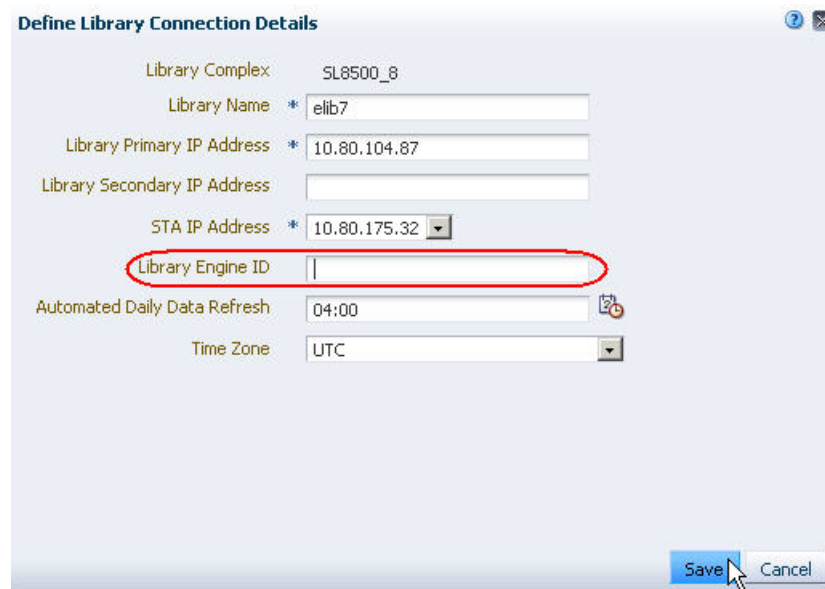
The procedure is divided into the following parts:

- [“Update SNMP Settings in the STA Application” on page 50](#)
- [“Update SNMP Settings on the Library” on page 48](#) — These steps apply only if you are using SNMP v3 for SNMP communications between STA and the libraries; you can skip these steps if you are using SNMP v2c.

▼ Update SNMP Settings in the STA Application

1. Log in to the STA user interface.
2. Edit the library connection details for the upgraded library. See [“Change SNMP Connection Details for a Monitored Library” on page 34](#) for details.

In the **Define Library Connection Details** dialog box, blank out the Library Engine ID field, and then click **Save**. This will force STA to update the engine ID to the new value when it reconnects to the library.



The dialog box titled "Define Library Connection Details" contains the following fields:

- Library Complex: SL8500_8
- Library Name: * elib7
- Library Primary IP Address: * 10.80.104.87
- Library Secondary IP Address: (empty)
- STA IP Address: * 10.80.175.32
- Library Engine ID: (empty, circled in red)
- Automated Daily Data Refresh: 04:00
- Time Zone: UTC

Buttons at the bottom right: Save, Cancel.

3. Re-establish the SNMP connection with the library. See [“Test a Library SNMP Connection” on page 39](#) for details.
4. Note the new SNMP engine ID displayed on the SNMP connections table.

This is the new SNMP engine ID for the library, and you will use it in [“Update SNMP Settings on the Library”, Step 4](#).

Library Name	Library Complex	Library IP Address(es)	STA IP Address	Library Engine ID	Automated Daily Data Refresh Time	Time Zone
elib7	SL8500_8	10.80.104.87	10.80.175.32	0x80001f8804363030303230313033303	04:00:00	UTC
tlib	SL8500_14	10.80.85.99	10.80.175.32	0x80001f888008547d06490f1a86	04:00:00	UTC

▼ Update SNMP Settings on the Library

Note – Perform this procedure only if you are using SNMP v3 for SNMP communications between STA and the upgraded library. Skip this procedure if you are using SNMP v2c.

Note – The examples in this procedure are for an SL8500 library. Command syntax is similar for SL500 and SL3000 libraries. See *“Configuring the Libraries for STA”* in the *STA Configuration Guide* for complete details about the referenced commands.

1. On the upgraded library, log in to the library CLI.
2. Display all SNMP trap recipients.

```
snmp listTrapRecipients
```

Example Command:

```
SL8500> snmp listTrapRecipients
```

```
requestId
requestId      1
Attributes    Auth      SHA
              AuthPass  *****
              Engine Id  0x81031f88804b7e542f49811753
              Host       10.80.123.92
              Index      1
              Name        STAuser
              Port        162
              Priv        DES
              Priv Pass   *****
              Trap Level  1,2,3,4,11,21,25,27,41,45,61,63,65,81,85,100
              Version     v3
Object         Snmp      snmp
Done
Failure Count  0
Success Count  1
COMPLETED
```

3. Verify the SNMP Version level displayed for the STA server.

If it is “v3”, continue to [Step 4](#); if it is “v2c”, you do not need to make any further changes, and you can quit this procedure.

4. Compare the engine ID displayed here with the one from the SNMP connections table in “[Update SNMP Settings in the STA Application](#)”, [Step 4](#).

- If they match, you do not need to make any further changes, and you can quit this procedure.
- If they do not match, continue to [Step 5](#).

5. Record the Index number of the STA trap recipient.

You will use this in [Step 6](#).

6. Delete the STA trap recipient.

```
snmp deleteTrapRecipient id index
```

Where:

- *index* is the index number of the STA server trap recipient.

Example Command:

```
SL8500> snmp deleteTrapRecipient id 1
```

```
requestId      1
requestId      2
Device         1,0,0,0,1
Success        true
Done
Failure Count  0
Success Count  1
COMPLETED
```

7. Re-add the STA trap recipient, specifying the new library engine ID.

```
snmp addTrapRecipient trapLevel 1,2,3,4,11,21,25,27,41,45,
61,63,65,81,85,100 host STA_server_IP version v3 name recipient_name
auth SHA authPass auth_password priv DES privPass priv_password
engineId library_engineID
```

Where:

- *STA_server_IP* is the IP address of the STA server.
- *recipient_name* is the SNMP user name for the STA server.
- *auth_password* is the authorization password.
- *priv_password* is the privacy password.
- *library_engineID* is the new library engine ID.

Note – You must include the 0x prefix.

Example Command:

```
SL8500> snmp addTrapRecipient trapLevel
1,2,3,4,11,21,25,27,41,45,61,63,65,81,85,100 host
10.80.175.34 version v3 name STAuser auth SHA authPass authpwd1
priv DES privPass privpwd1 engineId
0x80001f880436303030323031303433

requestId
requestId 12345
Device 1,0,0,0,1
Success true
Done
Failure Count 0
Success Count 1
COMPLETED
```

Attribute Cross-Reference

[TABLE 3-1 on page 56](#) lists all STA attributes, in alphabetical order, and identifies the screens where each one is displayed. To view the definition of an attribute, go to the page number indicated in the table cell.

Note – The page numbers are active links, so if you are viewing this document online, you can select a page number to go directly to the definition.

The screens are abbreviated as follows:

- Library – [“Libraries Overview Screen” on page 67](#)
- Complex – [“Library Complexes Screen” on page 75](#)
- Exch – [“Exchanges Screen” on page 81](#)
- Drive – [“Drives Overview and Analysis Screens” on page 117](#)
- Clean – [“Cleaning Activities Screen” on page 141](#)
- Media – [“Media Overview and Analysis Screens” on page 151](#)
- Notif – [“SNMP Notifications Screen” on page 173](#)

TABLE 3-1 STA Attribute Cross-Reference

	Library	Complex	Exch	Drive	Clean	Media	Notif
% Drive Utilization (30 Days)	72	79		132			
Agent Boot Date/Time							178
Avg Mount R/W MB (30 Days)				133			
Avg Mount R/W MB/sec (30 Days)						161	
Avg Mount Read MB (30 Days)				133			
Avg Mount Read MB/sec (30 Days)						161	
Avg Mount Write MB (30 Days)				133			
Avg Mount Write MB/sec (30 Days)						161	
Base Model		78					
Cart Memory Failure			93			160	
Cell SCSI Element ID						167	
Clean Now Alert			92				
Clean Periodic Alert			92				
Clean Volume Serial Number (VSN)					147		
Cleaning Media				128		168	
Cleaning Media Alert			106				
Cleaning Media Expired			93		148		
Cleans (30 Days)				132			
Complex Physical Library Count		78					
Current Cleaning Uses			92		147		
Data Compression Ratio			98	130		160	
Destination HLI Address			115				
Destination Library Number			114				
Destination Physical Address			114				
Destination Rail Number			114				
Destination SCSI Element ID			115				

TABLE 3-1 STA Attribute Cross-Reference

	Library	Complex	Exch	Drive	Clean	Media	Notif
Device Activity							178
Device Address							176
Device ID							178
Device State							176
Device Time							178
Diagnostics Required Alert			105	136			
Dismounts (30 Days)	72	79					
Dismounts with Errors (30 Days)						161	
Drive Bays Occupied		80					
Drive Bays Unoccupied		80					
Drive Cell SCSI Element ID				139			
Drive Cleans (30 days)	72	79					
Drive Dismounts (30 Days)				132			
Drive Dump Available			103				
Drive Errors (30 Days)				132			
Drive Event Log Near Full			103				
Drive Exchange Status			89	130	149		
Drive Firmware Version			94	125			
Drive FW Failure Alert			93				
Drive Health Indicator			95	124	145	170	
Drive HLI Address				139			
Drive ID				125	144	169	
Drive Interface				125			
Drive Interface fault			107				
Drive Library Name			109	137			
Drive Library Number			109	137			
Drive Library Serial Number			109	137			

TABLE 3-1 STA Attribute Cross-Reference

	Library	Complex	Exch	Drive	Clean	Media	Notif
Drive Lifetime Cleans			95	131	145		
Drive Lifetime Hours in Motion			105	136			
Drive Lifetime Loads			96	131	146		
Drive Lifetime Meters			96	131	146		
Drive Lifetime Power Hours			96	131			
Drive Load Alert			103				
Drive Load Limit Alert			103	130			
Drive Lost Statistics			92				
Drive Manufacturer				125			
Drive Media Maintenance Alert			102				
Drive Meters at High Speed			104				
Drive Meters of Head Contact			104				
Drive Model			94	125			
Drive Physical Address			110	138			
Drive Predictive Failure Alert			92				
Drive Properties Updated				125			
Drive Rail Number			109	137			
Drive Revision Down Level Alert			103				
Drive SCSI Element ID			111				
Drive Serial Number			94	123	144	169	
Drive SNMP Trap Count (30 Days)				132			
Drive Start Tracking			94		146		
Drive Stop Tracking			94		146		
Drive Suspicion Level			95				
Drive Temperature Alert			92				
Drive Type			94	123	144	169	
Drive Unload Prevented Alert			107				

TABLE 3-1 STA Attribute Cross-Reference

	Library	Complex	Exch	Drive	Clean	Media	Notif
Drive Voltage Alert			107				
Drive Write Warning			92				
Drive WWNN			94	123	144	169	
Drive WWPN (Port A)				125	144		
Drive WWPN (Port B)				125	144		
Duplicate Detected			99				
Ejects (30 Days)	72	79					
Empty Drive Bays	73						
Empty Storage Cells	73						
Encryption Capable				125			
Enters (30 Days)	72	79					
Exchange Drive Cleaning Required			92	131	145	160	
Exchange Drive Suspicion				131			
Exchange Elapsed Time			88	129	148	158	
Exchange Encryption Used				135		162	
Exchange End			88		148		
Exchange FSC			103	134	149	162	
Exchange Mount Time			88	129	148	158	
Exchange Read Margin				134		163	
Exchange Read Marginal				134		162	
Exchange Recording Technique			99	129			
Exchange Start			88	129	148		
Exchange Write Efficiency				134		162	
Exchange Write Inefficient				134		162	
Forced Eject Alert			107				
Formatted Density Code			106				
FW download Failed Alert			107				

TABLE 3-1 STA Attribute Cross-Reference

	Library	Complex	Exch	Drive	Clean	Media	Notif
Hard Error Alert			92				
Hardware A Alert			107				
Hardware B Alert			107				
HLI Address						167	
HP Device Status			105	136			
HP Media Status			105			164	
IBM Drive Efficiency			105	136			
IBM Media Efficiency			105	136		164	
Interface Name							178
Invalid Cleaning Alert			107				
Last Drive Notification				124			
Last Exchange Start						158	
Library Complex Name	70	78	100	140	150	171	177
Library Complex Number		78					177
Library Firmware Updated	71						
Library Firmware Version	71						
Library IP address #1	71						
Library IP address #2	71						
Library Last Booted	70						
Library Model	70		100	140	150	171	177
Library Name	70				150		177
Library Number	70					165	
Library Scan Completed	71						
Library Serial Number	70				150		177
Library SNMP Traps (30 Days)	72						
Library Top Level Condition							178
Library Top Level Indicator	70						

TABLE 3-1 STA Attribute Cross-Reference

	Library	Complex	Exch	Drive	Clean	Media	Notif
Library WWNN	70				150		
Lifetime Hours Incompatible			107				
Loading Failure Alert			93				
Maximum Cleaning Uses					148		
MB Between 2 Most Recent Cleans				131	147		
MB R/W (30 Days)	72	79		132		161	
MB Read (30 Days)	72	79		132		161	
MB Received (30 Days)	72	79		132		161	
MB Sent (30 Days)	72	79		132		161	
MB since Last Clean				131			
MB Write (30 Days)	72	79		132		161	
Media at End of Warranty Alert			102				
Media Auxiliary Memory Capacity			106			164	
Media Directory Corrupt			107			164	
Media Dismounts (30 Days)						161	
Media Eject Alert			107				
Media Error Alert			92				
Media Exchange Status			90			159	
Media Health Indicator			98	127	147	156	
Media Length in Meters			106			164	
Media Library Name						165	
Media Library Serial Number						165	
Media Life Alert			92				
Media Life Indicator						157	
Media Load Limit Alert			103			160	
Media Manufacturer			97			157	
Media Manufacturer Date			106			164	

TABLE 3-1 STA Attribute Cross-Reference

	Library	Complex	Exch	Drive	Clean	Media	Notif
Media Manufacturer Serial Number			97	127		157	
Media MB Avail Pre			105			164	
Media MB Avail Post			101			162	
Media MB Capacity			101, 105			162, 164	
Media Permanent Error Alert			103				
Media RFID Alert			103				
Media Snapped Alert			103				
Media Start of Data NOT Found			103				
Media Start Tracking			97				
Media Stop Tracking			97				
Media Suspicion Level			98			159	
Media Type			97			156	
MIR Invalid Alert			103				
Monitored since	69	77		122		155	
Mount R/W MB			91				
Mount R/W MB/sec			91	129, 133		160	
Mount Read MB			91				
Mount Read MB/sec			91	133			
Mount Received MB			92				
Mount Sent MB			91				
Mount Write MB			91				
Mount Write MB/sec			91	133			
Nearing Media Life Alert			105			164	
Not Data Grade Alert			107				
Occupied Drive Bays	73						
Occupied Storage Cells	73						

TABLE 3-1 STA Attribute Cross-Reference

	Library	Complex	Exch	Drive	Clean	Media	Notif
Partition Name			100	140		171	
Partition Number			100	140		171	
Partition Type			100	140		171	
Partitions	73	80					
Perm Read Errors			103				
Perm Write Errors			103				
Physical Address						166	
PTP Enters (30 Days)	72	79					
PTP Ejects (30 Days)	72	79					
R/W Mount Ratio			102	135		163	
R/W MB/sec			102	135		163	
Rail Number						165	
Read Failure Alert			107				
Read Margin			101				
Read MB/sec			101	134		163	
Read Mount Ratio			102	135		163	
Read Only Alert			107				
Read Warning Alert			92				
Received on							175
Recorded on			87		143		
Recording Technique						158	
Recover Mechanical Cart Failure Alert			107				
Repositioning cycles			102				
Repositioning cycles non ERP			102				
Request ID							178
Result Code							178
Servo Perm Errors			103				

TABLE 3-1 STA Attribute Cross-Reference

	Library	Complex	Exch	Drive	Clean	Media	Notif
Severity							178
SNMP Notification							175
Source HLI Address			113				
Source Library Number			112				
Source Physical Address			112				
Source Rail Number			112				
Source SCSI Element ID			113				
STA Start Tracking				126		157	
STA Stop Tracking				126		157	
Storage Cells Occupied		80					
Storage Cells Unoccupied		80					
Tape Directory Invalid at Unload			92				
Tape System Area Read Failure Alert			93				
Tape System Area Write Failure Alert			92				
Text							178
Time Spent Loaded			101				
Time Spent Reading			101	134		163	
Time Spent Reading or Writing			101	134		163	
Time Spent Writing			101	134		163	
Trap Type							176
Unload Errors			103				
Unrecoverable Unload Failure Alert			107				
Unsupported Format Alert			107				
Usage Perm Errors			103				
Username							178
Volume Serial Number (VSN)			97	127		156	

TABLE 3-1 STA Attribute Cross-Reference

	Library	Complex	Exch	Drive	Clean	Media	Notif
WORM Integrity Failure Alert			107				
WORM overwrite attempted			108				
WORM/VolSafe Media				128		157	
Write Efficiency			101				
Write Failure Alert			108				
Write MB/sec			102	134		163	
Write Mount Ratio			102	135		163	
Write Protect Alert			108				

Libraries Overview Screen

This section includes the following information:

- [“Libraries Detail View” on page 68](#)
- [“Library Attribute Definitions” on page 68](#)
 - [“Title” on page 69](#)
 - [“Library” on page 70](#)
 - [“Library Activity Counts \(Last 30 days\)” on page 72](#)
 - [“Library Auxiliary Counts” on page 73](#)

Libraries Detail View

The Detail View on the **Libraries – Overview** screen shows all available attributes related to one or more selected libraries.

Libraries - Overview

Format: [List Icon] [Table Icon] [Print Icon]

Templates: Default

Details for Library 516000100451 Monitored since 2012-09-21 15:05:52

Library	Library Activity Counts (Last 30 days)
Library Complex Name : SL8500_5	Library SNMP Traps : 3,009
Library Name : BASSL8500	Dismounts : 29,942
Library Number : 1	Enters : 0
Library Model : SL8500	Ejects : 0
Library Serial Number : 516000100451	PTP Enters : 0
Library WWNN : 50:01:04:F0:00:8A:BA:11	PTP Ejects : 0
Library Top Level Indicator : NORMAL	Drive Cleans : 18
Library Last Booted :	MB Read : 46,397.81
Library Firmware Updated : 2012-09-21 15:03:00	MB Write : 47,036,136.00
Library Firmware Version : FRS_8.01	MB R/W : 47,082,532.00
Library IP address #1 : 10.80.6.224	MB Sent : 175,408.38
Library IP address #2 : 10.80.6.219	MB Received : 55,518,976.00
Library Scan Completed : 2012-10-05 14:39:14	% Drive Utilization : 64.67%

Library Auxiliary Counts
Partitions : 4
Occupied Drive Bays : 30
Empty Drive Bays : 34
Occupied Storage Cells : 421
Empty Storage Cells : 2,755

Library Attribute Definitions

The library attributes are organized into the following sections.

- “Title” on page 69
- “Library” on page 70
- “Library Activity Counts (Last 30 days)” on page 72
- “Library Auxiliary Counts” on page 73

Title

Values for these attributes are assigned when STA first starts tracking the library.

Attribute	Definition
Library	Library frame serial number. Note – This field links to the Libraries – Overview screen, detail view, which displays all available details for this library. See “ Libraries Overview Screen ”.
Monitored since	Date and time when STA started tracking this resource (library, complex, drive, or media).

Library

Details about the library. These attributes come directly from the library and are updated with each library configuration data collection.

Attribute	Definition
Library Complex Name	<p>Name assigned to the complex by STA.</p> <ul style="list-style-type: none"> For SL150, SL500, and SL3000 libraries, this value is formatted as <i>library_model_library_serial_number</i>. Examples: SL150_262960B+1234BA0018, SL500_522000001839, SL3000_571000020075 For SL8500 libraries, this value is formatted as <i>library_model_complex_ID</i>. Examples: SL8500_1, SL8500_4 <p>This field links to the Libraries – Complexes Overview screen, detail view, which displays all available details about this complex. See “Library Complexes Screen”.</p>
Library Name	User-assigned name for the library. Assigned in the Settings – SNMP Connections screen.
Library Number	Unique ID assigned to the library.
Library Model	Library model number. Possible values: SL150, SL500, SL3000, or SL8500.
Library Serial Number	<p>Library frame serial number.</p> <p>Note – This field links to the Libraries – Overview screen, detail view, which displays all available details for this library. See “Libraries Overview Screen”.</p>
Library WWNN	Library World Wide Node Name.
Library Top Level Indicator	<p>Current library health. Examples:</p> <ul style="list-style-type: none"> DEGRADED – In a degraded state. NONOPERATIVE – Not operating. NORMAL – Functioning as normal. Null (no value displayed) – STA has not received any information.
Library Last Booted	Date and time the library was last rebooted.

Attribute	Definition
Library Firmware Updated	Date and time of last library firmware update.
Library Firmware Version	Current library firmware version.
Library IP address #1	<p>IP address of the public port on the library. The attribute value is specified by the user or administrator when the library connection is configured. For SL150 libraries, it is the Network Port 1 port; for SL500 libraries, it is the 1B port; for SL3000 and SL8500 libraries, it is the 2B port.</p> <p>Note – For SL3000 and SL8500 libraries using the Redundant Electronics feature, this should be the 2B port on the active controller card.</p>
Library IP address #2	<p>The attribute value is specified by the user or administrator when the library connection is configured. For and SL150 and SL500 libraries, this attribute is always blank.</p> <p>For SL3000 and SL8500 libraries, this entry enables STA to maintain uninterrupted SNMP communications with the library in the event of either a Redundant Electronics switch or a Dual TCP/IP failover, and it may be any of the following:</p> <ul style="list-style-type: none"> • For libraries with the Redundant Electronics feature, it is the IP address of the 2B port on the alternate (standby) controller card. • For libraries with the Dual TCP/IP feature, it is the IP address of the 2A port on the active controller card. • For libraries with both features, it may be either of the above, depending on what the user or administrator has specified. See “Configuring the Libraries for STA” in the <i>STA Configuration Guide</i> for detailed instructions. • For libraries with neither of these features, this attribute is blank.
Library Scan Completed	Date and time when the most recent successful library configuration data collection was completed.

Library Activity Counts (Last 30 days)

Activity totals for the library over the last 30 days. These are updated with each completed exchange.

Attribute	Definition
Library SNMP Traps (30 Days)	<p>Total SNMP traps received by STA from the library. Includes traps for any of the following: library, drive, CAP or mailslot, and pass-thru port (PTP) status, library environment checks, library logs, library connection tests, and library configuration data collections.</p> <p>Note – This field links to the Notifications – Overview screen, list view, which lists SNMP traps for this library. See “SNMP Notifications Screen” on page 173.</p>
Dismounts (30 Days)	<p>Total dismounts for all drives.</p> <p>Note – This field links to the Libraries – Exchanges screen, list view, which lists exchanges for this library. See “Exchanges Screen” on page 81.</p>
Enters (30 Days)	Total media entered into the library through all CAPs or mailslots.
Ejects (30 Days)	Total media ejected from the library through all CAPs or mailslots.
PTP Enters (30 Days)	Total cartridges entered through all PTPs over the last 30 days. Applies only to SL8500 libraries; all other libraries show 0.
PTP Ejects (30 Days)	Total cartridges ejected through all PTPs over the last 30 days. Applies only to SL8500 libraries; all other libraries show 0.
Drive Cleans (30 Days)	<p>Total drive cleans performed in the library.</p> <p>Note – This field links to the Drives – Cleaning Activities screen, list view, which lists cleaning activities for this library. See “Cleaning Activities Screen” on page 141.</p>
MB Read (30 Days)	Total megabytes read by all drives in the library.
MB Write (30 Days)	Total megabytes written by all drives in the library.
MB R/W (30 Days)	Total megabytes read and written by all drives in the library.
MB Sent (30 Days)	Total megabytes uncompressed data sent to hosts by all drives in the library.
MB Received (30 Days)	Total megabytes uncompressed data received from hosts by all drives in the library.
% Drive Utilization (30 Days)	Percentage of time all drives in the library were occupied. Does not include time drives are not available because of application reservation or library positioning.

Library Auxiliary Counts

Library resource counts. The summary fields are updated with each completed exchange. The asset fields are updated with each library data collection.

Attribute	Definition
Partitions	<p>Total partitions defined on the library.</p> <p>Note – This includes user-defined partitions only. The system partition (for storage of diagnostic cartridges) is not included in the count.</p>
Occupied Drive Bays	<p>Total drive bays with installed drives.</p> <p>Note – This field links to the Drives – Overview screen, list view, which lists all drives for this library. See “Drives Overview and Analysis Screens” on page 117.</p>
Empty Drive Bays	Total drive bays with no installed drives.
Occupied Storage Cells	<p>Total occupied storage cells.</p> <p>Note – This field links to the Media – Overview screen, list view, which lists all media for this library. See “Media Overview and Analysis Screens” on page 151.</p>
Empty Storage Cells	Total activated storage cells with no media

Library Complexes Screen

This section includes the following information:

- [“Library Complexes Detail View” on page 76](#)
- [“Library Complex Attribute Definitions” on page 76](#)
 - [“Title” on page 77](#)
 - [“Library Complex” on page 78](#)
 - [“Library Complex Activity Counts \(Last 30 days\)” on page 79](#)
 - [“Library Complex Auxiliary Counts” on page 80](#)

Library Complexes Detail View

The Detail View on the **Libraries – Complexes Overview** screen shows all available attributes related to one or more selected library complexes.

The screenshot displays the 'Libraries - Complexes Overview' interface. At the top, there's a title bar with a help icon, a 'Format' dropdown, and a 'Templates' dropdown set to 'Default'. Below this, the main content area is titled 'Details for Library Complex SL8500_5' and includes a timestamp 'Monitored since 2012-09-21 15:05:52'. The interface is divided into three main sections:

- Library Complex:**
 - Library Complex Name : **SL8500_5**
 - Base Model : **SL8500**
 - Library Complex Number : **5**
 - Complex Physical Library Count : **1**
- Library Complex Auxiliary Counts:**
 - Partitions : **4**
 - Drive Bays Occupied : **30**
 - Drive Bays Unoccupied : **34**
 - Storage Cells Occupied : **421**
 - Storage Cells Unoccupied : **2,755**
- Library Complex Activity Counts (Last 30 days):**
 - Dismounts : **29,962**
 - Enters : **0**
 - Ejects : **0**
 - PTP Enters : **0**
 - PTP Ejects : **0**
 - Drive Cleans : **18**
 - MB Read : **46,440**
 - MB Write : **47,056,867**
 - MB R/W : **47,103,308**
 - MB Sent : **175,632**
 - MB Received : **55,544,524**
 - % Drive Utilization : **67.62%**

Library Complex Attribute Definitions

The attributes are organized into the following sections.

- [“Title” on page 77](#)
- [“Library Complex” on page 78](#)
- [“Library Complex Activity Counts \(Last 30 days\)” on page 79](#)
- [“Library Complex Auxiliary Counts” on page 80](#)

Title

Values for these attributes are assigned when STA first starts tracking the library complex.

Attribute	Definition
Library Complex	<p>Name assigned to the complex by STA.</p> <ul style="list-style-type: none"> For SL150, SL500, and SL3000 libraries, this value is formatted as <i>library_model_library_serial_number</i>. Examples: SL150_262960B+1234BA0018, SL500_522000001839, SL3000_571000020075 For SL8500 libraries, this value is formatted as <i>library_model_complex_ID</i>. Examples: SL8500_1, SL8500_4 <p>This field links to the Libraries – Complexes Overview screen, detail view, which displays all available details about this complex. See “Library Complexes Screen”.</p>
Monitored since	Date and time when STA started tracking this resource (library, complex, drive, or media).

Library Complex

Details about the library complex. These attributes are rolled up for all libraries that share the same complex ID. These attributes come directly from the libraries and are updated with each library configuration data collection.

Attribute	Definition
Library Complex Name	<p>Name assigned to the complex by STA.</p> <ul style="list-style-type: none"> For SL150, SL500, and SL3000 libraries, this value is formatted as <i>library_model_library_serial_number</i>. Examples: SL150_262960B+1234BA0018, SL500_522000001839, SL3000_571000020075 For SL8500 libraries, this value is formatted as <i>library_model_complex_ID</i>. Examples: SL8500_1, SL8500_4 <p>This field links to the Libraries – Complexes Overview screen, detail view, which displays all available details about this complex. See “Library Complexes Screen”.</p>
Base Model	Library model.
Library Complex Number	Library complex ID, as configured on the library. For SL150, SL500, and SL3000 libraries, the value is always “1”. For SL8500 libraries, the value is set by your Oracle support representative and must be unique for each complex.
Complex Physical Library Count	<p>Total number of libraries in the complex (always “1” for non-SL8500 libraries).</p> <p>Note – This field links to the Libraries – Overview screen, list view, which lists all libraries in this complex. See “Libraries Overview Screen” on page 67.</p>

Library Complex Activity Counts (Last 30 days)

Activity totals for all libraries in the complex over the last 30 days. These are updated with each completed exchange.

Attribute	Definition
Dismounts (30 Days)	Total dismounts for all drives in the complex Note – This field links to the Libraries – Exchanges screen, list view, which lists exchanges for this complex. See “Exchanges Screen” on page 81 .
Enters (30 Days)	Total media entered into the complex through all CAPs, AEMs (SL3000 only), mailslots (SL150 only), and PTPs (SL8500 only)
Ejects (30 Days)	Total media ejected from the complex through all CAPs, AEMs (SL3000 only), mailslots (SL150 only), and PTPs (SL8500 only)
PTP Enters (30 Days)	Total cartridges entered through all PTPs in the complex over the last 30 days. Applies only to SL8500 libraries; all other libraries show 0.
PTP Ejects (30 Days)	Total cartridges ejected through all PTPs in the complex over the last 30 days. Applies only to SL8500 libraries; all other libraries show 0.
Drive Cleans (30 days)	Total drive cleans performed in the complex Note – This field links to the Drives – Cleaning Activities screen, list view, which lists all cleaning actions for this complex. See “Cleaning Activities Screen” on page 141 .
MB Read (30 Days)	Total megabytes read by all drives in the complex
MB Write (30 Days)	Total megabytes written by all drives in the complex
MB R/W (30 Days)	Total megabytes read and written by all drives in the complex
MB Sent (30 Days)	Total megabytes uncompressed data sent to hosts by all drives in the complex
MB Received (30 Days)	Total megabytes uncompressed data received from hosts by all drives in the complex
% Drive Utilization (30 Days)	Percentage of time all drives in the complex were occupied. Does not include time drives are not available because of application reservation or library positioning.

Library Complex Auxiliary Counts

Total resource counts for all libraries in the complex. The summary fields are updated with each completed exchange. The asset fields are updated with each library data collection.

Attribute	Definition
Partitions	<p>Total partitions defined in the complex.</p> <p>Note – This includes user-defined partitions only. The system partition (for storage of diagnostic cartridges) is not included in the count.</p>
Drive Bays Occupied	<p>Total drive bays with installed drives.</p> <p>Note – This field links to the Drives – Overview screen, list view, which lists all drives for this complex. See “Drives Overview and Analysis Screens” on page 117.</p>
Drive Bays Unoccupied	Total empty drive bays
Storage Cells Occupied	<p>Total occupied storage cells.</p> <p>Note – This field links to the Media – Overview screen, list view, which lists all media for this complex. See “Media Overview and Analysis Screens” on page 151.</p>
Storage Cells Unoccupied	Total empty activated storage cells

Exchanges Screen

This section includes the following information:

- [“Exchanges Detail Views” on page 81](#)
- [“Exchange Attribute Definitions” on page 86](#)
 - [“Title” on page 87](#)
 - [“Exchange Health and Activity” on page 88](#)
 - [“Drive” on page 94](#)
 - [“Media” on page 97](#)
 - [“Library Complex” on page 100](#)
 - [“Enterprise Specific Information” on page 101](#)
 - [“Additional Enterprise Exchange Errors” on page 103](#)
 - [“LTO Specific Information” on page 105](#)
 - [“Additional LTO Exchange Errors” on page 107](#)
 - [“\(Drive\) Cell Location” on page 109](#)
 - [“\(Media\) Source Cell Location” on page 112](#)
 - [“\(Media\) Destination Cell Location” on page 114](#)

Exchanges Detail Views

The Detail View on the **Libraries – Exchanges** screen shows all available attributes related to one or more exchanges. There is one view for exchanges involving StorageTek enterprise media and a slightly different view for LTO media.

Detail for Enterprise Media Exchanges (page 1)

Details for Cartridge Exchange		Recorded on 2012-10-08 08:36:53	
Exchange Health and Activity		Drive	
Exchange Start :	2012-10-08 08:36:53	Drive Serial Number :	572004012140
Exchange End :	2012-10-08 08:40:39	Drive Start Tracking :	2012-10-05 15:55:37
Exchange Elapsed Time :	0:03:46	Drive Stop Tracking :	
Exchange Mount Time :	0:03:24	Drive WWNN :	50:01:04:F0:00:AC:BE:3D
Drive Exchange Status :	GOOD	Drive Type :	T10000b
Media Exchange Status :	GOOD	Drive Model :	T10000B
Mount Read MB/sec :	14.74	Drive Firmware Version :	1.48.206-5.30
Mount Write MB/sec :	14.74	Drive Health Indicator :	USE
Mount R/W MB/sec :	29.47	Drive Suspicion Level :	0.00%
Mount Read MB :	3,006.00	Drive Lifetime Cleans :	8
Mount Write MB :	3,006.00	Drive Lifetime Loads :	20,164
Mount R/W MB :	6,012.00	Drive Lifetime Meters :	2,297,551
Mount Sent MB :	3,000.50	Drive Lifetime Power Hours :	10,262
Mount Received MB :	3,000.50		
Drive Write Warning :	No	Media	
Exchange Drive Cleaning Required :	No	Volume Serial Number :	DVT057
Current Cleaning Uses :		Media Start Tracking :	2012-10-05 15:55:37
Read Warning Alert :	No	Media Stop Tracking :	
Hard Error Alert :	No	Media Type :	T10000
Media Error Alert :	No	Media Manufacturer :	STK
Media Life Alert :	No	Media Manufacturer Serial Number :	50703303131830
Clean Periodic Alert :	Yes	Media Health Indicator :	USE
Clean Now Alert :	No	Media Suspicion Level :	0.00%
Drive Temperature Alert :	No	Data Compression Ratio :	1 : 1
Drive Predictive Failure Alert :	No	Exchange Recording Technique :	T10000B
Drive Lost Statistics :	No	Duplicate Detected :	No
Tape Directory Invalid at Unload :	No		
Tape System Area Write Failure Alert :	No	Library Complex	
Tape System Area Read Failure Alert :	No	Library Complex Name :	SL3000_571000200060
Loading Failure Alert :	No	Library Model :	SL3000
Drive FW Failure Alert :	No	Partition Type :	SCSI
Cleaning Media Expired :	No	Partition Name :	SL3000_571000200060:SCSI:0
Cart Memory Failure :	No	Partition Number :	0
		(Drive) Cell Location	

Detail for Enterprise Media Exchanges (page 2)

Cart Memory Failure : **No**

Enterprise Specific Information

Media MB Capacity : **1,048,576.00**
 Media MB Avail Post : **950,677.56**
 Write Efficiency :
 Read Margin :
 Time Spent Loaded : **0:02:43**
 Time Spent Reading : **0:01:16**
 Time Spent Writing : **0:00:50**
 Time Spent Reading or Writing :
 Read MB/sec :
 Write MB/sec :
 R/W MB/sec :
 Read Mount Ratio :
 Write Mount Ratio :
 R/W Mount Ratio :
 Drive Media Maintenance Alert : **No**
 Repositioning cycles : **0**
 Repositioning cycles non ERP : **9**
 Media at End of Warranty Alert : **No**

Additional Enterprise Exchange Errors

Exchange FSC :
 Drive Load Limit Alert : **No**
 Media Load Limit Alert : **No**
 Perm Read Errors : **0**
 Perm Write Errors : **0**
 Servo Perm Errors : **0**
 Unload Errors : **0**
 Usage Perm Errors : **0**
 Drive Dump Available : **No**
 Drive Revision Down Level Alert : **No**
 Drive Event Log Near Full : **Yes**
 Drive Load Alert : **No**
 Media Snapped Alert : **No**
 MIR Invalid Alert : **No**
 Media RFID Alert : **No**
 Media Permanent Error Alert : **No**
 Media Start of Data NOT Found : **No**
 Drive Meters at High Speed : **0**
 Drive Meters of Head Contact : **8,438**

(Drive) Cell Location

Drive Library Name : **crimson11**
 Drive Library Serial Number : **571000200060**
 Drive Library Number : **1**
 Drive Rail Number : **1**
 Drive Physical Address : **1,1,2,1,1**
 Drive HLI Address :
 Drive SCSI Element ID : **1,001**

(Media) Source Cell Location

Source Library Number : **1**
 Source Rail Number : **1**
 Source Physical Address : **1,1,-12,1,38**
 Source HLI Address :
 Source SCSI Element ID : **2,037**

(Media) Destination Cell Location

Destination Library Number : **1**
 Destination Rail Number : **1**
 Destination Physical Address : **1,1,-12,1,38**
 Destination HLI Address :
 Destination SCSI Element ID : **2,037**

Detail for LTO Media Exchanges (page 1)

Details for Cartridge Exchange		Recorded on 2012-10-06 18:	
Exchange Health and Activity		Drive	
Exchange Start :	2012-10-06 18:14:27	Drive Serial Number :	HU19477NH0
Exchange End :	2012-10-06 20:57:13	Drive Start Tracking :	2012-10-05 15:55:37
Exchange Elapsed Time :	2:42:46	Drive Stop Tracking :	
Exchange Mount Time :	2:42:10	Drive WWNN :	50:01:04:F0:00:AC:BE:5E
Drive Exchange Status :	GOOD	Drive Type :	HpUltrium5
Media Exchange Status :	GOOD	Drive Model :	LT05
Mount Read MB/sec :	0.01	Drive Firmware Version :	I5B5-015.762
Mount Write MB/sec :	0.01	Drive Health Indicator :	MONITOR
Mount R/W MB/sec :	0.01	Drive Suspicion Level :	15.00%
Mount Read MB :	11.49	Drive Lifetime Cleans :	0
Mount Write MB :	11.49	Drive Lifetime Loads :	14,374
Mount R/W MB :	22.98	Drive Lifetime Meters :	708,965
Mount Sent MB :	1,000.51	Drive Lifetime Power Hours :	14,487
Mount Received MB :	1,000.51		
Drive Write Warning :	No	Media	
Exchange Drive Cleaning Required :	No	Volume Serial Number :	F50157
Current Cleaning Uses :		Media Start Tracking :	2012-10-05 15:55:37
Read Warning Alert :	No	Media Stop Tracking :	
Hard Error Alert :	No	Media Type :	LT05
Media Error Alert :	No	Media Manufacturer :	LTO
Media Life Alert :	No	Media Manufacturer Serial Number :	A9CGC8JLCM
Clean Periodic Alert :	No	Media Health Indicator :	USE
Clean Now Alert :	No	Media Suspicion Level :	0.00%
Drive Temperature Alert :	No	Data Compression Ratio :	87.09 : 1
Drive Predictive Failure Alert :	No	Exchange Recording Technique :	LT05
Drive Lost Statistics :	No	Duplicate Detected :	No
Tape Directory Invalid at Unload :	No		
Tape System Area Write Failure Alert :	No	Library Complex	
Tape System Area Read Failure Alert :	No	Library Complex Name :	SL3000_571000200060
Loading Failure Alert :	No	Library Model :	SL3000
Drive FW Failure Alert :	No	Partition Type :	SCSI
Cleaning Media Expired :	No	Partition Name :	SL3000_571000200060:SCSI:0
Cart Memory Failure :	No	Partition Number :	0
		(Drive) Cell Location	

Detail for LTO Media Exchanges (page 2)

Cart Memory Failure : No	
LTO Specific Information	
Media MB Capacity :	1,459,056.00
Media MB Avail Pre :	1,453,699.00
Diagnostics Required Alert :	No
Drive Lifetime Hours in Motion :	57
Nearing Media Life Alert :	No
IBM Drive Efficiency :	
IBM Media Efficiency :	
HP Device Status :	0x00050100
HP Media Status :	1
Media Length in Meters :	846
Media Manufacturer Date :	2009-12-10 17:00:00
Media Auxiliary Memory Capacity :	4,096
Cleaning Media Alert :	No
Formatted Density Code :	88
Additional LTO Exchange Errors	
Lifetime Hours Incompatible :	2
Drive Voltage Alert :	No
Recover Mechanical Cart Failure Alert :	No
Drive Unload Prevented Alert :	No
Unrecoverable Unload Failure Alert :	No
Media Eject Alert :	No
FW download Failed Alert :	No
Forced Eject Alert :	No
Hardware A Alert :	No
Hardware B Alert :	No
Drive Interface fault :	No
Media Directory Corrupt :	No
Invalid Cleaning Alert :	No
Not Data Grade Alert :	No
Read Failure Alert :	No
Read Only Alert :	No
Unsupported Format Alert :	No
WORM Integrity Failure Alert :	No
Write Failure Alert :	No
Write Protect Alert :	No
WORM overwrite attempted :	No
(Drive) Cell Location	
Drive Library Name :	crimson11
Drive Library Serial Number :	571000200060
Drive Library Number :	1
Drive Rail Number :	1
Drive Physical Address :	1,1,3,1,4
Drive HLI Address :	
Drive SCSI Element ID :	1,014
(Media) Source Cell Location	
Source Library Number :	1
Source Rail Number :	1
Source Physical Address :	1,1,-12,1,50
Source HLI Address :	
Source SCSI Element ID :	2,049
(Media) Destination Cell Location	
Destination Library Number :	1
Destination Rail Number :	1
Destination Physical Address :	1,1,-12,1,50
Destination HLI Address :	
Destination SCSI Element ID :	2,049

Exchange Attribute Definitions

The exchange attributes are organized into the following sections.

- [“Title” on page 87](#)
- [“Exchange Health and Activity” on page 88](#)
- [“Drive” on page 94](#)
- [“Media” on page 97](#)
- [“Enterprise Specific Information” on page 101](#)
- [“LTO Specific Information” on page 105](#)
- [“Library Complex” on page 100](#)
- [“\(Drive\) Cell Location” on page 109](#)
- [“\(Media\) Source Cell Location” on page 112](#)
- [“\(Media\) Destination Cell Location” on page 114](#)
- [“Additional Enterprise Exchange Errors” on page 103](#)
- [“Additional LTO Exchange Errors” on page 107](#)

Title

Values for these attributes are assigned at the start of the exchange.

Attribute	Definition
Recorded on	Date and time when the exchange started.

Exchange Health and Activity

Details about the media and drive health during the exchange

Attribute	Definition
Exchange Start	Date and time when the drive was reserved for the exchange or cleaning operation. Note – This field links to the Libraries – Exchanges screen, detail view, which displays all available detail for this exchange. See “Exchanges Screen” .
Exchange End	Date and time when the exchange completed
Exchange Elapsed Time	Total time the drive was reserved for the exchange. Starts at the beginning of the mount move and ends at the completion of the dismount move. Includes total mount time plus total transit time immediately before and after the mount. Displayed in hh:mm:ss format.
Exchange Mount Time	Total time the media was mounted in the drive. Includes the total time between the start of the mount and the start of the dismount. Does not include transit time before and after the mount. Displayed in hh:mm:ss format. If this attribute is blank, then it is likely that STA did not receive all the exchange data from the library.

Attribute	Definition
Drive Exchange Status	<p>Status of the drive upon completion of the exchange, as derived from a variety of factors, including drive errors, write efficiency, and read margin. Possible values:</p> <ul style="list-style-type: none"> • CART_MEM_FAILURE • CLEAN_REQ – The drive is due for cleaning. • DRIVE_ERROR • EXPIRED_CLEAN_TAPE • FAILED_MOUNT • FW_DOWN_LEVEL • GOOD • INCOMPLETE_UNLOAD – The application requested that the media be unloaded. The tape drive has detected data still in its buffer and has asked for confirmation from the application. • INSUFFICIENT_DATA(NULL) – STA has not received enough exchange data from the library to calculate drive health. It may be that the drive is not supported (LTO 2, for example) or the library firmware is downlevel. • LOAD_ERROR • LTO_NON_ADI_MODE – ADI mode has not been enabled on either the library, the drive, or both. • MEDIA_ERROR • NON_DRV_ERROR – This is neither a drive nor a media problem, so there is no effect on the suspicion of drive or media. • OTHER_ERROR • PERM_ERROR • READ_ERROR • WRITE_ERROR • UNKNOWN • UNLOAD_ERROR

Attribute	Definition
Media Exchange Status	<p>Status of the media upon completion of the exchange, as derived from a variety of factors, including media errors, write efficiency, and read margin. Possible values:</p> <ul style="list-style-type: none"> • CART_MEM_FAILURE • CLEAN_REQ – The drive is due for cleaning. • DRIVE_ERROR • EXPIRED_CLEAN_TAPE • FAILED_MOUNT • FW_DOWN_LEVEL • GOOD • INCOMPLETE_UNLOAD – The application requested that the media be unloaded. The tape drive has detected data still in its buffer and has asked for confirmation from the application. • INSUFFICIENT_DATA(NULL) – STA has not received enough exchange data from the library to calculate drive health. It may be that the drive is not supported (LTO 2, for example) or the library firmware is downlevel. • LOAD_ERROR • LTO_NON_ADI_MODE – ADI mode has not been enabled on either the library, the drive, or both. • MEDIA_ERROR • NON_DRV_ERROR – This is neither a drive nor a media problem, so there is no effect on the suspicion of drive or media. • OTHER_ERROR • PERM_ERROR • READ_ERROR • WRITE_ERROR • UNKNOWN • UNLOAD_ERROR

Attribute	Definition
Mount Read MB/sec	<p>Average read rate for the drive, in megabytes per second. Calculated as:</p> $\text{total MB read} / \text{total seconds mount time}$ <p>Note – This value may be affected by a variety of factors external to the drive, such as robot speed or application behavior—for example, some applications do not dismount media immediately upon completion of read/write operations, causing the drive to be idle for much of the mount. As a result, this value is not likely to represent the drive’s maximum potential read rate.</p>
Mount Write MB/sec	<p>Average write rate for the drive, in megabytes per second. Calculated as:</p> $\text{total MB written} / \text{total seconds mount time}$ <p>Note – This value may be affected by a variety of factors external to the drive, such as robot speed or application behavior—for example, some applications do not dismount media immediately upon completion of read/write operations, causing the drive to be idle for much of the mount. As a result, this value is not likely to represent the drive’s maximum potential write rate.</p>
Mount R/W MB/sec	<p>Average throughput rate for the drive, in megabytes per second. Calculated as:</p> $\text{total MB (read + written)} / \text{total seconds mount time}$ <p>Note – This value may be affected by a variety of factors external to the drive, such as robot speed or application behavior—for example, some applications do not dismount media immediately upon completion of read/write operations, causing the drive to be idle for much of the mount. As a result, this value is not likely to represent the drive’s maximum potential throughput rate.</p>
Mount Read MB	<p>Total megabytes read by the drive during the mount.</p> <p>Note – Some media transactions involve a very small amount of I/O. All values greater than 0.0 and less than 0.1 are displayed as 0.01. A value of 0.0 indicates no I/O.</p>
Mount Write MB	Total megabytes written by the drive during the mount
Mount R/W MB	Total megabytes read or written by the drive during the mount
Mount Sent MB	Total uncompressed megabytes sent from the application to the drive during the mount.

Attribute	Definition
Mount Received MB	Total uncompressed megabytes received by the application from the drive during the mount.
Drive Write Warning	The drive could not write to the media. The drive or media may need to be replaced.
Exchange Drive Cleaning Required	Indicates whether the drive needed cleaning at the time of the exchange. Possible values: Yes or No. Note – Additional detail may be available via the Clean Periodic Alert and Clean Now Alert attributes.
Current Cleaning Uses	Total number of times the cleaning media has been mounted in a drive since STA began monitoring the media.
Read Warning Alert	The drive has experienced severe trouble reading.
Hard Error Alert	Indicates an unrecoverable read, write, or positioning error. This alert is cleared internally when the media is ejected.
Media Error Alert	Media performance is severely degraded, or the media can no longer be read or written. This alert is set for any unrecoverable read, write, or positioning error caused by faulty media and is cleared internally when the media is ejected.
Media Life Alert	The media has exceeded its expected useful life. Available for IBM LTO4 and above drives only. Note – HP drives report the Nearing Media Life Alert attribute instead.
Clean Periodic Alert	A clean threshold has been exceeded. Set when a StorageTek enterprise or IBM LTO drive detects that it needs routine cleaning.
Clean Now Alert	A media error has caused a cleaning request.
Drive Temperature Alert	The drive has experienced a cooling problem.
Drive Predictive Failure Alert	The drive firmware has predicted a drive hardware failure.
Drive Lost Statistics	Statistics stored on the media have been lost at some time in the past.
Tape Directory Invalid at Unload	The media directory has been corrupted. No data was lost, but media performance could be impacted.
Tape System Area Write Failure Alert	The system area on the media could not be written to at unload. No data was lost, but media performance could be impacted.

Attribute	Definition
Tape System Area Read Failure Alert	The system area on the media could not be read from at load time. No data was lost, but media performance could be impacted.
Loading Failure Alert	The drive was unable to load the media and thread the tape.
Drive FW Failure Alert	The drive has detected a firmware fault. This alert remains active until all dumps are retrieved from the drive.
Cleaning Media Expired	The drive firmware has determined that the cleaning media has already been used the maximum number of times and cannot be used for this cleaning exchange.
Cart Memory Failure	Indicates the cartridge memory failed during the exchange.

Drive

Details about the drive involved in the exchange.

Attribute	Definition
Drive Serial Number	Electronic serial number of the drive. *NO-SERIAL* indicates it is not known. Note – This field links to the Drives – Overview screen, detail view, which displays all available details for this drive. See “Drives Overview and Analysis Screens” .
Drive Start Tracking	Date and time when STA first began tracking this drive serial number.
Drive Stop Tracking	Date and time when STA stopped tracking this drive serial number. This is when STA determined the drive serial number no longer exists in any of the monitored libraries and updated the drive status from “missing” to “removed”.
Drive WWNN	World Wide Node Name for the drive slot.
Drive Type	Drive type long description sent by the library. For example, T10000c-Enc, HpUltrium4, etc. UNKNOWN indicates a broken drive or a drive for which STA cannot determine the type. Note – Type is UNKNOWN for all DLT and SDLT drives, for which STA does not compute health.
Drive Model	Drive model short description. For example, T10000C, LTO4, etc. UNKNOWN indicates a broken drive or a drive for which STA cannot determine the type. Note – Type is UNKNOWN for all DLT and SDLT drives, for which STA does not compute health.
Drive Firmware Version	Drive firmware and host interface level. See the <i>STA Planning and Installation Guide</i> for details on whether this firmware version supports rich data for STA.

Attribute	Definition
Drive Health Indicator	<p>Drive health. This is a point-in-time value computed by STA analytics based on data gathered from the drive during current and past exchanges. It reflects a variety of factors, such as the drive's error history, read margin, and write efficiency.</p> <p>This value includes all data up to and including the last completed exchange. It is updated immediately after each completed exchange involving the drive.</p> <p>Possible values, in order of degrading health:</p> <ul style="list-style-type: none"> • USE – The drive has had no failures or degradation in the last ten exchanges. • MONITOR – The drive has had multiple errors; there is a less than 80 percent chance that it needs service. • EVALUATE – The drive has had multiple errors; there is a greater than 80 percent chance that it needs service. • ACTION – The drive has had an error that requires attention. The drive may require service. You should investigate and determine a proper course of action. • UNKNOWN – STA has not received enough data to compute health for the drive. This may be due to a variety of factors, including an unsupported drive model, downlevel drive firmware, or ADI mode not enabled for an LTO drive. <p>Note – STA only receives information about errors detected by a drive while performing read/write activity to a cartridge. STA does not receive information about errors that may occur in the data path or the host application.</p> <p>Note – Cleaning exchanges have a neutral impact on drive health.</p>
Drive Suspicion Level	<p>Calculated suspicion level for the drive. The higher the number, the higher the probability that this drive needs attention.</p>
Drive Lifetime Cleans	<p>Total cleans performed on the drive over its lifetime.</p> <p>Note – The drive lifetime may be longer than the time it has been monitored by STA.</p>

Attribute	Definition
Drive Lifetime Loads	Total media loads for the drive over its lifetime. Available for all drive types but LTO3. Note – The drive lifetime may be longer than the amount of time it has been monitored by STA.
Drive Lifetime Meters	Total meters of tape that have passed through the drive heads over the drive's lifetime. Available for all drive types but LTO3. Note – The drive lifetime may be longer than the amount of time it has been monitored by STA.
Drive Lifetime Power Hours	Total hours the drive has been powered on over its lifetime. Note – The drive lifetime may be longer than the amount of time it has been monitored by STA.

Media

Details about the media involved in the exchange.

Attribute	Definition
Volume Serial Number	<p>Volume serial number (VSN or volser) assigned to the media by its external label. If the library does not supply the volser, STA provides one composed of Library Serial Number : Physical Address.</p> <p>Note – This field links to the Media – Overview screen, detail view, which displays all available detail for this media. See “Media Overview and Analysis Screens”.</p>
Media Start Tracking	Date and time when STA first began tracking this volume serial number (VSN or volser). If the volser is used on more than one cartridge, this field reflects the earliest start date available.
Media Stop Tracking	Date and time when STA stopped tracking this volume serial number (VSN or volser). This is when STA determined the volser no longer exists in any of the monitored libraries and updated the volser status from “missing” to “removed”.
Media Type	<p>Media type short description. For example, LTO1, T10000B, etc. UNKNOWN indicates media with a missing or unreadable external volume serial number (VSN or volser) label.</p> <p>Note – Type is UNKNOWN for all DLT and SDLT media, for which STA does not compute health.</p>
Media Manufacturer	Media manufacturer. Possible values are “STK” for StorageTek enterprise media, or “LTO” for LTO media.
Media Manufacturer Serial Number	<p>Media serial number assigned by the manufacturer.</p> <p>Note – STA does not have this information until the media has been mounted in a drive.</p>

Attribute	Definition
Media Health Indicator	<p>Media health. This is a point-in-time value computed by STA analytics. It reflects a variety of factors, such as the media's error history, read margin, and write efficiency.</p> <p>This value includes all data up to and including the last completed exchange. It is updated immediately after each completed exchange involving this media.</p> <p>Possible values, in order of degrading health:</p> <ul style="list-style-type: none"> • USE – The media has had no failures or degradation in the last ten exchanges. • MONITOR – The media has had multiple errors; there is a less than 80 percent chance that it needs service. • EVALUATE – The media has had multiple errors; there is a greater than 80 percent chance that it needs service. • ACTION – The media has had an error that requires service. • UNKNOWN – STA has not received enough data to compute health for the media. This may be due to a variety of factors, including exchanges on unsupported drive models, drives with downlevel firmware, or LTO drives with ADI mode not enabled. <p>Note – STA only receives information about errors detected by a drive while performing read/write activity to the media. STA does not receive information about errors that may occur in the data path or host applications.</p>
Media Suspicion Level	Calculated suspicion level for the media. The higher the number, the higher the probability that this media needs attention.
Data Compression Ratio	Compression ratio for the exchange. Displayed as a ratio of total compressed data read or written by the drive, to total uncompressed data sent or received by the drive.

Attribute	Definition
Exchange Recording Technique	Recording method used by the drive during the exchange.
Duplicate Detected	<p>STA has detected that the volume serial number (VSN or volser) of the media used in the exchange is a duplicate. This alert appears only on the exchange in which the duplicate is detected.</p> <p>Duplicate volsers occur when two pieces of media with the same media type have the same volser and two different manufacturer serial numbers. If this alert appears multiple times for the same volser, it is likely there is more than one physical cartridge with the same media type and volser label in the tape environment. If it only appears once for the volser, it may be that the volser label from a retired cartridge has been re-used on a new cartridge.</p>

Library Complex

Information about the library complex where the exchange occurred. The information is current as of the last completed library data collection.

Attribute	Definition
Library Complex Name	<p>Name assigned to the complex by STA.</p> <ul style="list-style-type: none"> For SL150, SL500, and SL3000 libraries, this value is formatted as <i>library_model_library_serial_number</i>. Examples: SL150_262960B+1234BA0018, SL500_522000001839, SL3000_571000020075 For SL8500 libraries, this value is formatted as <i>library_model_complex_ID</i>. Examples: SL8500_1, SL8500_4 <p>This field links to the Libraries – Complexes Overview screen, detail view, which displays all available details about this complex. See “Library Complexes Screen”.</p>
Library Model	Library model number. Possible values: SL150, SL500, SL3000, or SL8500.
Partition Type	<p>Type of host-partition connection. Possible values:</p> <ul style="list-style-type: none"> HLI – HLI (Host Library Interface) protocol OTHER – System cells, used for storage of diagnostic cartridges. SCSI – SCSI protocol
Partition Name	Name assigned to the partition. In a non-partitioned library, this is system-assigned; in a partitioned library, this is user-assigned.
Partition Number	Unique partition ID. For non-partitioned libraries, the value is always “0”. For partitioned libraries, possible values are 1–8.

Enterprise Specific Information

Information specific to the StorageTek enterprise drive involved in the exchange.
Appears only if the exchange involved an enterprise drive.

Attribute	Definition
Media MB Capacity	Maximum media capacity, in megabytes. Note – Reported value varies by drive vendor and other factors.
Media MB Avail Post	Unused media capacity, in megabytes; this value is provided after the exchange completes. Note – Reported value varies by drive vendor and other factors.
Write Efficiency	Write efficiency for the exchange, based on capacity over distance.
Read Margin	Amount of error correction code (ECC) read margin remaining on the media, as reported by the drive during the last mount. Reported as a percentage. A high value is desirable. If STA determines that this value has gone below a threshold for this drive type, the Exchange Read Marginal attribute is set to Yes.
Time Spent Loaded	Total time during this exchange that the drive has tension on the media. Does not include the time required to thread the media.
Time Spent Reading	Total time the drive spent reading data during the exchange
Time Spent Writing	Total time the drive spent writing data during the exchange
Time Spent Reading or Writing	Total time the drive spent reading and writing data during the exchange
Read MB/sec	Read rate for the time spent actively reading; idle time is excluded. Expressed in megabytes per second. Calculated as: $\text{compressed MB read} / \text{total read time}$

Attribute	Definition
Write MB/sec	Write rate for the time spent actively writing; idle time is excluded. Expressed in megabytes per second. Calculated as: $\text{compressed MB written} / \text{total write time}$
R/W MB/sec	Throughput rate for the time spent actively reading and writing; idle time is excluded. Expressed in megabytes per second. Calculated as: $(\text{compressed MB read} + \text{compressed MB written}) / (\text{read time} + \text{write time})$
Read Mount Ratio	Ratio of read time to total mount time. Calculated as: $\text{read time} / \text{total mount time}$
Write Mount Ratio	Ratio of write time to total mount time. Calculated as: $\text{write time} / \text{total mount time}$
R/W Mount Ratio	Ratio of read and write time to total mount time. Displayed as a percentage. A value close to 1.0 indicates the drive is active over the entire mount. Calculated as: $(\text{read time} + \text{write time}) / \text{total mount time}$
Drive Media Maintenance Alert	Media in the drive requires physical maintenance, which must be corrected before the cartridge can be loaded successfully. For example, the leader may be pulled into the cartridge.
Repositioning cycles	Total times the media was repositioned for any reason
Repositioning cycles non ERP	Total times the media was repositioned due to non-ERP (error recovery process) reasons, such as data overrun or underrun.
Media at End of Warranty Alert	Media has reached the end of its warranty period and further use is not covered by warranty.

Additional Enterprise Exchange Errors

Information about errors that occurred during the exchange. Appears only if the exchange involved a StorageTek enterprise drive.

Attribute	Definition
Exchange FSC	Four-byte hexadecimal fault symptom code (FSC). For example, FD55, S053, etc. Reported only if an error occurred during the exchange.
Drive Load Limit Alert	Indicates whether the drive exceeded its lifetime limit of media loads at the time of the exchange. Possible values: Yes or No.
Media Load Limit Alert	Indicates whether the media has exceeded the recommended number of drive loads
Perm Read Errors	Number of permanent read errors
Perm Write Errors	Number of permanent write errors
Servo Perm Errors	Number of permanent servo errors
Unload Errors	Number of permanent unload errors
Usage Perm Errors	Number of unknown usage errors
Drive Dump Available	Drive dump is available
Drive Revision Down Level Alert	Drive is down-level for the media loaded
Drive Event Log Near Full	Drive event log is 75 percent or more full. This is an expected state, as the log is circular. If Oracle Service Delivery Platform (SDP) is installed, the logs are cleared.
Drive Load Alert	The media could not be loaded in the drive.
Media Snapped Alert	The media has snapped.
MIR Invalid Alert	The media directory is invalid, resulting in degraded file search performance.
Media RFID Alert	The media RFID was found to be open at load time, indicating the drive was powered off before the media was unloaded on the previous mount. Results in degraded media performance.
Media Permanent Error Alert	A permanent media error occurred while the media was mounted
Media Start of Data NOT Found	Start of customer data could not be found

Attribute	Definition
Drive Meters at High Speed	Total positioning meters of media passed through the drive heads at high speed over the drive's lifetime. Positioning meters occur during locate, rewind, and spacing operations.
Drive Meters of Head Contact	Total meters of media passed through the drive heads over the drive's lifetime

LTO Specific Information

Information specific to the LTO drive involved in the exchange. Appears only if the exchange involved an LTO drive.

Attribute	Definition
Media MB Capacity	Maximum media capacity, in megabytes. Note – Reported value varies by drive vendor and other factors.
Media MB Avail Pre	Unused media capacity, in megabytes; this value is provided before the beginning of the exchange. Note – Reported value varies by drive vendor and other factors.
Diagnostics Required Alert	A failure requiring diagnostics has occurred. Triggered by a tape alert 39.
Drive Lifetime Hours in Motion	Total hours the drive heads have been in motion over the life of the drive. Note – The drive lifetime may be longer than the time it has been monitored by STA.
Nearing Media Life Alert	The media is approaching the end of its expected useful life. Available for HP drives only.
IBM Drive Efficiency	Three-byte hexadecimal code indicating the drive's efficiency over its lifetime. Possible values are 01h (best) to FFh (worst); 00h indicates the efficiency is unknown. Available for IBM LTO4 and above drives only.
IBM Media Efficiency	Three-byte hexadecimal code indicating the media's efficiency over its lifetime. Possible values are 01h (best) to FFh (worst); 00h indicates the efficiency is unknown. Available for IBM LTO4 and above drives only.
HP Device Status	Four-byte hexadecimal code indicating the status of the drive. Available for HP drives only.
HP Media Status	Four-byte hexadecimal code indicating the status of the media. Available for HP media only.

Attribute	Definition
Media Length in Meters	Media length, in meters
Media Manufacturer Date	Date when the media was manufactured, in <code>yyyymmdd</code> format.
Media Auxiliary Memory Capacity	Media's total auxiliary memory at the time of manufacture, in bytes
Cleaning Media Alert	Indicates that cleaning media has been loaded in the drive
Formatted Density Code	Supported density for the drive, as reported by the SCSI Report Density Support command.

Additional LTO Exchange Errors

Information about errors that occurred during the exchange. Appears only if the exchange involved an LTO drive.

Attribute	Definition
Lifetime Hours Incompatible	Total head-motion hours during which incompatible media was loaded over the lifetime of the drive.
Drive Voltage Alert	Drive voltage limit has been exceeded
Recover Mechanical Cart Failure Alert	A recoverable mechanical failure has occurred with the media. The media can still be ejected.
Drive Unload Prevented Alert	Drive unload was prevented; a manual or software unload was attempted while Prevent Medium Removal was in force.
Unrecoverable Unload Failure Alert	Media could not be unloaded
Media Eject Alert	The eject operation has failed.
FW download Failed Alert	Drive firmware download has failed
Forced Eject Alert	A manual or forced eject occurred while the drive was reading or writing.
Hardware A Alert	The drive has experienced a hardware fault from which it can recover through a reset.
Hardware B Alert	The drive has experienced a hardware fault from which it can recover through a power cycle. This alert is set if the tape drive fails its internal power-on self-tests and is cleared internally when the drive is powered off.
Drive Interface fault	An error has occurred in the drive interface
Media Directory Corrupt	The media directory on the tape media is corrupted, leading to degraded file search performance until the directory is rebuilt.
Invalid Cleaning Alert	Cleaning media is incompatible with the drive
Not Data Grade Alert	Media is not data-grade
Read Failure Alert	Read has failed
Read Only Alert	Media is read-only
Unsupported Format Alert	Media is an unsupported format
WORM Integrity Failure Alert	WORM data has failed the integrity check

Attribute	Definition
Write Failure Alert	The drive was unable to write data to the media. This alert is set for any unrecoverable write/positioning error, due to either faulty media or faulty drive hardware. The alert is cleared internally when the tape is ejected.
Write Protect Alert	Media is write-protected
WORM overwrite attempted	Attempt has been made to overwrite WORM data

(Drive) Cell Location

Location of the drive involved in the exchange.

Attribute	Definition
Drive Library Name	User-assigned name for the library. Assigned in the Settings – SNMP Connections screen.
Drive Library Serial Number	Library frame serial number. Note – This field links to the Libraries – Overview screen, detail view, which displays all available details for this library. See “ Libraries Overview Screen ”.
Drive Library Number	Unique ID assigned to the library.
Drive Rail Number	Rail number. For SL150, SL500, and SL3000 libraries, this value is always 1. For SL8500 libraries, possible values are 1, 2, 3, or 4.

Attribute	Definition
Drive Physical Address	<p>Library internal address for the drive.</p> <p>For SL150 libraries, the format is <i>m, p</i> (for example, <i>Module 1, Bottom Drive</i>), where:</p> <ul style="list-style-type: none"> • <i>m</i> = module number; 1–10, from top (base module) to bottom • <i>p</i> = position; <i>Top Drive</i> or <i>Bottom Drive</i> <p>For SL500 libraries, the format is <i>l, m, r, c</i> (for example, <i>0, 2, 2, 3</i>), where:</p> <ul style="list-style-type: none"> • <i>l</i> = for non-partitioned libraries, this is the library ID (always 0); for partitioned libraries, this is the partition ID (1–8). • <i>m</i> = module number; 1–5, from top to bottom of the rack • <i>r</i> = drive row number; 1–2 (Base Module) or 1–4 (Drive Expansion Module), from top to bottom of the module • <i>c</i> = column number; always 9 for drives <p>For SL3000 and SL8500 libraries, the format is <i>l, r, c, s, w</i>, where:</p> <ul style="list-style-type: none"> • <i>l</i> = library number. For non-partitioned libraries, this is the library ID; for partitioned libraries, this is the partition ID (1–8). • <i>r</i> = rail number. For SL3000 libraries, this is always “1”. For SL8500 libraries, this is the rail number (1–4). • <i>c</i> = column number. • <i>s</i> = side number. • <i>w</i> = row number.

Attribute	Definition
Drive HLI Address	<p data-bbox="483 260 1419 352">Host Library Interface (HLI) address of the location. Applies only to drives or storage cells in HLI partitions or libraries. This address is assigned by the ACSLS or ELS host software.</p> <p data-bbox="597 373 1292 466">Note – Available only for SL8500 libraries with firmware FRS_7.80 or higher or SL3000 libraries with firmware FRS_4.0 or higher. For all others, the value is left blank.</p> <p data-bbox="483 487 1019 520">For storage cells, format is <i>l, p, w, c</i>, where:</p> <ul data-bbox="487 537 1416 718" style="list-style-type: none"> • <i>l</i> = logical storage manager (LSM) number. Possible values are 0, 1, 2, or 3. • <i>p</i> = panel number. • <i>w</i> = row number. • <i>c</i> = column number. <p data-bbox="483 739 915 772">For drives, format is <i>l, p, t</i>, where:</p> <ul data-bbox="487 789 1416 924" style="list-style-type: none"> • <i>l</i> = logical storage manager (LSM) number. Possible values are 0, 1, 2, or 3. • <i>p</i> = panel number • <i>t</i> = transport number
Drive SCSI Element ID	SCSI element ID of the location. Applies only to drives or storage cells in SCSI partitions or libraries; for all others, the value is "0".

(Media) Source Cell Location

Location of the media at the start of the exchange; the location immediately before the mount. Can be a storage cell or drive.

Attribute	Definition
Source Library Number	Unique ID assigned to the library.
Source Rail Number	Rail number. For SL150, SL500, and SL3000 libraries, this value is always 1. For SL8500 libraries, possible values are 1, 2, 3, or 4.
Source Physical Address	<p>Library internal address.</p> <p>For SL150 libraries, the format is <i>m, s, w, c</i> (for example, <i>1, Left, 1, 2</i>), where:</p> <ul style="list-style-type: none"> <i>m</i> = module number; 1–10, from top (base module) to bottom <i>s</i> = side; <i>Left</i> or <i>Right</i> <i>w</i> = row number; 1–3, from top to bottom <i>c</i> = column number; 1–5, from front to back <p>For SL500 libraries, the format is <i>l, m, r, c</i> (for example, <i>0, 2, 2, 3</i>), where:</p> <ul style="list-style-type: none"> <i>l</i> = for non-partitioned libraries, this is the library ID (always 0); for partitioned libraries, this is the partition ID (1–8). <i>m</i> = module number; 1–5, from top to bottom of the rack <i>r</i> = drive row number; 1–2 (Base Module) or 1–4 (Drive Expansion Module), from top to bottom of the module <i>c</i> = column number; always 9 for drives <p>For SL3000 and SL8500 libraries, the format is <i>l, r, c, s, w</i> (for example, <i>1, 1, 2, 2, 3</i>), where:</p> <ul style="list-style-type: none"> <i>l</i> = library number. For non-partitioned libraries, this is the library ID; for partitioned libraries, this is the partition ID (1–8). <i>r</i> = rail number. For SL3000 libraries, this value is always 1. For SL8500 libraries, possible values are 1, 2, 3, or 4. <i>c</i> = column number. <i>s</i> = side number. <i>w</i> = row number.

Attribute	Definition
Source HLI Address	<p>Host Library Interface (HLI) address of the location. Applies only to drives or storage cells in HLI partitions or libraries. This address is assigned by the ACSLS or ELS host software.</p> <p>Note – Available only for SL8500 libraries with firmware FRS_7.80 or higher or SL3000 libraries with firmware FRS_4.0 or higher. For all others, the value is left blank.</p> <p>For storage cells, format is <i>l, p, w, c</i>, where:</p> <ul style="list-style-type: none"> • <i>l</i> = logical storage manager (LSM) number. Possible values are 0, 1, 2, or 3. • <i>p</i> = panel number. • <i>w</i> = row number. • <i>c</i> = column number. <p>For drives, format is <i>l, p, t</i>, where:</p> <ul style="list-style-type: none"> • <i>l</i> = logical storage manager (LSM) number. Possible values are 0, 1, 2, or 3. • <i>p</i> = panel number • <i>t</i> = transport number
Source SCSI Element ID	<p>SCSI element ID of the location. Applies only to drives or storage cells in SCSI partitions or libraries; for all others, the value is "0".</p>

(Media) Destination Cell Location

Location of the media at the completion of the exchange; the first location of the media immediately after the dismount. Can be a storage cell or drive.

Attribute	Definition
Destination Library Number	Unique ID assigned to the library.
Destination Rail Number	Rail number. For SL150, SL500, and SL3000 libraries, this value is always 1. For SL8500 libraries, possible values are 1, 2, 3, or 4.
Destination Physical Address	<p>Library internal address.</p> <p>For SL150 libraries, the format is <i>m, s, w, c</i> (for example, <i>1, Left, 1, 2</i>), where:</p> <ul style="list-style-type: none"> <i>m</i> = module number; 1–10, from top (base module) to bottom <i>s</i> = side; <i>Left</i> or <i>Right</i> <i>w</i> = row number; 1–3, from top to bottom <i>c</i> = column number; 1–5, from front to back <p>For SL500 libraries, the format is <i>l, m, r, c</i> (for example, <i>0, 2, 2, 3</i>), where:</p> <ul style="list-style-type: none"> <i>l</i> = for non-partitioned libraries, this is the library ID (always 0); for partitioned libraries, this is the partition ID (1–8). <i>m</i> = module number; 1–5, from top to bottom of the rack <i>r</i> = drive row number; 1–2 (Base Module) or 1–4 (Drive Expansion Module), from top to bottom of the module <i>c</i> = column number; always 9 for drives <p>For SL3000 and SL8500 libraries, the format is <i>l, r, c, s, w</i> (for example, <i>1, 1, 2, 2, 3</i>), where:</p> <ul style="list-style-type: none"> <i>l</i> = library number. For non-partitioned libraries, this is the library ID; for partitioned libraries, this is the partition ID (1–8). <i>r</i> = rail number. For SL3000 libraries, this value is always 1. For SL8500 libraries, possible values are 1, 2, 3, or 4. <i>c</i> = column number. <i>s</i> = side number. <i>w</i> = row number.

Attribute	Definition
Destination HLI Address	<p>Host Library Interface (HLI) address of the location. Applies only to drives or storage cells in HLI partitions or libraries. This address is assigned by the ACSLS or ELS host software.</p> <p>Note – Available only for SL8500 libraries with firmware FRS_7.80 or higher or SL3000 libraries with firmware FRS_4.0 or higher. For all others, the value is left blank.</p> <p>For storage cells, format is <i>l, p, w, c</i>, where:</p> <ul style="list-style-type: none"> • <i>l</i> = logical storage manager (LSM) number. Possible values are 0, 1, 2, or 3. • <i>p</i> = panel number. • <i>w</i> = row number. • <i>c</i> = column number. <p>For drives, format is <i>l, p, t</i>, where:</p> <ul style="list-style-type: none"> • <i>l</i> = logical storage manager (LSM) number. Possible values are 0, 1, 2, or 3. • <i>p</i> = panel number • <i>t</i> = transport number
Destination SCSI Element ID	<p>SCSI element ID of the location. Applies only to drives or storage cells in SCSI partitions or libraries; for all others, the value is "0".</p>

Drives Overview and Analysis Screens

This section includes the following information:

- [“Drives Detail Views” on page 118](#)
- [“Drive Attribute Definitions” on page 121](#)
 - [“Title” on page 122](#)
 - [“Drive” on page 123](#)
 - [“Media” on page 127](#)
 - [“Most Recent Exchange” on page 129](#)
 - [“Drive Activity Counts \(Last 30 Days\)” on page 132](#)
 - [“Additional Exchange Information for Enterprise Drives” on page 134](#)
 - [“Additional Exchange Information for LTO Drives” on page 136](#)
 - [“Drive Location” on page 137](#)
 - [“Library Complex” on page 140](#)

Drives Detail Views

The Detail View on the **Drives – Overview** screen shows all available attributes related to drives. There is one view for StorageTek enterprise drives and a slightly different view for LTO drives.

Detail for Enterprise Drives

Details for Drive 576004000812

Monitored since 2012-10-05 14:44

Drive

Drive Serial Number : **576004000812**
 Drive WWNN : **50:01:04:F0:00:8B:03:80**
 Drive Type : **T10000c-Enc**
 Drive Health Indicator : **USE**
 Last Drive Notification : **UNKNOWN**
 Drive ID : **5**
 Drive WWPN (Port A) : **50:01:04:F0:00:8B:03:81**
 Drive WWPN (Port B) :
 Drive Model : **T10000C**
 Drive Manufacturer : **STK**
 Encryption Capable : **Yes**
 Drive Interface : **FIBRE**
 Drive Properties Updated : **2012-10-08 04:47:10**
 Drive Firmware Version : **1.53.316-5.30**
 STA Start Tracking : **2012-10-05 14:44:35**
 STA Stop Tracking :

Media

Volume Serial Number(VSN) : **TTC155**
 Media Manufacturer Serial Number : **81021003001601**
 Media Health Indicator : **USE**
 WORM/VolSafe Media : **No**
 Cleaning Media : **No**

Most Recent Exchange

Exchange Start : **2012-10-08 10:06:55**
 Exchange Elapsed Time : **0:04:33**
 Exchange Mount Time : **0:04:09**
 Mount R/W MB/sec : **1.62**
 Exchange Recording Technique : **T10000C**
 :
 Drive Exchange Status : **GOOD**
 Data Compression Ratio : **1.55 : 1**
 Drive Load Limit Alert : **No**
 Exchange Drive Suspicion : **0.00%**
 Exchange Drive Cleaning Required : **No**
 MB Between 2 Most Recent Cleans :
 MB since Last Clean : **321,571.00**
 Drive Lifetime Cleans : **2**
 Drive Lifetime Loads : **15,592**
 Drive Lifetime Meters : **22,334,455**
 Drive Lifetime Power Hours : **7,764**

Drive Activity Counts (Last 30 Days)

% Drive Utilization : **68.65%**
 Drive Dismounts : **604**
 Drive SNMP Trap Count : **0**
 Drive Errors : **0**
 Cleans : **0**
 MB Read : **161,572.00**
 MB Write : **159,588.00**
 MB R/W : **321,160.00**
 MB Sent : **249,118.33**
 MB Received : **247,872.02**
 Mount Read MB/sec : **0.72**
 Mount Write MB/sec : **0.71**
 Mount R/W MB/sec : **1.43**
 Avg Mount Read MB : **267.50**
 Avg Mount Write MB : **264.22**
 Avg Mount R/W MB : **531.72**

Additional Exchange Information for Enterprise Drives

Exchange FSC :
 Exchange Write Inefficient : **No**
 Exchange Read Marginal :
 Exchange Write Efficiency : **97.80%**
 Exchange Read Margin : **93.70%**
 Time Spent Reading : **0:00:00**
 Time Spent Writing : **0:00:11**
 Time Spent Reading or Writing :
 :
 Read MB/sec :
 Write MB/sec :
 R/W MB/sec :
 Read Mount Ratio :
 Write Mount Ratio :
 R/W Mount Ratio :
 Exchange Encryption Used : **Encrypted Sun KMS**

Drive Location

Drive Library Name : **tl1b**
 Drive Library Serial Number : **516000100534**
 :
 Drive Library Number : **1**
 Drive Rail Number : **2**
 Drive Physical Address : **1,2,2,1,3**
 Drive HLI Address : **1,1,14,0**
 Drive Cell SCSI Element ID : **0**

Library Complex

Library Complex Name : **SL8500_14**
 Library Model : **SL8500**
 Partition Type : **HLI**
 Partition Name : **SL8500_14:HLI:0**
 Partition Number : **0**

Detail for LTO Drives

Details for Drive 1168001956
Monitored since 2012-10-05 15

Drive

Drive Serial Number : **1168001956**
 Drive WWNN : **50:01:04:F0:00:AC:BE:61**
 Drive Type : **IbmUltrium5**
 Drive Health Indicator : **MONITOR**
 Last Drive Notification : **UNKNOWN**
 Drive ID : **8**
 Drive WWPN (Port A) : **50:01:04:F0:00:AC:BE:62**
 Drive WWPN (Port B) :
 Drive Model : **LTO5**
 Drive Manufacturer : **IBM**
 Encryption Capable : **Yes**
 Drive Interface : **FIBRE**
 Drive Properties Updated : **2012-10-08 04:48:30**
 Drive Firmware Version : **BBNH**
 STA Start Tracking : **2012-10-05 15:55:37**
 STA Stop Tracking :

Media

Volume Serial Number(VSN) : **LT4068**
 Media Manufacturer Serial Number :
 Media Health Indicator : **MONITOR**
 WORM/VolSafe Media : **No**
 Cleaning Media : **No**

Most Recent Exchange

Exchange Start : **2012-10-05 19:25:44**
 Exchange Elapsed Time : **0:03:59**
 Exchange Mount Time : **0:03:19**
 Mount R/W MB/sec : **0.00**
 Exchange Recording Technique :
 Drive Exchange Status : **CART_MEM_FAILURE**
 Data Compression Ratio :
 Drive Load Limit Alert :
 Exchange Drive Suspicion : **25.00%**
 Exchange Drive Cleaning Required : **No**
 MB Between 2 Most Recent Cleans :
 MB since Last Clean : **54,610.82**
 Drive Lifetime Cleans : **3**
 Drive Lifetime Loads : **14,916**
 Drive Lifetime Meters : **4,377,832**
 Drive Lifetime Power Hours : **21,023**

Additional Exchange Information for LTO Drives

Diagnostics Required Alert : **No**
 Drive Lifetime Hours in Motion : **203**
 :
 IBM Drive Efficiency : **0x3F**
 IBM Media Efficiency : **0x17**
 HP Device Status :

Drive Activity Counts (Last 30 Days)

% Drive Utilization : **1.69%**
 Drive Dismounts : **28**
 Drive SNMP Trap Count : **0**
 Drive Errors : **1**
 Cleans : **0**
 MB Read : **27,305.41**
 MB Write : **27,305.41**
 MB R/W : **54,610.82**
 MB Sent : **54,013.50**
 MB Received : **54,013.50**
 Mount Read MB/sec : **5.30**
 Mount Write MB/sec : **5.30**
 Mount R/W MB/sec : **10.61**
 Avg Mount Read MB : **975.19**
 Avg Mount Write MB : **975.19**
 Avg Mount R/W MB : **1,950.39**

Drive Location

Drive Library Name : **crimson11**
 Drive Library Serial Number : **571000200060**
 Drive Library Number : **1**
 Drive Rail Number : **1**
 Drive Physical Address : **1,1,2,1,4**
 Drive HLI Address :
 Drive Cell SCSI Element ID : **1,013**

Library Complex

Library Complex Name : **SL3000_571000200060**
 Library Model : **SL3000**
 Partition Type : **SCSI**
 Partition Name : **SL3000_571000200060:SCSI:0**
 Partition Number : **0**

Drive Attribute Definitions

The drive attributes are organized into the following sections.

- [“Title” on page 122](#)
- [“Drive” on page 123](#)
- [“Media” on page 127](#)
- [“Most Recent Exchange” on page 129](#)
- [“Drive Activity Counts \(Last 30 Days\)” on page 132](#)
- [“Additional Exchange Information for Enterprise Drives” on page 134](#)
- [“Additional Exchange Information for LTO Drives” on page 136](#)
- [“Drive Location” on page 137](#)
- [“Library Complex” on page 140](#)

Title

Values for these attributes are assigned when STA first starts tracking the drive.

Attribute	Definition
Drive	Electronic serial number of the drive. *NO-SERIAL* indicates it is not known. Note – This field links to the Drives – Overview screen, detail view, which displays all available details for this drive. See “ Drives Overview and Analysis Screens ”.
Monitored since	Date and time when STA started tracking this resource (library, complex, drive, or media).

Drive

Information about the drive properties.

Attribute	Definition
Drive Serial Number	<p>Electronic serial number of the drive. *NO-SERIAL* indicates it is not known.</p> <p>Note – This field links to the Drives – Overview screen, detail view, which displays all available details for this drive. See “Drives Overview and Analysis Screens”.</p>
Drive WWNN	World Wide Node Name for the drive slot.
Drive Type	<p>Drive type long description sent by the library. For example, T10000c-Enc, HpUltrium4, etc. UNKNOWN indicates a broken drive or a drive for which STA cannot determine the type.</p> <p>Note – Type is UNKNOWN for all DLT and SDLT drives, for which STA does not compute health.</p>

Attribute	Definition
Drive Health Indicator	<p>Drive health. This is a point-in-time value computed by STA analytics based on data gathered from the drive during current and past exchanges. It reflects a variety of factors, such as the drive's error history, read margin, and write efficiency.</p> <p>This value includes all data up to and including the last completed exchange. It is updated immediately after each completed exchange involving the drive.</p> <p>Possible values, in order of degrading health:</p> <ul style="list-style-type: none"> • USE – The drive has had no failures or degradation in the last ten exchanges. • MONITOR – The drive has had multiple errors; there is a less than 80 percent chance that it needs service. • EVALUATE – The drive has had multiple errors; there is a greater than 80 percent chance that it needs service. • ACTION – The drive has had an error that requires attention. The drive may require service. You should investigate and determine a proper course of action. • UNKNOWN – STA has not received enough data to compute health for the drive. This may be due to a variety of factors, including an unsupported drive model, downlevel drive firmware, or ADI mode not enabled for an LTO drive. <p>Note – STA only receives information about errors detected by a drive while performing read/write activity to a cartridge. STA does not receive information about errors that may occur in the data path or the host application.</p> <p>Note – Cleaning exchanges have a neutral impact on drive health.</p>
Last Drive Notification	<p>Health of the library drive control path. Updated whenever notifications for the drive are received by STA from the library. Possible values:</p> <ul style="list-style-type: none"> • DEGRADED – The drive is offline. Also may indicate the drive is in need of cleaning (applies only to SL3000 and SL8500 libraries with the drive cleaning warning set to "on"). • NORMAL – The drive is functioning normally. • NOTOPERATIVE – The library has lost communication with the drive, or the drive has experienced an error or mechanical failure. • UNKNOWN – STA has not received any notifications for the drive. This is the default value until the first notification is received for the drive.

Attribute	Definition
Drive ID	Library drive bay where the drive is located.
Drive WWPN (Port A)	World Wide Port Name for drive port A. This is automatically generated by the library controller during library initialization.
Drive WWPN (Port B)	World Wide Port Name for drive port B. This is automatically generated by the library controller during library initialization.
Drive Model	<p>Drive model short description. For example, T10000C, LTO4, etc. UNKNOWN indicates a broken drive or a drive for which STA cannot determine the type.</p> <p>Note – Type is UNKNOWN for all DLT and SDLT drives, for which STA does not compute health.</p>
Drive Manufacturer	<p>Drive manufacturer.</p> <p>For example, STK, IBM, QUANTUM, etc.</p>
Encryption Capable	<p>Indicates whether the drive is capable of supporting encryption, but does not necessarily indicate that encryption has been enabled. Possible values are Yes or No.</p> <p>Note – Additional hardware or software components may be necessary to actually enable encryption on the drive. For example HP LTO4 drives require a Deoni card and IBM LTO4 drives require a Belisarius card.</p>
Drive Interface	<p>Host interface type for the drive. Possible values:</p> <ul style="list-style-type: none"> • SAS – Serial Attached SCSI • SCSI – Small Computer System Interface • FIBRE – Fibre channel • UNKNOWN – The library did not report the interface type.
Drive Properties Updated	Date and time when the drive properties were last updated. Initially set to the date and time when STA first recognized the drive, and updated whenever subsequent updates occur, such as updating the drive firmware.
Drive Firmware Version	Drive firmware and host interface level. See the <i>STA Planning and Installation Guide</i> for details on whether this firmware version supports rich data for STA.

Attribute	Definition
STA Start Tracking	Date and time when STA first began tracking this drive serial number.
STA Stop Tracking	Date and time when STA stopped tracking this drive serial number. This is when STA determined the drive serial number no longer exists in any of the monitored libraries and updated the drive status from “missing” to “removed”.

Media

Details about the media used in the drive's most recent exchange that occurred during or before this aggregation period.

Attribute	Definition
Volume Serial Number (VSN)	<p>Volume serial number (VSN or volser) assigned to the media by its external label. If the library does not supply the volser, STA provides one composed of Library Serial Number : Physical Address.</p> <p>Note – This field links to the Media – Overview screen, detail view, which displays all available detail for this media. See “Media Overview and Analysis Screens”.</p>
Media Manufacturer Serial Number	<p>Media serial number assigned by the manufacturer.</p> <p>Note – STA does not have this information until the media has been mounted in a drive.</p>
Media Health Indicator	<p>Media health. This is a point-in-time value computed by STA analytics. It reflects a variety of factors, such as the media's error history, read margin, and write efficiency.</p> <p>This value includes all data up to and including the last completed exchange. It is updated immediately after each completed exchange involving this media.</p> <p>Possible values, in order of degrading health:</p> <ul style="list-style-type: none"> • USE – The media has had no failures or degradation in the last ten exchanges. • MONITOR – The media has had multiple errors; there is a less than 80 percent chance that it needs service. • EVALUATE – The media has had multiple errors; there is a greater than 80 percent chance that it needs service. • ACTION – The media has had an error that requires service. • UNKNOWN – STA has not received enough data to compute health for the media. This may be due to a variety of factors, including exchanges on unsupported drive models, drives with downlevel firmware, or LTO drives with ADI mode not enabled. <p>Note – STA only receives information about errors detected by a drive while performing read/write activity to the media. STA does not receive information about errors that may occur in the data path or host applications.</p>

Attribute	Definition
WORM/VolSafe Media	Indicates whether the media uses StorageTek VolSafe technology. STA does not know the status until the media has been mounted. Possible values: Yes or No. Blank indicates unknown.
Cleaning Media	<p>Indicates whether this is a cleaning media, as determined by the media domain and type. Possible values: Yes or No.</p> <p>Note – Not all cleaning media have a volser starting with “CLN”.</p>

Most Recent Exchange

Details about the drive's most recent exchange that occurred during or before this aggregation period.

Attribute	Definition
Exchange Start	<p>Date and time when the drive was reserved for the exchange or cleaning operation.</p> <p>Note – This field links to the Libraries – Exchanges screen, detail view, which displays all available detail for this exchange. See “Exchanges Screen”.</p>
Exchange Elapsed Time	<p>Total time the drive was reserved for the exchange. Starts at the beginning of the mount move and ends at the completion of the dismount move. Includes total mount time plus total transit time immediately before and after the mount. Displayed in hh:mm:ss format.</p>
Exchange Mount Time	<p>Total time the media was mounted in the drive. Includes the total time between the start of the mount and the start of the dismount. Does not include transit time before and after the mount. Displayed in hh:mm:ss format. If this attribute is blank, then it is likely that STA did not receive all the exchange data from the library.</p>
Mount R/W MB/sec	<p>Average throughput rate for the drive, in megabytes per second. Calculated as:</p> $\text{total MB (read + written) / total seconds mount time}$ <p>Note – This value may be affected by a variety of factors external to the drive, such as robot speed or application behavior—for example, some applications do not dismount media immediately upon completion of read/write operations, causing the drive to be idle for much of the mount. As a result, this value is not likely to represent the drive's maximum potential throughput rate.</p>
Exchange Recording Technique	<p>Recording method used by the drive during the exchange.</p>

Attribute	Definition
Drive Exchange Status	<p>Status of the drive upon completion of the exchange, as derived from a variety of factors, including drive errors, write efficiency, and read margin. Possible values:</p> <ul style="list-style-type: none"> • CART_MEM_FAILURE • CLEAN_REQ – The drive is due for cleaning. • DRIVE_ERROR • EXPIRED_CLEAN_TAPE • FAILED_MOUNT • FW_DOWN_LEVEL • GOOD • INCOMPLETE_UNLOAD – The application requested that the media be unloaded. The tape drive has detected data still in its buffer and has asked for confirmation from the application. • INSUFFICIENT_DATA(NULL) – STA has not received enough exchange data from the library to calculate drive health. It may be that the drive is not supported (LTO 2, for example) or the library firmware is downlevel. • LOAD_ERROR • LTO_NON_ADI_MODE – ADI mode has not been enabled on either the library, the drive, or both. • MEDIA_ERROR • NON_DRV_ERROR – This is neither a drive nor a media problem, so there is no effect on the suspicion of drive or media. • OTHER_ERROR • PERM_ERROR • READ_ERROR • WRITE_ERROR • UNKNOWN • UNLOAD_ERROR
Data Compression Ratio	<p>Compression ratio for the exchange. Displayed as a ratio of total compressed data read or written by the drive, to total uncompressed data sent or received by the drive.</p>
Drive Load Limit Alert	<p>Indicates whether the drive exceeded its lifetime limit of media loads at the time of the exchange. Possible values: Yes or No.</p>

Attribute	Definition
Exchange Drive Suspicion	Calculated suspicion level for the drive. The higher the number, the higher the probability that this drive needs attention.
Exchange Drive Cleaning Required	Indicates whether the drive needed cleaning at the time of the exchange. Possible values: Yes or No. Note – Additional detail may be available via the Clean Periodic Alert and Clean Now Alert attributes.
MB Between 2 Most Recent Cleans	Total megabytes read and written by the drive between the two most recent cleanings.
MB since Last Clean	Total megabytes read and written by the drive since its last cleaning.
Drive Lifetime Cleans	Total cleans performed on the drive over its lifetime. Note – The drive lifetime may be longer than the time it has been monitored by STA.
Drive Lifetime Loads	Total media loads for the drive over its lifetime. Available for all drive types but LTO3. Note – The drive lifetime may be longer than the amount of time it has been monitored by STA.
Drive Lifetime Meters	Total meters of tape that have passed through the drive heads over the drive's lifetime. Available for all drive types but LTO3. Note – The drive lifetime may be longer than the amount of time it has been monitored by STA.
Drive Lifetime Power Hours	Total hours the drive has been powered on over its lifetime. Note – The drive lifetime may be longer than the amount of time it has been monitored by STA.

Drive Activity Counts (Last 30 Days)

Total activity counts for the drive over the last 30 days. These values are updated with each completed exchange involving the drive.

Attribute	Definition
% Drive Utilization (30 Days)	Percentage of time the drive was occupied. Does not include time the drive was not available because of application reservation or library positioning.
Drive Dismounts (30 Days)	<p>Total number of times media have been unloaded from this drive.</p> <p>Note – This field links to the Libraries – Exchanges screen, list view, which lists this drive’s exchanges. See “Exchanges Screen” on page 81.</p>
Drive SNMP Trap Count (30 Days)	<p>Total drive notifications received from the library over the last 30 days. A sudden increase in this number indicates a condition that should be investigated.</p> <p>Note – This field links to the Notifications – Overview screen, list view, which lists SNMP traps for this drive. See “SNMP Notifications Screen” on page 173.</p>
Drive Errors (30 Days)	<p>Total drive errors recorded.</p> <p>Note – This field links to the Libraries – Exchanges screen, list view, which lists this drive’s exchanges with errors. See “Exchanges Screen” on page 81.</p>
Cleans (30 Days)	<p>Total cleaning operations performed.</p> <p>Note – This field links to the Drives – Cleaning Activities screen, list view, which lists this drive’s cleaning activities. See “Cleaning Activities Screen” on page 141.</p>
MB Read (30 Days)	Total megabytes read by the drive.
MB Write (30 Days)	Total megabytes written by the drive.
MB R/W (30 Days)	Total megabytes read and written by the drive.
MB Sent (30 Days)	Total megabytes sent by the drive to hosts during read operations. This could be compressed or uncompressed megabytes, depending on whether compression has been enabled on the drive.
MB Received (30 Days)	Total megabytes received by the drive from hosts during write operations. This could be compressed or uncompressed megabytes, depending on the host application.

Attribute	Definition
Mount Read MB/sec (30 Days)	<p>Average read rate for the drive, in megabytes per second. Calculated as:</p> $\text{total MB read} / \text{total seconds mount time}$ <p>Note – This value may be affected by a variety of factors external to the drive, such as robot speed or application behavior—for example, some applications do not dismount media immediately upon completion of read/write operations, causing the drive to be idle for much of the mount. As a result, this value is not likely to represent the drive’s maximum potential read rate.</p>
Mount Write MB/sec (30 Days)	<p>Average write rate for the drive, in megabytes per second. Calculated as:</p> $\text{total MB written} / \text{total seconds mount time}$ <p>Note – This value may be affected by a variety of factors external to the drive, such as robot speed or application behavior—for example, some applications do not dismount media immediately upon completion of read/write operations, causing the drive to be idle for much of the mount. As a result, this value is not likely to represent the drive’s maximum potential write rate.</p>
Mount R/W MB/sec (30 Days)	<p>Average throughput rate for the drive, in megabytes per second. Calculated as:</p> $\text{total MB (read + written)} / \text{total seconds mount time}$ <p>Note – This value may be affected by a variety of factors external to the drive, such as robot speed or application behavior—for example, some applications do not dismount media immediately upon completion of read/write operations, causing the drive to be idle for much of the mount. As a result, this value is not likely to represent the drive’s maximum potential throughput rate.</p>
Avg Mount Read MB (30 Days)	<p>Average megabytes read by the drive per mount. Calculated as:</p> $\text{total MB read} / \text{total completed exchanges}$
Avg Mount Write MB (30 Days)	<p>Average megabytes written by the drive per mount. Calculated as:</p> $\text{total MB written} / \text{total completed exchanges}$
Avg Mount R/W MB (30 Days)	<p>Average megabytes read and written by the drive per mount. Calculated as:</p> $\text{total MB (read + written)} / \text{total completed exchanges}$

Additional Exchange Information for Enterprise Drives

Additional details about the drive's most recent exchange. This section appears only for StorageTek enterprise drives, such as 9840D or T10000C.

Attribute	Definition
Exchange FSC	Four-byte hexadecimal fault symptom code (FSC). For example, FD55, S053, etc. Reported only if an error occurred during the exchange.
Exchange Write Inefficient	Indicates whether the drive failed to meet the write efficiency standard for the drive type. Available only for StorageTek T10000A and above and IBM LTO3 and above drives. Possible values: Yes or No.
Exchange Read Marginal	Indicates whether the drive met the read margin standard for the drive type. Available only for StorageTek T10000A and above drives. Possible values: Yes or No.
Exchange Write Efficiency	Write efficiency for the exchange, based on capacity over distance. A high value is desirable.
Exchange Read Margin	<p>Amount of error correction code (ECC) read margin remaining on the media, as reported by the drive during the last mount. Reported as a percentage. A high value is desirable.</p> <p>If STA determines that this value has gone below a threshold for this drive type, the Exchange Read Marginal attribute is set to Yes.</p>
Time Spent Reading	Total time the drive spent reading data during the exchange
Time Spent Writing	Total time the drive spent writing data during the exchange
Time Spent Reading or Writing	Total time the drive spent reading and writing data during the exchange
Read MB/sec	<p>Read rate for the time spent actively reading; idle time is excluded. Expressed in megabytes per second. Calculated as:</p> $\text{compressed MB read} / \text{total read time}$
Write MB/sec	<p>Write rate for the time spent actively writing; idle time is excluded. Expressed in megabytes per second. Calculated as:</p> $\text{compressed MB written} / \text{total write time}$

Attribute	Definition
R/W MB/sec	Throughput rate for the time spent actively reading and writing; idle time is excluded. Expressed in megabytes per second. Calculated as: $\frac{(\text{compressed MB read} + \text{compressed MB written})}{(\text{read time} + \text{write time})}$
Read Mount Ratio	Ratio of read time to total mount time. Calculated as: $\text{read time} / \text{total mount time}$
Write Mount Ratio	Ratio of write time to total mount time. Calculated as: $\text{write time} / \text{total mount time}$
R/W Mount Ratio	Ratio of read and write time to total mount time. Displayed as a percentage. A value close to 1.0 indicates the drive is active over the entire mount. Calculated as: $(\text{read time} + \text{write time}) / \text{total mount time}$
Exchange Encryption Used	Encryption method used by the drive for the exchange. Available for StorageTek enterprise drives only. Possible values: <ul style="list-style-type: none"> • Encrypted_ANSI_10 – ANSI encryption. • Encrypted_Sun_KMS – Oracle Key Manager (OKM) encryption. • Not_Encrypted – Not encrypted. • Unknown – The drive did not report encryption information. • Blank (no value displayed) – STA did not receive any encryption information; the value is always blank for ADI/LTO exchanges.

Additional Exchange Information for LTO Drives

Additional details about the drive's most recent exchange. This section appears only for LTO drives.

Attribute	Definition
Diagnostics Required Alert	A failure requiring diagnostics has occurred. Triggered by a tape alert 39.
Drive Lifetime Hours in Motion	Total hours the drive heads have been in motion over the life of the drive. Note – The drive lifetime may be longer than the time it has been monitored by STA.
IBM Drive Efficiency	Three-byte hexadecimal code indicating the drive's efficiency over its lifetime. Possible values are 01h (best) to FFh (worst); 00h indicates the efficiency is unknown. Available for IBM LTO4 and above drives only.
IBM Media Efficiency	Three-byte hexadecimal code indicating the media's efficiency over its lifetime. Possible values are 01h (best) to FFh (worst); 00h indicates the efficiency is unknown. Available for IBM LTO4 and above drives only.
HP Device Status	Four-byte hexadecimal code indicating the status of the drive. Available for HP drives only.

Drive Location

Details about the location of the drive within the library. These attributes are updated whenever a library data collection is performed.

Attribute	Definition
Drive Library Name	User-assigned name for the library. Assigned in the Settings – SNMP Connections screen.
Drive Library Serial Number	Library frame serial number. Note – This field links to the Libraries – Overview screen, detail view, which displays all available details for this library. See “ Libraries Overview Screen ”.
Drive Library Number	Unique ID assigned to the library.
Drive Rail Number	Rail number. For SL150, SL500, and SL3000 libraries, this value is always 1. For SL8500 libraries, possible values are 1, 2, 3, or 4.

Attribute	Definition
Drive Physical Address	<p>Library internal address for the drive.</p> <p>For SL150 libraries, the format is <i>m, p</i> (for example, Module 1, Bottom Drive), where:</p> <ul style="list-style-type: none"> • <i>m</i> = module number; 1–10, from top (base module) to bottom • <i>p</i> = position; Top Drive or Bottom Drive <p>For SL500 libraries, the format is <i>l, m, r, c</i> (for example, 0, 2, 2, 3), where:</p> <ul style="list-style-type: none"> • <i>l</i> = for non-partitioned libraries, this is the library ID (always 0); for partitioned libraries, this is the partition ID (1–8). • <i>m</i> = module number; 1–5, from top to bottom of the rack • <i>r</i> = drive row number; 1–2 (Base Module) or 1–4 (Drive Expansion Module), from top to bottom of the module • <i>c</i> = column number; always 9 for drives <p>For SL3000 and SL8500 libraries, the format is <i>l, r, c, s, w</i>, where:</p> <ul style="list-style-type: none"> • <i>l</i> = library number. For non-partitioned libraries, this is the library ID; for partitioned libraries, this is the partition ID (1–8). • <i>r</i> = rail number. For SL3000 libraries, this is always “1”. For SL8500 libraries, this is the rail number (1–4). • <i>c</i> = column number. • <i>s</i> = side number. • <i>w</i> = row number.

Attribute	Definition
Drive HLI Address	<p>Host Library Interface (HLI) address of the location. Applies only to drives or storage cells in HLI partitions or libraries. This address is assigned by the ACSLS or ELS host software.</p> <p>Note – Available only for SL8500 libraries with firmware FRS_7.80 or higher or SL3000 libraries with firmware FRS_4.0 or higher. For all others, the value is left blank.</p> <p>For storage cells, format is <i>l, p, w, c</i>, where:</p> <ul style="list-style-type: none"> • <i>l</i> = logical storage manager (LSM) number. Possible values are 0, 1, 2, or 3. • <i>p</i> = panel number. • <i>w</i> = row number. • <i>c</i> = column number. <p>For drives, format is <i>l, p, t</i>, where:</p> <ul style="list-style-type: none"> • <i>l</i> = logical storage manager (LSM) number. Possible values are 0, 1, 2, or 3. • <i>p</i> = panel number • <i>t</i> = transport number
Drive Cell SCSI Element ID	<p>SCSI element ID of the location. Applies only to drives or storage cells in SCSI partitions or libraries; for all others, the value is "0".</p>

Library Complex

Information about the library complex where the drive is located, as of the last completed library data collection.

Attribute	Definition
Library Complex Name	<p>Name assigned to the complex by STA.</p> <ul style="list-style-type: none"> For SL150, SL500, and SL3000 libraries, this value is formatted as <i>library_model_library_serial_number</i>. Examples: SL150_262960B+1234BA0018, SL500_522000001839, SL3000_571000020075 For SL8500 libraries, this value is formatted as <i>library_model_complex_ID</i>. Examples: SL8500_1, SL8500_4 <p>This field links to the Libraries – Complexes Overview screen, detail view, which displays all available details about this complex. See “Library Complexes Screen”.</p>
Library Model	Library model number. Possible values: SL150, SL500, SL3000, or SL8500.
Partition Type	<p>Type of host-partition connection. Possible values:</p> <ul style="list-style-type: none"> HLI – HLI (Host Library Interface) protocol OTHER – System cells, used for storage of diagnostic cartridges. SCSI – SCSI protocol
Partition Name	Name assigned to the partition. In a non-partitioned library, this is system-assigned; in a partitioned library, this is user-assigned.
Partition Number	Unique partition ID. For non-partitioned libraries, the value is always “0”. For partitioned libraries, possible values are 1–8.

Cleaning Activities Screen

This section includes the following information:

- [“Cleaning Activities Detail View” on page 142](#)
- [“Cleaning Activity Attribute Definitions” on page 142](#)
 - [“Title” on page 143](#)
 - [“Drive” on page 144](#)
 - [“Cleaning Activity” on page 147](#)
 - [“Library” on page 150](#)

Cleaning Activities Detail View

The Detail View on the **Drives – Cleaning Activities** screen shows all available attributes related to drive cleaning exchanges.

Details about a drive clean		Recorded on 2012-07-12 23:36:21
Drive	Cleaning Activity	
Drive Type :	Clean Volume Serial Number(VSN) : CLN203	
Drive Serial Number :	Media Health Indicator : USE	
Drive WWNN :	MB Between 2 Most Recent Cleans :	
Drive ID :	Current Cleaning Uses : 13	
Drive WWPN (Port A) :	Maximum Cleaning Uses : 50	
Drive WWPN (Port B) :	Cleaning Media Expired : No	
Drive Health Indicator :	Exchange Start : 2012-07-12 23:36:21	
Exchange Drive Cleaning Required :	Exchange End : 2012-07-12 23:39:15	
Drive Lifetime Cleans :	Exchange Elapsed Time : 0:02:54	
Drive Lifetime Loads :	Exchange Mount Time : 0:00:11	
Drive Lifetime Meters :	Drive Exchange Status : GOOD	
Drive Start Tracking :	Exchange FSC :	
Drive Stop Tracking :		
Library		
Library Complex Name :	SL8500_1	
Library Name :	CIT-ucsl8500a01	
Library Model :	SL8500	
Library Serial Number :	516000201058	
Library WWNN :	50:01:04:F0:00:BB:14:E4	

Cleaning Activity Attribute Definitions

The attributes are organized into the following sections.

- “Title” on page 143
- “Drive” on page 144
- “Cleaning Activity” on page 147
- “Library” on page 150

Title

Values for these attributes are assigned when the cleaning action starts.

Attribute	Definition
Recorded on	Date and time when the cleaning action started.

Drive

Details about the drive involved in the cleaning action.

Attribute	Definition
Drive Type	<p>Drive type long description sent by the library. For example, T10000c-Enc, HpUltrium4, etc. UNKNOWN indicates a broken drive or a drive for which STA cannot determine the type.</p> <p>Note – Type is UNKNOWN for all DLT and SDLT drives, for which STA does not compute health.</p>
Drive Serial Number	<p>Electronic serial number of the drive. *NO-SERIAL* indicates it is not known.</p> <p>Note – This field links to the Drives – Overview screen, detail view, which displays all available details for this drive. See “Drives Overview and Analysis Screens”.</p>
Drive WWNN	World Wide Node Name for the drive slot.
Drive ID	Library drive bay where the drive is located.
Drive WWPN (Port A)	World Wide Port Name for drive port A. This is automatically generated by the library controller during library initialization.
Drive WWPN (Port B)	World Wide Port Name for drive port B. This is automatically generated by the library controller during library initialization.

Attribute	Definition
Drive Health Indicator	<p>Drive health. This is a point-in-time value computed by STA analytics based on data gathered from the drive during current and past exchanges. It reflects a variety of factors, such as the drive's error history, read margin, and write efficiency.</p> <p>This value includes all data up to and including the last completed exchange. It is updated immediately after each completed exchange involving the drive.</p> <p>Possible values, in order of degrading health:</p> <ul style="list-style-type: none"> • USE – The drive has had no failures or degradation in the last ten exchanges. • MONITOR – The drive has had multiple errors; there is a less than 80 percent chance that it needs service. • EVALUATE – The drive has had multiple errors; there is a greater than 80 percent chance that it needs service. • ACTION – The drive has had an error that requires attention. The drive may require service. You should investigate and determine a proper course of action. • UNKNOWN – STA has not received enough data to compute health for the drive. This may be due to a variety of factors, including an unsupported drive model, downlevel drive firmware, or ADI mode not enabled for an LTO drive. <p>Note – STA only receives information about errors detected by a drive while performing read/write activity to a cartridge. STA does not receive information about errors that may occur in the data path or the host application.</p> <p>Note – Cleaning exchanges have a neutral impact on drive health.</p>
Exchange Drive Cleaning Required	<p>Indicates whether the drive needed cleaning at the time of the exchange. Possible values: Yes or No.</p> <p>Note – Additional detail may be available via the Clean Periodic Alert and Clean Now Alert attributes.</p>
Drive Lifetime Cleans	<p>Total cleans performed on the drive over its lifetime.</p> <p>Note – The drive lifetime may be longer than the time it has been monitored by STA.</p>

Attribute	Definition
Drive Lifetime Loads	Total media loads for the drive over its lifetime. Available for all drive types but LTO3. Note – The drive lifetime may be longer than the amount of time it has been monitored by STA.
Drive Lifetime Meters	Total meters of tape that have passed through the drive heads over the drive's lifetime. Available for all drive types but LTO3. Note – The drive lifetime may be longer than the amount of time it has been monitored by STA.
Drive Start Tracking	Date and time when STA first began tracking this drive serial number.
Drive Stop Tracking	Date and time when STA stopped tracking this drive serial number. This is when STA determined the drive serial number no longer exists in any of the monitored libraries and updated the drive status from “missing” to “removed”.

Cleaning Activity

Details about the drive clean exchange.

Attribute	Definition
Clean Volume Serial Number (VSN)	<p>Volume serial number (VSN or volser) assigned to the media by its external label. If the library does not supply the volser, STA provides one composed of Library Serial Number : Physical Address.</p> <p>Note – This field links to the Media – Overview screen, detail view, which displays all available detail for this media. See “Media Overview and Analysis Screens”.</p>
Media Health Indicator	<p>Media health. This is a point-in-time value computed by STA analytics. It reflects a variety of factors, such as the media’s error history, read margin, and write efficiency.</p> <p>This value includes all data up to and including the last completed exchange. It is updated immediately after each completed exchange involving this media.</p> <p>Possible values, in order of degrading health:</p> <ul style="list-style-type: none"> • USE – The media has had no failures or degradation in the last ten exchanges. • MONITOR – The media has had multiple errors; there is a less than 80 percent chance that it needs service. • EVALUATE – The media has had multiple errors; there is a greater than 80 percent chance that it needs service. • ACTION – The media has had an error that requires service. • UNKNOWN – STA has not received enough data to compute health for the media. This may be due to a variety of factors, including exchanges on unsupported drive models, drives with downlevel firmware, or LTO drives with ADI mode not enabled. <p>Note – STA only receives information about errors detected by a drive while performing read/write activity to the media. STA does not receive information about errors that may occur in the data path or host applications.</p>
MB Between 2 Most Recent Cleans	Total megabytes read and written by the drive between the two most recent cleanings.
Current Cleaning Uses	Total number of times the cleaning media has been mounted in a drive since STA began monitoring the media.

Attribute	Definition
Maximum Cleaning Uses	<p>Manufacturer's recommended usage limit for the cleaning media.</p> <p>Note – Not available for all media and drive types. This value may show as “0” or blank, which should be interpreted as not available or unknown.</p>
Cleaning Media Expired	The drive firmware has determined that the cleaning media has already been used the maximum number of times and cannot be used for this cleaning exchange.
Exchange Start	<p>Date and time when the drive was reserved for the exchange or cleaning operation.</p> <p>Note – This field links to the Libraries – Exchanges screen, detail view, which displays all available detail for this exchange. See “Exchanges Screen”.</p>
Exchange End	Date and time when the exchange completed
Exchange Elapsed Time	Total time the drive was reserved for the exchange. Starts at the beginning of the mount move and ends at the completion of the dismount move. Includes total mount time plus total transit time immediately before and after the mount. Displayed in hh:mm:ss format.
Exchange Mount Time	Total time the media was mounted in the drive. Includes the total time between the start of the mount and the start of the dismount. Does not include transit time before and after the mount. Displayed in hh:mm:ss format. If this attribute is blank, then it is likely that STA did not receive all the exchange data from the library.

Attribute	Definition
Drive Exchange Status	<p>Status of the drive upon completion of the exchange, as derived from a variety of factors, including drive errors, write efficiency, and read margin. Possible values:</p> <ul style="list-style-type: none"> CART_MEM_FAILURE CLEAN_REQ – The drive is due for cleaning. DRIVE_ERROR EXPIRED_CLEAN_TAPE FAILED_MOUNT FW_DOWN_LEVEL GOOD INCOMPLETE_UNLOAD – The application requested that the media be unloaded. The tape drive has detected data still in its buffer and has asked for confirmation from the application. INSUFFICIENT_DATA(NULL) – STA has not received enough exchange data from the library to calculate drive health. It may be that the drive is not supported (LTO 2, for example) or the library firmware is downlevel. LOAD_ERROR LTO_NON_ADI_MODE – ADI mode has not been enabled on either the library, the drive, or both. MEDIA_ERROR NON_DRV_ERROR – This is neither a drive nor a media problem, so there is no effect on the suspicion of drive or media. OTHER_ERROR PERM_ERROR READ_ERROR WRITE_ERROR UNKNOWN UNLOAD_ERROR
Exchange FSC	<p>Four-byte hexadecimal fault symptom code (FSC). For example, FD55, S053, etc. Reported only if an error occurred during the exchange.</p>

Library

Details about the library where the drive clean took place.

Attribute	Definition
Library Complex Name	<p>Name assigned to the complex by STA.</p> <ul style="list-style-type: none"> For SL150, SL500, and SL3000 libraries, this value is formatted as <i>library_model_library_serial_number</i>. Examples: SL150_262960B+1234BA0018, SL500_522000001839, SL3000_571000020075 For SL8500 libraries, this value is formatted as <i>library_model_complex_ID</i>. Examples: SL8500_1, SL8500_4 <p>This field links to the Libraries – Complexes Overview screen, detail view, which displays all available details about this complex. See “Library Complexes Screen”.</p>
Library Name	User-assigned name for the library. Assigned in the Settings – SNMP Connections screen.
Library Model	Library model number. Possible values: SL150, SL500, SL3000, or SL8500.
Library Serial Number	<p>Library frame serial number.</p> <p>Note – This field links to the Libraries – Overview screen, detail view, which displays all available details for this library. See “Libraries Overview Screen”.</p>
Library WWNN	Library World Wide Node Name.

Media Overview and Analysis Screens

This section includes the following information:

- [“Media Detail Views” on page 152](#)
- [“Media Attribute Definitions” on page 154](#)
 - [“Title” on page 155](#)
 - [“Media Details” on page 156](#)
 - [“Most Recent Exchange” on page 158](#)
 - [“Media DATA Activity Counts \(Last 30 Days\)” on page 161](#)
 - [“Additional Exchange Information for Enterprise Media” on page 162](#)
 - [“Additional Exchange Information for LTO Media” on page 164](#)
 - [“Current Home Media Location” on page 165](#)
 - [“Cleaning Usage” on page 168](#)
 - [“Drive” on page 169](#)
 - [“Library Complex” on page 171](#)

Media Detail Views

The Detail View on the **Media – Overview** screen shows all available attributes related to media. There is one view for StorageTek enterprise media and a slightly different view for LTO media.

Detail for Enterprise Media

Details for Media TTC155		Monitored since 2012-10-05 14:30	
Media Details Volume Serial Number : TTC155 Media Type : T10000C Media Health Indicator : USE WORM/VolSafe Media : No Media Manufacturer Serial Number : 81021003001601 Media Manufacturer : STK Media Life Indicator : UNKNOWN STA Start Tracking : 2012-10-05 14:44:39 STA Stop Tracking :		Most Recent Exchange Last Exchange Start : 2012-10-08 10:49:30 Exchange Elapsed Time : 0:04:20 Exchange Mount Time : 0:03:58 Recording Technique : T10000C Media Exchange Status : GOOD Media Suspicion : 0.00% Exchange Drive Cleaning Required : No Mount R/W MB/sec : 1.69 Media Load Limit Alert : No Data Compression Ratio : 1.55 : 1 Cart Memory Failure : No	
Media DATA Activity Counts (Last 30 Days) Media Dismounts : 610 Dismounts with Errors : 0 MB Read : 163,216.00 MB Write : 161,200.00 MB R/W : 324,416.00 MB Sent : 251,653.11 MB Received : 250,375.78 Avg Mount Read MB/sec : 0.72 Avg Mount Write MB/sec : 0.71 Avg Mount R/W MB/sec : 1.43		Additional Exchange Information for Enterprise Media Media MB Capacity : 5,242,880 Media MB Avail Post : 4,427,364.00 Exchange Encryption Used : Encrypted Sun KMS Exchange FSC : Exchange Write Inefficient : No Exchange Read Marginal : Exchange Write Efficiency : 98.40% Exchange Read Margin : 93.72% Time Spent Reading : 0:00:00 Time Spent Writing : 0:00:09 Time Spent Reading or Writing : Read MB/sec : Write MB/sec : R/W MB/sec : Read Mount Ratio : Write Mount Ratio : R/W Mount Ratio :	
Current Home Media Location Media Library Name : tlib Media Library Serial Number : 516000100534 Library Number : 1 Rail Number : 2 Physical Address : 1,2,-9,1,5 HLI Address : 1,8,4,0 Cell SCSI Element ID : 0			
Drive Drive Serial Number : 576004000812 Drive WWNN : 50:01:04:F0:00:8B:03:80 Drive ID : 5 Drive Type : T10000c-Enc Drive Health Indicator : USE		Cleaning Usage Cleaning Media : No	
Library Complex Library Complex Name : SL8500_14 Library Model : SL8500 Partition Type : HLI Partition Name : SL8500_14:HLI:0 Partition Number : 0			

Detail for LTO Media

Details for Media T3B099		Monitored since 2012-10-05 21
Media Details Volume Serial Number : T3B099 Media Type : LTO4 Media Health Indicator : USE WORM/VolSafe Media : No Media Manufacturer Serial Number : 075B102636 Media Manufacturer : LTO Media Life Indicator : UNKNOWN STA Start Tracking : 2012-10-05 21:00:48 STA Stop Tracking :		Most Recent Exchange Last Exchange Start : 2012-10-08 10:49:03 Exchange Elapsed Time : 0:03:24 Exchange Mount Time : 0:02:42 Recording Technique : LTO4 Media Exchange Status : GOOD Media Suspicion : 0.00% Exchange Drive Cleaning Required : No Mount R/W MB/sec : 31.62 Media Load Limit Alert : Data Compression Ratio : 1 : 1 Cart Memory Failure : No
Media DATA Activity Counts (Last 30 Days) Media Dismounts : 706 Dismounts with Errors : 0 MB Read : 1,597,638.25 MB Write : 4,413,489.50 MB R/W : 6,011,127.50 MB Sent : 2,306,053.75 MB Received : 5,120,523.00 Avg Mount Read MB/sec : 10.21 Avg Mount Write MB/sec : 28.20 Avg Mount R/W MB/sec : 38.41		Additional Exchange Information for LTO Media Media MB Capacity : 800,226 Media MB Avail Pre : 774,840.00 Nearing Media Life Alert : No IBM Media Efficiency : HP Media Status : 1 Media Length in Meters : 820 Media Manufacturer Date : 2007-06-04 18:00:00 Media Auxiliary Memory Capacity : 4,096 Media Directory Corrupt : No
Current Home Media Location Media Library Name : mctape01 Media Library Serial Number : 559000202341 Library Number : 0 Rail Number : 1 Physical Address : 0,1,1,9 HLI Address : Cell SCSI Element ID : 500		Cleaning Usage Cleaning Media : No
Drive Drive Serial Number : HU18504E8V Drive WWNN : 50:01:04:F0:00:B8:06:0D Drive ID : 1 Drive Type : HpUltrium4 Drive Health Indicator : USE		
Library Complex Library Complex Name : SL500_559000202341 Library Model : SL500 Partition Type : SCSI Partition Name : SL500_559000202341:SCSI:0 Partition Number : 0		

Media Attribute Definitions

The media attributes are organized into the following sections.

- [“Title” on page 155](#)
- [“Media Details” on page 156](#)
- [“Most Recent Exchange” on page 158](#)
- [“Media DATA Activity Counts \(Last 30 Days\)” on page 161](#)
- [“Additional Exchange Information for Enterprise Media” on page 162](#)
- [“Additional Exchange Information for LTO Media” on page 164](#)
- [“Current Home Media Location” on page 165](#)
- [“Cleaning Usage” on page 168](#)
- [“Drive” on page 169](#)
- [“Library Complex” on page 171](#)

Title

Values for these attributes are assigned when STA first starts tracking the media.

Attribute	Definition
Media	<p>Volume serial number (VSN or volser) assigned to the media by its external label. If the library does not supply the volser, STA provides one composed of Library Serial Number : Physical Address.</p> <p>Note – This field links to the Media – Overview screen, detail view, which displays all available detail for this media. See “Media Overview and Analysis Screens”.</p>
Monitored since	Date and time when STA started tracking this resource (library, complex, drive, or media).

Media Details

Details about a data or cleaning media.

Attribute	Definition
Volume Serial Number	<p>Volume serial number (VSN or volser) assigned to the media by its external label. If the library does not supply the volser, STA provides one composed of Library Serial Number : Physical Address.</p> <p>Note – This field links to the Media – Overview screen, detail view, which displays all available detail for this media. See “Media Overview and Analysis Screens”.</p>
Media Type	<p>Media type short description. For example, LTO1, T10000B, etc. UNKNOWN indicates media with a missing or unreadable external volume serial number (VSN or volser) label.</p> <p>Note – Type is UNKNOWN for all DLT and SDLT media, for which STA does not compute health.</p>
Media Health Indicator	<p>Media health. This is a point-in-time value computed by STA analytics. It reflects a variety of factors, such as the media’s error history, read margin, and write efficiency.</p> <p>This value includes all data up to and including the last completed exchange. It is updated immediately after each completed exchange involving this media.</p> <p>Possible values, in order of degrading health:</p> <ul style="list-style-type: none"> • USE – The media has had no failures or degradation in the last ten exchanges. • MONITOR – The media has had multiple errors; there is a less than 80 percent chance that it needs service. • EVALUATE – The media has had multiple errors; there is a greater than 80 percent chance that it needs service. • ACTION – The media has had an error that requires service. • UNKNOWN – STA has not received enough data to compute health for the media. This may be due to a variety of factors, including exchanges on unsupported drive models, drives with downlevel firmware, or LTO drives with ADI mode not enabled. <p>Note – STA only receives information about errors detected by a drive while performing read/write activity to the media. STA does not receive information about errors that may occur in the data path or host applications.</p>

Attribute	Definition
WORM/VolSafe Media	Indicates whether the media uses StorageTek VolSafe technology. STA does not know the status until the media has been mounted. Possible values: Yes or No. Blank indicates unknown.
Media Manufacturer Serial Number	Media serial number assigned by the manufacturer. Note – STA does not have this information until the media has been mounted in a drive.
Media Manufacturer	Media manufacturer. Possible values are “STK” for StorageTek enterprise media, or “LTO” for LTO media.
Media Life Indicator	Indicates whether the media has reached the end of its expected useful life. Possible values: EOL, GOOD, UNKNOWN.
STA Start Tracking	Date and time when STA first began tracking this volume serial number (VSN or volser). If the volser is used on more than one cartridge, this field reflects the earliest start date available.
STA Stop Tracking	Date and time when STA stopped tracking this volume serial number (VSN or volser). This is when STA determined the volser no longer exists in any of the monitored libraries and updated the volser status from “missing” to “removed”.

Most Recent Exchange

Details about the most recent exchange for the media.

Attribute	Definition
Last Exchange Start	<p>Date and time when the drive was reserved for the most recent exchange.</p> <p>Note – This field links to the Libraries – Exchanges Overview screen, detail view, which displays all available details for this exchange. See “Exchanges Screen” on page 81.</p>
Exchange Elapsed Time	Total time the drive was reserved for the exchange. Starts at the beginning of the mount move and ends at the completion of the dismount move. Includes total mount time plus total transit time immediately before and after the mount. Displayed in hh:mm:ss format.
Exchange Mount Time	Total time the media was mounted in the drive. Includes the total time between the start of the mount and the start of the dismount. Does not include transit time before and after the mount. Displayed in hh:mm:ss format. If this attribute is blank, then it is likely that STA did not receive all the exchange data from the library.
Recording Technique	Recording method used by the drive

Attribute	Definition
Media Exchange Status	<p>Status of the media upon completion of the exchange, as derived from a variety of factors, including media errors, write efficiency, and read margin. Possible values:</p> <ul style="list-style-type: none"> • CART_MEM_FAILURE • CLEAN_REQ – The drive is due for cleaning. • DRIVE_ERROR • EXPIRED_CLEAN_TAPE • FAILED_MOUNT • FW_DOWN_LEVEL • GOOD • INCOMPLETE_UNLOAD – The application requested that the media be unloaded. The tape drive has detected data still in its buffer and has asked for confirmation from the application. • INSUFFICIENT_DATA(NULL) – STA has not received enough exchange data from the library to calculate drive health. It may be that the drive is not supported (LTO 2, for example) or the library firmware is downlevel. • LOAD_ERROR • LTO_NON_ADI_MODE – ADI mode has not been enabled on either the library, the drive, or both. • MEDIA_ERROR • NON_DRV_ERROR – This is neither a drive nor a media problem, so there is no effect on the suspicion of drive or media. • OTHER_ERROR • PERM_ERROR • READ_ERROR • WRITE_ERROR • UNKNOWN • UNLOAD_ERROR
Media Suspicion Level	<p>Calculated suspicion level for the media. The higher the number, the higher the probability that this media needs attention.</p>

Attribute	Definition
Exchange Drive Cleaning Required	<p>Indicates whether the drive needed cleaning at the time of the exchange. Possible values: Yes or No.</p> <p>Note – Additional detail may be available via the Clean Periodic Alert and Clean Now Alert attributes.</p>
Mount R/W MB/sec	<p>Average throughput rate for the drive, in megabytes per second. Calculated as:</p> $\text{total MB (read + written) / total seconds mount time}$ <p>Note – This value may be affected by a variety of factors external to the drive, such as robot speed or application behavior—for example, some applications do not dismount media immediately upon completion of read/write operations, causing the drive to be idle for much of the mount. As a result, this value is not likely to represent the drive's maximum potential throughput rate.</p>
Media Load Limit Alert	Indicates whether the media has exceeded the recommended number of drive loads
Data Compression Ratio	Compression ratio for the exchange. Displayed as a ratio of total compressed data read or written by the drive, to total uncompressed data sent or received by the drive.
Cart Memory Failure	Indicates the cartridge memory failed during the exchange.

Media DATA Activity Counts (Last 30 Days)

Total activity counts for the media over the last 30 days.

Attribute	Definition
Media Dismounts (30 Days)	Total number of dismounts for this media. Note – This field links to the Libraries – Exchanges screen, list view, which lists this cartridge's exchanges. See "Exchanges Screen" on page 81 .
Dismounts with Errors (30 Days)	Total dismounts with drive or media errors involving this media. Note – This field links to the Libraries – Exchanges screen, list view, which lists this cartridge's exchanges with errors. See "Exchanges Screen" on page 81 .
MB Read (30 Days)	Total megabytes read from the media
MB Write (30 Days)	Total megabytes written to the media
MB R/W (30 Days)	Total megabytes read from and written to the media
MB Sent (30 Days)	Total megabytes sent from the media to hosts. This could be compressed or uncompressed megabytes, depending on whether compression has been enabled on the drive.
MB Received (30 Days)	Total megabytes written to the media from hosts. The data could be compressed or uncompressed megabytes, depending on the host application.
Avg Mount Read MB/sec (30 Days)	Average read rate for the media, in megabytes per second. Calculated as: total MB read / total seconds mount time
Avg Mount Write MB/sec (30 Days)	Average write rate for the media, in megabytes per second. Calculated as: total MB written / total seconds mount time
Avg Mount R/W MB/sec (30 Days)	Average throughput rate for the media, in megabytes per second. Calculated as: total MB (read + written) / total seconds mount time

Additional Exchange Information for Enterprise Media

Appears for StorageTek enterprise media only.

Attribute	Definition
Media MB Capacity	Maximum media capacity, in megabytes. Note – Reported value varies by drive vendor and other factors.
Media MB Avail Post	Unused media capacity, in megabytes; this value is provided after the exchange completes. Note – Reported value varies by drive vendor and other factors.
Exchange Encryption Used	Encryption method used by the drive for the exchange. Available for StorageTek enterprise drives only. Possible values: <ul style="list-style-type: none"> Encrypted_ANSI_10 – ANSI encryption. Encrypted_Sun_KMS – Oracle Key Manager (OKM) encryption. Not_Encrypted – Not encrypted. Unknown – The drive did not report encryption information. Blank (no value displayed) – STA did not receive any encryption information; the value is always blank for ADI/LTO exchanges.
Exchange FSC	Four-byte hexadecimal fault symptom code (FSC). For example, FD55, S053, etc. Reported only if an error occurred during the exchange.
Exchange Write Inefficient	Indicates whether the media met the write efficiency standard for the media type. Possible values: Yes or No.
Exchange Read Marginal	Indicates whether the media met the read margin standard for the media type. Possible values: Yes or No.
Exchange Write Efficiency	Write efficiency for the exchange, based on capacity over distance. A high value is desirable.

Attribute	Definition
Exchange Read Margin	<p>Amount of error correction code (ECC) read margin remaining on the media, as reported by the drive during the last mount. Reported as a percentage. A high value is desirable.</p> <p>If STA determines that this value has gone below a threshold for this drive type, the Exchange Read Marginal attribute is set to Yes.</p>
Time Spent Reading	Total time the drive spent reading data during the exchange
Time Spent Writing	Total time the drive spent writing data during the exchange
Time Spent Reading or Writing	Total time the drive spent reading and writing data during the exchange
Read MB/sec	<p>Read rate for the time spent actively reading; idle time is excluded. Expressed in megabytes per second. Calculated as:</p> $\text{compressed MB read} / \text{total read time}$
Write MB/sec	<p>Write rate for the time spent actively writing; idle time is excluded. Expressed in megabytes per second. Calculated as:</p> $\text{compressed MB written} / \text{total write time}$
R/W MB/sec	<p>Throughput rate for the time spent actively reading and writing; idle time is excluded. Expressed in megabytes per second. Calculated as:</p> $(\text{compressed MB read} + \text{compressed MB written}) / (\text{read time} + \text{write time})$
Read Mount Ratio	Time spent reading divided by exchange time.
Write Mount Ratio	Time spent writing divided by exchange time.
R/W Mount Ratio	Time spent reading or writing divided by exchange time.

Additional Exchange Information for LTO Media

Appears for LTO media only.

Attribute	Definition
Media MB Capacity	Maximum media capacity, in megabytes. Note – Reported value varies by drive vendor and other factors.
Media MB Avail Pre	Unused media capacity, in megabytes; this value is provided before the beginning of the exchange. Note – Reported value varies by drive vendor and other factors.
Nearing Media Life Alert	The media is approaching the end of its expected useful life. Available for HP drives only.
IBM Media Efficiency	Three-byte hexadecimal code indicating the media's efficiency over its lifetime. Possible values are 01h (best) to FFh (worst); 00h indicates the efficiency is unknown. Available for IBM LTO4 and above drives only.
HP Media Status	Four-byte hexadecimal code indicating the status of the media. Available for HP media only.
Media Length in Meters	Media length, in meters
Media Manufacturer Date	Date when the media was manufactured, in yyyyymmdd format.
Media Auxiliary Memory Capacity	Media's total auxiliary memory at the time of manufacture, in bytes
Media Directory Corrupt	The media directory on the tape media is corrupted, leading to degraded file search performance until the directory is rebuilt.

Current Home Media Location

Details about the media's current location, as of the last completed exchange.

Attribute	Definition
Media Library Name	User-assigned name for the library. Assigned in the Settings – SNMP Connections screen.
Media Library Serial Number	Library frame serial number. Note – This field links to the Libraries – Overview screen, detail view, which displays all available details for this library. See " Libraries Overview Screen ".
Library Number	Unique ID assigned to the library.
Rail Number	Rail number. For SL150, SL500, and SL3000 libraries, this value is always 1. For SL8500 libraries, possible values are 1, 2, 3, or 4.

Physical Address	<p>Library internal address.</p> <p>For SL150 libraries, the format is <i>m, s, w, c</i> (for example, <i>1, Left, 1, 2</i>), where:</p> <ul style="list-style-type: none">• <i>m</i> = module number; 1–10, from top (base module) to bottom• <i>s</i> = side; <i>Left</i> or <i>Right</i>• <i>w</i> = row number; 1–3, from top to bottom• <i>c</i> = column number; 1–5, from front to back <p>For SL500 libraries, the format is <i>l, m, r, c</i> (for example, <i>0, 2, 2, 3</i>), where:</p> <ul style="list-style-type: none">• <i>l</i> = for non-partitioned libraries, this is the library ID (always 0); for partitioned libraries, this is the partition ID (1–8).• <i>m</i> = module number; 1–5, from top to bottom of the rack• <i>r</i> = drive row number; 1–2 (Base Module) or 1–4 (Drive Expansion Module), from top to bottom of the module• <i>c</i> = column number; always 9 for drives <p>For SL3000 and SL8500 libraries, the format is <i>l, r, c, s, w</i> (for example, <i>1, 1, 2, 2, 3</i>), where:</p> <ul style="list-style-type: none">• <i>l</i> = library number. For non-partitioned libraries, this is the library ID; for partitioned libraries, this is the partition ID (1–8).• <i>r</i> = rail number. For SL3000 libraries, this value is always 1. For SL8500 libraries, possible values are 1, 2, 3, or 4.• <i>c</i> = column number.• <i>s</i> = side number.• <i>w</i> = row number.
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HLI Address	Host Library Interface (HLI) address of the location. Applies only to drives or storage cells in HLI partitions or libraries. This address is assigned by the ACSLS or ELS host software.
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Note – Available only for SL8500 libraries with firmware FRS_7.80 or higher or SL3000 libraries with firmware FRS_4.0 or higher. For all others, the value is left blank.

For storage cells, format is l, p, w, c , where:

- l = logical storage manager (LSM) number. Possible values are 0, 1, 2, or 3.
- p = panel number.
- w = row number.
- c = column number.

For drives, format is l, p, t , where:

- l = logical storage manager (LSM) number. Possible values are 0, 1, 2, or 3.
- p = panel number
- t = transport number

Cell SCSI Element ID	SCSI element ID of the location. Applies only to drives or storage cells in SCSI partitions or libraries; for all others, the value is "0".
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Cleaning Usage

Details about drive cleans for the media.

Attribute	Definition
Cleaning Media	<p>Indicates whether this is a cleaning media, as determined by the media domain and type. Possible values: Yes or No.</p> <p>Note – Not all cleaning media have a volser starting with "CLN".</p>

Drive

Details about the drive involved in the latest exchange.

Attribute	Definition
Drive Serial Number	Electronic serial number of the drive. *NO-SERIAL* indicates it is not known. Note – This field links to the Drives – Overview screen, detail view, which displays all available details for this drive. See “Drives Overview and Analysis Screens” .
Drive WWNN	World Wide Node Name for the drive slot.
Drive ID	Library drive bay where the drive is located.
Drive Type	Drive type long description sent by the library. For example, T10000c-Enc, HpUltrium4, etc. UNKNOWN indicates a broken drive or a drive for which STA cannot determine the type. Note – Type is UNKNOWN for all DLT and SDLT drives, for which STA does not compute health.

Attribute	Definition
Drive Health Indicator	<p>Drive health. This is a point-in-time value computed by STA analytics based on data gathered from the drive during current and past exchanges. It reflects a variety of factors, such as the drive's error history, read margin, and write efficiency.</p> <p>This value includes all data up to and including the last completed exchange. It is updated immediately after each completed exchange involving the drive.</p> <p>Possible values, in order of degrading health:</p> <ul style="list-style-type: none">• USE – The drive has had no failures or degradation in the last ten exchanges.• MONITOR – The drive has had multiple errors; there is a less than 80 percent chance that it needs service.• EVALUATE – The drive has had multiple errors; there is a greater than 80 percent chance that it needs service.• ACTION – The drive has had an error that requires attention. The drive may require service. You should investigate and determine a proper course of action.• UNKNOWN – STA has not received enough data to compute health for the drive. This may be due to a variety of factors, including an unsupported drive model, downlevel drive firmware, or ADI mode not enabled for an LTO drive. <p>Note – STA only receives information about errors detected by a drive while performing read/write activity to a cartridge. STA does not receive information about errors that may occur in the data path or the host application.</p> <p>Note – Cleaning exchanges have a neutral impact on drive health.</p>

Library Complex

Details about the library complex where the media is located.

Attribute	Definition
Library Complex Name	<p>Name assigned to the complex by STA.</p> <ul style="list-style-type: none"> For SL150, SL500, and SL3000 libraries, this value is formatted as <i>library_model_library_serial_number</i>. Examples: SL150_262960B+1234BA0018, SL500_522000001839, SL3000_571000020075 For SL8500 libraries, this value is formatted as <i>library_model_complex_ID</i>. Examples: SL8500_1, SL8500_4 <p>This field links to the Libraries – Complexes Overview screen, detail view, which displays all available details about this complex. See “Library Complexes Screen”.</p>
Library Model	Library model number. Possible values: SL150, SL500, SL3000, or SL8500.
Partition Type	<p>Type of host-partition connection. Possible values:</p> <ul style="list-style-type: none"> HLI – HLI (Host Library Interface) protocol OTHER – System cells, used for storage of diagnostic cartridges. SCSI – SCSI protocol
Partition Name	Name assigned to the partition. In a non-partitioned library, this is system-assigned; in a partitioned library, this is user-assigned.
Partition Number	Unique partition ID. For non-partitioned libraries, the value is always “0”. For partitioned libraries, possible values are 1–8.

SNMP Notifications Screen

This section includes the following information:

- [“Notifications Detail View” on page 174](#)
- [“Notification Attribute Definitions” on page 174](#)
 - [“Title” on page 175](#)
 - [“Trap Details” on page 176](#)
 - [“Library” on page 177](#)
 - [“Library Trap Details” on page 178](#)

Notifications Detail View

The Detail View on the **Notifications – Overview** screen shows all available attributes relating to SNMP traps received by STA from the libraries.

Details for SNMP Notification Library Log		Received on 2012-07-23 10:55:46
Trap Details Trap Type : Library Log Device State : Device Address : 1.0.0.0.0		Library Library Complex Name : SL8500 14 Library Complex Number : 14 Library Name : tlib Library Model : SL8500 Library Serial Number : 516000100534
Library Trap Details Library Top Level Condition : UNKNOWN Device ID : HBC 66000053 Device Time : 2012-07-23 05:15:14 Username : root Interface Name : hli0 Device Activity : reserveCap Request ID : 7213601 Severity : info Result Code : 3851 Text : "Cap reserve changed", state=released cap=1,0,0,0 Agent Boot Date/Time :		

Notification Attribute Definitions

The attributes are organized into the following sections.

- “Title” on page 175
- “Trap Details” on page 176
- “Library” on page 177
- “Library Trap Details” on page 178

Title

Values for these attributes are assigned when the SNMP trap is received from the library.

Attribute	Definition
SNMP Notification	Type of SNMP trap. Options are: <ul style="list-style-type: none">• Drive• Library Environment Check• Library Log
Received on	Date and time when the STA server received the SNMP trap from the library.

Trap Details

Provides information about the type of SNMP trap and the device involved.

Attribute	Definition
Trap Type	Entity type to which the trap pertains. One of the following: <ul style="list-style-type: none">• Library status• SNMP agent start• Library configuration• Library environment check• Library log• Drive status• CAP or mailslot status• PTP status
Device State	State of the device at the time the trap was sent. Varies by device type, as in the following examples: <ul style="list-style-type: none">• Drives – EMPTY, LOADED, NEEDS_CLEANING• CAPs – OPEN, CLOSE, UNKNOWN• Pass-thru ports (PTPs) – OK, ERROR, WARNING, INFO, TRACE
Device Address	Address of the device associated with the SNMP trap.

Library

Provides information about the library that sent the SNMP trap.

Attribute	Definition
Library Complex Name	<p>Name assigned to the complex by STA.</p> <ul style="list-style-type: none"> For SL150, SL500, and SL3000 libraries, this value is formatted as <i>library_model_library_serial_number</i>. Examples: SL150_262960B+1234BA0018, SL500_522000001839, SL3000_571000020075 For SL8500 libraries, this value is formatted as <i>library_model_complex_ID</i>. Examples: SL8500_1, SL8500_4 <p>This field links to the Libraries – Complexes Overview screen, detail view, which displays all available details about this complex. See “Library Complexes Screen”.</p>
Library Complex Number	Library complex ID, as configured on the library. For SL150, SL500, and SL3000 libraries, the value is always “1”. For SL8500 libraries, the value is set by your Oracle support representative and must be unique for each complex.
Library Name	User-assigned name for the library. Assigned in the Settings – SNMP Connections screen.
Library Model	Library model number. Possible values: SL150, SL500, SL3000, or SL8500.
Library Serial Number	<p>Library frame serial number.</p> <p>Note – This field links to the Libraries – Overview screen, detail view, which displays all available details for this library. See “Libraries Overview Screen”.</p>

Library Trap Details

Provides detailed information from the SNMP trap.

Attribute	Definition
Library Top Level Condition	Current library health. Examples: DEGRADED, NOT OPERATIVE, NORMAL.
Device ID	FRU ID of the device associated with the event.
Device Time	Date and time of the event, in UTC standard format.
Username	Username associated with the event.
Interface Name	Interface type of the device associated with the event.
Device Activity	Device activity associated with the event.
Request ID	Unique ID for the SNMP request.
Severity	Severity of the event.
Result Code	Device result code for the event.
Text	Additional text regarding the event, sent by the subsystem.
Agent Boot Date/Time	Date and time the SNMP agent was started, in the library's local time.

STA Toolbar Quick Reference

This section contains quick reference information for all STA toolbars.

General Toolbars

- “Main Toolbar” on page 180
- “Template Toolbar” on page 181

Graphics Toolbars

- “Overview Graphics Area Toolbar” on page 182
- “Overview Graph Pane Toolbar” on page 183
- “Exchanges Graph Pane Toolbar” on page 184
- “Analysis Graphics Area Toolbar” on page 185
- “Analysis Graph Pane Toolbar” on page 186

Table Toolbars

- “List View Table Toolbar” on page 187
- “Pivot Table Toolbar” on page 189

Service Log Toolbar

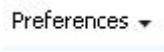





- “Service Log Toolbar” on page 190

Configuration Settings Toolbars

- “SMTP Server Settings Toolbar” on page 191
- “Email Addresses Toolbar” on page 192
- “Client Attributes Toolbar” on page 193
- “Monitored Libraries Toolbar” on page 194

General Toolbars


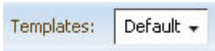


Main Toolbar

Icon	Name	Description
	Preferences	Menu provides options for you to modify display settings for STA screens and templates.
	Help	Link displays help for the current screen.
 Username	Username	Displays the username currently logged in.
	Logout	Link logs you out of STA.
 Idle	Progress Indicator	Indicates whether the screen has finished or is in the process of loading.
 Loading		

Where Used

- All screens

Template Toolbar






Icon	Name	Description
	Help	Displays help for template functions.
	Templates menu	Menu lists all available templates for this screen. The first entry is always “Default”. The list includes pre-packaged templates and custom templates that are available to all users. Select a template to apply it to the current screen.
	Save Template	Allows you to save the current screen configuration, either as a new template or as a modification of an existing template.
	Delete Template	Allows you to delete a template.

Where Used

- Libraries – Overview
- Libraries – Complexes Overview
- Libraries – Exchanges
- Drives – Overview
- Drives – Analysis
- Drives – Cleaning Activities
- Media – Overview
- Media – Analysis
- Notifications – Overview
- Notifications – Analysis

Graphics Toolbars







Overview Graphics Area Toolbar

Icon	Name	Description
	Help	Displays help for the Graphics Area.
	Narrow View	Tiles graph panes across the Graphics Area in rows of up to three graphs each. This is the default view.
	Wide View	Expands each graph horizontally across the entire Graphics Area with individual graphs stacked vertically.
	Printable Graphs	Provides a “quick print” function. Displays a printable form of the displayed graphs in a separate browser tab or window.
	Add Graph	Adds a new graph pane displaying the default attribute to the Graphics Area.

Where Used

- Libraries – Overview
- Libraries – Complexes Overview
- Libraries – Exchanges
- Drives – Overview
- Drives – Cleaning Activities
- Media – Overview





Overview Graph Pane Toolbar

Icon	Name	Description
	Choose Date Range	Displays the date editor, which allows you to change the date range to a new range or a single day.
	Synchronize Date Range	Applies the date range for the current graphics pane to all graphics panes on the screen.
	Show Percentages	Switches between real value and percentage value displays.
	Change Graphed Attribute	Allows you to change the attribute displayed on the graph.
	Detach Pane	Detaches the graph from the screen and displays it in a separate window in the browser foreground.
	Remove Pane	Deletes the graph pane from the screen.

Where Used

- Libraries – Overview
- Libraries – Complexes Overview
- Drives – Overview
- Media – Overview





Exchanges Graph Pane Toolbar

Icon	Name	Description
	Show Percentages	Switches between real value and percentage value displays.
	Change Graphed Attribute	Allows you to change the attribute displayed on the graph.
	Detach Pane	Detaches the graph from the screen and displays it in a separate window in the browser foreground.
	Remove Pane	Deletes the graph pane from the screen.

Where Used

- Libraries – Exchanges
- Drives – Cleaning Activities



Analysis Graphics Area Toolbar

Icon	Name	Description
	Help	Displays help for the Graphics Area.
	Narrow View	Tiles graph panes across the Graphics Area in rows of up to three graphs each. This is the default view.
	Wide View	Expands each graph horizontally across the entire Graphics Area with individual graphs stacked vertically.
	Printable Graphs	Provides a “quick print” function. Displays a printable form of the displayed graphs in a separate browser tab or window.

Where Used

- Drives – Analysis
- Media – Analysis
- Notifications – Analysis

Analysis Graph Pane Toolbar











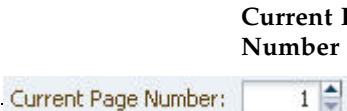
Icon	Name	Description
	Show Percentages	Toggles between real value and percentage value displays.
	Detach Pane	Detaches the graph from the screen and displays it in a separate window in the browser foreground.

Where Used

- Drives – Analysis
- Media – Analysis
- Notifications – Analysis

Table Toolbars

List View Table Toolbar

Icon	Name	Description
	Help	Displays help for this area of the screen.
	List View	Displays data in a list format, which is the default for List View tables.
	Detail View	Displays detailed data for selected resources in a page format.
	Printable Table	Provides a “quick print” function. Displays a printable form of the currently displayed data in a separate browser tab or window.
	Applied Filter	Displays filter criteria that have been applied to the table. If the table data is not filtered, this area is blank. Filter descriptions longer than 250 characters are truncated. You can hover the cursor over the text to display a tooltip containing the full description.
	View menu	Provides options for modifying the table display, such as sort order and hidden and revealed columns.
	Apply Selection	Applies the currently selected table rows to the graphs in the Graphics Area.
	Export	Exports the currently displayed table data to a file that can be viewed and edited with Microsoft Excel.
	Filter Data	Displays a dialog box that allows you to define, modify, or reset filter criteria and then apply them to the table.
	Detach	Detaches the table from the screen and displays it in a separate window in the browser foreground.
	Current Page Number	Displays the current table page number and allows you to go directly to a specified page. Appears only for Exchanges, Cleaning Activities, and Notifications tables.







Where Used

- Libraries – Overview
- Libraries – Complexes Overview
- Libraries – Exchanges
- Drives – Overview

Table Toolbars

- Drives – Cleaning Activities
- Media – Overview
- Notifications – Overview

Pivot Table Toolbar







Icon	Name	Description
	Help	Displays help for this area of the screen.
	Change Attributes	Displays a dialog box that allows you to show, hide, or reorder attributes in the table.
	Apply Selection	Applies the currently selected table rows to the graphs in the Graphics Area.
	Export	Exports the currently displayed table data to a file that can be viewed and edited with Microsoft Excel.
	Filter Data	Displays a dialog box that allows you to define, modify, or reset filter criteria and then apply them to the table.
	Applied Filter	<p>Displays filter criteria that have been applied to the table. If the table data is not filtered, this area is blank.</p> <p>Filter descriptions longer than 250 characters are truncated. You can hover the cursor over the text to display a tooltip containing the full description.</p>

Where Used

- Drives – Analysis
- Media – Analysis
- Notifications – Analysis

Service Log Toolbar

Service Log Toolbar






Icon	Name	Description
	Help	Displays help for the Logs screen.
	Create New Log Bundle	Allows you to create a new log bundle.
	Log Bundle Run Info	Allows you to display status information from the log bundle collection process.
	Download Selected Log Bundle	Allows you to save the selected log bundle to your local computer.
	Delete Selected Log Bundle	Allows you to delete the selected log bundle.
	Refresh Table	Refreshes the table to display any new updates to the list of log bundles.

Where Used

- Service – Logs

Configuration Settings Toolbars









SMTP Server Settings Toolbar

Icon	Name	Description
	Help	Displays help for this area of the screen.
	View menu	Provides options for modifying the table display, such as sort order and hidden and revealed columns.
	Edit Selected SMTP Server	Allows you to edit the configuration information for the selected SMTP server.
	Printable Table	Provides a “quick print” function. Displays a printable form of the current table in a separate browser tab or window.
	Detach	Detaches the table from the screen and displays it in a separate window in the browser foreground.

Where Used

- SMTP Server Settings






Email Addresses Toolbar

Icon	Name	Description
	Help	Displays help for this area of the screen.
	View menu	Provides options for modifying the table display, such as sort order and hidden and revealed columns.
	Test SMTP and Email Address Setup	Sends a test email from the SMTP server to the selected email recipients.
	Add Email	Allows you to add an address to receive email notifications of significant events that STA detects in your tape library environment.
	Edit Selected Email	Allows you to edit information for the selected email recipient.
	Delete Selected Email(s)	Allows you to delete the selected email recipient.
	Printable Table	Provides a “quick print” function. Displays a printable form of the currently displayed data in a separate browser tab or window.
	Detach	Detaches the table from the screen and displays it in a separate window in the browser foreground.

Where Used

- Settings – Email Notifications










Client Attributes Toolbar

Icon	Name	Description
	Help	Displays help for this area of the screen.
	View menu	Provides options for modifying the table display, such as sort order and hidden and revealed columns.
	Edit	Allows you to edit SNMP connection settings for the STA server, so it can receive SNMP data from one or more libraries.
	Printable Table	Provides a “quick print” function. Displays a printable form of the current table in a separate browser tab or window.
	Detach	Detaches the table from the screen and displays it in a separate window in the browser foreground.

Where Used

- Settings – SNMP Connections

Monitored Libraries Toolbar

Icon	Name	Description
	Help	Displays help for this area of the screen.
	View menu	Provides options for modifying the table display, such as sort order and hidden and revealed columns.
	Check/Test Connection	Tests the SNMP connection between the selected library and the STA server.
	Get Latest Data	Retrieve the most current configuration and status data for the selected library and all of its devices.
	Add	Allows you to add a library to be monitored by STA.
	Edit	Allows you to edit SNMP connection information for the selected library.
	Delete	Allows you to delete the selected library SNMP connection.
	Printable Table	Provides a “quick print” function. Displays a printable form of the currently displayed data in a separate browser tab or window.
	Detach	Detaches the table from the screen and displays it in a separate window in the browser foreground.

Where Used

- Settings – SNMP Connections

STA Dialog Box Reference

This section contains reference information for all STA data entry dialog boxes. The following types of dialog boxes are described.

- [“Login and Screen Display Dialog Boxes” on page 196](#)
- [“Table Display Dialog Boxes” on page 206](#)
- [“Service Log Dialog Box” on page 216](#)
- [“Configuration Settings Dialog Boxes” on page 218](#)

Login and Screen Display Dialog Boxes

- [“Login” on page 197](#)
- [“Data Handling” on page 198](#)
- [“Refresh Settings” on page 200](#)
- [“Accessibility Settings” on page 201](#)
- [“Reset \(Templates\)” on page 203](#)
- [“Confirmations” on page 204](#)

Login

Sample Screen

Description

This dialog box appears when you enter the URL of the STA server in your browser. Your STA administrator will provide you with a username and password for logging in.

Note – You have up to five chances to log in successfully. After five unsuccessful login attempts within a five-minute period, you will be locked out of your user account for 30 minutes. For security reasons, your account cannot be reset during the lockout period, even by the STA administrator, so you must wait the full 30-minutes before attempting to log in again.

Screen Fields

Username

Required.

Enter the username you want to log in with.

Password

Required.

Enter the password assigned to the username.

Buttons

Login

Click to log in. Once your username and password are authenticated, you are taken to the **Dashboard**.

Note – The **Accessibility Settings** dialog box may appear before the **Dashboard**.

Data Handling

Sample Screen



Description

This dialog box allows you to selectively show or hide removed drives and media and their associated data. This dialog box appears when you select **Preferences > Data Handling** from the Main Toolbar.

Screen Fields

Show Removed Drives

Select this check box to turn on the display of removed drives, as follows:

- Removed drives are listed on the **Drives – Overview** screen.
- Aggregated data for removed drives are included on the **Drives – Analysis** screen.
- On all other screens, drive serial numbers of removed drives are active links to the **Drives – Overview, Detail View** screen.

Deselect this check box to turn off the display of removed drives, as follows:

- Removed drives are not listed on the **Drives – Overview** screen.
- Aggregated data for removed drives are not included on the **Drives – Analysis** screen.
- On all other screens, drive serial numbers of removed drives are dimmed and are not active links.

This check box is deselected by default.

Show Removed Media

- Removed media are listed on the **Media – Overview** screen.

- Aggregated data for removed media are included on the **Media – Analysis** screen.
- On all other screens, volume serial numbers (VSNs or volsers) of removed media are active links to the **Media – Overview, Detail View** screen.

Deselect this check box to turn off the display of removed drives, as follows:

- Removed media are not listed on the **Media – Overview** screen.
- Aggregated data for removed media are not included on the **Media – Analysis** screen.
- On all other screens, media serial numbers (VSNs or volsers) of removed media are dimmed and are not active links.

This check box is deselected by default.

Buttons

OK

Click to apply your entries.

Cancel

Click to dismiss this dialog box without applying your entries.

-

Refresh Settings

Sample Screen



Description

This dialog box allows you to set the refresh rate for the STA screen display and the timeout interval for login sessions. This dialog box appears when you select **Preferences > Refresh Settings** from the Main Toolbar. The settings apply to the username you are currently logged in as.

Screen Fields

Refresh interval in seconds

Enter the new refresh rate, in seconds. STA screens will be updated to display new data at the frequency you specify. Your entry must be between 60 and 43200 (12 hours). The default is 480 (8 minutes).

Session timeout in minutes

Enter the new timeout interval, in minutes. Login sessions that are idle for longer than this amount of time will be ended automatically. Your entry must be between 10 and 86400 (60 days). The default is 30.

Buttons

OK

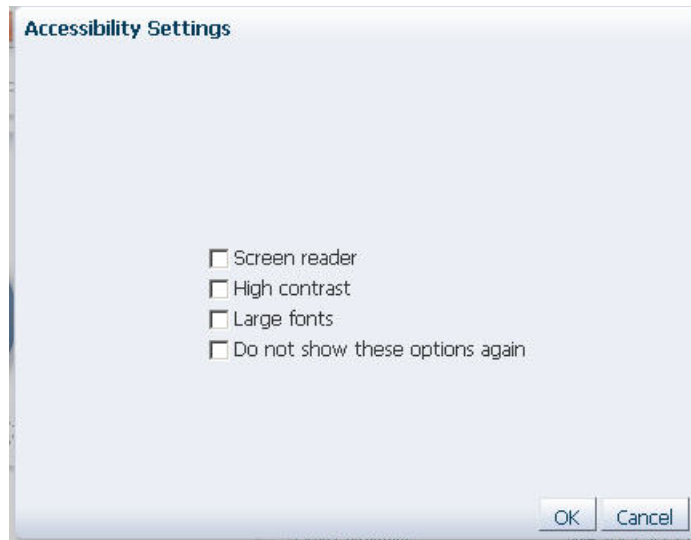
Click to apply your entries.

Cancel

Click to dismiss this dialog box without applying your entries.

Accessibility Settings

Sample Screen



Description

This dialog box allows you to customize the accessibility settings for your STA login session. This dialog box appears when you select **Preferences > Accessibility** from the Main Toolbar. It also appears whenever you log into STA, as long as the “Do not show these options again” check box has not been selected previously.

Screen Fields

Screen Reader

Select this check box to enable screen reader mode for users with low vision, blindness, color blindness, or other visual impairments. This mode causes the screen display to be optimized for use with screen readers such as JAWS. It also allows you to perform all screen actions with the keyboard instead of a mouse.

This check box is deselected by default.

High Contrast

Select this check box to enable high-contrast mode. This mode causes STA screens to be compatible with high-contrast features provided by your browser. For best results, you may also want to enable large fonts mode, described below.

This mode is designed to be used in conjunction with your browser’s high-contrast capabilities (see your browser’s documentation for details). You should disable this mode if you are not using these capabilities in your browser.

This check box is deselected by default.

Large fonts

Select this check box to enable large font mode. This mode causes STA screens to be compatible with larger font sizes and zoom capabilities provided by your browser. For best results, you may also want to enable high-contrast mode, described above.

This mode is designed to be used with larger fonts or zoom capabilities in your browser (see your browser's documentation for details). You should disable this mode if you are not using these capabilities in your browser.

This check box is deselected by default.

Do not show these options again

Select this check box to indicate that you do not want this dialog box to be displayed automatically when you log in. If you apply this option, this dialog box will be skipped for all future times that you log in to STA. You can reset this option at any time by manually displaying this dialog box.

This check box is deselected by default.

Buttons

OK

Click to apply your entries.

Cancel

Click to dismiss this dialog box without applying your entries.

Reset (Templates)

Sample Screen



Description

This dialog box allows you to restore all Default and pre-packaged templates to their default settings. Any modifications you have made to these templates will be lost. Deleted pre-packaged templates will be restored and made available to all users.

This dialog box appears when you select **Preferences > Templates** from the Main Toolbar.

Screen Fields

None

Buttons

Logout

Click to reset all templates and log out of STA. When you log back in, the restored templates will be available to all users.

Cancel

Click to dismiss this dialog box without applying your selections.

Confirmations

Sample Screen



Description

This dialog box allows you to indicate whether you want to display or suppress selected confirmation dialog boxes. This dialog box appears when you select **Preferences > Confirmations** from the Main Toolbar.

Screen Fields

Graph Time Sync

Select this check box to indicate that you want a confirmation dialog box to appear before you synchronize all graphs on a screen to the same date range.

If you deselect this check box, the confirmation dialog box will be suppressed, and graphs will be synchronized as soon as you click the **Synchronize Date Range** button in the Graph Pane Toolbar.

This check box is selected by default.

Template Overwrite

Select this check box to indicate that you want a confirmation dialog box to appear before you save changes to an existing template.

If you deselect this check box, the confirmation dialog box will be suppressed, and existing templates will be overwritten as soon as you click the **Save** button in the **Save Template** dialog box.

This check box is selected by default.

Template Delete

Select this check box to indicate that you want a confirmation dialog box to appear before you delete an existing template.

If you deselect this check box, the confirmation dialog box will be suppressed, and templates will be deleted as soon as you click **Delete** in the **Delete Template** dialog box.

This check box is selected by default.

Buttons

OK

Click to apply your entries.

Cancel

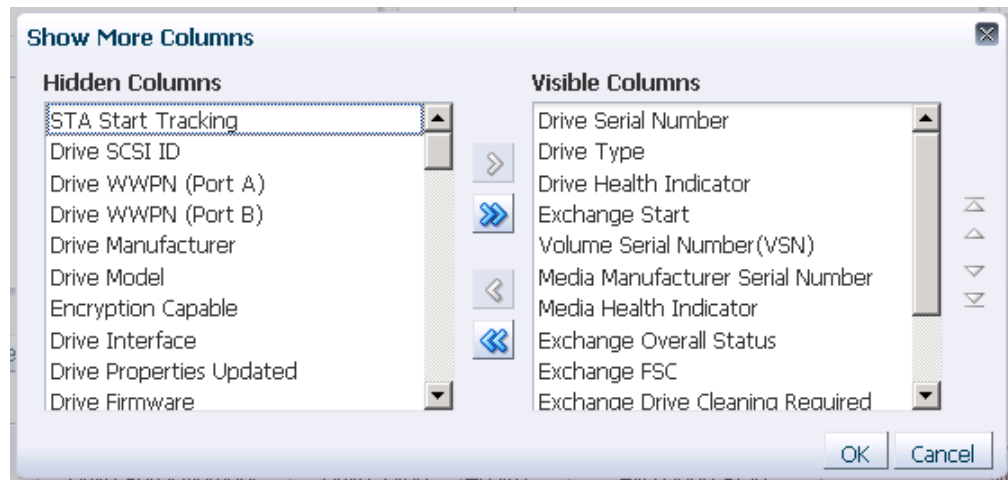
Click to dismiss this dialog box without applying your entries.

Table Display Dialog Boxes

- [“Show More Columns” on page 207](#)
- [“Advanced Sort” on page 209](#)
- [“Reorder Columns” on page 211](#)
- [“Filter Data” on page 212](#)
- [“Change Attributes” on page 214](#)

Show More Columns

Sample Screen



Description

This dialog box allows you to indicate which attributes you want to reveal and hide on the current List View table. You can also indicate the order in which you want the revealed attributes to appear in the table. The specific list of attributes included in this dialog box varies, depending on whether the List View table displays libraries, drives, or media.

This dialog box appears when you select **View > Columns > Show More Columns** from the List Table Toolbar.

Screen Fields

Hidden Columns

List of all attributes to be hidden from the List View table. Select one or more attributes you want to move to the Visible Columns list. This field supports multi-select.

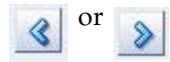
Visible Columns

List of all attributes to be revealed in the List View table. Select one or more attributes you want to either move to the Hidden Columns list or re-order in the table display. This field supports multi-select.

Buttons

Selection arrows

Active buttons depend on whether you have selected items in one or both lists.



or

Move the selected item(s) to the indicated list.

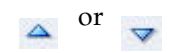


or

Move all items from one list to the other.

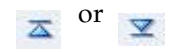
Ordering arrows

These buttons are active only if you have selected one or more items in the Visible Columns list.



or

Move the selected item(s) up or down, one place at a time.



or

Move the selected item(s) to the top or bottom of the list.

OK

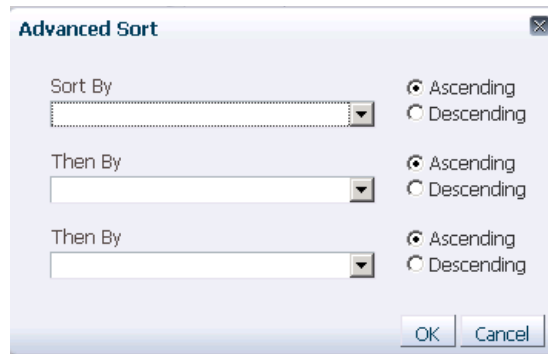
Click to apply your entries.

Cancel

Click to dismiss this dialog box without applying your entries.

Advanced Sort

Sample Screen



Description

This dialog box allows you to specify a nested sort on a List View table, using up to three columns. You can use any available table attributes for the sorts, even if the attributes are hidden from the current table display.

This dialog box appears when you select **View > Sort > Advanced** from the List Table Toolbar.

Screen Fields

Sort by

In the menu, select the attribute you want to use for the primary sort. The menu displays all available attributes for the table, including those that are currently hidden.

Then by

This field appears twice. In the menu, select the attribute(s) you want to use for up to two additional nested sorts.

Ascending

Click to indicate that you want the associated attribute to be sorted in ascending order.

Descending

Click to indicate that you want the associated attribute to be sorted in descending order.

Buttons

OK

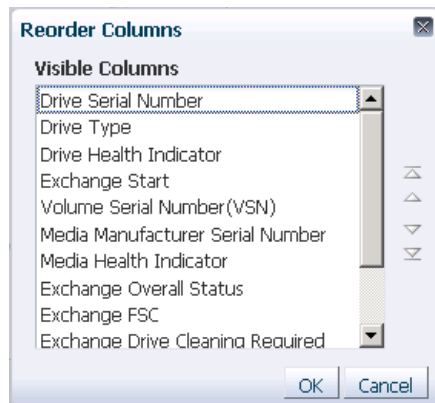
Click to apply your entries.

Cancel

Click to dismiss this dialog box without applying your entries.

Reorder Columns

Sample Screen



Description

This dialog box allows you to specify the order you want columns to appear in a List View table.

This dialog box appears when you select **View > Reorder Columns** from the List Table Toolbar.

Screen Fields

Visible Columns

List of all revealed attributes, in the order they are to appear in the table. Select one or more attributes you want to re-order. This field supports multi-select.

Buttons

Ordering arrows

These buttons are active only if you have selected one or more items in the Visible Columns list.



or



Move the selected item(s) up or down, one place at a time.



or



Move the selected item(s) to the top or bottom of the list.

OK

Click to apply your entries.

Cancel

Click to dismiss this dialog box without applying your entries.

Filter Data

Sample Screen

Filter Data

Filter Matching: ☒ Match ANY entered criteria
☐ Match ALL entered criteria

STA Start Tracking: [dropdown] [text box]

Volume Serial Number: [dropdown] [text box]

Media Type: [dropdown]

Media Health Indicator: [dropdown]

WORM Media: [dropdown]

Manufacturer Serial Number: [dropdown] [text box]

Media Manufacturer: [dropdown] [text box]

Media MB Available: [dropdown] [text box]

Media MB Capacity: [dropdown] [text box]

Drive WWNN: [dropdown] [text box]

Drive SCSI ID: [dropdown] [text box]

Drive Type: [dropdown]

Drive Health Indicator: [dropdown]

Last Exchange Start: [dropdown] [text box]

Exchange Elapsed Time: [dropdown] [text box]

Apply Reset Cancel

Description

This dialog box allows you to specify the criteria you want to use to filter data in a List View or Pivot table. You can specify any number of criteria.

This dialog box appears when you click the **Filter Data** icon on the List View or Pivot Table Toolbar.

Screen Fields

Filter Matching

Required field.

Indicate the type of matching you want to use for the filter. Options are:

- Match ANY entered criteria – The table will display records that meet any of the selection criteria you specify. This is the default.
- Match ALL entered criteria – The table will display only those records that meet all the selection criteria you specify.

Attributes List

All available attributes for this library resource type (libraries, drives, or media) are listed in the dialog box. Each attribute has a menu that includes one of the following:

- A list of pre-defined values for the attribute.
- A list of comparison operators. For these fields there is also an associated text entry field in which you enter the specified value for the comparison. The available comparison operators in the menu vary, depending on the type of data, as follows:
 - Dates – Operators are: Is Before, Is, and Is After.
 - Numeric data – Operators are: Less Than, Is, and Great Than
 - Alphanumeric data – Operators are: Is, Starts With, Contains, and Ends With.

Specify the criteria you want to use to filter data. If you leave an attribute blank, it will not be included in the selection criteria.

Note – Text string entries are case-sensitive. For example, the entry “CLN” is not the same as “cln” or “Cln”.

Buttons**Apply**

Click to apply your entries. The table is updated to display only those records that meet the selection criteria you have specified.

Reset

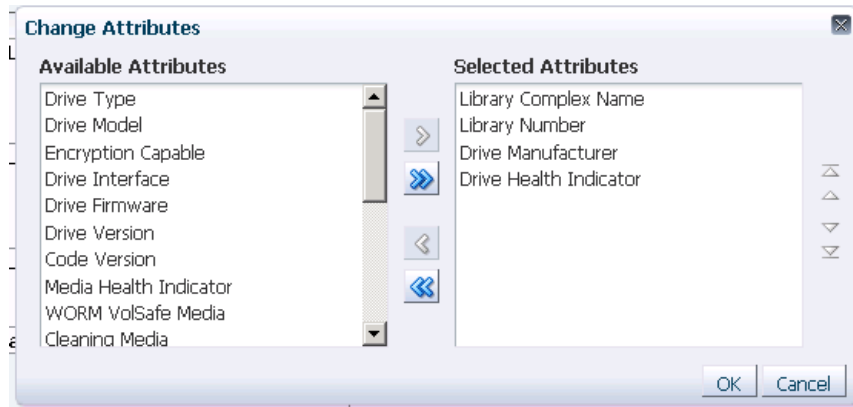
Click to reset the dialog box to the default settings.

Cancel

Click to dismiss this dialog box without applying your entries.

Change Attributes

Sample Screen



Description

This dialog box allows you to change the attributes displayed in a pivot table and the order in which they are nested.

Note – Pivot tables can include between two and seven attributes.

This dialog box appears when you click the **Change Attributes** icon on the Pivot Table Toolbar.

Screen Fields

Available Attributes

List of all attributes to be hidden from the pivot table. Select one or more attributes you want to move to the Selected Attributes list. This field supports multi-select.

Selected Attributes

List of all attributes to be included in the pivot table. The last attribute in the list appears on the column edge of the table. The other attribute(s) appear on the row edge, nested in the order they appear in the list; the top attribute is the outer layer.

Select one or more attributes you want to either move to the Available Attributes list or re-order in the nesting. This field supports multi-select.

Note – This list must contain a minimum of two and a maximum of seven attributes.

Buttons

Selection arrows

Active buttons depend on whether you have selected items in one or both lists.



or



Move the selected item(s) to the indicated list.



or



Move all items from one list to the other.

Ordering arrows

These buttons are active only if you have selected one or more items in the Selected Attributes list.



or



Move the selected item(s) up or down, one place at a time.



or



Move the selected item(s) to the top or bottom of the list.

OK

Click to apply your entries.

Cancel

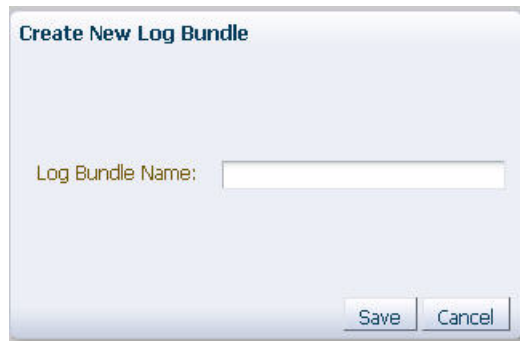
Click to dismiss this dialog box without applying your entries.

Service Log Dialog Box

- [“Create New Log Bundle” on page 217](#)

Create New Log Bundle

Sample Screen



Description

This dialog box allows you to assign a name to a new RDA (Remote Diagnostic Agent) log bundle.

This dialog box appears when you click the **Create New Log Bundle** icon on the Logs Toolbar.

Screen Fields

Log Bundle Name

Enter a name. Log name requirements are:

- Up to 210 characters long.
- Illegal special characters are: . : \$ / \ ____ (four consecutive underscores)
- Any name beginning with the following uppercase characters is invalid:
 - COM
 - LPT
 - PRN
 - CON
 - AUX
 - NUL

Buttons

Save

Click to apply your entries.

Cancel

Click to dismiss this dialog box without applying your entries.

Configuration Settings Dialog Boxes

- [“Define SMTP Server Details” on page 219](#)
- [“Define Email Details” on page 221](#)
- [“Define SNMP Client Settings” on page 223](#)
- [“Define Library Connection Details” on page 226](#)

Define SMTP Server Details

Sample Screen

Define SMTP Server Details

SMTP Host Address *

SMTP Port

From Name

From Email Address

☐ Use Secure Connection Protocol

☐ TLS

☐ SSL

☐ Requires Authentication

Username

Enter Password

Verify Password

Save Cancel

Description

This dialog box allows you to define the email settings for your SMTP server.

This dialog box appears when you click the **Edit Selected SMTP Server** icon on the SMTP Server Settings Toolbar.

Screen Fields

SMTP Host Address

Enter the IP address or fully qualified DNS alias of your SMTP email server.

SMTP Port

Enter the SMTP port number for outgoing mail transport. Typically, this is port 25, but check with your IT system administrator to verify that this is the port used at your site.

From Name

Enter the name you want displayed in the “From” line in email from the server.

From Email Address

Enter the email address from which the email is being sent. If you do not want users to reply to this email, you may want to enter an address in the format:

DoNotReply@Your_Company.com

Use Secure Connection Protocol

Select this check box to select the appropriate secure connection protocol. See your IT system administrator to determine which connection is right for you. You must select one of the following options:

- TLS -- Click to select Transport Layer Security.
- SSL-- Click to select Secure Sockets Layer.

Requires Authentication

Select this check box to indicate that the SMTP server requires authentication.

Username

Enter a username supported by the SMTP server. Required only if you have selected the **Requires Authentication** check box.

Enter Password

Enter the password assigned to the user. Required only if you have selected the **Requires Authentication** check box.

Verify Password

Enter the password again to verify that you have entered it correctly. Required only if you have selected the **Requires Authentication** check box.

Buttons

Save

Click to apply your entries.

Cancel

Click to dismiss this dialog box without applying your entries.

Define Email Details

Sample Screen



The screenshot shows a dialog box titled "Define Email Details". It has a standard Windows-style title bar with a question mark icon and a close button. The dialog contains three labeled fields: "Address" followed by an asterisk, a text input field; "Language-Locale" followed by a dropdown menu currently showing "English"; and "Time Zone" followed by a dropdown menu currently showing "UTC". At the bottom right of the dialog are two buttons: "Save" and "Cancel".

Description

This dialog box allows you to add an email address to receive notifications from STA.

This dialog box appears when you click the **Add Email** or the **Edit Selected Email** icon on the Email Addresses Toolbar.

Screen Fields

Address

Enter a destination to send email to in the form:

your_name@your.company.com

Language-Locale

In the menu, select English if it is not already displayed.

Time Zone

In the menu, select the recipient's time zone.

Buttons

Save

Click to apply your entries.

Cancel

Click to dismiss this dialog box without applying your entries.

Define SNMP Client Settings

Sample Screen

Define SNMP Client Settings

STA SNMP Connection Username (Auth) *

Enter STA SNMP Connection Password (Auth) *

Verify STA SNMP Connection Password (Auth) *

Connection Password Encryption (Auth) SHA

Enter Privacy Encryption Password (Privacy) *

Verify Privacy Encryption Password (Privacy) *

Privacy Encryption Protocol (Privacy) DES

STA Engine ID 0x8000002a050000013999a19013

Trap Levels 1,2,3,4,11,21,25,27,41,45,61,63,65,81,85,100

User Community *

Trap Community *

Save Cancel

Description

This dialog box allows you to define SNMP connection settings for STA so it can receive SNMP data from one or more libraries. You must define settings for both the SNMP v3 and SNMP v2c protocols. The appropriate settings (SNMP v3 or SNMP v2c) will be used with each monitored library, depending on library firmware level and which SNMP protocol the library is configured to use. See [“STA and SNMP” on page 22](#) for details.

You must define all of the following settings:

- For SNMP v3 connections:
 - User name
 - Connection authorization password
 - Privacy password
- For SNMP v2c connections:
 - User community name
 - Trap recipient name

This dialog box appears when you click the **Edit** icon on the SNMP Client Attributes Toolbar.

Screen Fields

Note – The following fields define the SNMP v3 connection settings for STA, and all are required. If all monitored libraries use SNMP v2c for STA communications, these entries will be ignored and you can enter any values.

STA SNMP Connection Username (Auth)

Required.

Enter the name of the STA SNMP v3 user. This user must also be defined on all monitored libraries that use the SNMP v3 protocol for STA communications.

Enter STA SNMP Connection Password (Auth)

Required.

Enter the connection authorization password for the SNMP v3 user. This password must also be defined on all monitored libraries that use the SNMP v3 protocol for STA communications.

Verify STA SNMP Connection Password (Auth)

Required.

Re-type the connection password to ensure that you have entered it correctly. An error message will be displayed if the two passwords do not match.

Connection Password Encryption (Auth)

Display only.

Encryption technique for storing the connection password. This is always SHA (Secure Hash Algorithm).

Enter Privacy Encryption Password (Privacy)

Required.

Enter the privacy encryption password for the SNMP v3 user. This password must also be defined on all monitored libraries that use the SNMP v3 protocol for STA communications.

Verify Privacy Encryption Password (Privacy)

Required.

Re-type the privacy password to ensure that you have entered it correctly. An error message will be displayed if the two passwords do not match.

Privacy Encryption Protocol (Privacy)

Display only.

Encryption technique for the SNMP privacy mechanism. This is always DES (Data Encryption Standard).

STA Engine ID

Display only.

Globally unique SNMP engine ID for the STA server. This is assigned by STA and is distinct from the library engine ID provided by each library. Both are required to ensure secure communication.

Trap Levels

Display only.

List of all the SNMP traps that STA can process. This does not necessarily mean that these traps have been configured on the monitored libraries; you must verify this on each library.

Note – The following fields define the SNMP v2c connection settings for STA, and both are required.

User Community

Required.

Enter the name of the STA SNMP v2c user. This user must also be defined on all monitored libraries that use the SNMP v2 protocol for STA communications. The default is `public`.

Note – If all monitored libraries use SNMP v3 for STA communications, this entry will be ignored and you should leave the value set to `public`.

Trap Community

Required.

Enter the name of the STA SNMP v2c trap recipient. This trap recipient must also be defined on all monitored libraries that use the SNMP v2 protocol for sending traps to STA. The default is `public`.

Note – If all monitored libraries use SNMP v3 for sending STA traps, this entry will be ignored and you should leave the value set to `public`.

Buttons**Save**

Click to apply your entries.

Cancel

Click to dismiss this dialog box without applying your entries.

Define Library Connection Details

Sample Screen

Define Library Connection Details

Library Complex

Library Name *

Library Primary IP Address *

Library Secondary IP Address

STA IP Address *

Library Engine ID

Automated Daily Data Refresh

Time Zone

Save Cancel

Description

This dialog box allows you to define connection details for a library that you want to connect to STA.

This dialog box appears when you click the **Add** or **Edit** icon on the SNMP Monitored Libraries Toolbar.

Screen Fields

Library Complex

Display only.

Library complex ID. This ID is automatically generated by STA when you successfully retrieve the latest library configuration data.

Library Name

Required.

Enter the name you want to assign to the library. This name will be used to identify the library throughout the STA screens. You may want to use the library host name.

Library Primary IP Address

Required.

Enter the IP address of the public port on the library. For SL150 libraries, this is the Network Port 1 port; for SL500 libraries, it is the 1B port; for SL3000 and SL8500 libraries, it is the 2B port.

Note – For SL3000 and SL8500 libraries using the Redundant Electronics feature, this is the 2B port on the active controller card.

Library Secondary IP Address

This field does not apply to SL150 and SL500 libraries and should be left blank.

For SL3000 and SL8500 libraries, your entry in this field depends on the specific configuration of the library. This entry enables STA to maintain uninterrupted SNMP communications with the library in the event of either a Redundant Electronics switch or a Dual TCP/IP failover.

- For libraries with the Redundant Electronics feature, enter the IP address of the 2B port on the alternate (standby) controller card.
- For libraries with the Dual TCP/IP feature, enter the IP address of the 2A port on the active controller card.
- For libraries with both features, you can choose which IP address to enter, depending on which feature you want STA to support without interruption. See “Configuring the Libraries for STA” in the *STA Configuration Guide* for detailed instructions.
- For libraries with neither of these features, leave this field blank.

STA IP Address

Required.

The menu lists all available IP addresses for the STA server. Select the IPv4 address the library should use to send SNMP data to the server. If there is more than one listed and you are not sure which one to use, see your STA administrator for assistance.

Library Engine ID

Do not modify this field. This is the unique SNMP engine ID of the library. It is automatically provided by the library whenever a library data collection is performed.

Automated Daily Data Refresh

Enter the time of day when you want STA to collect the latest configuration data from the library. The data will be collected automatically every 24 hours at this time, local to the time zone you specify in the Time Zone field.

The default is 00:00 (12:00 am). Use 24-hour time format for your entry (for example, 13:00 is 1:00 pm).

Note – It is recommended that you choose a time period when there is typically lighter library usage, so the data collection does not conflict with other significant library activity.

Caution – If you leave this field blank, scheduled automatic library data collections will be disabled. This will cause your STA library configuration data to become out of sync with the library.

Time Zone

In the menu, select the library's local time zone.

Buttons

Save

Click to apply your entries.

Cancel

Click to dismiss this dialog box without applying your entries.

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