

# Management and Configuration for the Next Generation hp AlphaServer Systems

Session 2227



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# Agenda

- 
- Summary of Design and Implementation for the Next Generation AlphaServer
  - Objectives & Design Requirements for Platform Management
  - Implementation, Physical and Functional
  - Demonstration

# Presenting the next generation hp AlphaServer systems



- 2P AlphaServer ES47 tower
- 2-4P AlphaServer ES47 rack
- 2-8P AlphaServer ES80 system
- 2-64P AlphaServer GS1280 system

## family-wide capabilities

### *enterprise capabilities now on departmental and workgroup systems*

- partitions (as small as 2 CPUs)
- scalable building block components for processing, memory & I/O
- capacity on demand

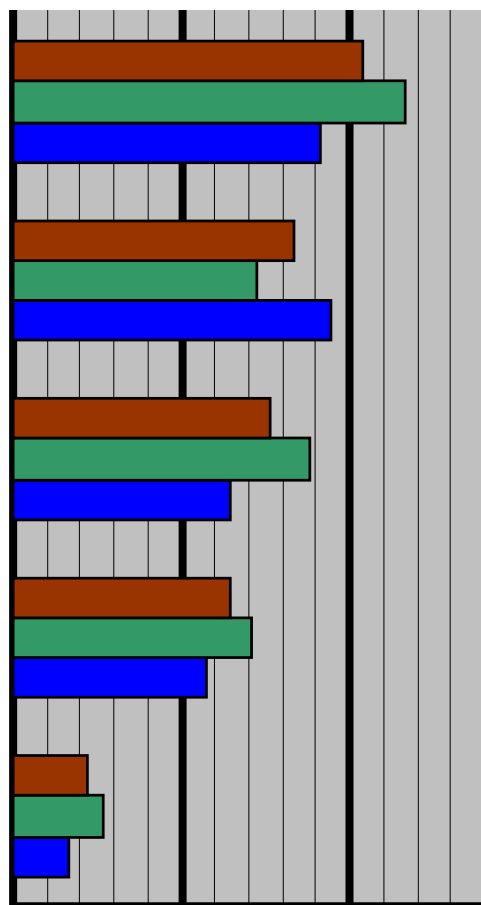
### *new capabilities for the entire family*

- **server management that is modular, scalable, and introduces a browser GUI**
- PCI-X I/O
- RAID memory



# Manageability: Top Customer Priority

## Customer Priorities



Combined  
Small Systems  
Large Systems

### Manageability

- Comprehensive and easy to use system management across entire product family
- Multiple choice partitioning
- Low cost, modular, and independent increments for processing, memory, and I/O capacity
- Most components owner installable

### Availability

- Hot plug everything
- Redundant power
- RAID memory

### Performance

- Low latency cache, memory, and I/O access
- I/O bandwidth

### Standards Compliance

- Choice of the latest in I/O options: PCI-X, AGP/Pro, Infiniband ....
- Compaq Standard Options

### Scalability

#### (based on 128P partitionable system)

- Up to 384 PCI-X I/O buses; up to 128 AGP 4X buses
- 512MB to 4TB memory
- Up to 750,000 Tpm per 64P SMP partition



# System Design Dictated Modular and Scalable Platform Management

Modular building blocks

Produce a broad range of  
systems

common components



EV7 dual CPU  
module



2P and 8P system drawers

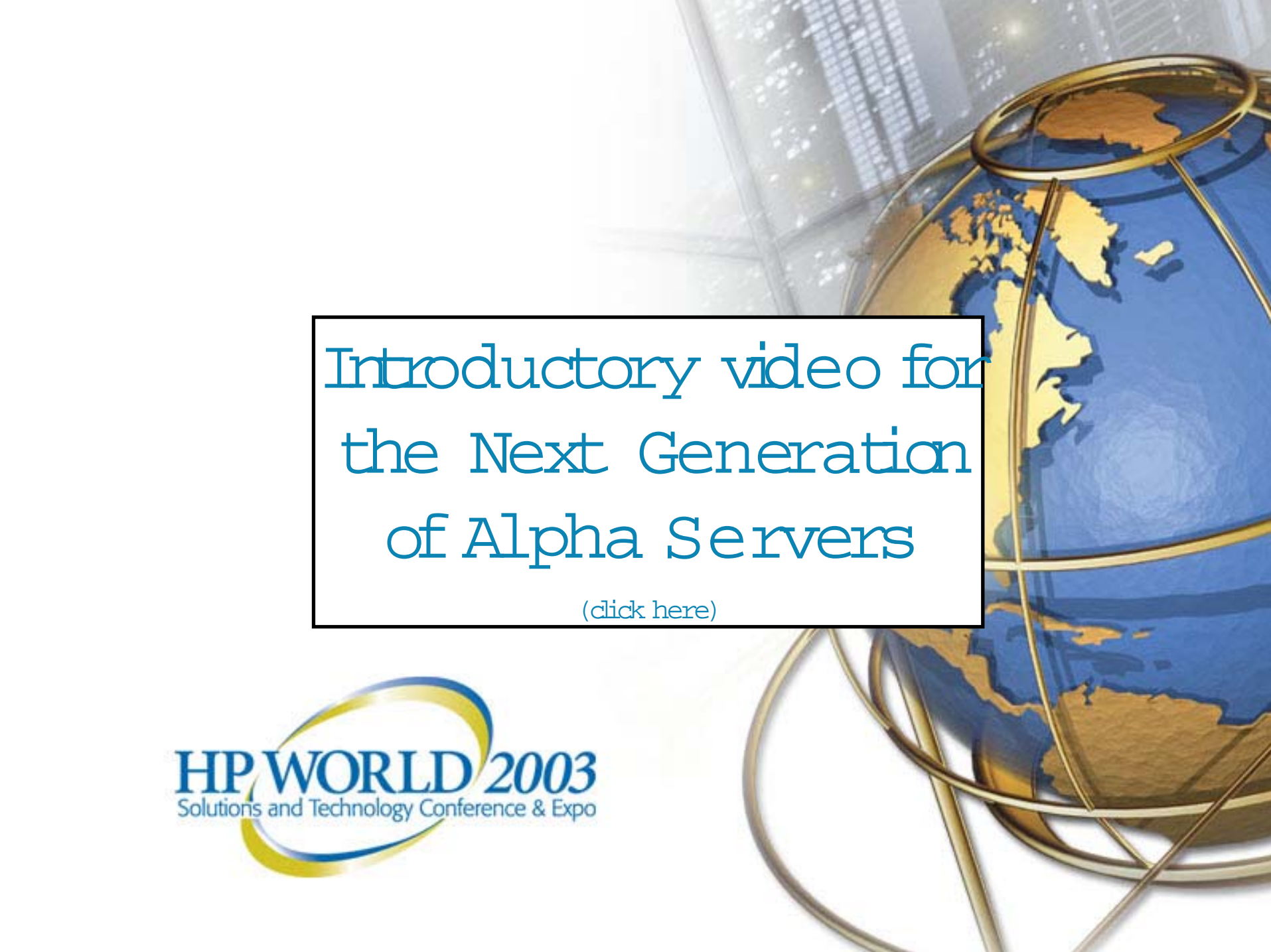


standard & high performance  
I/O drawers



platform management





# Introductory video for the Next Generation of Alpha Servers

[\(click here\)](#)





# AlphaServer GS1280

**32P Available Now**

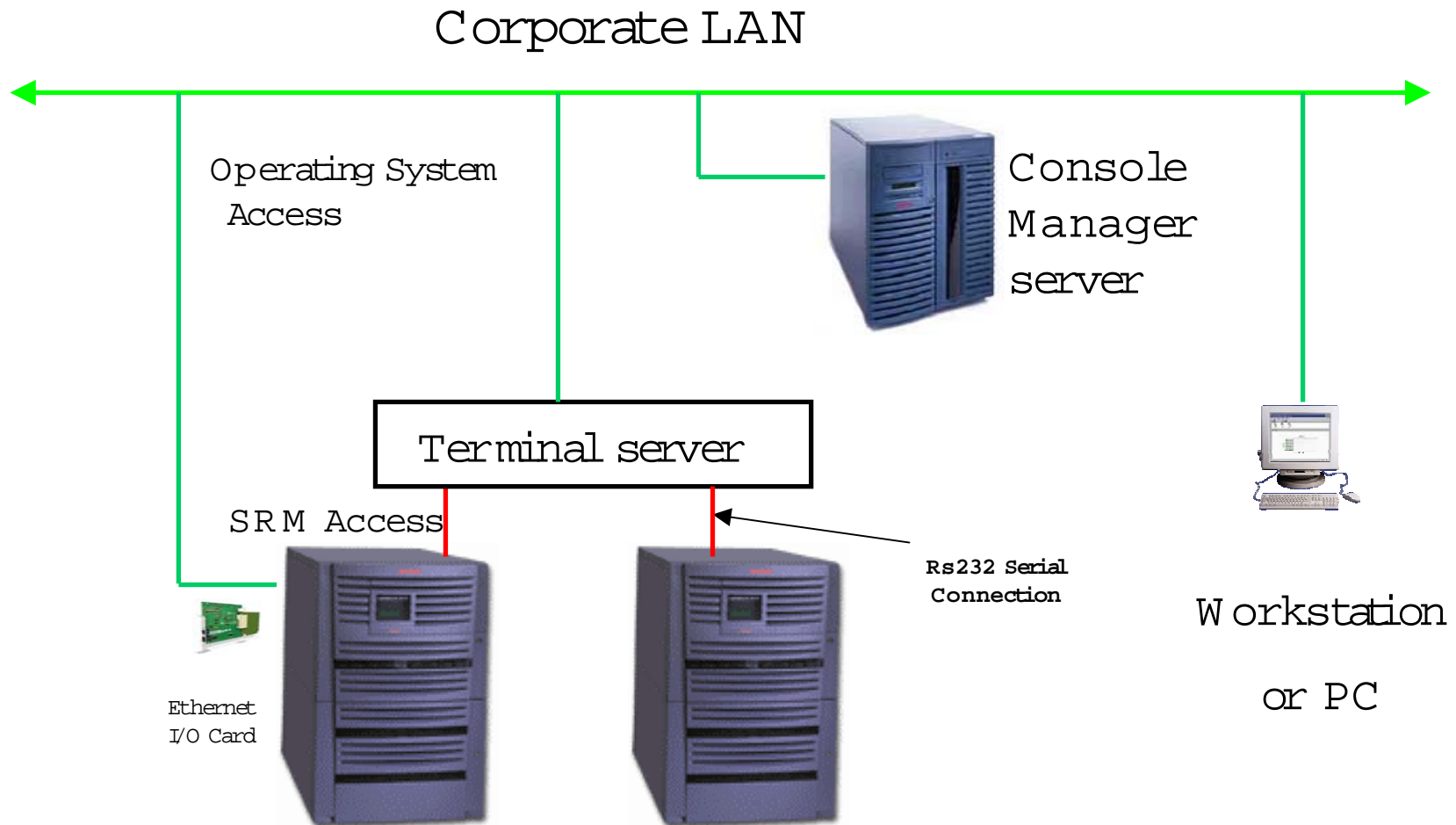
**64P Available October**



## ***Design Limits***

- **2 to 128 processors**
  - ▢ **Max 64p SMP**
- **Up to 4 TB Memory**
  - ▢ **RAID Memory**
- **Up to 1152 PCI-X slots**
- **Up to 128 AGP 4x slots**
- **System Management**
- **Hard & Soft Partitions**

# Past Designs for Platform Management



simplified: Terminal server directly on Corporate LAN



# Objectives for Platform Management

## ■ Design Objectives

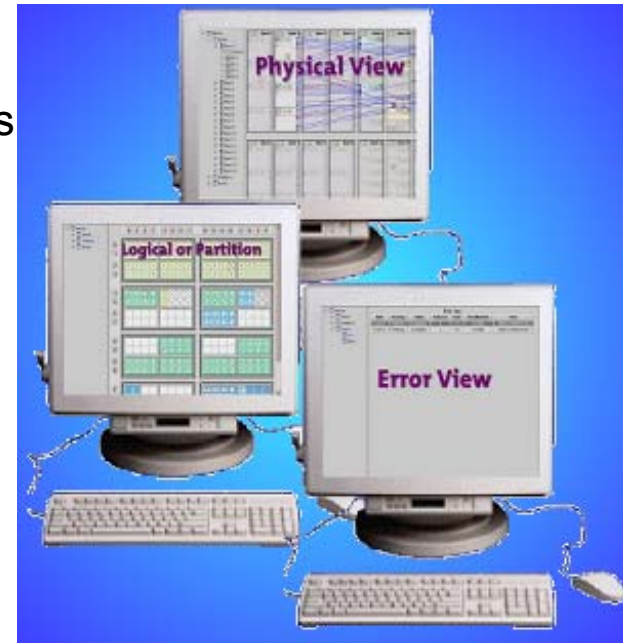
- Scale from 1 processor to 128 processors
- Scale from 1 I/O subsystem to 128 I/O subsystems
- Support and simplify resource migration in a partitioned system
- Eliminate requirement for a hardware console for each partition
- Tolerate failures in the server management hardware without taking down the entire system.
- Directly connect to and control EV7 processor without traversing system memory and I/O
- Monitor complete infrastructure and environmental state of the platform

## ■ Implementation Objectives

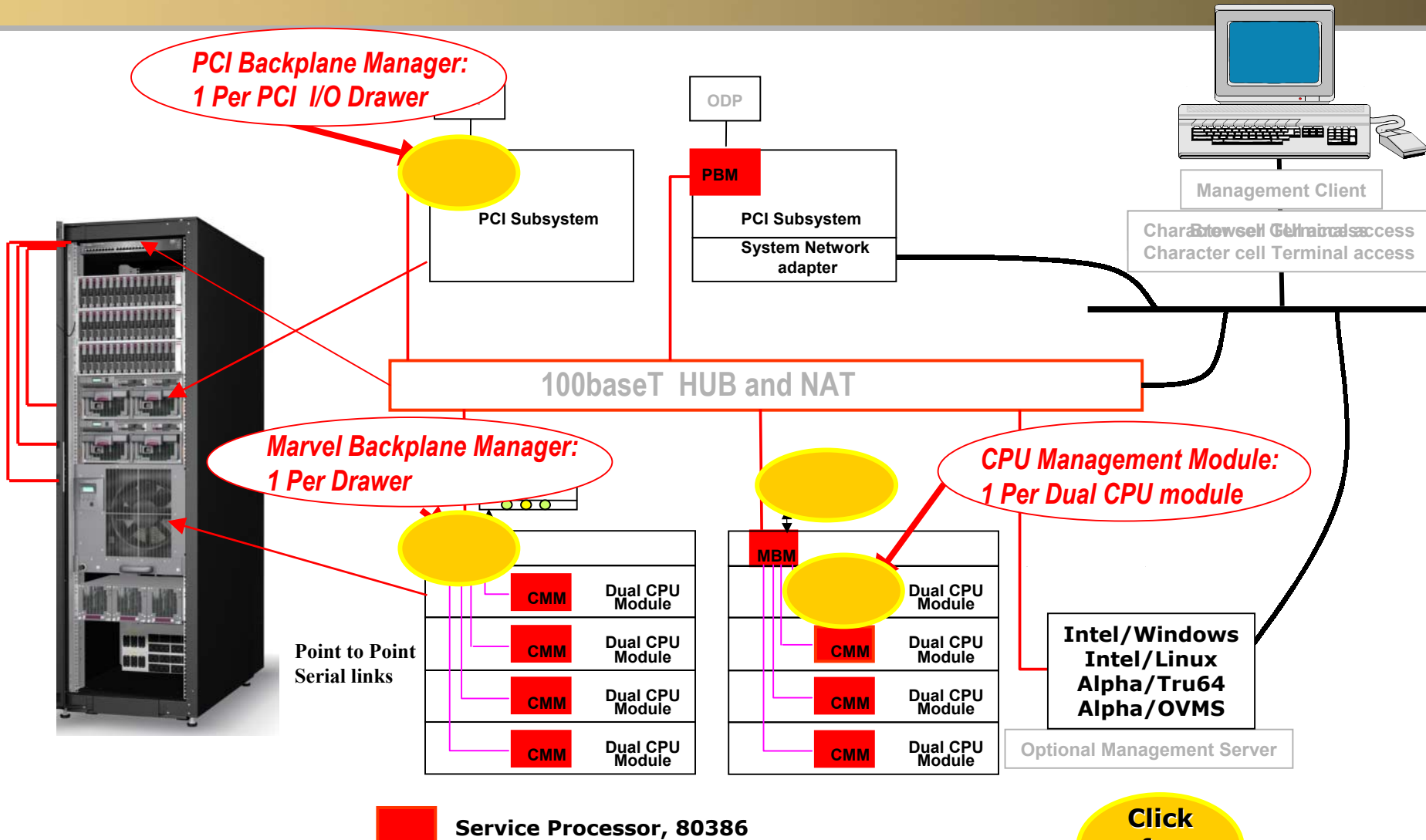
- Use commercially available hardware components
- Use redundancy to ensure survivability
- Use standard interconnect technology
- Use off-the-shelf software for service processor O/S and utilities
- Provide single external point of connection
- Permit multiple external management stations
- Manage multiple servers from one station

# The New Platform Management System

- New Web Browser GUI Based on Client/Server design
  - Better display and control for large systems
  - Same interface for small systems and large
  - Support for multiple management stations and remote access
- Maintains system information from integrated network of service processors
  - Integrates Operating System Console functions and Platform Management Functions
  - Fault Resilient
    - System continues to run if any component fails.
    - Most components hot swappable
- Backward compatible with existing console management environments
  - No changes in existing operational practices
  - Integrates with PolyCenter Console Manager, Console Works, HP Insight Manager, and other Telnet accessible system management tools



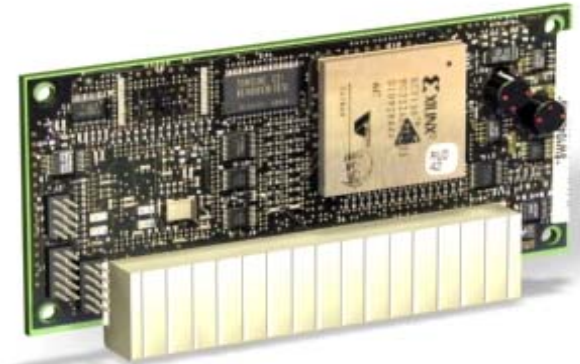
# Platform Management Architecture



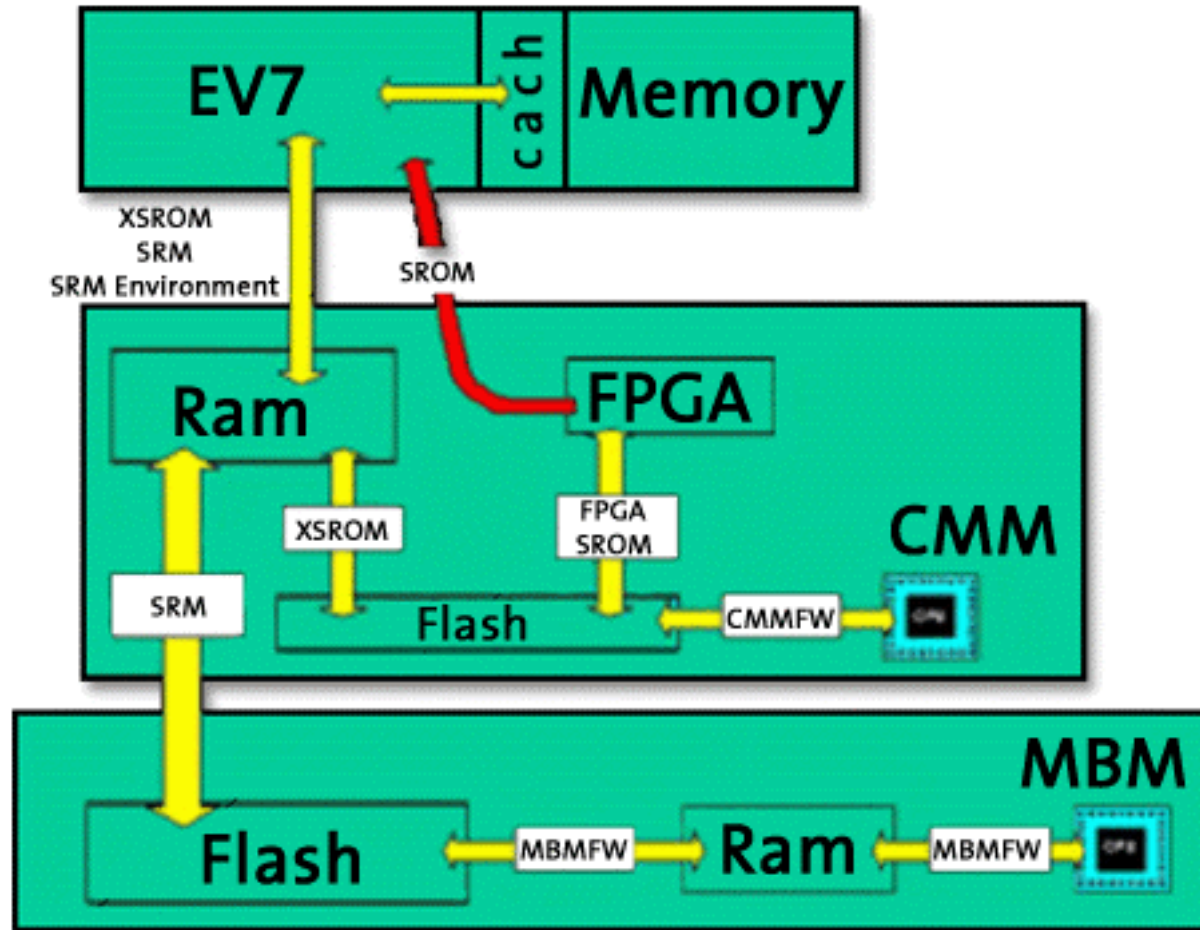


# CPU Management Module (CMM) Functions

- CPU Power Regulator Control
- CPU Reset and Halt
- FLASH ROM updates
- Voltage, ambient temperature, CPU Package temperature status reporting
- Virtual serial console communication to SRM Console & O/S
- CPU debug state capture
- Diagnostic support for the EV7's On-board Circuit Logic Analyzer (OCLA)

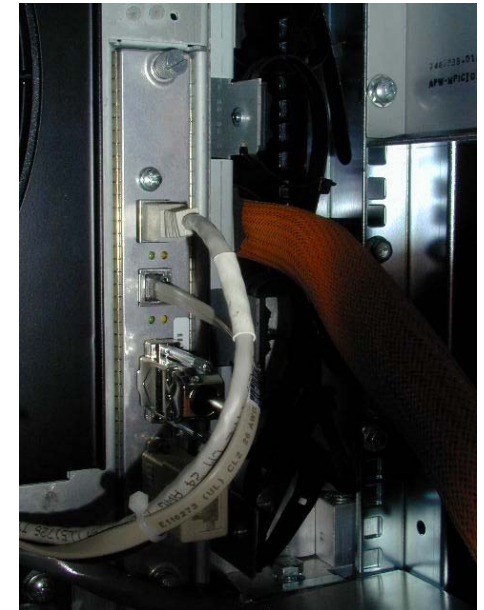


# Firmware Code Loads



# Marvel Backplane Manager (MBM) Functions

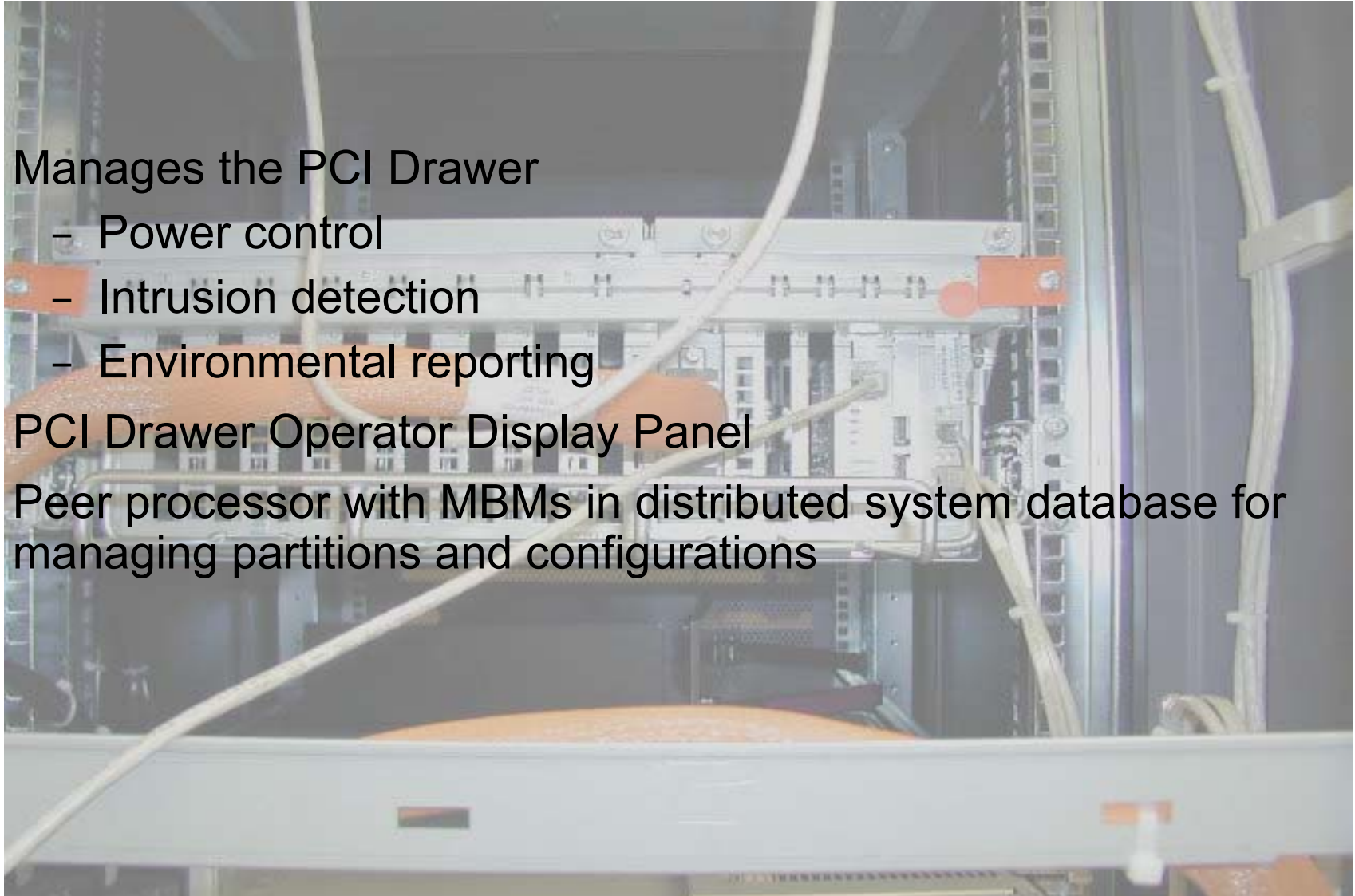
- Manages up to four CMM's (8 CPU's)
- Manages CPU drawer Operator Control Panel
- Interfaces to cabinet Operator Control Panel
- Power control for 48Volt Bulk supply
- Flash RAM storage
  - FSL and XSROM
- Toy clock
- IP Cable identification and placement
- Peer processor with PBMs in distributed system database for managing partitions and configurations





# PCI Backplane Manager (PBM) Functions

- Manages the PCI Drawer
  - Power control
  - Intrusion detection
  - Environmental reporting
- PCI Drawer Operator Display Panel
- Peer processor with MBMs in distributed system database for managing partitions and configurations



# Operator Control Panel for Cabinet

- Backlit LCD OCP for rack status messages
- User interface key switches
- Thumbwheel rack ID selection switch
- LED readout showing rack ID selection
- Fully integrated with system Platform Management
- Enclosure door lock controls access to thumbwheel



# Operator Display Panel for I/O Drawer

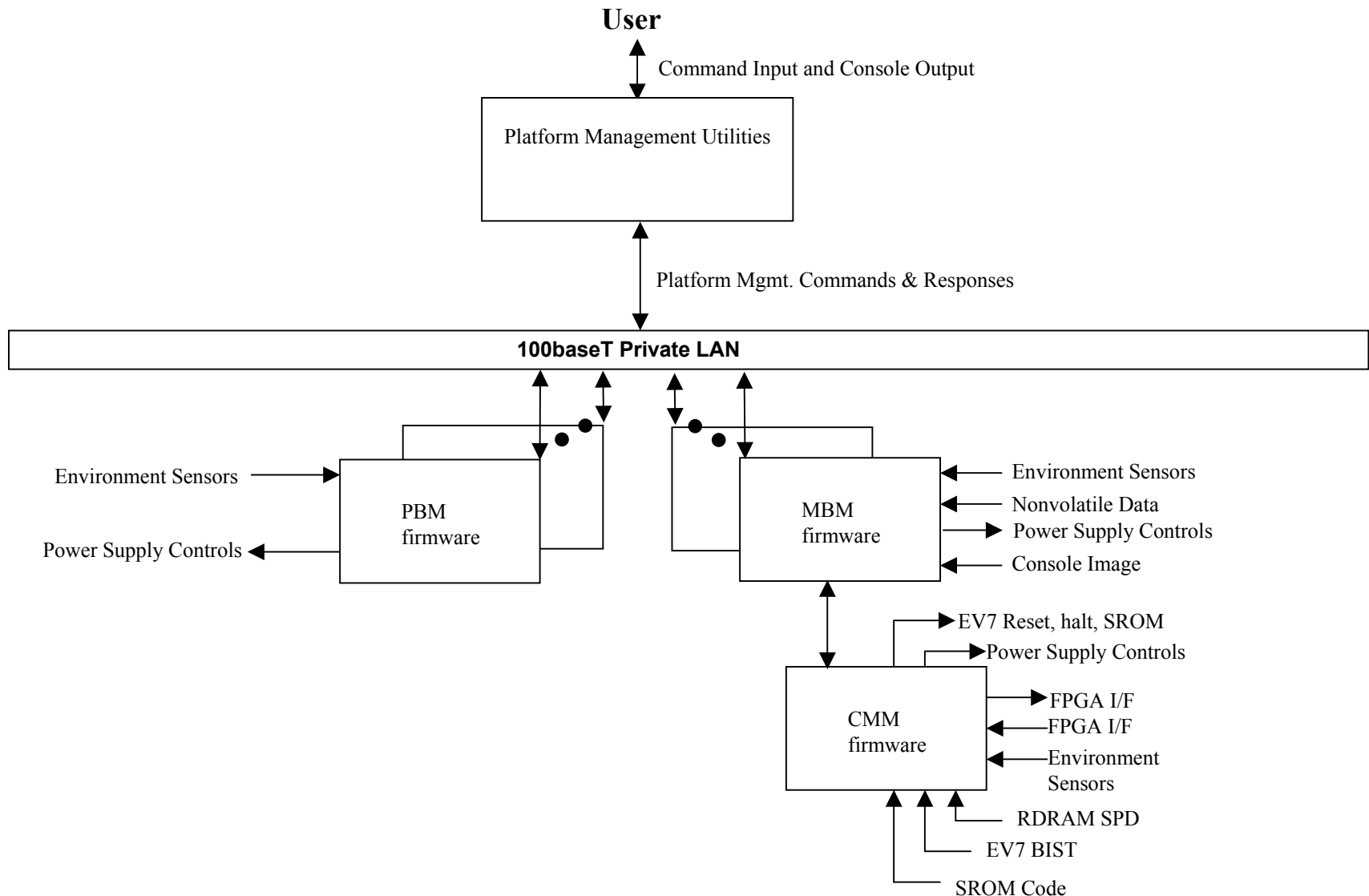
Backlit  
LCD ODP

Thumbwheel ID Selector



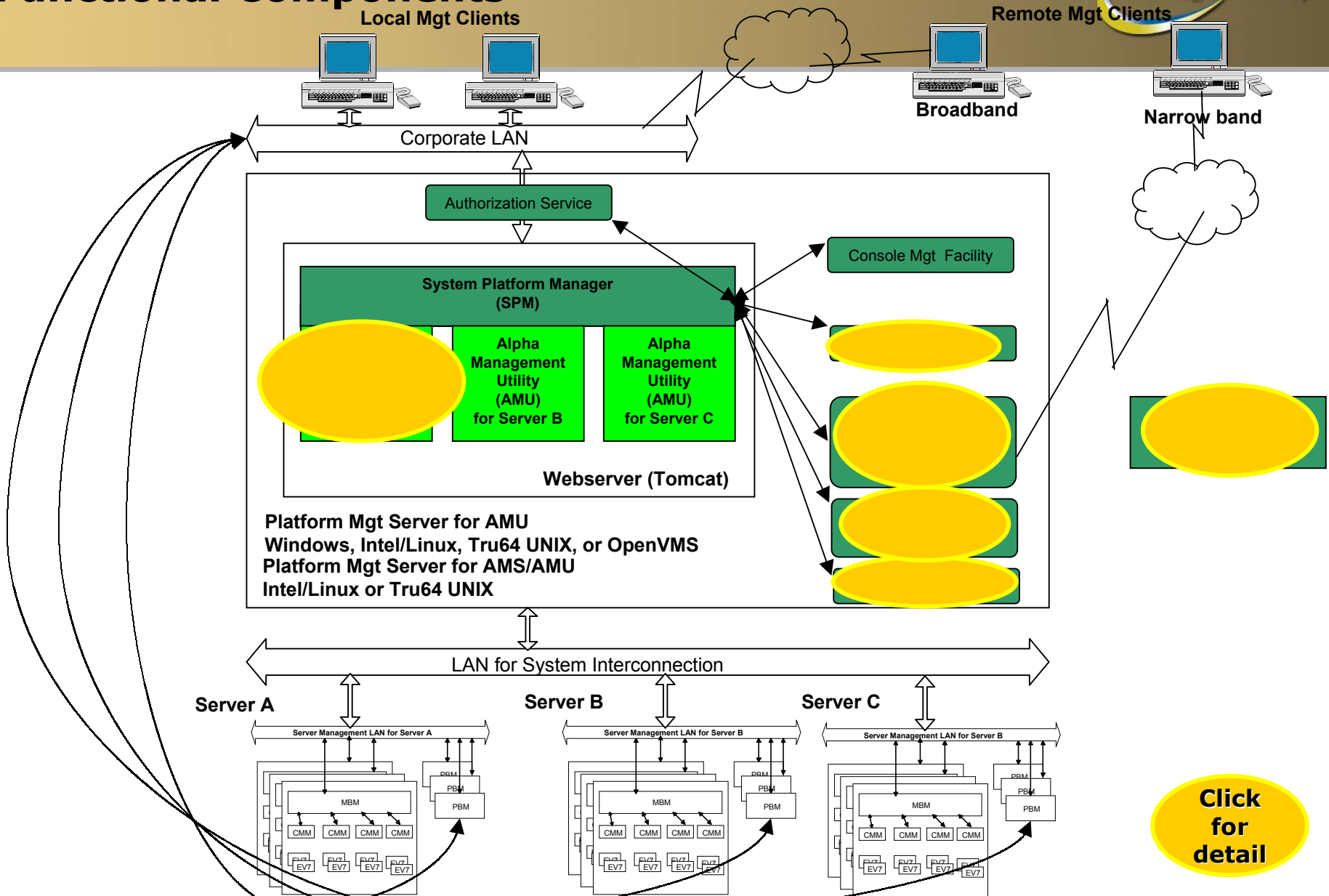


# Platform Management Functional Heirarchy



# Platform Management Utilities

## Functional Components



# Alpha Management Station (AMS)

## Main Components



- The Server Platform Manager (SPM), a client-server web based application. The client is the AMS main user interface.
- The AlphaServer Management Utility (AMU), a client-server web based application that manages the Marvel Platform by communicating directly with the Marvel SMLAN firmware.
- The Console Management Facility (CMF), a utility that manages connections to consoles and monitors and logs console output.
- Event Manager ...
- The Platform Console Manager (PCM), a character cell user interface that allows you to monitor and manage consoles over low bandwidth connections
- The AlphaServer Partitioning Wizard (APW), a web-based wizard style utility that simplifies the configuration of partitions



# Server Platform Manager (SPM)

- Provides central point of control for multiple systems
- Displays all platforms connected to the AMS and configured in SPM
- Monitors the status of all platforms
- Displays environmental errors
- Launches AMU, APW and OS management applications
- Provides telnet access to the MBM and OS/SRM consoles
- Displays the logs of all consoles
- Displays the event logs that contain events generated by CMF

# SPM (cont'd)

Menu bar    Monitor bar    Left frame    Right frame    Bottom frame

File View Actions Configuration Help

Current User: guest

AMS

- Ams\_Host (smcunx4.yourcompany)
  - Platforms
    - mvnat2
    - natm08
      - Default\_HP
        - Default\_SP (natm08co)
      - natm44
        - Default\_HP
          - Default\_SP (m44p0)
    - Consoles
      - m44p0
      - mvnat2\_MBM
      - mvnat2cons
      - natm08\_MBM
      - natm08cons
      - natm44\_MBM

mvnat2 natm08 natm44

**Hardware Warnings and Errors for All Platforms**

Platform	Cabinet	Drawer	Instance	Type	Subtype	Severity	Description
NATM44	0	0	-	MBM	PowerStatus	!	SystemBox powered off
NATM44	0	0	0	CMM	PowerStatus	!	DualCPUModule powered off
NATM44	0	0	2	CMM	PowerStatus	!	DualCPUModule powered off
NATM44	0	1	-	MBM	PowerStatus	!	SystemBox powered off
NATM44	0	1	0	CMM	PowerStatus	!	DualCPUModule powered off
NATM44	0	1	2	CMM	PowerStatus	!	DualCPUModule powered off
NATM44	0	2	-	MBM	PowerStatus	!	SystemBox powered off

3 Platforms

# Alpha Management Utility (AMU)

## Display

- Graphic view of dynamic information about the configuration and status of platforms, system drawers, I/O drawers, CPU modules and partitions.
- Environmental readings
- Hardware error logs
- Firmware versions

## Control

- Configure partitions
- Upgrade Firmware (while system running)
- Telnet access to a platform's character cell console ports
  - Platform Management -- MBM/PBM service processors
  - Direct access to system – SRM (O/S loader) and O/S

# AMU (cont'd)

Menu bar      Left frame      Right frame      Bottom frame

The screenshot displays the AMU interface with the following components:

- Menu bar:** Contains 'File', 'View', 'Actions', and 'Help'.
- Left frame:** A tree view showing the hierarchy:
  - Platform [Webshooter76]
    - Hardware
      - Cabinet #0
        - 8P 8P System Drawer #0 - Powered On
        - 8P 8P System Drawer #1 - Powered On
        - 8P 8P System Drawer #2 - Powered On
        - 8P 8P System Drawer #3 - Powered On
      - Cabinet #4
        - Power Supply Tray #0
        - Power Supply Tray #1
        - Power Supply Tray #2
        - Power Supply Tray #3
        - Standard IO 3 Volt #4 - Powered On
    - Partitions
      - Hard #0 [Default\_HP] - Powered On
        - Sub #0 [Default\_SP] - Running OS/S

- Right frame:** Displays two vertical panels for Cabinet #0 and Cabinet #4. Each panel shows a list of components with status indicators (green for powered on, yellow for warning, red for error). Cabinet #0 shows four 8P System Drawers. Cabinet #4 shows three Power Supply Trays and one Standard IO 3 Volt.
- Bottom frame:** A status bar showing two messages:
- [12:33:54 PM] Retrieving Hardware information completed
- [12:34:00 PM] Retrieving Partitions information completed



## **Character cell utility for basic management and monitoring over a low bandwidth telnet connection**

- Displays a list of all consoles and their status.
- Displays a real time list of the latest console output of all managed consoles.
- Provides console access to each partition and MBM ports.
- Provides access to console logs.

# PCM (cont'd)

dtterm

Window Edit Options Help

PCM

Console	Platform	Model	Status	Description
<TS_CTRL_PORT> ts1		M90	Open	Terminal server
>Machine-A	>ts1	>M90	>Open	>Labmachine #1

Connect... Console... Tools... Events... Configure...

Latest Console Output for Managed Systems

Time	Console	Message
03/04/15_17:48:09	Machine-A	CPU EXCEPTION
03/04/15_17:48:23	Machine-A	AdvFS Domain Panic
03/04/15_17:48:34	Machine-A	Machine Check
03/04/15_17:48:45	Machine-A	CNX MGR: quorum lost

The systems that are being managed. Select Configure... to modify this list

[Exit] Help

# Alpha Partitioning Wizard (APW)

- Simplifies creation of new partitions or modifies existing ones.
- Can validate partitions before committing.
- Can save a partition configuration into a partition map file that can be used to restore or replicate partitions



# APW (cont'd)

APW: Current Partition Map

Platform **hulk**; Model **GS1280**; AMS host **amshost.customer.com**.

A partition map specifies the hard partitions and soft partitions on a hardware platform, and assigns each Dual Processor Module (Duo) to a partition. The platform has a default hard partition until other partitions are defined. Similarly, each hard partition contains a default soft partition until other partitions are defined. OpenVMS Galaxy allows you to create multiple soft partitions within a hard partition. The partition map below shows your platform's current configuration. Select **Resources** for more information.

**NOTE:** If an operating system is running in any partition, no changes can be made to that partition. However, while operating systems are running, you can create and edit partition maps for future use.

	Partition	Console	OS Status	OS Type	Duos	CPUs	Memory (MB)	Soft Partitions
0	rice	rice	Not Running	Tru64 UNIX	2	4	10240	1
1	beans	beans	Not Running	Tru64 UNIX	2	4	10240	1

Refresh

Resources...

Move the mouse over a component for tooltip help

Next>

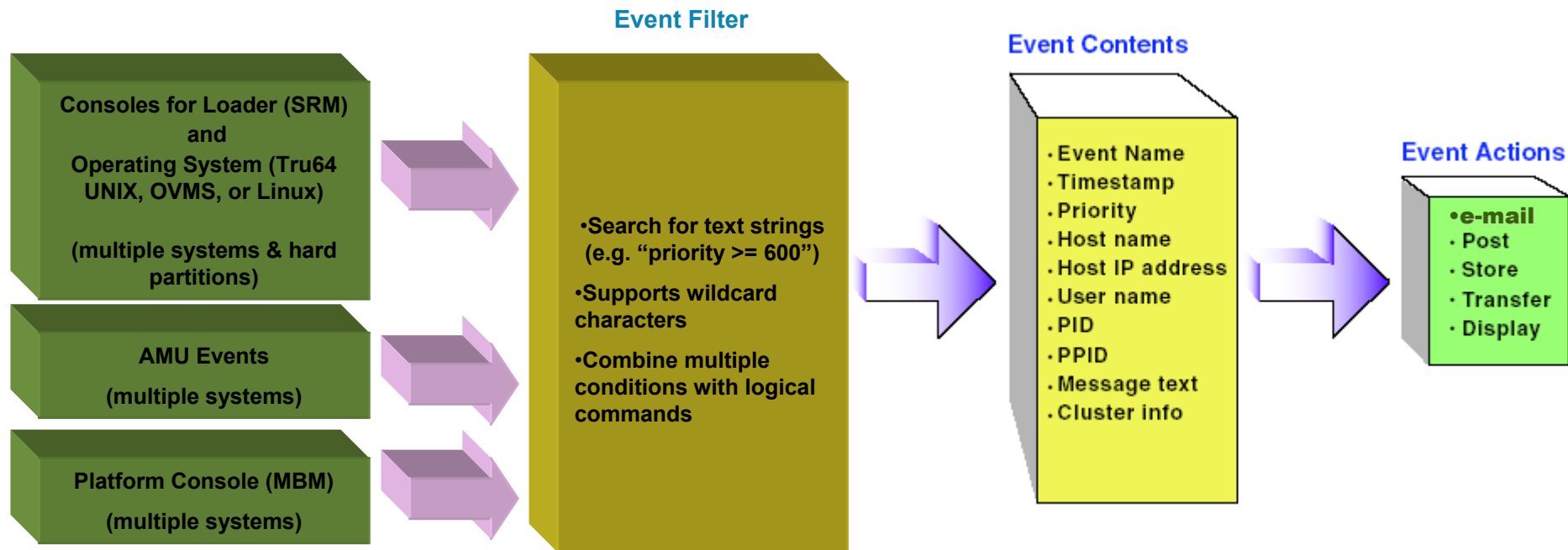
Quit

Help

Java Applet Window



# Event Manager



# Event Viewer

View Events on *platform2\_hostname*

Event summaries from *platform2\_hostname*

3 events matched specified filter. 3 event summaries displayed.


EventId	Pri	Timestamp	Host	Summary
201	600	05-Nov-2002 12:00:52	platform2	Console Event : platform2_host:P00>>>
137	700	05-Nov-2002 08:51:52	platform2	Console Event : platform2_hostname: Connection failed. I'll try again
344	700	05-Nov-2002 06:49:07	platform2	Console Event : platform2_hostname: Connection failed. I'll try again

Details... Refresh Filter... Customize... Sort... Options...

Exit Help

Java Applet Window

# Connections to O/S Management



Management Agents for Servers

**Login Account:** user

[Refresh](#) [Options](#) [Logout](#)

hostname.domain.com  
12.12.123.123  
Friday, November 15, 2002 17:01:06

**Device Home Page**



Management Agents for Tru64 UNIX



Tru64 UNIX Configuration Report



Tru64 UNIX SysMan

HP Insight Management Agents provide device information for all managed subsystems. Alerts are generated by SNMP traps.

---

Tru64 UNIX Configuration Report identifies the configuration and current operating parameters for the system. The report also gives advice and warnings on possible configuration and operational problems.

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Tru64 UNIX SysMan is a suite of applications for managing Tru64 UNIX systems for PC and non-PC platforms. Two complementary applications, the [SysMan Menu](#) and the [SysMan Station](#) provide centralized access to the SysMan suite.

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[Credits](#)

[Troubleshooting Tips](#)

# Platform Management Service Processor Failure



- At system power-up
  - Loss of access to the components under that microprocessor's control
  - These components will be mapped out when the partition(s) are configured
  - Components can be hot-added at a later time
- During system operation
  - The firmware is designed to “ride through” a server management outage, so that the failing component can be replaced online or when downtime is scheduled



# New Platform Management for New AlphaServer Systems

- New GUI interface analogous to the change from DOS to Windows
  - Required to visualize and monitor large systems with multiple instances of operating systems
  - Simplifies partitioning and reconfiguration
  - Character cell console retained for backwards compatibility with current system management practices
- Functionality incorporated in a single platform management solution that previously was external to the system
  - Eliminates separate physical consoles, “built-in” terminal server
  - Comprehensive console logging and event management
  - Access control and security
- Modular, reliable implementation
  - Uses industry standard hardware and software components
    - 80386 for service processors
    - Ethernet for interconnection
    - Vxworks for service processor O/S
  - Resilient design
    - Redundant hardware and software components
    - System and O/S instances continue to run if hardware components fail
    - Many key hardware components can be hot swapped

# Future Enhancements

- Console Management for AlphaServer GS80/160/320 (Wildfire)
- Console Management for any Alpha or other system that supports Telnet, character cell output



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