

Brief Operating Procedures for HP StorageWorks ESL E-322 Tape Library

Do-and-Don't for Operations Teams

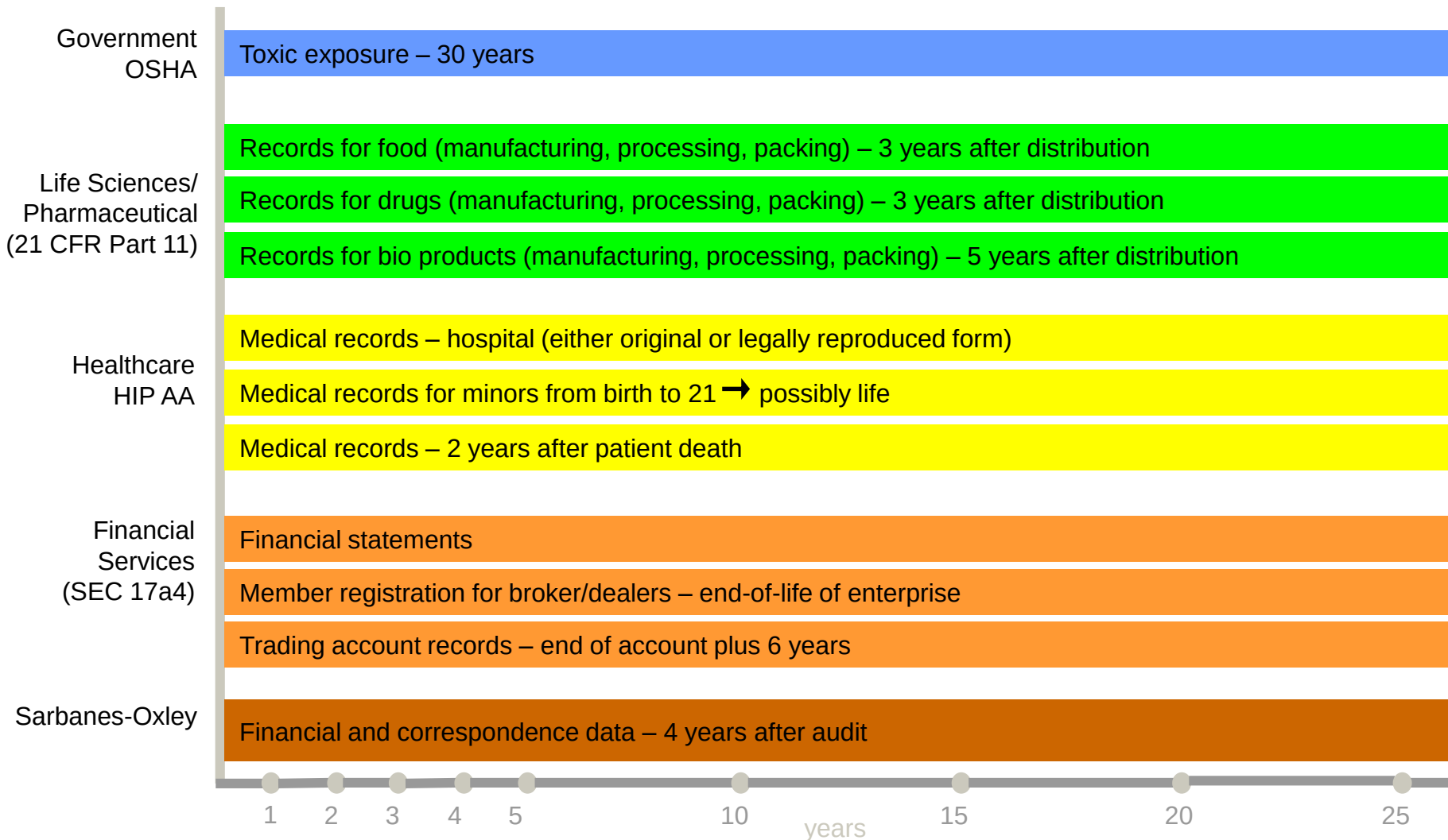
Dusan Baljevic, Australia

Glory of Operations Team

- Typically, forgotten in maze of business units,
- Undeservedly considered to be running boring and repetitive tasks,
- Respected and “suddenly” remembered only when a major disaster strikes,
- Viciously attacked if data restores fail,
- Critical to any business continuity plans.

Regulatory Compliance

Increasing Document Retention Periods



Enterprise Platform - ESL E-Series Product Overview



- 1-44 drives
- 322-3546 cartridges (LTO Ultrium drives)
Maximum depending on model
- Footprint/density – 28.5 TB per sq.foot
- Maximum capacity (compressed 2:1)
5673 TB (LTO-4)
- LTO-3, LTO-4, SDLT 600 Tape Drives
- Maximum Sustained Transfer Rate
(compressed 2:1) 38 TB/hour
- Embedded Manageability
- HP enhanced interface controllers
- Bulk Load Ports: 16/32/48 Ultrium
cartridges in removable magazines
- Intelligent robotics

ESL E-Series Main Features

Secure Key Manager support

- HP StorageWorks Secure Key Manager reduces your risk of a costly data breach and reputation damage. It also improves regulatory compliance with a secure centralized encryption key management solution using HP LTO-4 1840 Tape Drives in the ESL E-series Tape Library.

LTO-4 Ultrium 1840 tape drive support

- Compared to LTO-3 Ultrium 960 tape drives, LTO-4 Ultrium 1840 tape drive capacity is doubled, performance is increased by approximately 50% and encryption is supported.

AES 256-bit embedded hardware encryption

- Provides a high level of encryption security, with compression, for strong backup data privacy to secure confidential information and address compliance quickly.

ESL E-series multi-unit scalability

- The ESL E-series can be managed as a single library with up to 3546 Ultrium cartridges and up to 44 tape drives using the ESL E-series Cross Link Kit and Cross Link Expansion Kit. This allows for better utilization of existing tape libraries and easier management and support.

ESL E-Series Main Features (continued)

Best-in-class cartridge and tape drive density

- In a single frame the HP StorageWorks ESL E-series Tape Library has the ability to scale from 322 to 712 LTO cartridges and up to twenty-four Ultrium tape drives. At 109 TB per square foot, the ESL E-series minimizes floor space while maximizing storage capacity.

Improved backup and restore reliability

- The HP StorageWorks Extended Tape Library Architecture (ETLA) provides customers with improved backup and restore reliability. Based on research conducted by Axios Partners in 2005, customers purchasing an ESL E-series with ETLA experienced up to 90% reduction in annualized backup failures.

Simplified installation and SAN integration

- HP StorageWorks Extended Tape Library Architecture (ETLA) simplifies the installation and integration of the library into the SAN.

Simplified backup through automated management

- HP StorageWorks Extended Tape Library Architecture (ETLA) simplifies backup through better, more automated management of the entire library. ETLA-based libraries are self-aware, self-managed, and automatically maintained, to simplify monitoring and maintenance.

ESL E-Series Main Features (continued)

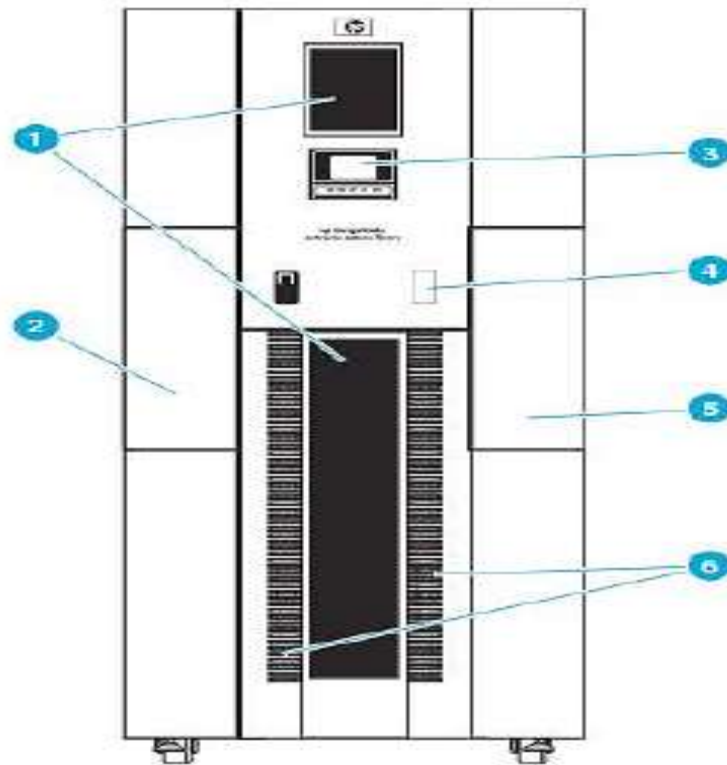
Partitioning support

- The HP StorageWorks ESL E-series Tape Library provides the ability to easily partition the library into up to six virtual tape libraries. Partitioning can be used to easily change the tape library configuration to adapt to ongoing changes that take place in the SAN environment.

Mixed media capability

- Supports a mixture of LTO-4 Ultrium 1840 FC tape drives, LTO-3 Ultrium 960 FC tape drives and SDLT 600 tape drives in a single cabinet. This allows customers to easily migrate their library forward as new tape drive technologies become available.

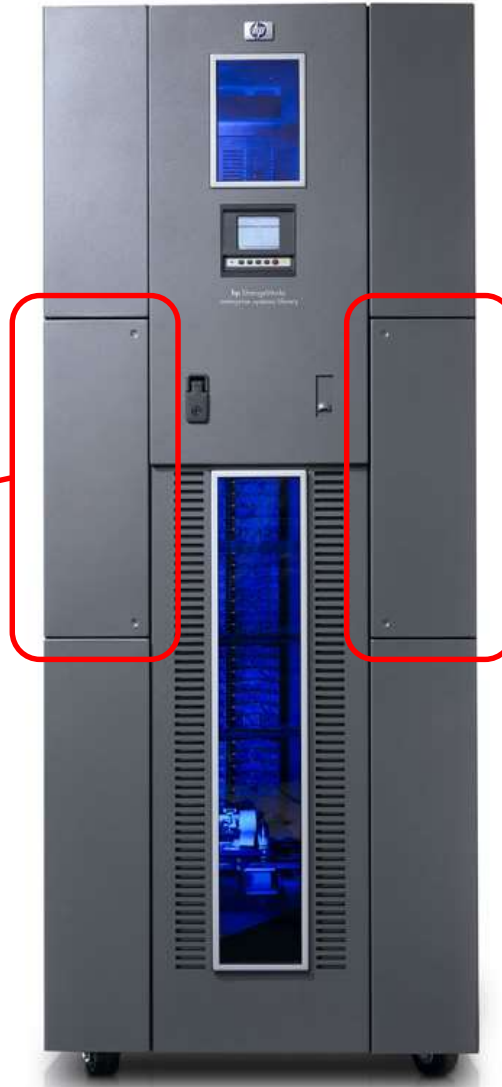
ESL – Front View



- | | |
|---|--|
| 1 | Viewing windows |
| 2 | Left load port |
| 3 | OCP |
| 4 | Power button (lift button guard to access) |
| 5 | Right load port |
| 6 | Ventilation and air filters |

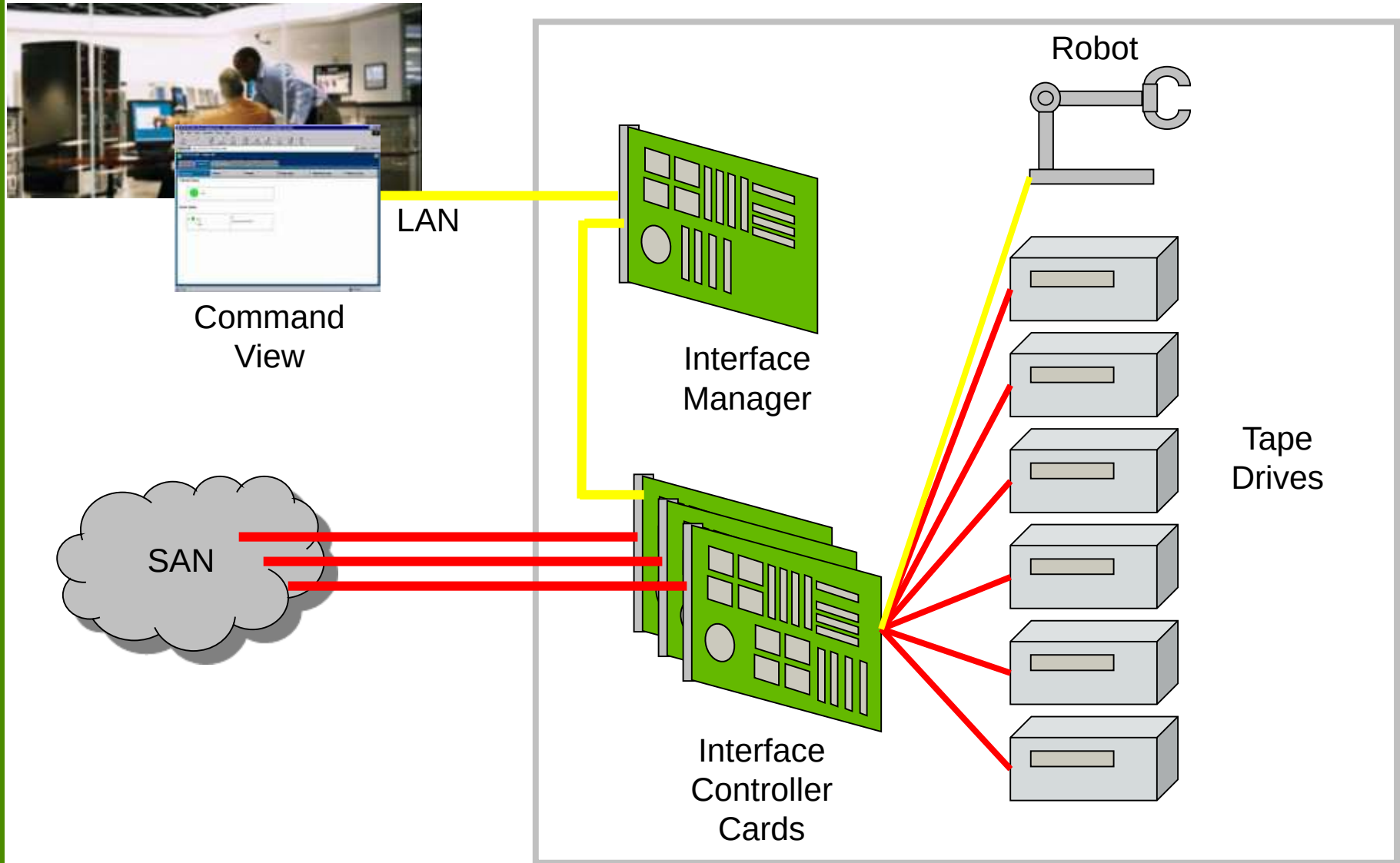
Load port doors

Left load port
(16
cartridges)

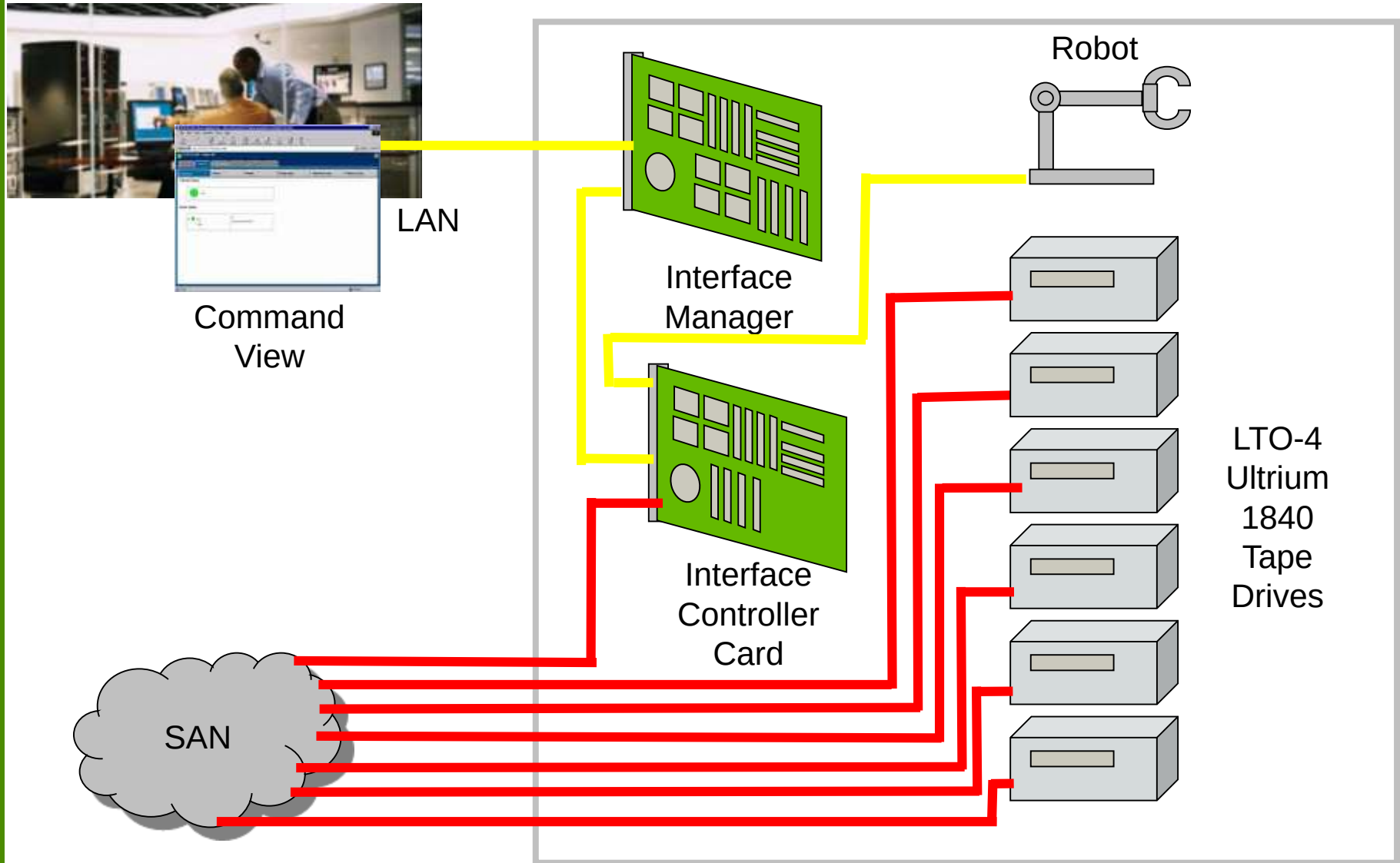


Right load port
(32 cartridges)

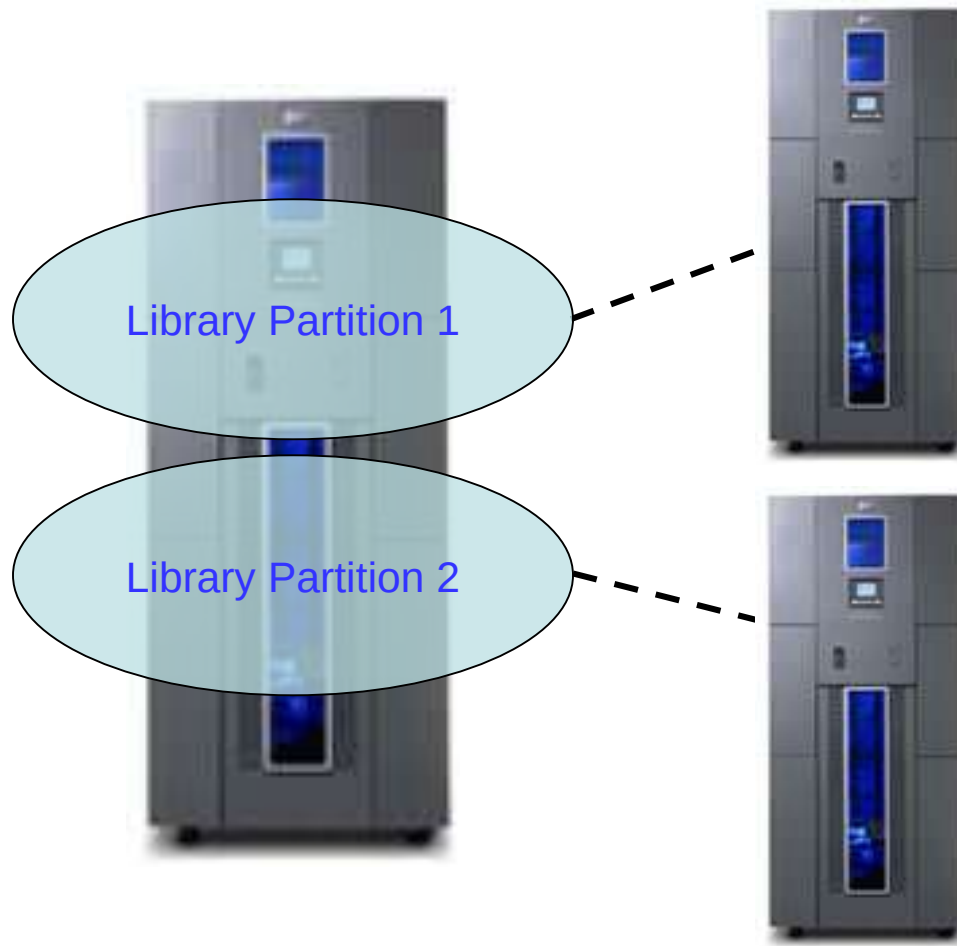
Extended Tape Library Architecture – legacy tape drives



Extended Tape Library Architecture – LTO-4 and newer tape drives



Partitioning ESL



- Each library partition consists of:
 - One virtual robotic device
 - One or more tape drives
 - User defined number of storage slots
 - User selectable import/export access ports
- Configuration dimensions:
 - Up to six “virtual” partitions available
 - Paths to robotics can be separated between two independent SANs for isolation purposes
 - Storage slots are assigned to zones; each zone contains a number of slots defined by the administrator

Load Ports

Bulk Loading/Unloading Flexibility

User-programmable load ports provide the ultimate in flexibility and in security for customers who off-site multiple cartridges daily for disaster recovery purposes or replication

The ability for the customer to easily remove cartridges from the load port. Include a handle for easy removal. The mixed media kit contains removable magazines for all load port

LTO

SDLT

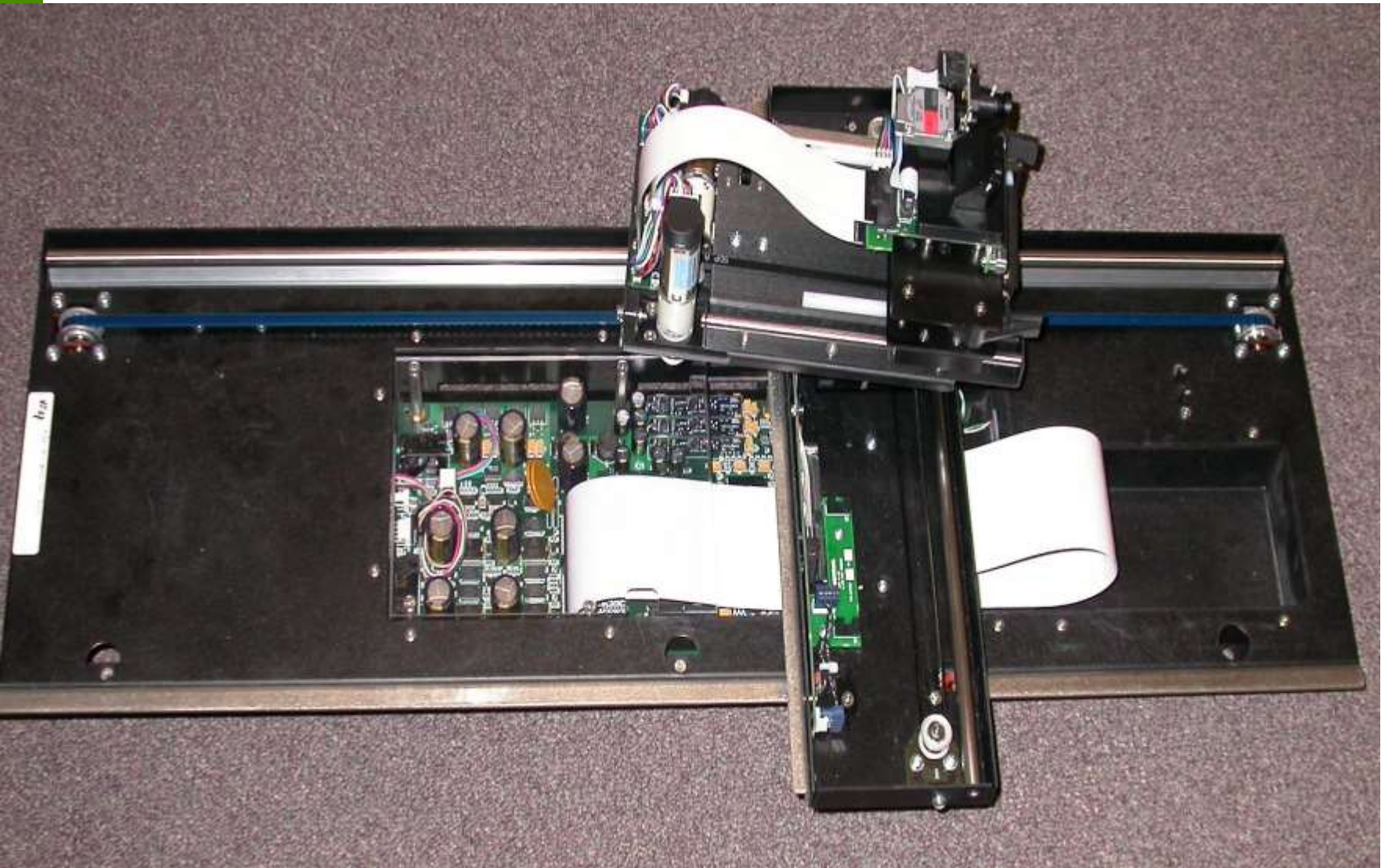
Removable Load Port

0, 16, 32, 48

0, 14, 28, 42

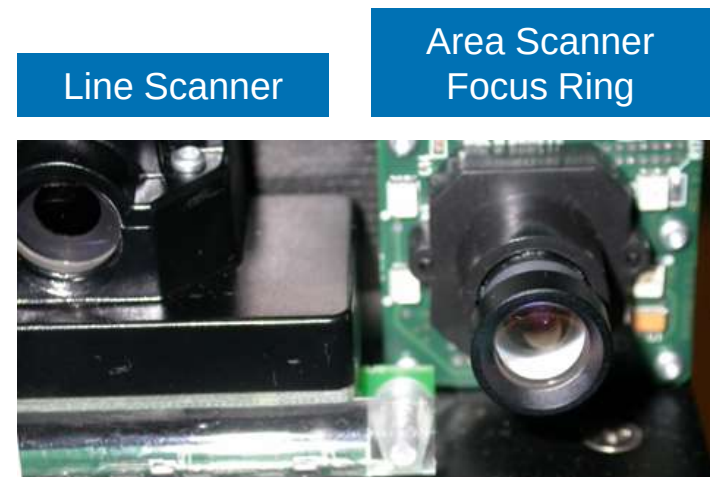
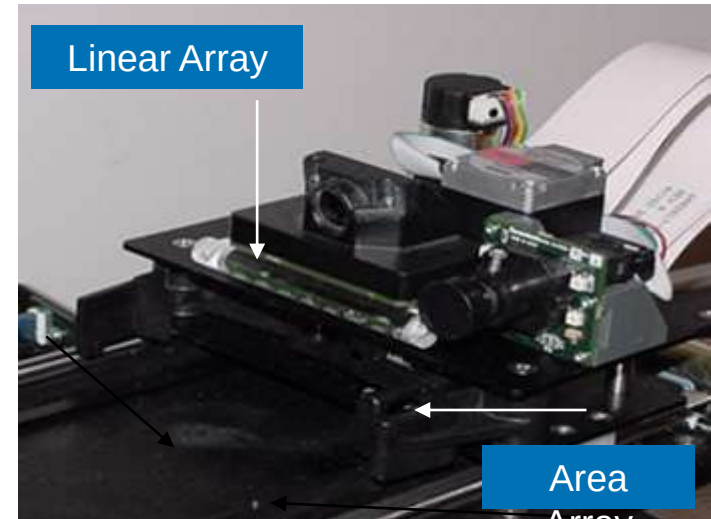


Intelligent Robotics Mechanism



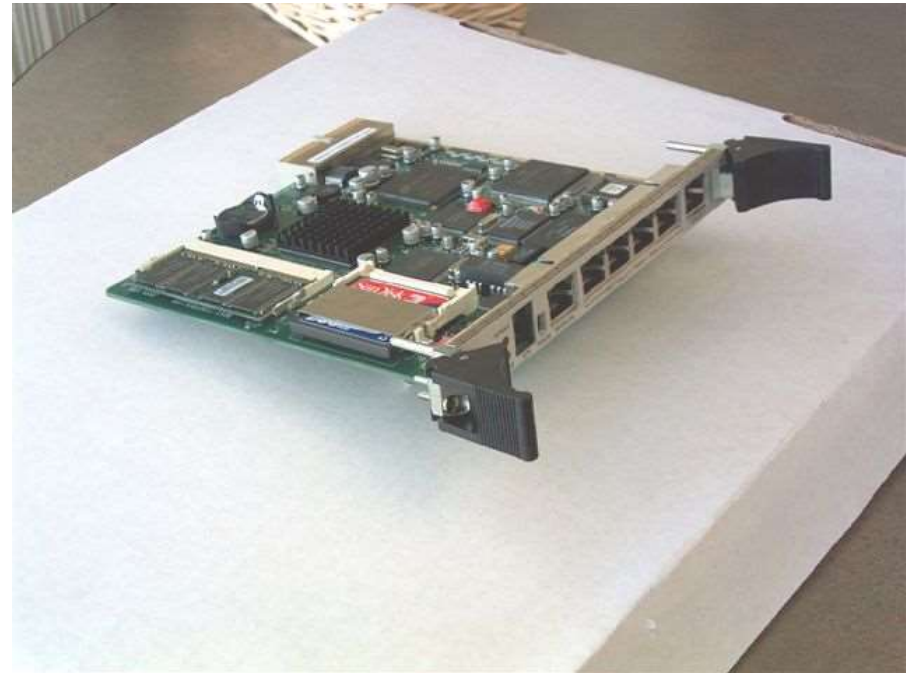
ESL E-Series Gripper

- Linear Array – Bar Code
- Area Array – Calibration
- Demonstrating 14 scans per barcode label at 30ips
 - 3 times faster than the ESL9000 (5 scans at 10ips)
- Very fast calibration & inventory
- Supports multiple barcode label formats
- Detects empty bin, non-label cartridges and cartridge type



Interface Manager

- network connected to the internal library network
- contains embedded LINUX OS on flash memory
- embedded diagnostics



Control Panel Design

- Simple control panel display features:
 - 5-button user interface
 - 320 x 240 LCD (3.2" x 2.4")
 - 2 LEDs, Red and Green
 - Basic functionality for local control requirements only
- Used to:
 - configure initial network address details
 - operate load ports
 - configure drive modules



Command View TL Connection

To start Command View TL, open your browser, either on the management station or on a client machine on the LAN, and enter the following URL in the address field:

<http://hostname:4095/>

(where *hostname* is the IP address or network name of the management station. If you are starting Command View TL on the management station itself, you can substitute *localhost* for the *hostname*).

On the management station, you can also start Command View TL from the Windows Start button:

Start > All Programs > HP Command View TL > Command View TL

If the Java Runtime Environment (JRE) plug-in is not already installed on your computer and you are using a Windows operating system, Command View TL attempts to download and install it for you. If you are prompted to install the JRE plug-in, click OK and follow the instructions in the window. If you are using a non-Windows operating system, you are instructed how to download and install the JRE plugin. If the JRE plug-in is not available, then Command View TL will not run on that machine.

After the JRE is successfully installed, the Command View TL Launcher window opens.

Command View

Integrated and centralized interface for management of all library components

Port Connection Settings

Interface Manager Mode: Automatic
Port Connection Type settings apply to ALL ports when the Interface Manager is in 'Automatic' mode.

Port Connection Type

☒ **Fabric (SAN) Attach**
Use this connection type when connecting all fibre channel ports to a fibre channel switch.

☐ **Direct Attach**
Use this connection type when connecting all fibre channel ports to a Host Bus Adapter on a backup server.

Port Speed

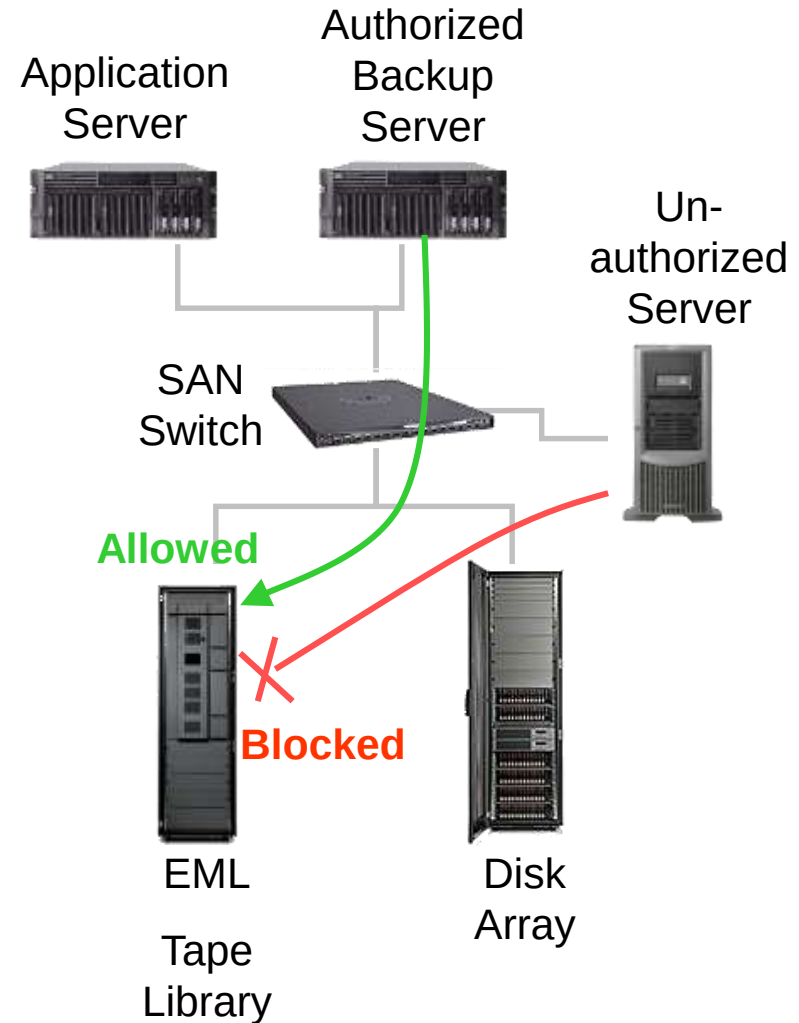
Speed: 4 Gigabits per second
1 Gigabit per second
2 Gigabits per second
4 Gigabits per second

OK Cancel help

Interface Controller	World Wide Name	Connection Type	Fibre Mode	Host ID	Speed
Interface Controller 1 (HBA)	100000000000000000	Fabric	N-Port	N/A	4 Gbps
Interface Controller 2 (HBA)	100000000000000000	Fabric	N-Port	N/A	4 Gbps

Increased Reliability with Advanced Secure Manager

Limits the access of non-authorized servers to specific tape drives within ESL libraries, increasing the reliability and efficiency of backup operations



Launcher – Select Library

hp Command View TL - Microsoft Internet Explorer provided by Hewlett-Packard

File Edit View Favorites Tools Help Links

hp Command View TL - Launcher Home About

Ready Help Updates

Library Selection Management Station License Key Summary Support

Library Selection

Actions

- Manage Library...
- Add Library...
- Remove Library
- Library Discovery Wizard...
- Connectivity Check...
- Refresh

Network Name	Status
tkmeml01.gr.hp.com	Ready to Manage

Ready.

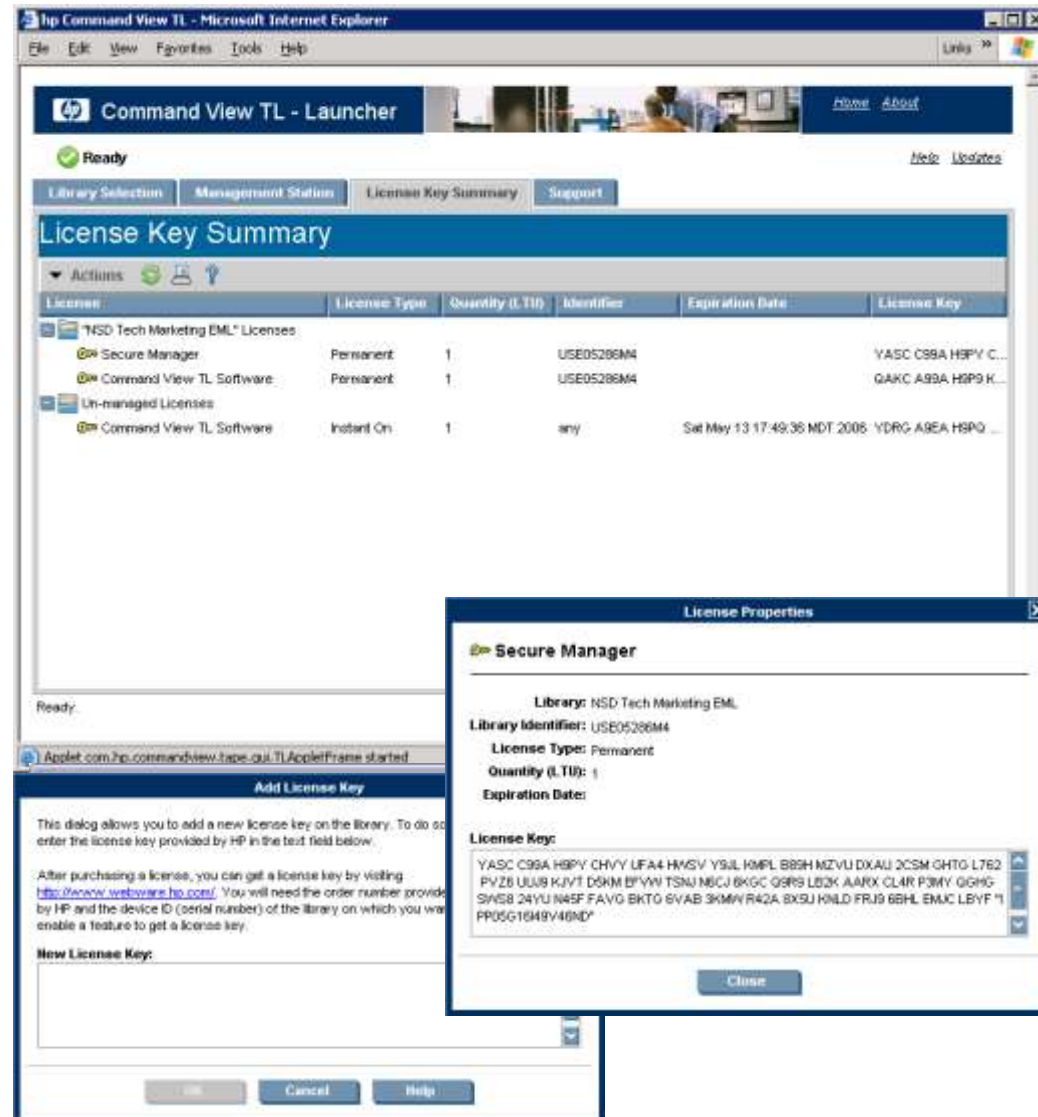
Applet com.hp.commandview.tape.gui.TLAppletFrame started Local intranet

Add, Remove and Manage a Library

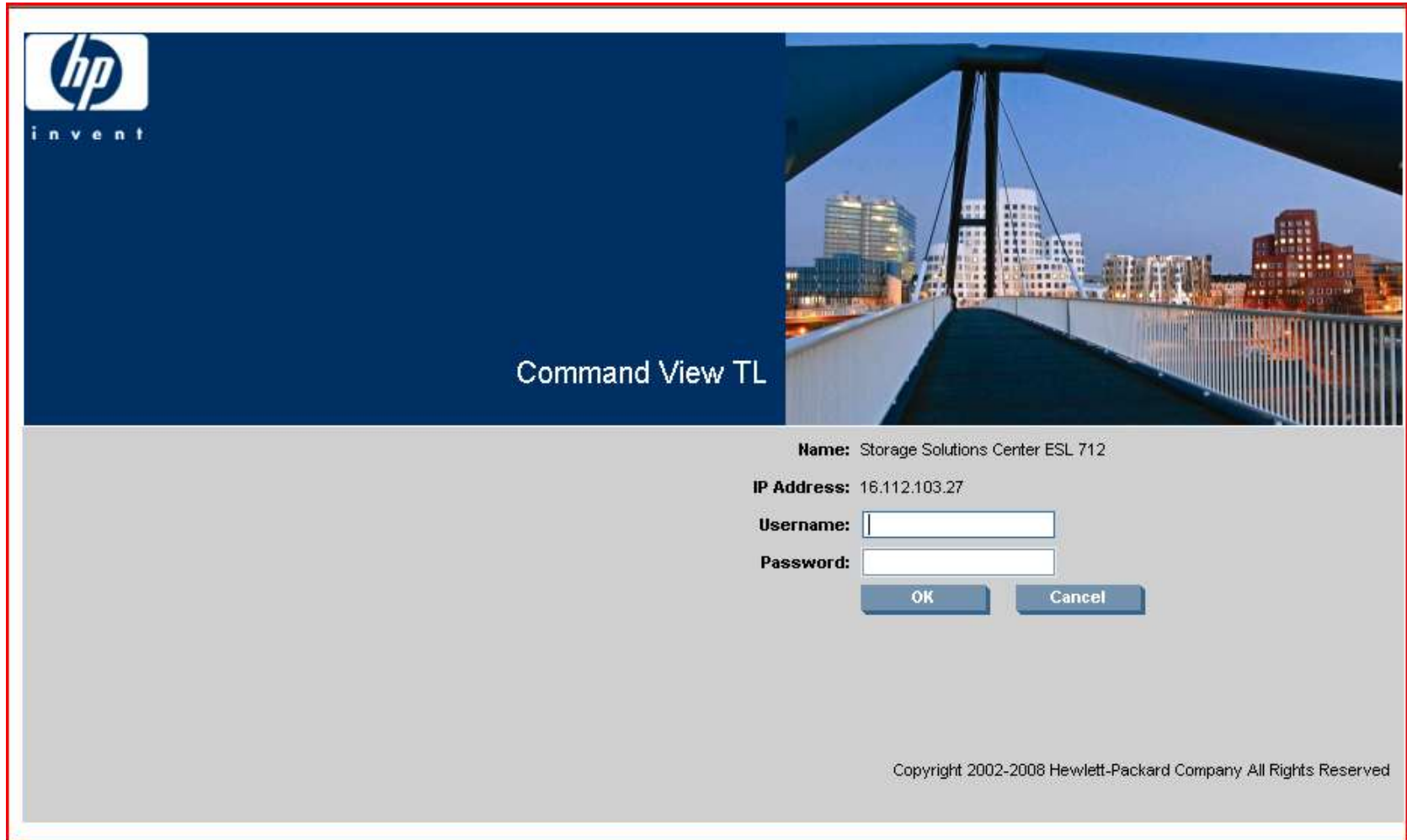
Configure MS settings and add/remove licenses

License Management

- Shows installed licenses and LTU, on a per library basis.
- License is locked to a library serial number
- Licenses can be added and removed from the management station
- Management station notifies IM of available advanced feature.
- Performs native calls to Win32 Autopass component
- Licensed Capacity license for ESL E-Series
- Secure Manager and Partitioning activated by single Secure Manager license



Command View TL library login screen



The login screen features a dark blue header on the left with the HP logo and the word "invent" in white. To the right of the header is a photograph of a modern bridge at night, with city lights visible in the background. The text "Command View TL" is displayed in white on the blue background.

Name: Storage Solutions Center ESL 712
IP Address: 16.112.103.27

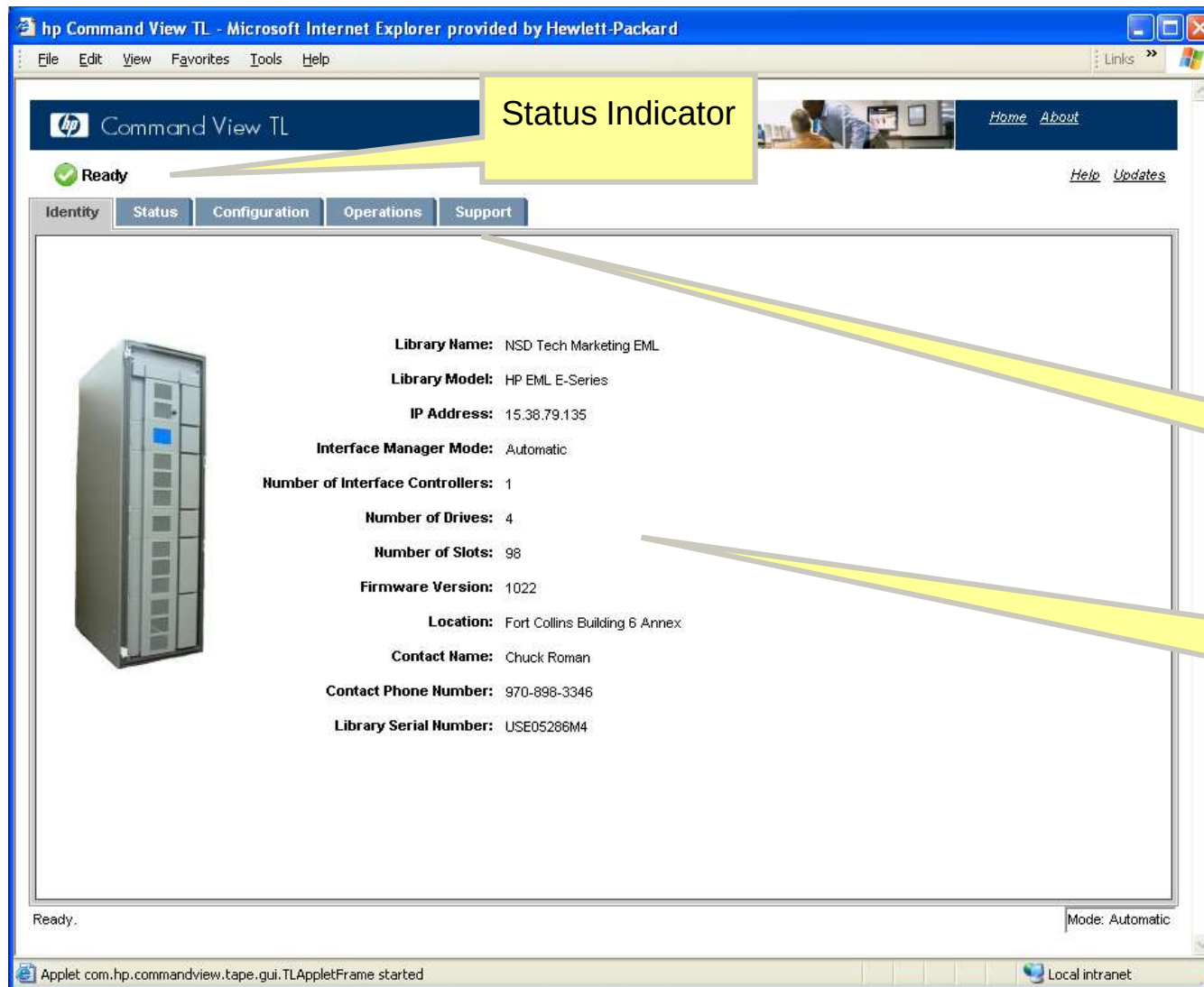
Username:
Password:

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Command View TL accounts

- Guest
 - Monitor status, view support tickets
- User
 - Guest, plus move media, reboot components, clean drives, generate support tickets
- Admin
 - User, plus change configuration settings and update firmware
- Security
 - Admin, plus set encryption key management options/policies
- Service
 - Admin, plus perform service-level commands

Library Management Interface



Status Indicator

Task-based
Navigation

Library
Summary
Information

Command View TL Health Summary

Command View TL

Home Help About Updates

Ready

Component Status: 0 0 20
Recent Alerts (Last 5 Days): 80 296 13222

Identity Status Configuration Operations Support

Status

- Health Summary
- Cabling View
- Component Status
- Library
- Library Sensors
- Robotics
- Drives
- Advanced LTO-4 Drives
- Interface Controllers
- Interface Manager
- Alert Log
- Inventory

Health Summary

Actions

Component	Health	Description	Recent Alerts
Advanced Features	Ready	Secure Manager is operational	
Secure Manager	Ready	Operational	
System Health	Operational	No additional sense information	26 critical, 55 warning
Library			
Library Sensors			
Cabinet 1	Ready		11 critical, 5 warning
Cabinet 2	Ready		7 critical, 3 warning
Robotics			
Cabinet 1	Operative - Picker Empty		0 critical, 3 warning
Cabinet 2	Operative - Picker Empty		0 critical, 0 warning
Drives			
Drive 1 (Ultrium 3-SCSI)	Operative - Drive empty		0 critical, 0 warning
Drive 2 (Ultrium 3-SCSI)	Operative - Tape Loaded		0 critical, 0 warning
Drive 3 (Ultrium 3-SCSI)	Operative - Tape Loaded		0 critical, 0 warning
Drive 4 (Ultrium 3-SCSI)	Operative - Tape Loaded		0 critical, 0 warning
Drive 5 (Ultrium 3-SCSI)	Operative - Drive empty		0 critical, 0 warning
Drive 6 (Ultrium 3-SCSI)	Operative - Drive empty		0 critical, 0 warning
Drive 7 (Ultrium 3-SCSI)	Operative - Drive empty		0 critical, 0 warning
Drive 8 (Ultrium 3-SCSI)	Operative - Drive empty		0 critical, 0 warning
Drive 9 (Ultrium 4-SCSI)	Operative - Drive empty		0 critical, 0 warning
Drive 10 (Ultrium 4-SCSI)	Operative - Drive empty		0 critical, 0 warning
Drive 11 (Ultrium 4-SCSI)	Operative - Tape Loaded		0 critical, 0 warning
Drive 12 (Ultrium 4-SCSI)	Operative - Tape Loaded		0 critical, 0 warning
Drive 13 (Ultrium 4-SCSI)	Operative - Drive empty		0 critical, 0 warning
Drive 14 (Ultrium 4-SCSI)	Operative - Drive empty		0 critical, 0 warning
Drive 15 (Ultrium 4-SCSI)	Operative - Drive empty		0 critical, 0 warning
Drive 16 (Ultrium 4-SCSI)	Operative - Drive empty		0 critical, 0 warning
Drive 17 (Ultrium 4-SCSI)	Operative - Drive empty		0 critical, 0 warning
Drive 18 (Ultrium 4-SCSI)	Operative - Drive empty		0 critical, 0 warning
Drive 19 (Ultrium 4-SCSI)	Operative - Drive empty		0 critical, 0 warning
Drive 20 (Ultrium 4-SCSI)	Operative - Drive empty		0 critical, 0 warning
Interface Controllers			
Interface Controller 1 (HP NS E2400FC-4G)	Operative	Ready	9 critical, 10 warning
Interface Controller 2 (HP NS E2400FC-4G)	Operative	Ready	1 critical, 28 warning
Interface Manager	Ready	Operational	25 critical, 136 warning

Ready (Last Update: 12:39 PM 2007.07.11)

admin

ESL E-Series 2U10537093

ESL E-Series Cabling View

Command View TL

Ready

Component Status: 0 0 28
Recent Alerts (Last 5 Days): 80 296 13222

Identity Status Configuration Operations Support

Cabling View

Actions

Component	Health	Identifiers
Interface Manager	Ready	Serial Number: 00:80:66:05:fa:2b
Interface Controller 2 (HP NS E2400FC-4G)	Operative	WWPN: 100000e002030424
Host Ports		
FC Host Port 0	Operative - Link Up	WWPN: 100000e002230424
FC Host Port 1	Operative - Link Up	WWPN: 100000e002430424
Device Ports		
FC Device Port 0	Operative - Link Up	WWPN: 100000e002630424
Drive 1 (Ultrium 3-SCSI)	Operative - Drive empty	Serial Number: HU10540KPV
FC Device Port 1	Operative - Link Up	WWPN: 100000e002830424
Drive 2 (Ultrium 3-SCSI)	Operative - Tape Loaded	Serial Number: HU10449387
FC Device Port 2	Operative - Link Up	WWPN: 100000e002a30424
Drive 3 (Ultrium 3-SCSI)	Operative - Tape Loaded	Serial Number: HU10540KMM
FC Device Port 3	Operative - Link Up	WWPN: 100000e002c30424
Drive 4 (Ultrium 3-SCSI)	Operative - Tape Loaded	Serial Number: HU10539G6B
Interface Controller 1 (HP NS E2400FC-4G)	Operative	WWPN: 100000e002030991
Host Ports		
FC Host Port 0	Operative - Link Up	WWPN: 100000e002230991
FC Host Port 1	Operative - Link Up	WWPN: 100000e002430991
Device Ports		
IP Device	Operative - Link Up	WWPN: 100000e002630991
Robotics	Operative - Picker Empty	Serial Number: 2U10537093
FC Device Port 0	Operative - Link Up	WWPN: 100000e002830991
Drive 5 (Ultrium 3-SCSI)	Operative - Drive empty	Serial Number: HU10540KNV
FC Device Port 1	Operative - Link Up	WWPN: 100000e002a30991
Drive 6 (Ultrium 3-SCSI)	Operative - Drive empty	Serial Number: HU104493A4
FC Device Port 2	Operative - Link Up	WWPN: 100000e002c30991
Drive 7 (Ultrium 3-SCSI)	Operative - Drive empty	Serial Number: HU10539G5J
FC Device Port 3	Operative - Link Up	WWPN: 100000e002e30991
Drive 8 (Ultrium 3-SCSI)	Operative - Drive empty	Serial Number: HU10540KRF
Drive 9 (Ultrium 4-SCSI)	Operative - Drive empty	Serial Number: HU171801VM
Drive 10 (Ultrium 4-SCSI)	Operative - Drive empty	Serial Number: HU171801VA
Drive 11 (Ultrium 4-SCSI)	Operative - Tape Loaded	Serial Number: HU171801TB
Drive 12 (Ultrium 4-SCSI)	Operative - Tape Loaded	Serial Number: HU171801UE
Drive 13 (Ultrium 4-SCSI)	Operative - Drive empty	Serial Number: HU171801UC
Drive 14 (Ultrium 4-SCSI)	Operative - Drive empty	Serial Number: HU171801VD

Ready (Last Update: 12:40 PM 07.07.11)

admin

ESL E-Series 2U10537093

ESL E-Series Drive Status

Command View TL

Ready

Home Help About Updates

Component Status: 0 0 28
Recent Alerts (Last 5 Days): 80 296 13222

Identity Status Configuration Operations Support

Status

- Health Summary
- Cabling View
- Component Status
- Library
- Library Sensors
- Robotics
- Drives
- Advanced LTO-4 Drives
- Interface Controllers
- Interface Manager
- Alert Log
- Inventory

Drives

Actions

Drive	Health	Drive Type	Serial Number	Available	Interface Controller
Drive 1	Operative - Drive empty	Ultrium 3-SCSI	HJ105408PV	Yes	Interface Controller 2 (HP NS E2400...
Drive 2	Operative - Tape Loaded	Ultrium 3-SCSI	HJ10448387	Yes	Interface Controller 2 (HP NS E2400...
Drive 3	Operative - Tape Loaded	Ultrium 3-SCSI	HJ105408MM	Yes	Interface Controller 2 (HP NS E2400...
Drive 4	Operative - Tape Loaded	Ultrium 3-SCSI	HJ10539G6B	Yes	Interface Controller 2 (HP NS E2400...
Drive 5	Operative - Drive empty	Ultrium 3-SCSI	HJ105408NY	Yes	Interface Controller 1 (HP NS E2400...
Drive 6	Operative - Drive empty	Ultrium 3-SCSI	HJ104483A4	Yes	Interface Controller 1 (HP NS E2400...
Drive 7	Operative - Drive empty	Ultrium 3-SCSI	HJ10539G5J	Yes	Interface Controller 1 (HP NS E2400...
Drive 8	Operative - Drive empty	Ultrium 3-SCSI	HJ105408RF	Yes	Interface Controller 1 (HP NS E2400...
Drive 9	Operative - Drive empty	Ultrium 4-SCSI	HJ171801VM	Yes	Advanced LTO-4 Drive
Drive 10	Operative - Drive empty	Ultrium 4-SCSI	HJ171801VA	Yes	Advanced LTO-4 Drive
Drive 11	Operative - Tape Loaded	Ultrium 4-SCSI	HJ171801T8	Yes	Advanced LTO-4 Drive
Drive 12	Operative - Tape Loaded	Ultrium 4-SCSI	HJ171801LE	Yes	Advanced LTO-4 Drive
Drive 13	Operative - Drive empty	Ultrium 4-SCSI	HJ171801UC	Yes	Advanced LTO-4 Drive
Drive 14	Operative - Drive empty	Ultrium 4-SCSI	HJ171801V8	Yes	Advanced LTO-4 Drive
Drive 15	Operative - Drive empty	Ultrium 4-SCSI	HJ171801TN	Yes	Advanced LTO-4 Drive
Drive 16	Operative - Drive empty	Ultrium 4-SCSI	HJ171801V6	Yes	Advanced LTO-4 Drive
Drive 17	Operative - Drive empty	Ultrium 4-SCSI	HJ171801LP	Yes	Advanced LTO-4 Drive
Drive 18	Operative - Drive empty	Ultrium 4-SCSI	HJ171801LM	Yes	Advanced LTO-4 Drive
Drive 19	Operative - Drive empty	Ultrium 4-SCSI	HJ171801TM	Yes	Advanced LTO-4 Drive
Drive 20	Operative - Drive empty	Ultrium 4-SCSI	HJ171801TP	Yes	Advanced LTO-4 Drive

Ready (Last Update: 12:42 PM 2007.07.11)

admin

ESL E-Series 2U10537093

ESL E-Series Advanced LTO-4 Drive Status

Command View TL

Ready

Component Status: 0 0 28
Recent Alerts (Last 5 Days): 80 296 13222

Identity Status Configuration Operations Support

Advanced LTO-4 Drives

Component	Health	World Wide Name	Port Active	Port Topology	Hard AL PA	Connection Speed
Drive 9 (Ultrium 4-SCSI)	Operative - Drive empty	20:18:00:13:21:44:0D:68				
Host Ports						
FC Host Port 0	Operative	20:19:00:13:21:44:0D:68	Yes	Fabric	N/A	2 Gbps
FC Host Port 1	Warning	20:1A:00:13:21:44:0D:68	No	Unknown		Unknown
Drive 10 (Ultrium 4-SCSI)	Operative - Drive empty	20:1B:00:13:21:44:0D:68				
Host Ports						
FC Host Port 0	Operative	20:1C:00:13:21:44:0D:68	Yes	Fabric	N/A	2 Gbps
FC Host Port 1	Warning	20:1D:00:13:21:44:0D:68	No	Unknown		Unknown
Drive 11 (Ultrium 4-SCSI)	Operative - Tape Loaded	20:1E:00:13:21:44:0D:68				
Host Ports						
FC Host Port 0	Operative	20:1F:00:13:21:44:0D:68	Yes	Fabric	N/A	2 Gbps
FC Host Port 1	Warning	20:20:00:13:21:44:0D:68	No	Unknown		Unknown
Drive 12 (Ultrium 4-SCSI)	Operative - Tape Loaded	20:21:00:13:21:44:0D:68				
Host Ports						
FC Host Port 0	Operative	20:22:00:13:21:44:0D:68	Yes	Fabric	N/A	2 Gbps
FC Host Port 1	Warning	20:23:00:13:21:44:0D:68	No	Unknown		Unknown
Drive 13 (Ultrium 4-SCSI)	Operative - Drive empty	20:00:00:13:21:44:04:53				
Host Ports						
FC Host Port 0	Operative	20:01:00:13:21:44:04:53	Yes	Fabric	N/A	2 Gbps
FC Host Port 1	Warning	20:02:00:13:21:44:04:53	No	Unknown		Unknown
Drive 14 (Ultrium 4-SCSI)	Operative - Drive empty	20:03:00:13:21:44:04:53				
Host Ports						
FC Host Port 0	Operative	20:04:00:13:21:44:04:53	Yes	Fabric	N/A	2 Gbps
FC Host Port 1	Warning	20:05:00:13:21:44:04:53	No	Unknown		Unknown
Drive 15 (Ultrium 4-SCSI)	Operative - Drive empty	20:06:00:13:21:44:04:53				
Host Ports						
FC Host Port 0	Operative	20:07:00:13:21:44:04:53	Yes	Fabric	N/A	2 Gbps
FC Host Port 1	Warning	20:08:00:13:21:44:04:53	No	Unknown		Unknown
Drive 16 (Ultrium 4-SCSI)	Operative - Drive empty	20:09:00:13:21:44:04:53				
Host Ports						
FC Host Port 0	Operative	20:0A:00:13:21:44:04:53	Yes	Fabric	N/A	2 Gbps
FC Host Port 1	Warning	20:0B:00:13:21:44:04:53	No	Unknown		Unknown
Drive 17 (Ultrium 4-SCSI)	Operative - Drive empty	20:0C:00:13:21:44:04:53				
Host Ports						
FC Host Port 0	Operative	20:0D:00:13:21:44:04:53	Yes	Fabric	N/A	2 Gbps
FC Host Port 1	Warning	20:0E:00:13:21:44:04:53	No	Unknown		Unknown

Ready (Last Update: 12:41 PM 2007.07.11)

admin

ESL E-Series 2U10537093

IFC Connection Properties

hp Command View TL - Microsoft Internet Explorer provided by Hewlett-Packard

File Edit View Favorites Tools Help

hp Command View TL

Ready

Identity Status Configuration Operations Support

Configuration

- Library Properties
- Interface Settings
 - Interface Manager Mode
 - Connection Properties
 - VWVN Retention
- Partitioning
 - Host Access (Secure Manage)
 - Partition 1
- Network Settings
 - TCP/IP
 - SNMP Alerts
 - Save / Restore

Connection Properties

Actions

Interface Controller	World Wide Name	Conn Type
Interface Manager		
Interface Controller 1 (HP NS E 100000e002034767)		
FC Host Port 0	100000e002234767	Fabric
FC Host Port 1	100000e002434767	Fabric

Ready.

Applet com.hp.commandview.tape.gui.TLAppletFrame started

Local intranet

Port Connection Settings

Interface Manager Mode: Automatic

Port Connection Type settings apply to ALL ports when the Interface Manager is in 'Automatic' mode.

Port Connection Type

☒ **Fabric (SAN) Attach**

Use this connection type when connecting all fibre channel ports to a fibre channel switch.

☐ **Direct Attach**

Use this connection type when connecting all fibre channel ports to a Host Bus Adapter on a backup server.

Port Speed

Speed: 4 Gigabits per second

- 1 Gigabit per second
- 2 Gigabits per second
- 4 Gigabits per second

OK Cancel Help

ESL E-Series LTO-4 Configuration

Command View TL

Ready

Component Status: 0 0 28
Recent Alerts (Last 5 Days): 90 296 13222

Identity Status Configuration Operations Support

Configuration

- Library Settings
- Interface Settings
 - Interface Manager Mode
 - Connection Properties
 - Drive Connection Properties**
 - Host Access (Secure Manage)
- Network Settings
 - TCP/IP
 - SNMP Alerts
 - User Account Settings
 - Save / Restore

Drive Connection Properties

Actions

Drive	World Wide Name	Connection Type	Port Mode	Hard AL-PA	Speed (Gbps)
FC Host Port 0			N-Port	N/A	Auto-Negotiate
FC Host Port 1			N-Port	N/A	Auto-Negotiate
Drive 10			N-Port	N/A	Auto-Negotiate
FC Host Port 0			N-Port	N/A	Auto-Negotiate
FC Host Port 1			N-Port	N/A	Auto-Negotiate
Drive 11			N-Port	N/A	Auto-Negotiate
FC Host Port 0			N-Port	N/A	Auto-Negotiate
FC Host Port 1			N-Port	N/A	Auto-Negotiate
Drive 12			N-Port	N/A	Auto-Negotiate
FC Host Port 0			N-Port	N/A	Auto-Negotiate
FC Host Port 1			N-Port	N/A	Auto-Negotiate
Drive 13			N-Port	N/A	Auto-Negotiate
FC Host Port 0			N-Port	N/A	Auto-Negotiate
FC Host Port 1			N-Port	N/A	Auto-Negotiate
Drive 14			N-Port	N/A	Auto-Negotiate
FC Host Port 0			N-Port	N/A	Auto-Negotiate
FC Host Port 1			N-Port	N/A	Auto-Negotiate
Drive 15			N-Port	N/A	Auto-Negotiate
FC Host Port 0			N-Port	N/A	Auto-Negotiate
FC Host Port 1			N-Port	N/A	Auto-Negotiate
Drive 16			N-Port	N/A	Auto-Negotiate
FC Host Port 0			N-Port	N/A	Auto-Negotiate
FC Host Port 1			N-Port	N/A	Auto-Negotiate
Drive 17			N-Port	N/A	Auto-Negotiate
FC Host Port 0			N-Port	N/A	Auto-Negotiate
FC Host Port 1			N-Port	N/A	Auto-Negotiate
Drive 18			N-Port	N/A	Auto-Negotiate
FC Host Port 0			N-Port	N/A	Auto-Negotiate
FC Host Port 1			N-Port	N/A	Auto-Negotiate
Drive 19			N-Port	N/A	Auto-Negotiate
FC Host Port 0			N-Port	N/A	Auto-Negotiate
FC Host Port 1			N-Port	N/A	Auto-Negotiate
Drive 20			N-Port	N/A	Auto-Negotiate
FC Host Port 0			N-Port	N/A	Auto-Negotiate
FC Host Port 1			N-Port	N/A	Auto-Negotiate

Port Connection Settings

Advanced LTO-4 Drive: Drive 16 (Ultrium 4-SCSI)

Port Connection Settings apply to ALL ports on this tape drive.

Port Connection Type

☐ Autosense
Use this connection type when connecting the tape drive's fibre channel port to a fibre channel switch, or directly to a Host Bus Adapter on a backup server.

☒ Fabric (SAN) Attach
Use this connection type when connecting all fibre channel ports to a fibre channel switch.

☐ Direct Attach
Use this connection type when connecting all fibre channel ports to a Host Bus Adapter on a backup server.

☐ Use Hard AL-PA:

Port Speed

Speed:

☐ Apply settings to:

OK Cancel Help

Ready (Last Update: 12:45 PM 2007/07/11)

admin

ESL E-Series 2U10537093

Secure Manager

hp Command View TL - Microsoft Internet Explorer provided by Hewlett-Packard

File Edit View Favorites Tools Help Links »

hp Command View TL Home About

Ready Help Updates

Identity Status Configuration Operations Support

Configuration

- Library Properties
- Interface Settings
 - Interface Manager Mode
 - Connection Properties
 - VLAN Retention
- Partitioning
- Host Access (Secure Manager)
- Network Settings
 - TCP/IP
 - SNMP Alerts
- Save / Restore

Host Access (Secure Manager)

Actions

Host/HBA	Robotics	D1	D2	D3	D4
TKMVIN06 Port 2	✓			✓	✓
TKMVIN08		✓	✓	✓	✓
TKMVIN07		✓	✓	✓	✓
TKMVIN06 Port 1		✓	✓		

Ready. Mode: Automatic

Applet com.hp.commandview.tape.gui.TLAppletFrame started Local intranet

List of hosts that have access to at least one device in the library.

Checkmark indicates host will be granted access to the device.

Secure Manager - Host Access Editor

Secure Manager - Host Access Editor

Actions

Add/Remove Host
Edit Host Alias
Copy/Paste Settings

Device Access:

Host/HBA	Robotics	D1	D2	D3	D4
TKM\WIN06 Port 2	☒	☐	☐	☒	☒
TKM\WIN08	☐	☒	☒	☒	☒
TKM\WIN07	☐	☒	☒	☒	☒
TKM\WIN06 Port 1	☐	☒	☒	☐	☐

OK Cancel Help

Secure Manager – Device Map Properties

The screenshot displays the HP Command View TL interface in a Microsoft Internet Explorer window. The main window shows the 'Host Access (Secure Manager)' configuration page. A yellow callout points to the 'Host Access (Secure Manager)' link in the left-hand navigation tree, with the text: "Select Host. Double-click to see Properties." Another yellow callout points to the 'TKMWIN06 Port 1' entry in the 'Host/HBA' list, with the text: "FC Port/LUN mapping. Device Map shows hosts".

The 'Host/HBA Properties' dialog box is open, showing details for 'TKMWIN06 Port 1'. It includes the following information:

- World Wide Node Name:** 200000e08b85a85b
- World Wide Port Name:** 210000e08b85a85b
- Source ID:** 00020000

The 'Device Map' section shows a table of FC Port/LUN mappings:

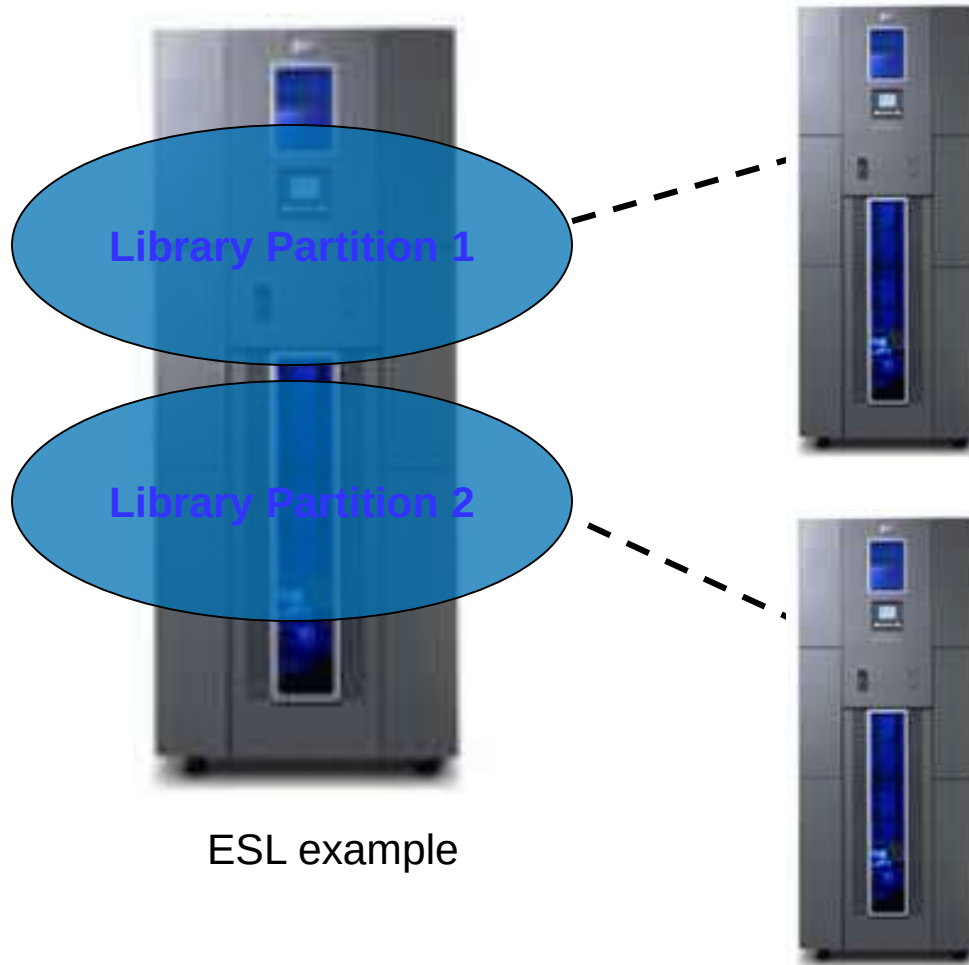
Device	FC Port	LUN
Interface Controller 1 (HP NS E2400f)		
Drive 1 (HP Ultrium 3-SCSI)	0	0
Drive 2 (HP Ultrium 3-SCSI)	0	1

The dialog box has a 'Close' button at the bottom right. The status bar at the bottom of the main window shows 'Ready.' and 'Mode: Automatic'. The footer of the browser window displays 'Applet com.hp.commandview.tape.gui.TLAppletFrame started' and 'Local intranet'.

Secure Manager - Benefits

- Presents user logical view of the library instead of IFC centric view.
- Automatic Load Balancing
 - Load balances devices across FC Ports on an IFC using logical ordering of drives
- Maintains Host's Device Map after Cabling Event
 - If device cable is moved from one device port to another (*on the same IFC*) then Secure Manager will update its internal routing table to maintain a consistent host device map.
 - Host will not have to be reconfigured!
- Maintains Consistent Host Device Map when new Devices are added (Advanced Secure Manager)

Advanced Secure Manager Partitioning Capability



ESL example

- Each library partition consists of:
 - One virtual robotic device
 - One or more tape drives
 - User defined number of storage slots
 - User selectable import/export access ports
- Configuration dimensions:
 - Up to six “virtual” partitions available
 - Paths to robotics can be separated between two independent SANs for isolation purposes
 - Storage slots are assigned to zones; each zone contains a number of slots defined by the administrator

ESL = EML partitioning capabilities

Partitioning Configuration Wizard

Add Partition Page 2 of 5

Drive Selection

Please select which drives will be included in this partition...

Drive	Partition
☐ Drive 1 (HP Ultrium 3-SCSI)	LTO3 Partition
☐ Drive 2 (HP Ultrium 3-SCSI)	LTO3 Partition
☒ Drive 3 (HP Ultrium 2-SCSI)	LTO2 Partition
☒ Drive 4 (HP Ultrium 2-SCSI)	LTO2 Partition

< Back Next >

Add Partition Page 3 of 5

Mailslot Selection

Please select which mailslots will be included in this partition...

☐ Include Module 1 Mailslots in this partition (Mailslots 1 - 5)

Next > Cancel Help

Add Partition Page 4 of 5

Slot Selection

Please select which slots will be included in this partition...

Location	Status	Barcode	Partition
☐ Module 1	Slots 1-66 (22 full)		
☒ Module 2	Slots 67-98 (8 full)		
☐ Module 3			
☐ Module 4			
☐ Module 5			
☐ Module 6			

< Back Next > Cancel Help

Operations – Move Media

hp Command View TL - Microsoft Internet Explorer provided by Hewlett-Packard

File Edit View Favorites Tools Help

hp Command View TL

Ready

Identity Status Configuration Operations Support

Operations

Reboot

Media Management

Media Management

Actions

Location	Status	Barcode
Robotics	Empty	
Drives		
Drive 1 (HP Ultrium 3-SCSI)	Empty	
Drive 2 (HP Ultrium 3-SCSI)	Empty	
Drive 3 (HP Ultrium 2-SCSI)	Empty	
Drive 4 (HP Ultrium 2-SCSI)	Empty	
Mailslots 1-5	0 full slot(s)	
Module 1	Slots 1-66 (22 full)	
Module 2	Slots 67-98 (8 full)	
Module 3		
Module 4		
Module 5		
Module 6		

Ready.

Applet com.hp.commandview.tape.gui.TLAppletFrame started

Move Media

Page 1 of 4

Source Media

Select the piece of media that you would like to move...

Source Location: Unknown
Destination: Unknown

Location	Status	Barcode	Partition
Drives			
Drive 1 (HP Ultrium 3-SCSI)	Empty		LTO3 Partition, Drive 1
Drive 2 (HP Ultrium 3-SCSI)	Empty		LTO3 Partition, Drive 2
Drive 3 (HP Ultrium 2-SCSI)	Empty		LTO2 Partition, Drive 1
Drive 4 (HP Ultrium 2-SCSI)	Empty		LTO2 Partition, Drive 2
Mailslots 1-5	0 full slot(s)		
Module 1	Slots 1-66 (22 full)		
Slot 1	Full	GE5968L3	LTO3 Partition, Slot 1
Slot 2	Full	GE5969L3	LTO3 Partition, Slot 2
Slot 3	Full	GE6006L3	LTO3 Partition, Slot 3
Slot 4	Full	GE6005L3	LTO3 Partition, Slot 4
Slot 5	Full	GE6002L3	LTO3 Partition, Slot 5
Slot 6	Full	GE5989L3	LTO3 Partition, Slot 6

Move Media

Page 2 of 4

Media Destination

Select the location where you would like the media to be placed...

Source Location: Slot 1
Destination: Unknown

Location	Status	Barcode	Partition
Drives			
Drive 1 (HP Ultrium 3-SCSI)	Empty		LTO3 Partition, Drive 1
Drive 2 (HP Ultrium 3-SCSI)	Empty		LTO3 Partition, Drive 2
Drive 3 (HP Ultrium 2-SCSI)	Empty		LTO2 Partition, Drive 1
Drive 4 (HP Ultrium 2-SCSI)	Empty		LTO2 Partition, Drive 2
Mailslots 1-5	0 full slot(s)		
Mailslot 1	Empty		LTO3 Partition, Mails...
Mailslot 2	Empty		LTO3 Partition, Mails...
Mailslot 3	Empty		LTO3 Partition, Mails...
Mailslot 4	Empty		LTO3 Partition, Mails...
Mailslot 5	Empty		LTO3 Partition, Mails...
Module 1	Slots 1-66 (22 full)		
Module 2	Slots 67-98 (8 full)		

< Back Next > Cancel Help

Support – Firmware Update

hp Command View TL - Microsoft Internet Explorer provided by Hewlett-Packard

File Edit View Favorites Tools Help

hp Command View TL

Ready

Identity Status Configuration Operations Support

Support

- HP on the Web
- Support Ticket
- Firmware Update
- Restore Factory Defaults

Firmware Update

Actions

Device	Current Revision
Robotics	1022
Drives	
Drive 1 (HP Ultrium 3-SCSI)	L29S
Drive 2 (HP Ultrium 3-SCSI)	L29S
Drive 3 (HP Ultrium 2-SCSI)	K4B0
Drive 4 (HP Ultrium 2-SCSI)	K4B0
Interface Controllers	
Interface Controller 1 (HP NS 5718)	
Interface Manager	1170

Ready.

Mode: Automatic

Applet com.hp.commandview.tape.gui.TLAppletFrame started

Local intranet

Firmware Update Wizard

Page 2 of 4

Device Selection

Select the devices to update and the firmware revisions to use...

Device	Download Time (Se...	Current Revision	New Revision
☐ Robotics	Unknown	1022	
☐ Drive 1 (HP Ultrium 3-SCSI)	140	L29S	
☐ Drive 2 (HP Ultrium 3-SCSI)	140	L29S	
☐ Drive 3 (HP Ultrium 2-SCSI)	40	K4B0	
☐ Drive 4 (HP Ultrium 2-SCSI)	40	K4B0	
☐ Interface Controller 1 (HP N 210)		5718	
☐ Interface Manager	210	1170	

< Back Next > Cancel Help

No	No
No	No
No	No

Support – Support Ticket

hp Command View TL - Microsoft Internet Explorer provided by Hewlett-Packard

File Edit View Favorites Tools Help

hp Command View TL

Ready

Identity Status Configuration Operations Support

Support

- HP on the Web
- Support Ticket
- Firmware Update
- Restore Factory Defaults

Support Ticket

Actions

No generated support tickets to display.
Click **Actions->Launch Support Ticket Wizard...** to generate a support ticket.

Ready.

Mode: Automatic

Applet com.hp.commandview.tape.gui.TLAppletFrame started

Local intranet

Support Ticket Wizard

Page 2 of 4

Support Ticket Configuration

Please enter a name for the Support Ticket and select which components will be included...

Support Ticket Name: NSD Tech Marketing EML_Support_Ticket1

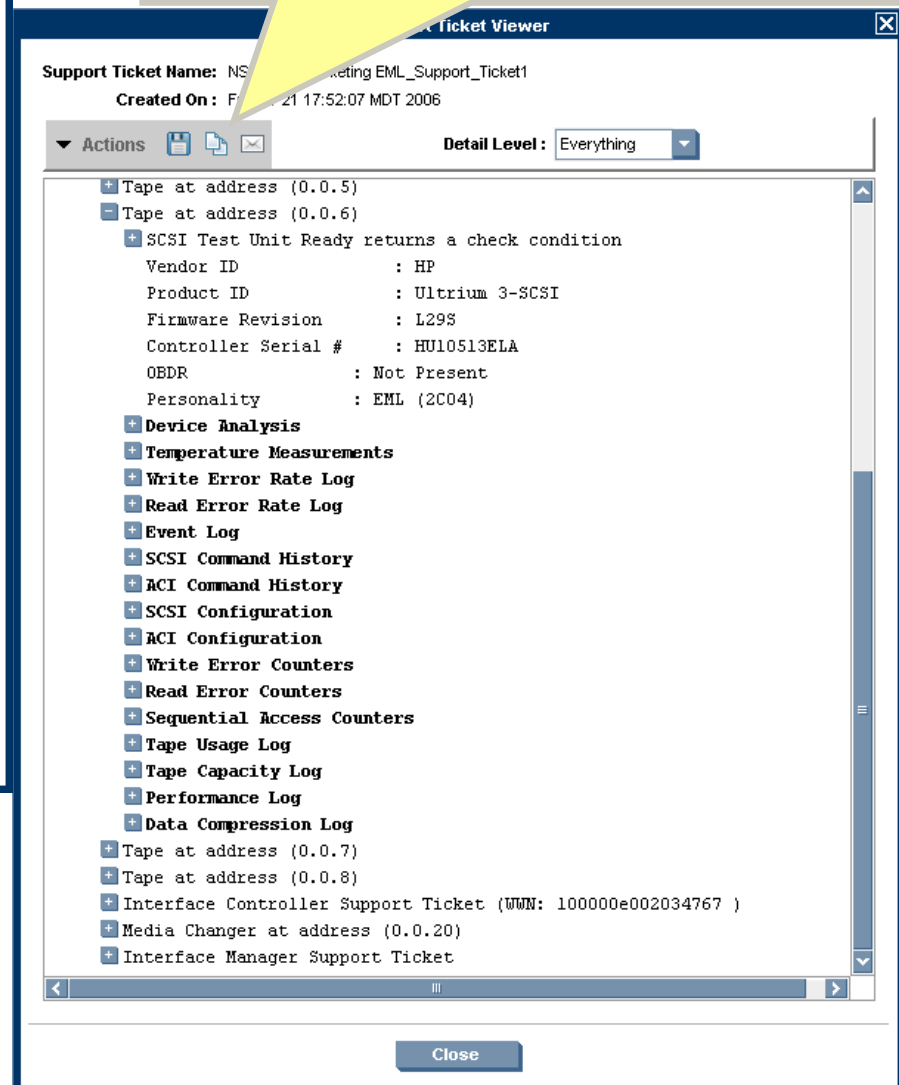
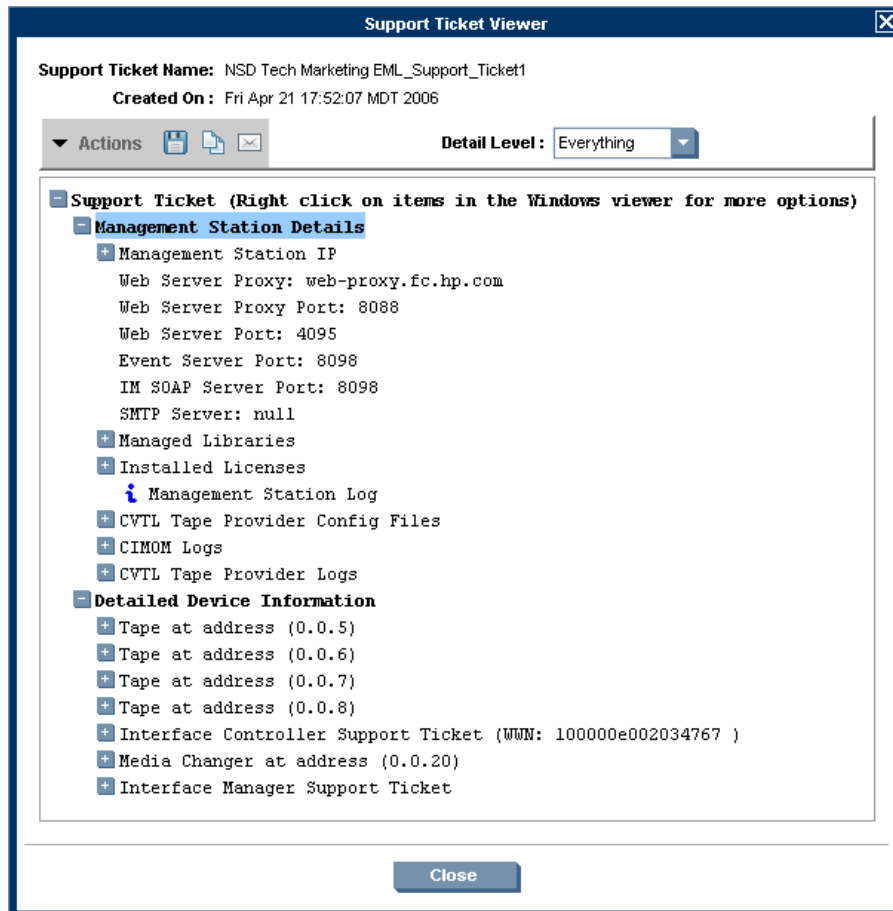
Component Selection:

Components	Included in Ticket
Robotics	☐
Drives	☐
Drive 1 (HP Ultrium 3-SCSI)	☐
Drive 2 (HP Ultrium 3-SCSI)	☐
Drive 3 (HP Ultrium 2-SCSI)	☐
Drive 4 (HP Ultrium 2-SCSI)	☐
Interface Controllers	☐
Interface Controller 1 (HP NS E2400FC-4G)	☐
Interface Manager	☐

< Back Next > Cancel Help

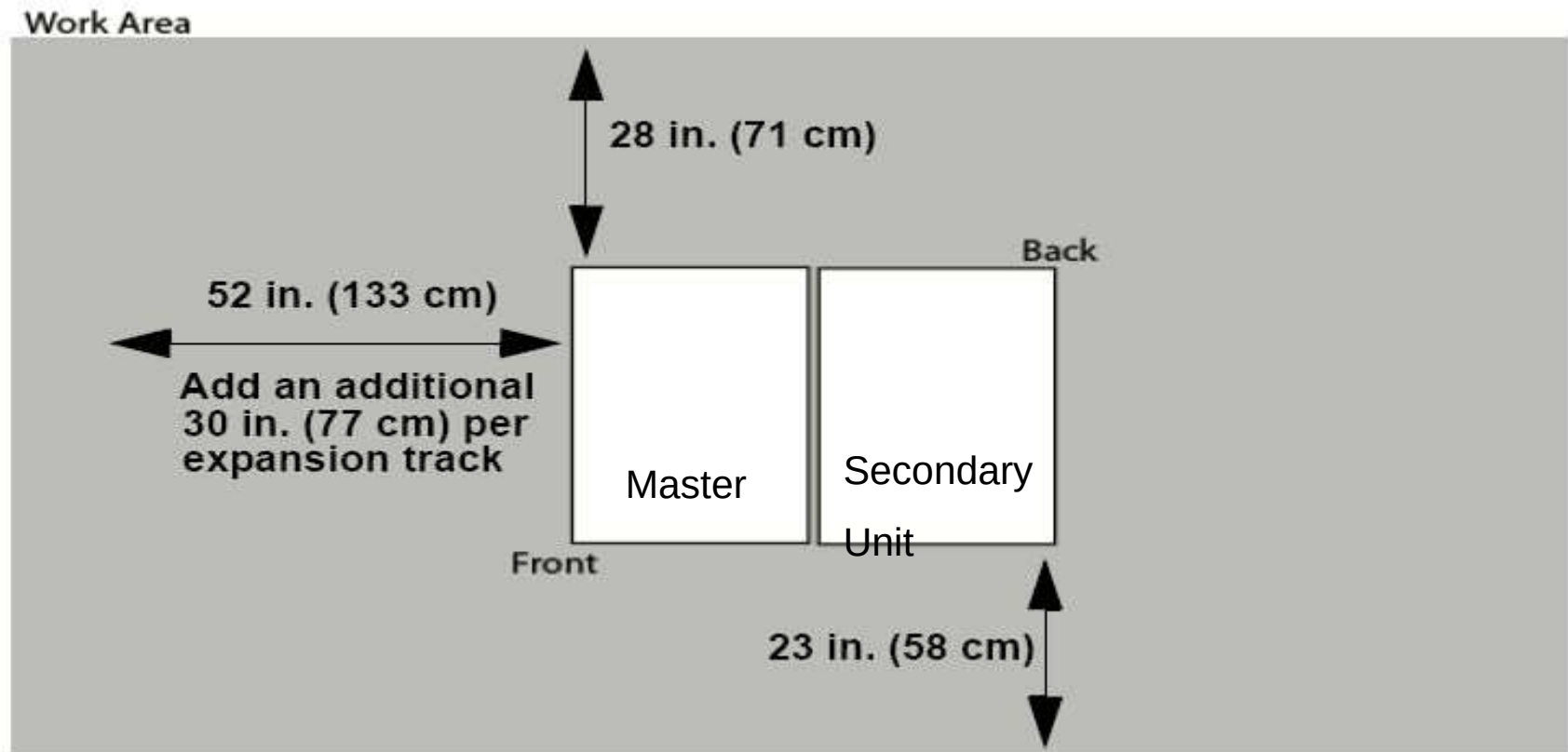
Support – Support Ticket Viewer

Save, copy data, or e-mail support ticket



ESL-E multi-frame space requirement

Note: 52 inches required on left side of front of master to allow for service. This should be noted when planning where a customer will install this library.



ESL E-series Tape Library – Common Tasks and Warnings

- It is critical to ensure that the media you use matches the format of your tape drive. Cleaning cartridges and formatted data cartridges are unique for each drive technology. Damage may occur if inappropriate media is used in tape drives.
- By default, Autoclean is disabled. Ensure your application software supports this feature before enabling it.
- If a drive experiences read/write errors when the Autoclean function is enabled, the library issues an error message stating that drive cleaning is required. Without user intervention, the media picker replaces the data cartridge with a cleaning cartridge. When the cleaning procedure finishes, the media picker returns the data cartridge to the drive.

ESL E-series Tape Library – Common Tasks and Warnings

- Do not connect switch for the internal network to your local LAN. It is for internal library use only. Connecting this switch to the LAN could cause library components to perform incorrectly or report failures.
- If you use Telnet to change the IP address of the Interface Manager card or library, you must log in to a new Telnet session with the new IP address.
- Multiple users can log in to Command View TL at the same time. If one user is modifying the settings for a library, other modify operations for that library will be denied.

ESL E-series Tape Library – Common Tasks and Warnings

- Use the various tabs, menus, and buttons throughout the program to navigate Command View TL. Do not use the browser navigation buttons. Doing so may cause loss of configuration data entered on a window.
- The Library Discovery wizard might not find some library types, depending on the version of Command View TL, Interface Manager card firmware, or library firmware. If your library is not discovered, you must add it manually.
- For the ESL E-series, ESL9000, and EML libraries, Command View TL has an instant-on 60-day license. You are entitled to use it for up to 60 days after initial installation, during which time you are required to purchase a license. After the 60 days expire, the program is still functional, but you see a reminder window each time you start the program until you enter a license key.

ESL E-series Tape Library – Common Tasks and Warnings

- You cannot remove the Command View TL Instant-On, Secure Manager, Licensed Capacity Upgrade, or VLS licenses. If you select one of these licenses, the Remove Licensed Feature command will be grayed out.
- Removing a license key for an advanced feature might require a reboot of the Interface Manager card. If a reboot is required, confirm or cancel the action in the dialog box that opens. To prevent data loss, make sure that all backup jobs are complete before making any changes that might require a reboot.

ESL E-series Tape Library – Common Tasks and Warnings

- The Health Summary window is automatically updated whenever the status of the library changes.
- HP strongly recommends that you leave the Interface Manager mode set to the default setting of Automatic. When the Interface Manager mode is Automatic, if you make changes to one FC host port, those changes are applied to all the FC host ports on all the FC interface controllers in the library. When the Interface Manager mode is Manual, changes apply only to the selected FC host port.

ESL E-series Tape Library – Common Tasks and Warnings

- Depending on the library type, number of slots, tape cartridge locations, and whether the tape cartridges have barcodes, rebooting a library can take 20 to 45 minutes. If you choose to remotely reboot the library, please allow sufficient time for the reboot to complete before attempting to manage or configure the library.
- Whenever possible, move media using your backup application. The move media functionality of Command View TL is provided as an alternate means of moving media if you encounter a problem with your backup application or with the library. After using Command View TL to move media, you must re-inventory the library from within your backup application so that the library and backup application remain synchronized.

ESL E-series Tape Library – Common Tasks and Warnings

- HP recommends that you allow the Interface Manager card to configure device maps automatically. Creating custom device maps can increase the possibility of device conflicts and errors and is only intended for experienced users.

ESL E-series Tape Library – Common Tasks and Warnings

- Ultrium cleaning cartridges have a 50-use limit, while SDLT cleaning cartridges have a 20-use limit.
- Once a cleaning cartridge has reached its use limit it must be replaced. If the drive continues to request cleaning after a cleaning cartridge has been loaded, replace the cleaning cartridge with a new one.
- Do not bulk erase Ultrium formatted cartridges. This destroys prerecorded servo information and makes the cartridge unusable.

ESL E-series Tape Library – Common Tasks and Warnings

- Always visually inspect your tape cartridges when loading or removing them from your tape library. Taking a few minutes to check the condition of your cartridges lowers the risk of repeated failures and helps ensure uninterrupted backup.
- Always discard damaged tape cartridges. If a defective tape cartridge is loaded into a tape drive, it may damage the drive, potentially requiring drive replacement.
- Using the Reset button during an ongoing data backup, restore, or other data transfer process, can result in a disruption of that process and a loss of data. Before selecting the Reset button, verify that no data is currently transferring through the FC interface controller by visually inspecting the Activity LEDs of all I/O ports on the FC interface controller.

ESL E-series Tape Library – Common Tasks and Warnings

- Use tape cartridges in temperatures between 10°C and 40°C.
- If a tape cartridge has been exposed to extreme heat or cold, stabilize the tape cartridge at room temperature for the same amount of time it was exposed for up to 24 hours.
- Keep cartridges out of direct sunlight and do not place tape cartridges near electromagnetic interference sources, such as terminals, motors, and video or X-ray equipment. Doing so may cause data on the tape cartridge to be altered or erased.

ESL E-series Tape Library – Common Tasks and Warnings

- Store tape cartridges in a dust-free environment where the relative humidity is between 20 percent and 80 percent. For longer tape cartridge life, store the tape cartridge at 40 percent to 60 percent relative humidity.
- If a tape cartridge is dropped or damage is suspected, gently shake the tape cartridge:

If it rattles, it is damaged. Restore the data on the tape cartridge if possible and discard the damaged one.

If it doesn't rattle, check the tape leader inside the cartridge. To do this, open the door on the rear of the tape cartridge by releasing the door lock. The tape leader should be visible at the top-left of the tape cartridge.

ESL E-series Tape Library – Common Tasks and Warnings

- Do not use a DLT, DLT1, or VS cleaning tape (almond in color) in an SDLT drive. SDLT cleaning tapes are gray and use a 7- or 8-character bar code label, CLNxxxS or CLNxxxS1.
- Moving or shipping the library without proper packing materials can result in damage to library components.
- Always prepare the library for relocation before any move.
- The library weighs approximately 771 kg. Use at least two people to perform any steps that involve lifting or guiding the library.

ESL E-series Tape Library – Common Tasks and Warnings

- With all panels and enclosures in place, this product is rated as a Class I laser product. The bar code scanner inside this product, however, is a Class II laser. Avoid exposure to the laser light emitted from the bar code scanner. Do not stare into the beam.
- Use of controls or adjustments or performance of procedures other than those specified in HP documents may result in hazardous exposure.

ESL E-series Tape Library – Switch LEDs

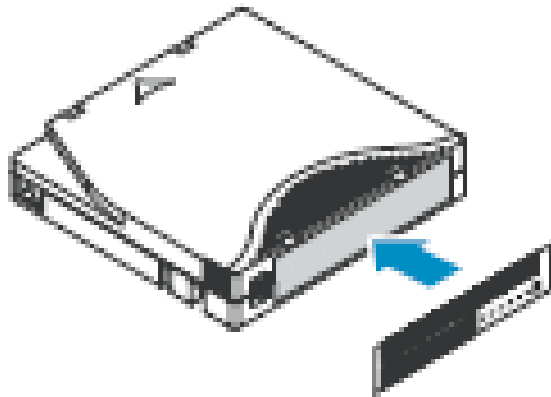
Call-out	LED	State	Description
1	Power (green)	On	The switch is receiving power.
		Off	The switch is not receiving power.
2	Fault (orange)	Off	The normal state; indicates that there are no fault conditions on the switch.
		On	On briefly after the switch is powered on or reset, at the beginning of switch self test. If on for a prolonged time, the switch has a hardware failure, or has failed its self test.
3	Link (green—overlaid with the port number)	On	Indicates the port is enabled and receiving a link indication from the connected device.
		Off	One of these conditions exists: - no active network cable is connected to the port - the port is not receiving link beat (RJ-45 ports)
4	Mode (green)	On	If the Act LED Mode Select indicator is lit (5), indicates that the port Mode LEDs are displaying network activity information. If the FDx LED Mode Select indicator is lit (5), indicates that the port Mode LEDs are lit for ports that are in Full Duplex Mode. If the 100 LED Mode Select indicator is lit (5), indicates that the port Mode LEDs are lit for ports that are operating at 100 Mbps.

ESL E-series Tape Library – Status LED Diagnostic Codes

Red LED	Green LED	Description
On	Off	BIOS code failed to run.
Blinks 1x per 5 second interval	Off	Hardware POST failed. No firmware images are loaded.
Blinks 2x per 5 second interval	Off	No CompactFlash disk or valid boot sector image found. Be sure to transfer the memory module from the old card to the new card if the Interface Manager was replaced.
Blinks 3x per 5 second interval	Off	Specified firmware image files were not found. Neither the current nor the previous image was found.
Blinks 4x per 5 second interval	Off	Load or execute command failed (boot code remains at end of process). This indicates that load, decompress, or execution failed on both the current and previous image files.
Off	Blinks 1x per 5 second interval	Normal state. Load or execute command succeeded. Boot code successfully loaded, decompressed, and initiated execution of one of the image files.

ESL E-series Tape Library – Common Tasks and Warnings

- The bar code label should be applied as shown, with the alphanumeric portion facing the hub side of the cartridge. Never apply multiple labels onto a cartridge, because extra labels can cause the cartridge to jam inside a tape drive.



Labels:

LTO2



LTO3



LTO4



ESL E-series Tape Library – Common Tasks and Warnings



Guided Troubleshooting for HP StorageWorks ESL-E Tape Libraries

- http://h20499.www2.hp.com/gts/sparks/public/Storage_ESL_E_All_START_Null_PUB_EN?lang=en&cc=us&product=Storage&series=na&subseries=na&prodTypeId=12169&prodSeriesId=392031
- HP StorageWorks Library And Tape Tools 4.8 (L&TT 4.8):