HP Extended Tape Library Architecture

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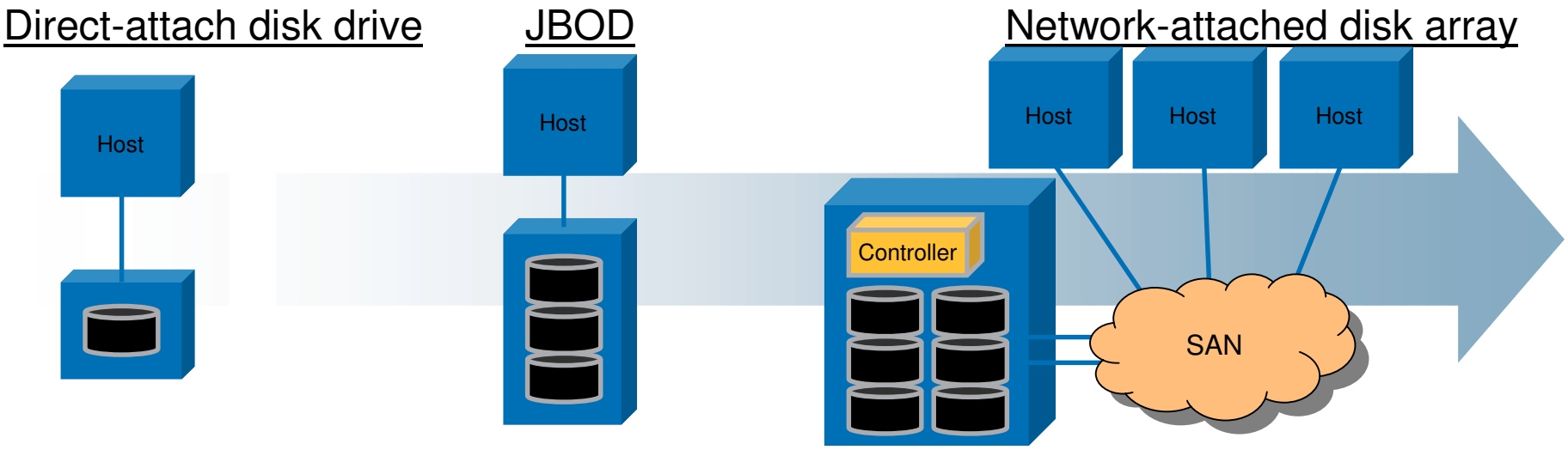
Agenda

- Solution archtect needs
- HP Extended tape library architecture concepts
- HP ESL E-Series interfaces and internal data paths
- HP ESL E-Series Enterprise tape library
- E-Series connectivity at launch
- Any questions?
- Reference material

Solution architects needs:

- **Customers and Analysts tell us that:**
  - Library reliability is high priority
  - Library remote management is a must
  - Library integration into a SAN can be complex, error prone, not robust and is difficult to maintain.
  - Library troubleshooting can be equally difficult
  - Behavioral incompatibility within the SAN infrastructure leads to resetting of components and interruption of critical backups
- **Solution architects need this technology!**

Evolution of disk network storage



Attributes of well-designed network storage:

- Consolidated
- Secure
- Scalable
- Shareable
- Reliable
- Manageable

Today's tape libraries

- Native-FC tape libraries provide JBOD equivalent capability
- Additional capability available with router-based tape libraries
- Need more security, reliability, shareability and manageability

HP Extended Tape Library architecture

- HP extended tape library architecture is what will differentiate HP tape Libraries from all other tape libraries in the market place.
- Available on all current & future Enterprise HP Libraries Makes HP Tape Libraries Truly SAN aware
- Single pane of glass control & monitoring of multiple libraries
- Wide range of future enhancements

Improving reliability in a storage network - Terminology

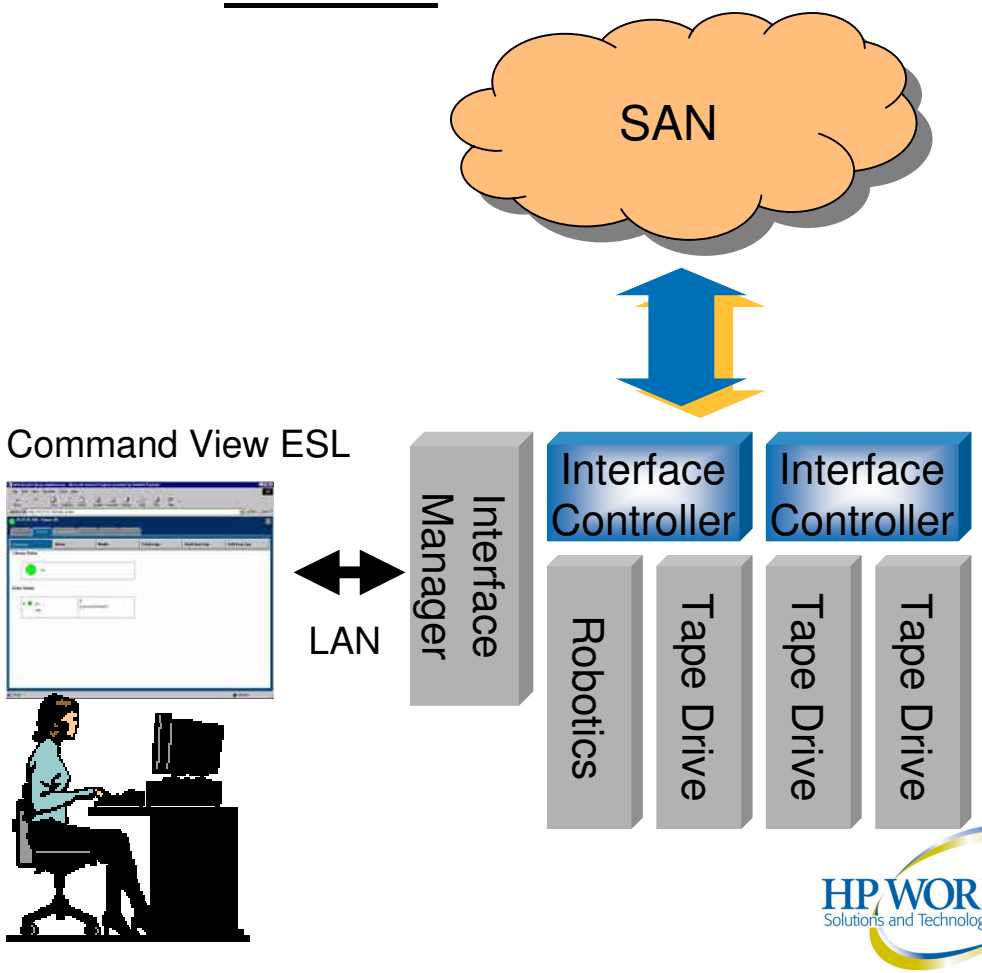
- Interface Controller
  - Manages concurrent access to library tape drives from a SAN
  - Security – blocks disruptive I/O
  - Caching – responds when tape drives are busy
  - Behaviour – intelligently handles SAN events
  - SAN aware event reporting
  - Track and detect SAN specific errors (fabric events, aborted I/Os, reservation conflicts etc.)
  - Identify configuration issues and conflicts in the SAN
- Interface Manager
  - Enables automated, simple and robust configuration
  - Intelligent and consistent
  - Based on knowledge of tape library and the SAN environment
  - Adapts to changes
  - Automatically corrects and maintains consistency
  - Persistent extended history of tape library and SAN health
  - In-depth analysis and data collection

HP Extended Tape Library Architecture

- Products and solutions that are part of HP's Extended Tape Library Architecture are *created* for SANs

Interface Controllers

- **Layer of intelligence between tape drives and the SAN**
- **Manages shared access to the tape library, intelligently handling conflicts and storage network events**
- **Similar architecture to disk-arrays with controllers in front of disk drives**

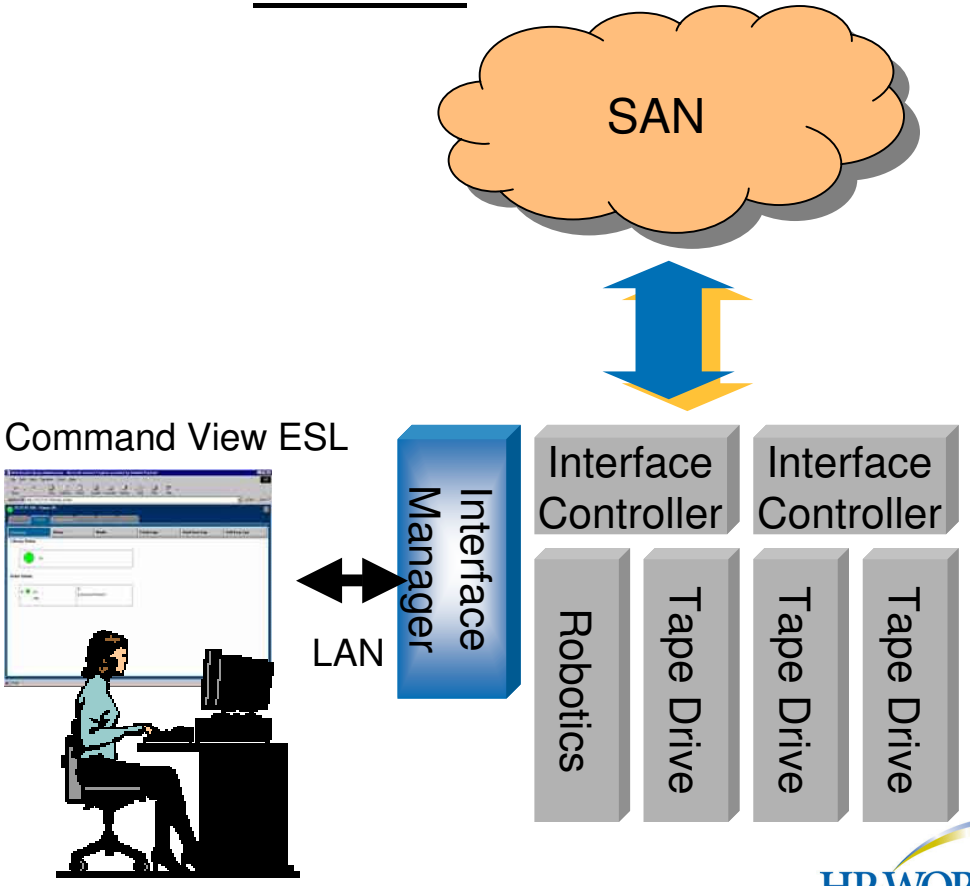


HP Extended Tape Library Architecture

- Products and solutions that are part of HP's Extended Tape Library Architecture are *created* for SANs

Interface Manager

- **Extends the intelligent management**
- **A central point of knowledge for the entire tape library subsystem**
- **Enables remote management**



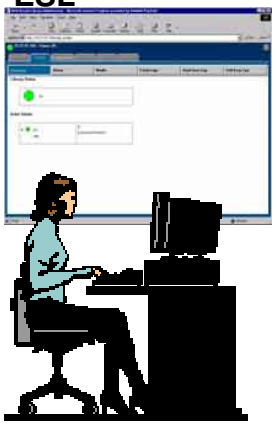
HP Extended Tape Library Architecture

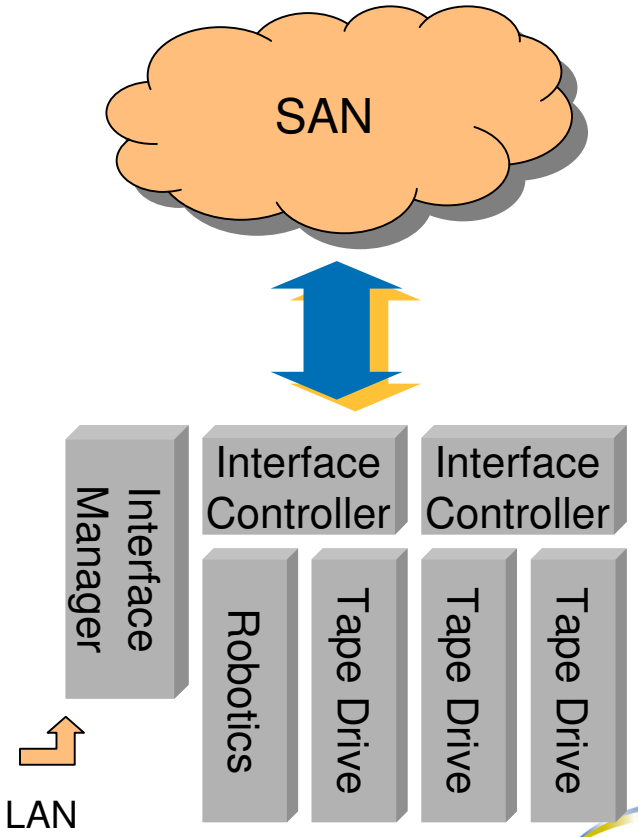
- Products and solutions that are part of HP's Extended Tape Library Architecture are *created* for SANs

Command View ESL

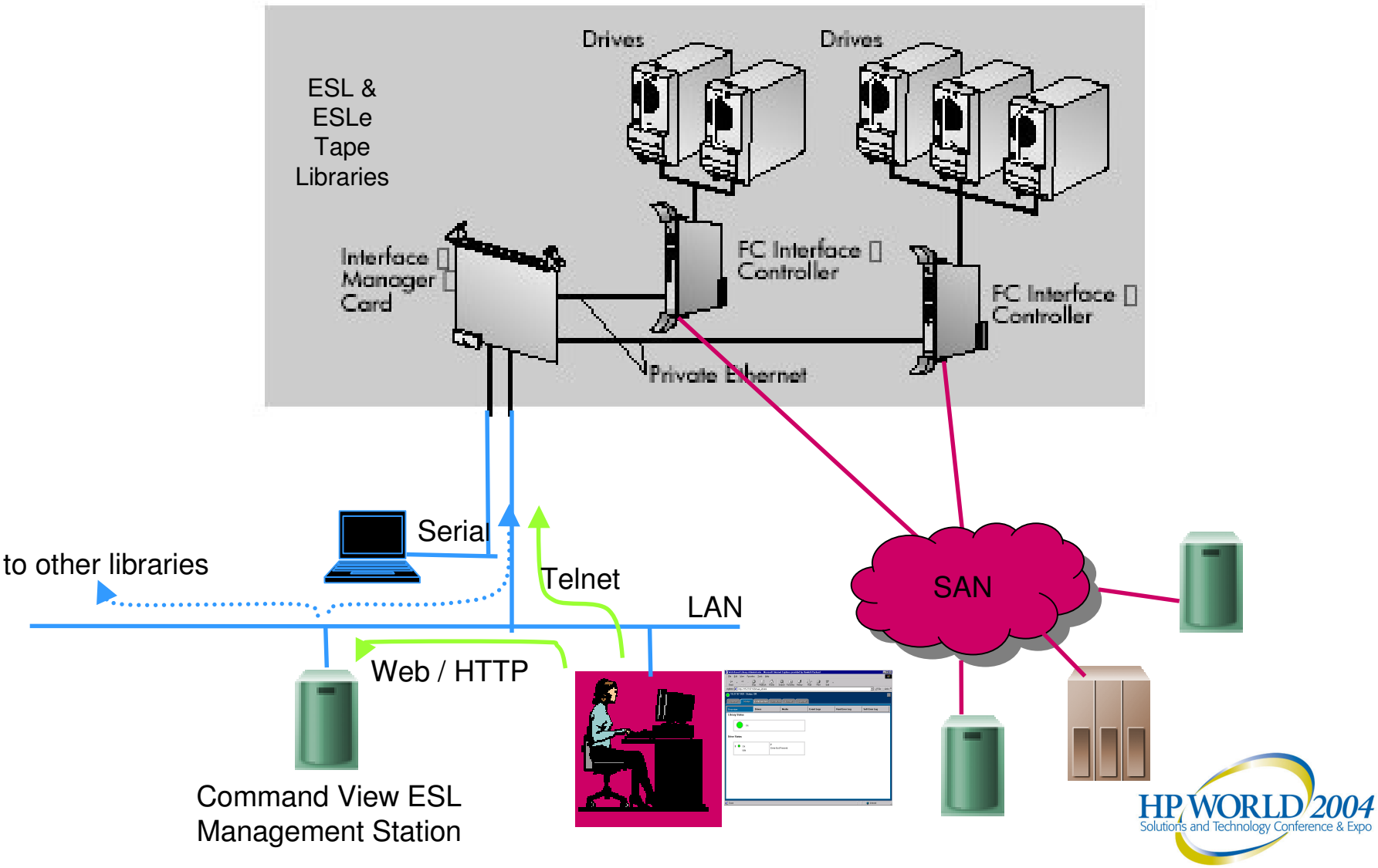
- **A single pane of glass view of the entire library**
- **Delivers easy-to-use remote management**
- **Simplifies and automates the most complex tasks**
- **Stays out of the SAN to allow critical traffic to flow**

Command View ESL

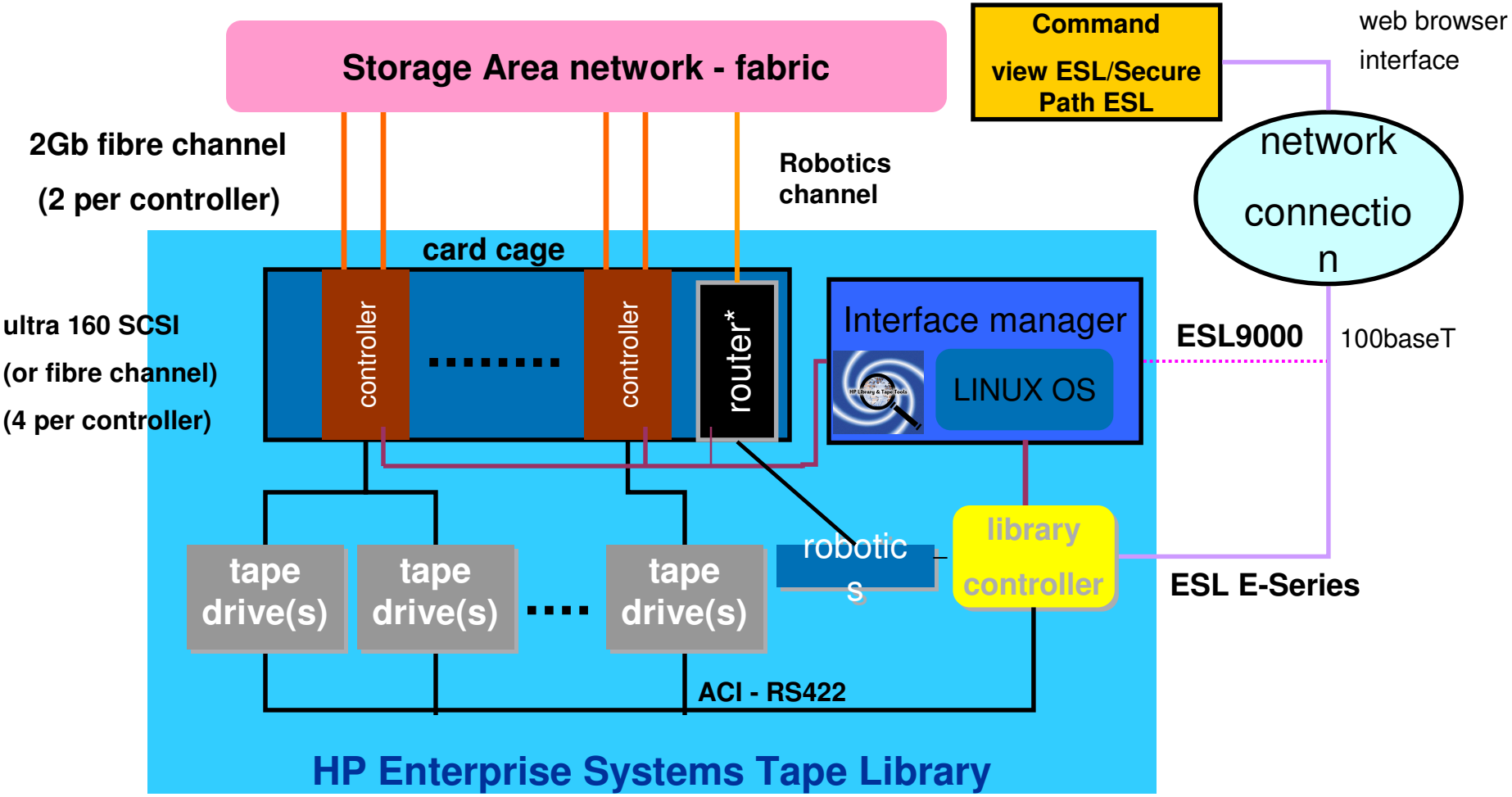




Extended Library Architecture - Topology and Interfaces



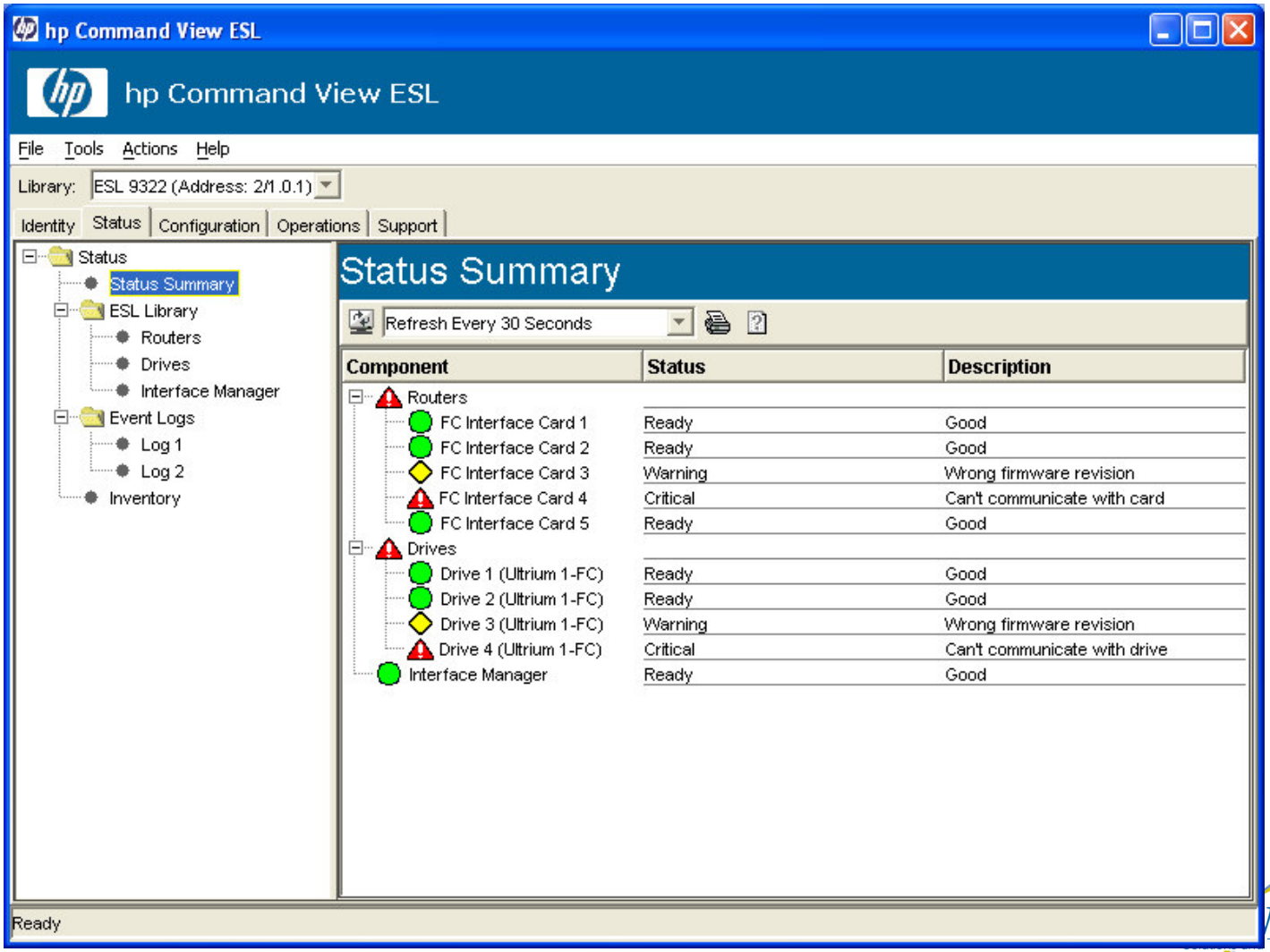
HP Extended Library Architecture concepts



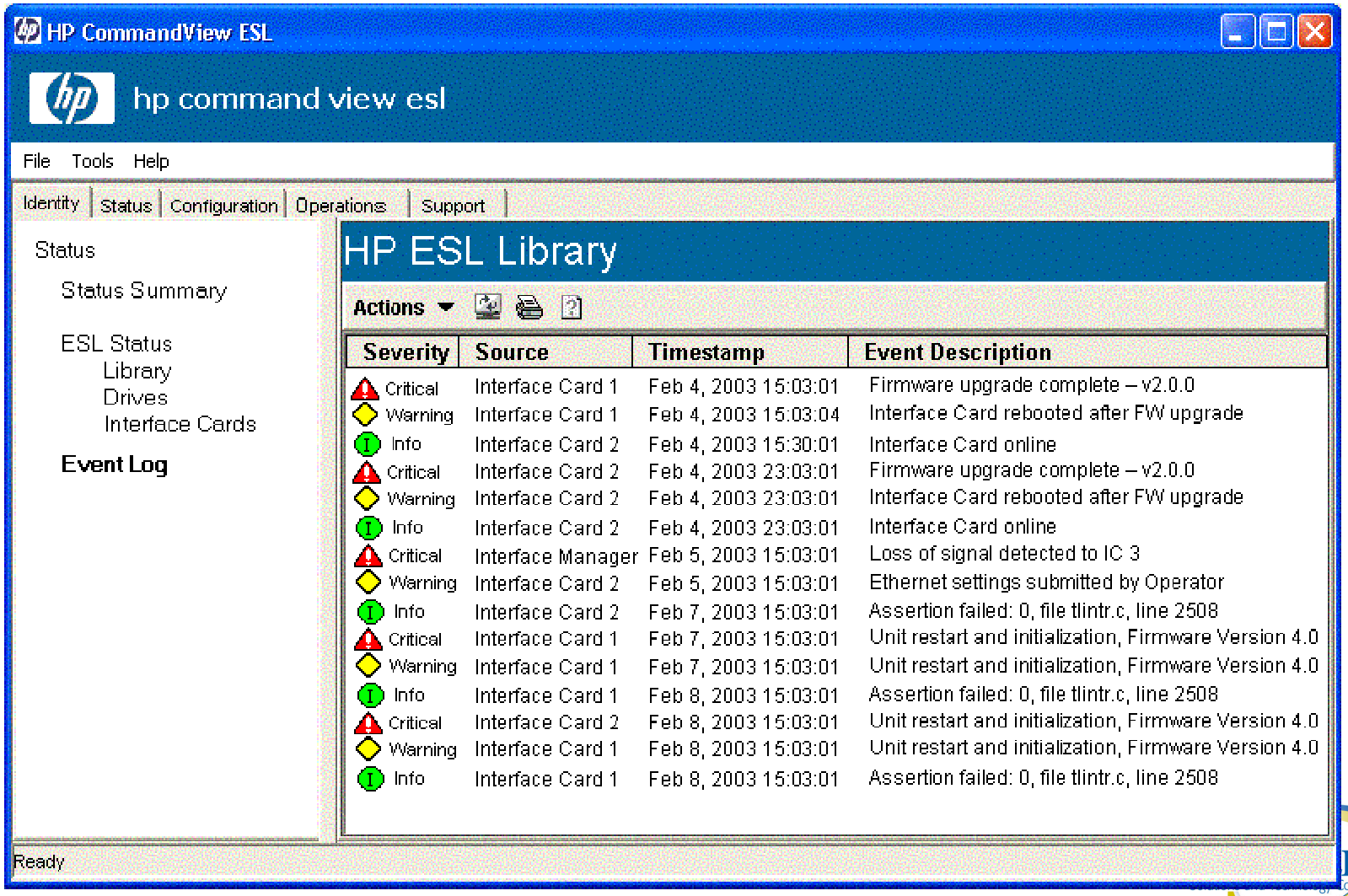
* e1200-160 router E-Series only

Command View ESL “Identity” screen

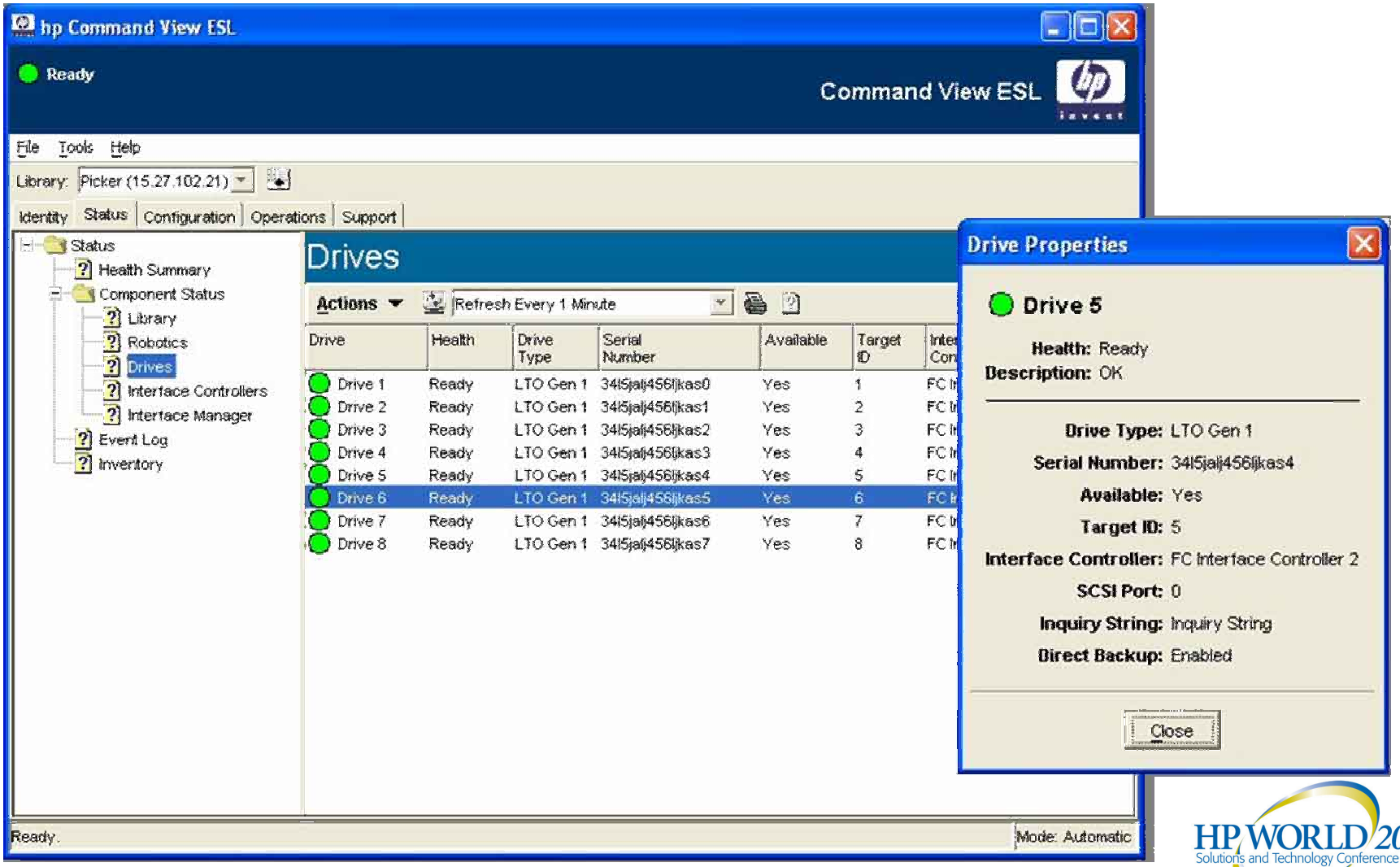
HP Command View ESL - screenshots



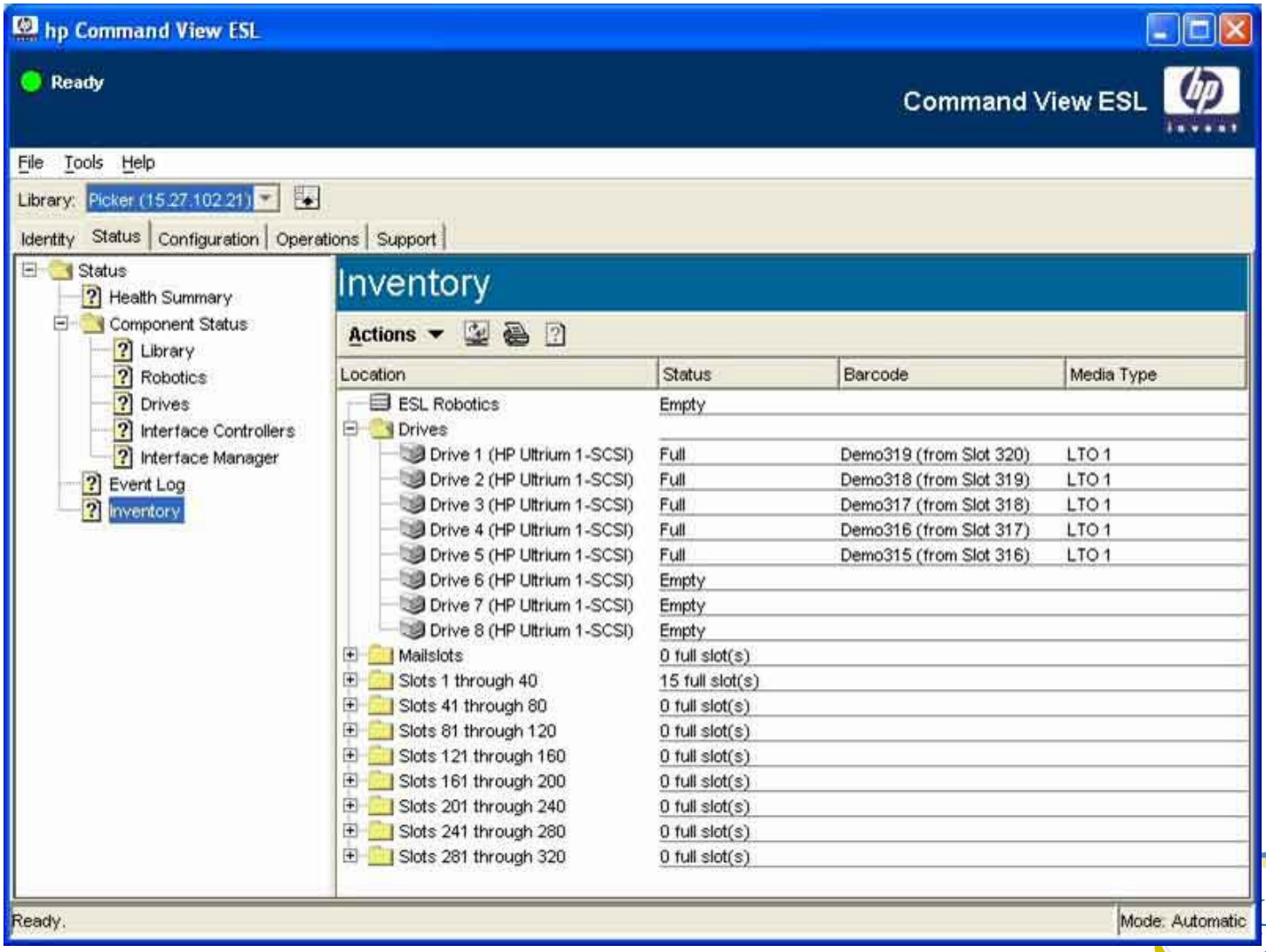
HP Command view ESL – event logging



HP Command View ESL screenshots – drive status

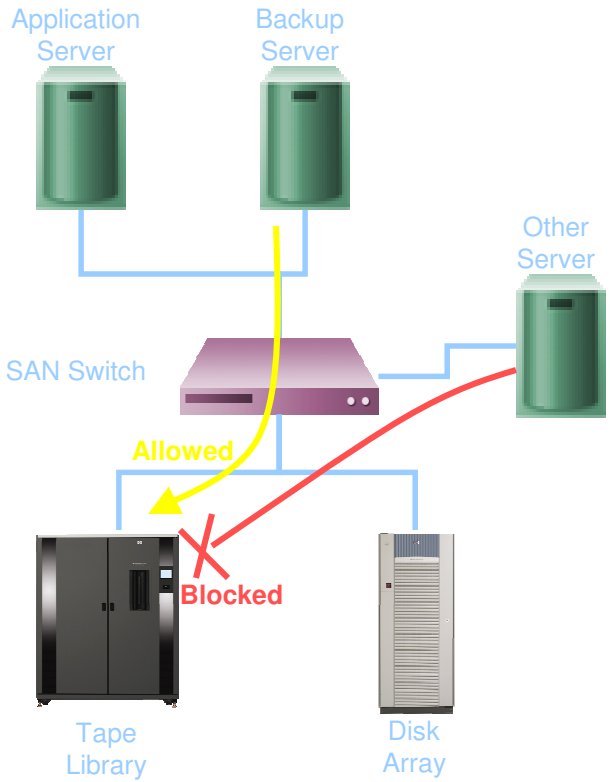


Searchable Library Inventory

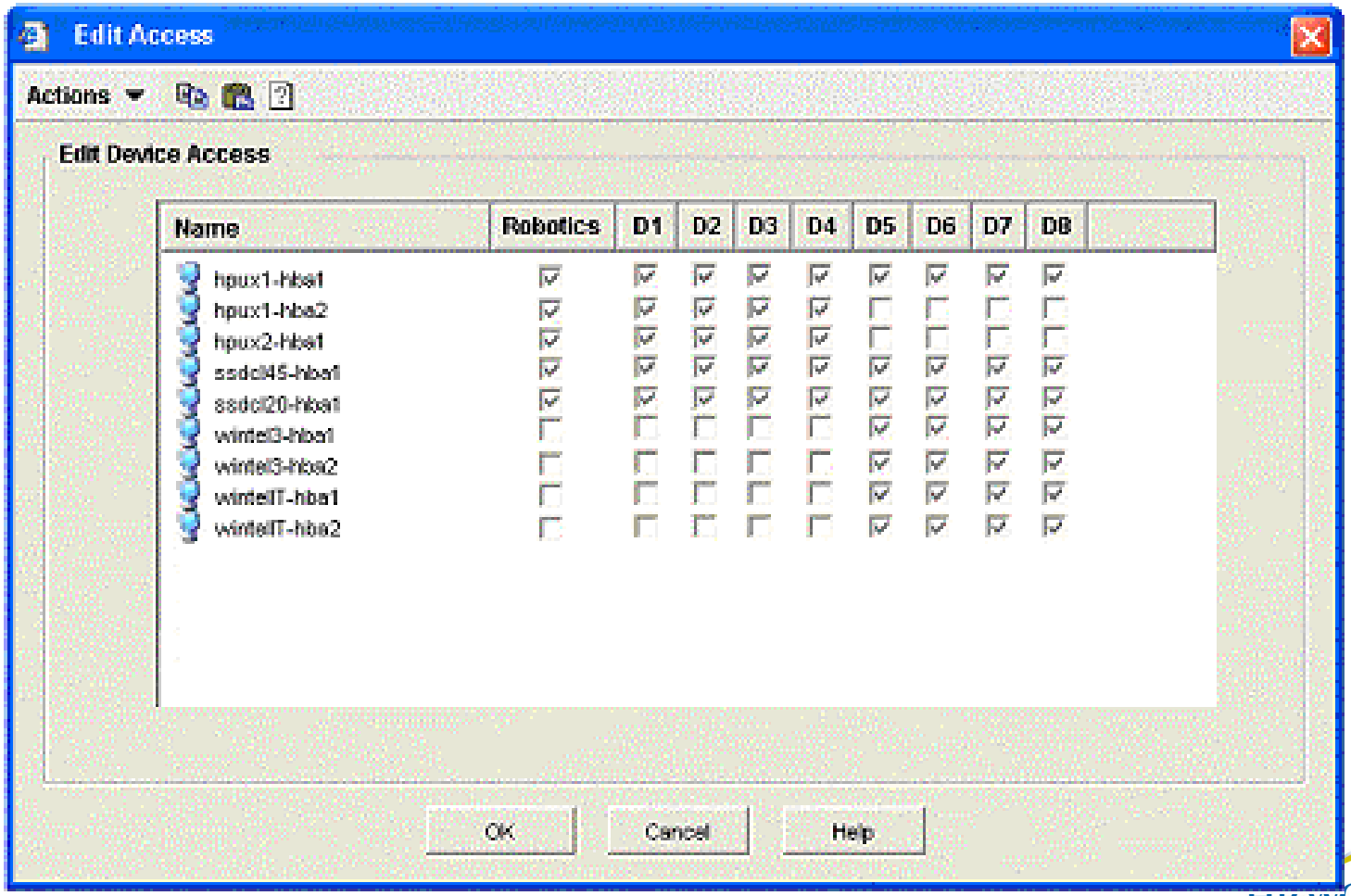


Advanced Access Control with Secure Manager

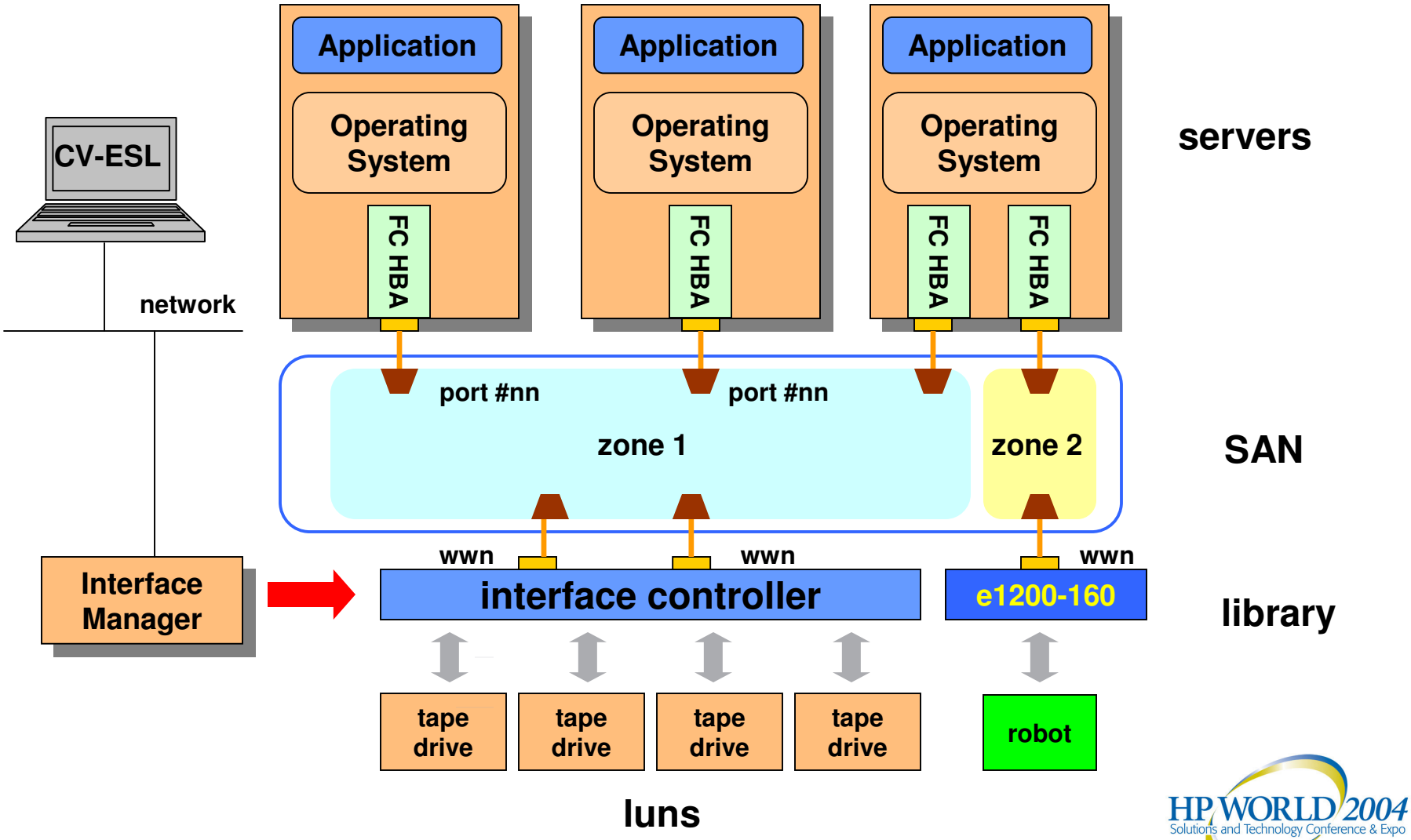
- Secure Manager for ESL:
  - Manages access from HBAs to individual tape drives
  - Increases reliability of backup operations by blocking disruptive traffic from selected hosts:
    - Unexpected device resets
    - Fibre Channel loop initializations
    - Repetitive OS and driver polling
    - Unwanted application queries which can disrupt streaming and lower backup/restore performance
  - Improves robustness and simplifies configuration of tape libraries in large SANs
  - Presents multi-HBA servers with a single view of library and drives
  - Configurable through Command View's easy-to-use graphical interface



HP Command View ESL – Secure manager



SAN & Network connections to an HP tape library with ETLA



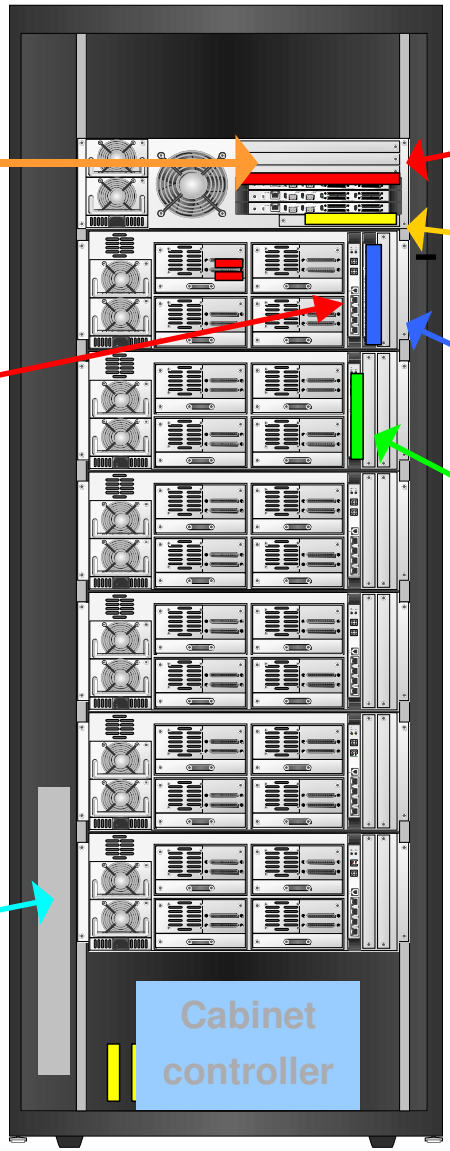
Enterprise Platform - ESL E-Series Product Overview

- 1-24 drives in single cabinet
- 712 LTO Cartridges (max config)
- 630 SDLT Cartridges (max config)
- Footprint/density – 28.5 TB per sq.foot
- Smaller form factor: ½ width of 9595
- Scalable to ~3000 cartridges (5 units)
- LTO/SDLT/NFC* Tape Drives
- Embedded Manageability
- HP enhanced interface controllers
- Bulk Loading: 42 SDLT or 48 Ultrium cartridges in removable magazines
- Intelligent robotics

ESL9000 series - product overview

- single cabinet
- 8 drives (ESL9322) 16 drives (ESL9595)
- Ultrium 1,2 or SDLT320
- 222(SDLT),322(ultrium) slots for the ESL9322
- 595 slots ESL9595
- SCSI or FC
- HP ETLA
- redundant PSU and fans

ESL E-Series Internal components



FC Inputs (up to 12)

Interface Controllers
(up to 6)

Library FC
Controller
E1200-160

SCSI connections to
tape drives

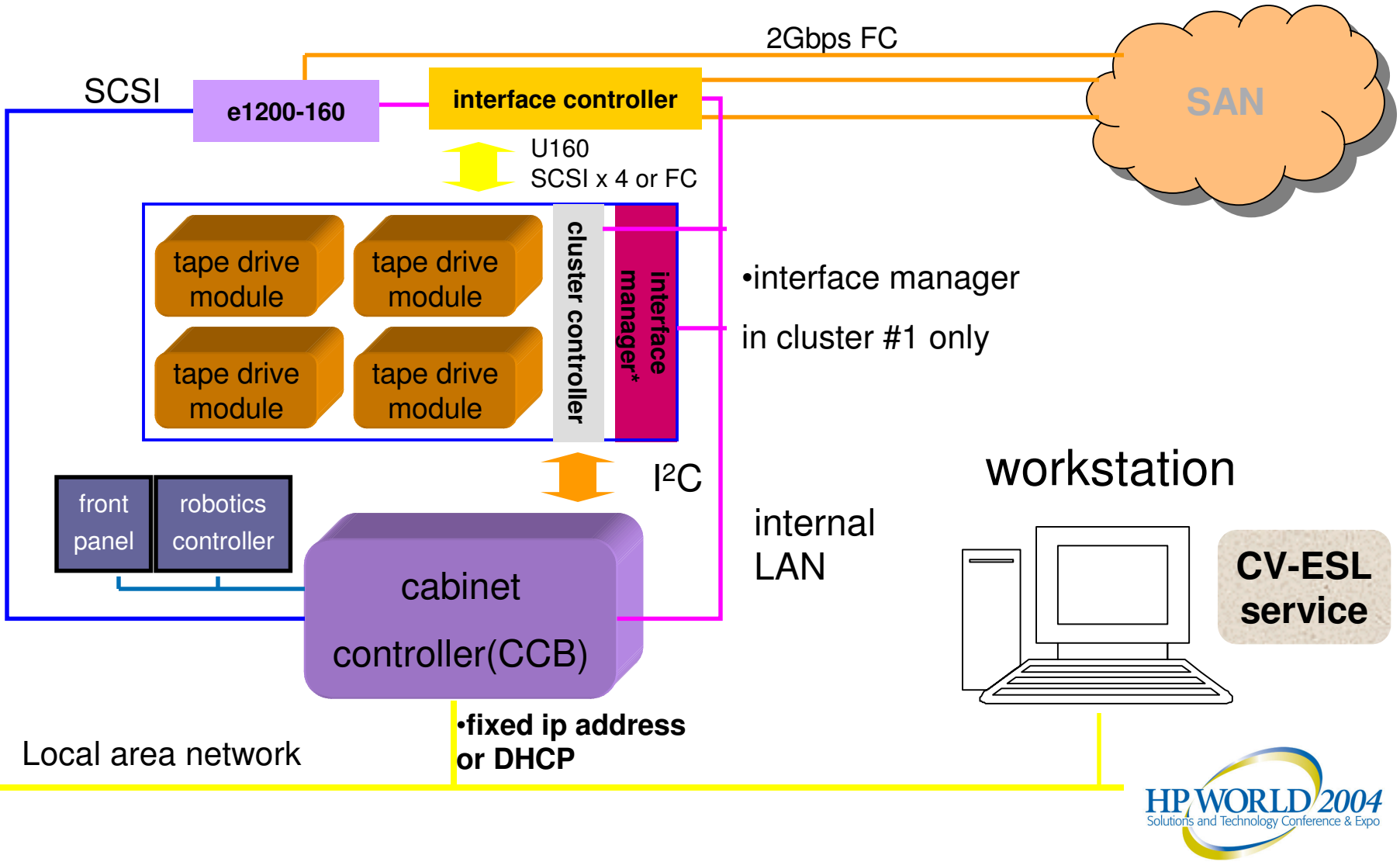
Interface
Manager

Cluster
controller

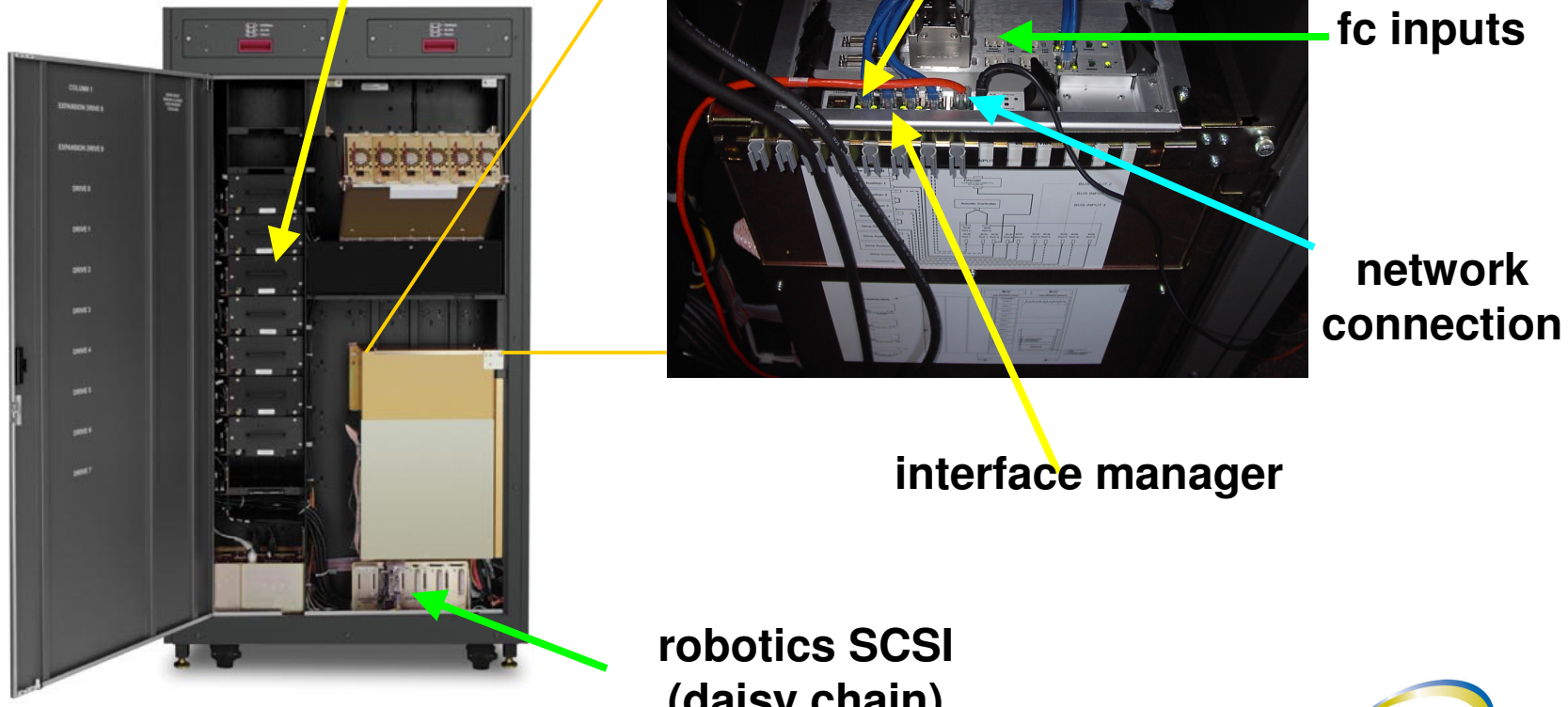
1 per cluster

AC Power
distribution
IEC C20 16A x 2

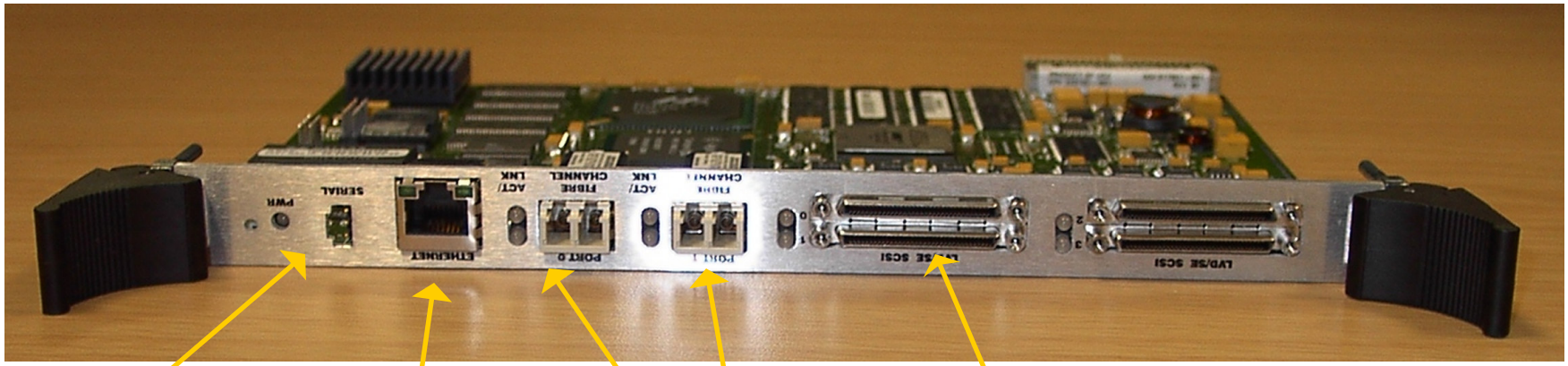
HP ESL E-Series - internal data paths



ESL9000 series - internal components



Interface Controller PCA



RS232 (service)

network (to interface manager PCS)

2Gbps FC

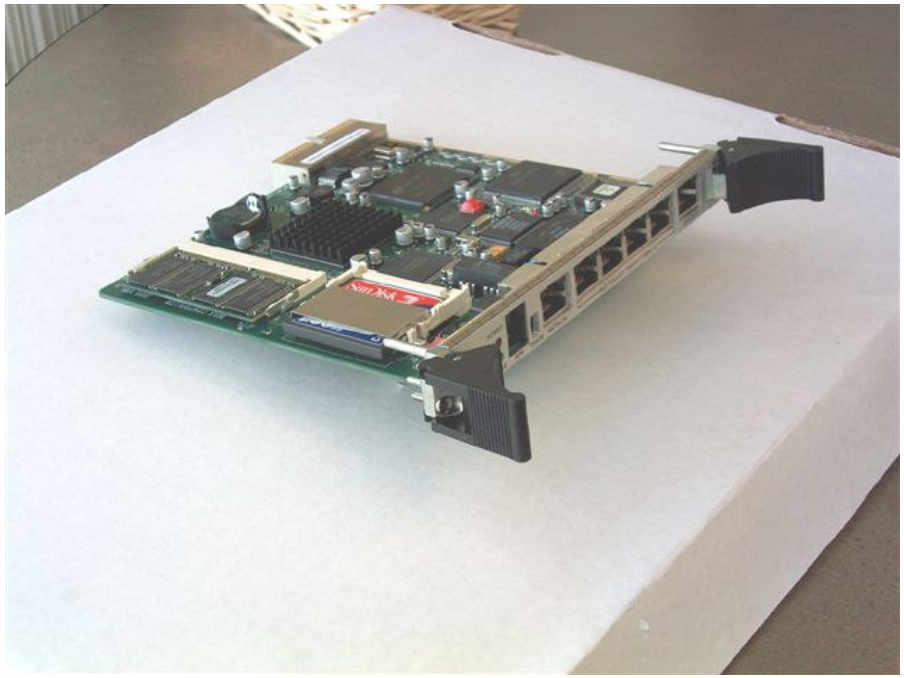
Ultra-160 SCSI (4)

Interface Manager

- network connected to the internal library network
- contains embedded LINUX

OS on flash memory

- embedded diagnostics
- same PCA as ESL9000 series



HP Extended Tape Library Architecture delivers:

- Easy & efficient SAN configuration
- Secure SAN access to tape drives and robotics
- Advanced diagnostics and monitoring of tape library and SAN
- Event logging and alerts
- SNMP alerts via standardised API (SMI-S)
- A platform for upgrades and advanced features such as Direct Backup, Native Fibre Channel, Hardware partitions

Reference material

- www.hp.com/go/ebs

[full compatibility matrix]

- www.hp.com/go/automated

[product information]

HP StorageWorks Extended Tape Library Architecture

- The HP StorageWorks Extended Tape Library Architecture provides enterprise storage network users superior reliability, interoperability and advanced functionality by incorporating intelligent controllers in front of drives in the tape library.

Self-aware storage
designed for your SAN

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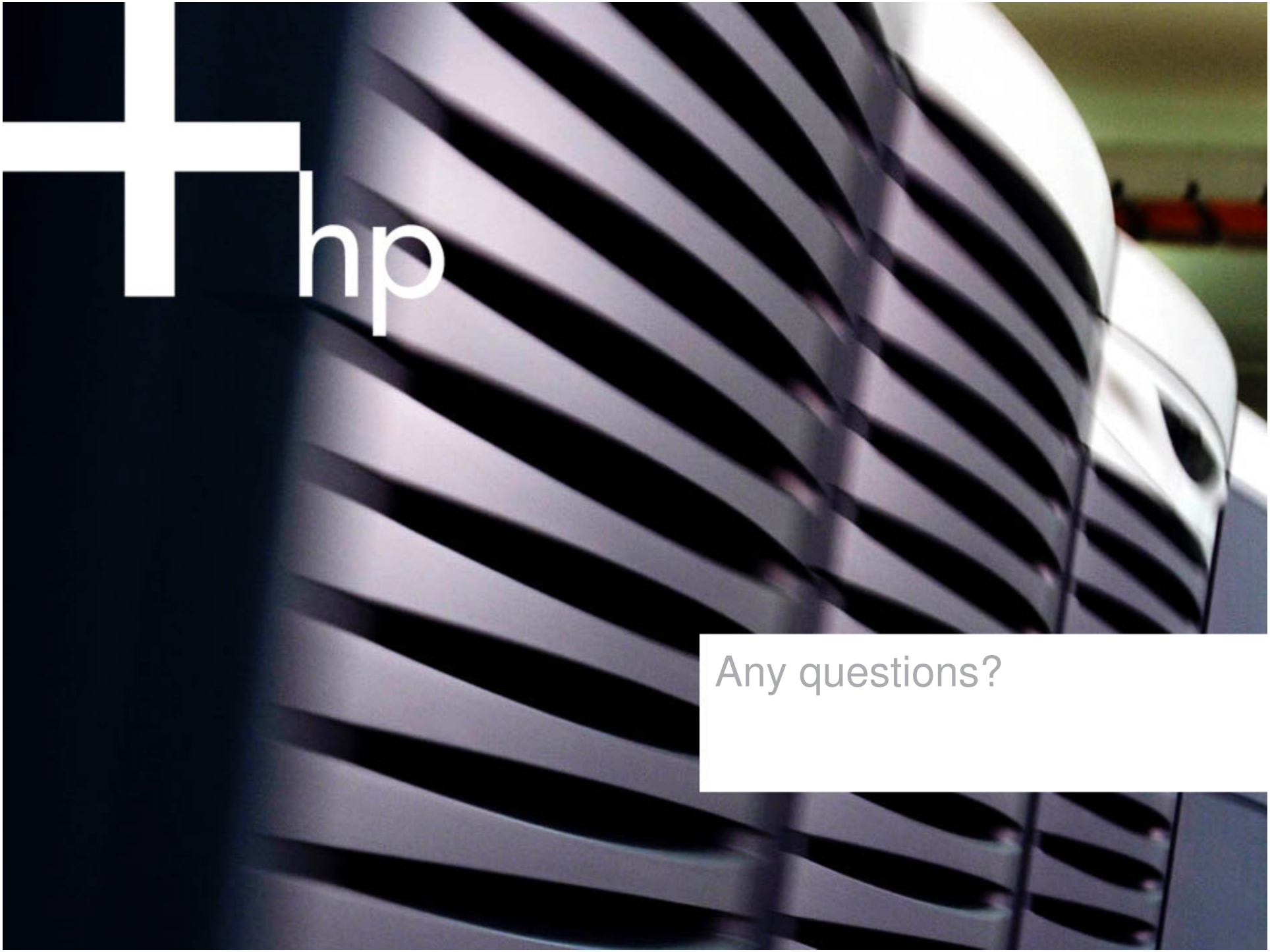
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Any questions?


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