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IBM

IBM Systems Director (for Power) Overview and Basics

Version 6.2.1

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Advanced Technical Skills

Agenda

- Systems Management environment

- IBM Systems Director Overview

- IBM Systems Director Features

- IBM Systems Director plug-ins

- IBM Systems Director Editions

- Power Systems Details for IBM Systems Director 6.2.1

IBM® Systems Director

Management
Energy
Security
Availability
Operating Systems
Virtualization

IBM® Systems Software

Agenda

- **Systems Management environment**

- IBM Systems Director Overview

- IBM Systems Director Features

- IBM Systems Director plug-ins

- IBM Systems Director Editions

- Power Systems Details for IBM Systems Director 6.2.1
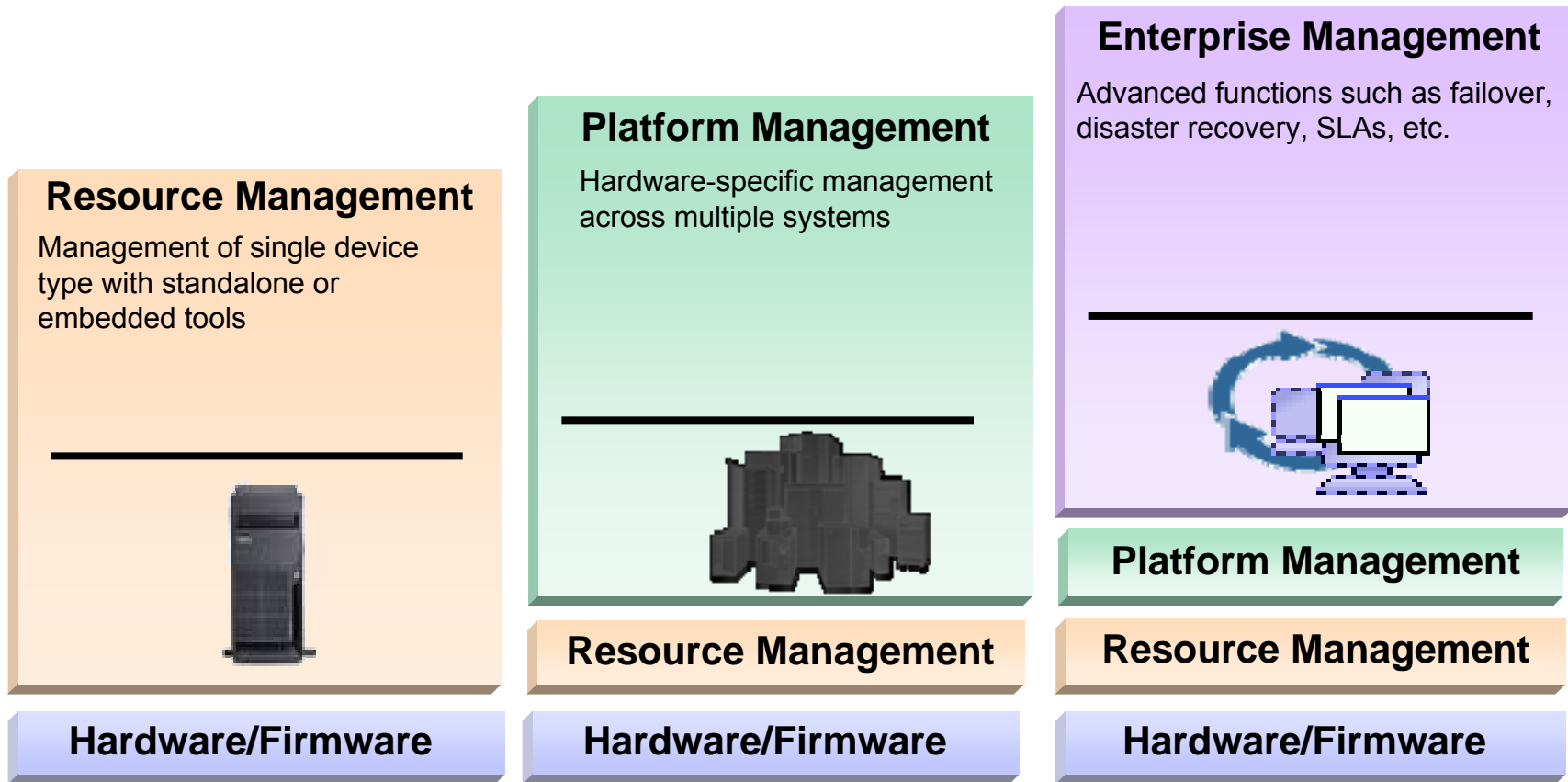

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IT Organization Challenges

- Thousands of things to manage

- Capital and operational expenses

  - Space and power constraints

  - Needs for diverse administration skills

- Legacy infrastructures

  - Fragile and difficult to change

  - Many specialized skills and tools required

  - Silos: OS, hardware, technologies, facilities

- Little time for planning, optimization and improvements

- Pressures from criticality of IT to the business

Layers of Systems Management

Resource Management

Management of single device type with standalone or embedded tools

Platform Management

Hardware-specific management across multiple systems

Enterprise Management

Advanced functions such as failover, disaster recovery, SLAs, etc.

Platform Management

Resource Management

Resource Management

Hardware/Firmware

Hardware/Firmware

Hardware/Firmware

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Agenda

- Systems Management environment

- **IBM Systems Director Overview**

- IBM Systems Director Features

- IBM Systems Director plug-ins

- IBM Systems Director Editions

- Power Systems Details for IBM Systems Director 6.2.1

IBM® Systems Director

- Strategic cross-brand hardware platform manager
- Focuses on the "care and feeding" of the physical and virtual environment
- Helps reduce the costs of IT service management

IBM® Systems Director

Discover managed endpoints and collect detailed OS and system level information

Hardware failure and pre-failure notification, event logging, and automation

Ensure systems are operating optimally thru platform update identification and distribution

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IBM® Systems Director

- Consolidation of Platform Management Tools

  ➢ Single consistent cross-platform management tool

  ➢ Simplified tasks via browser-based interface

  ➢ Manage many resources from one console

- Integrated Physical and Virtual Management

  ➢ Discovery and inventory of physical and virtual resources

  ➢ Configuration and provisioning of platform resources

  ➢ Status, health and monitoring of platform resources

  ➢ Visualization of server resource topologies

  ➢ Move virtual servers between systems without disruption to running workloads

- Platform Update Management

  ➢ Simplified consistent cross-platform tools to acquire, distribute and install firmware and OS updates
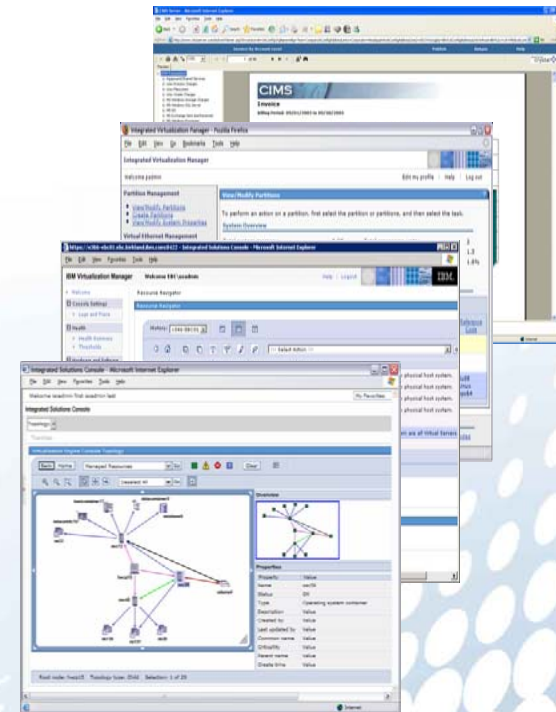
IBM Systems Director 6.2.1

- Simplified installation, deployment and update process

- Single, consistent Web-based user interface

- Learn new tasks with wizards, tutorials and integrated help

- Topology views to simplify troubleshooting

- Increased platform support through industry standards and embedded agents

- Navigation via groups, search, status and relationships

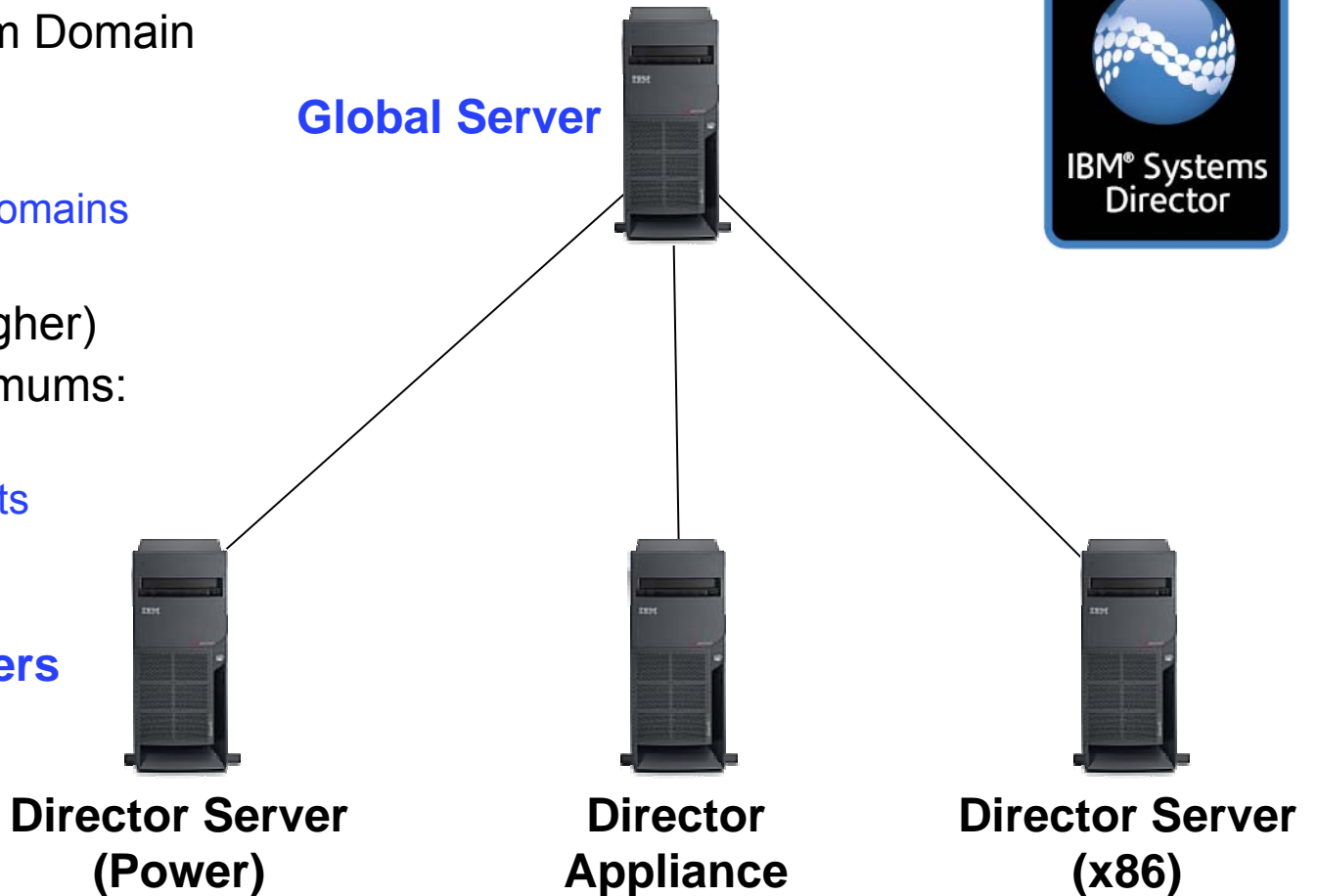- Integrates Systems Director Navigator for i, AIX Systems Director Console and HMC Console

IBM® Systems Director

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IBM Systems Director Topology

IBM System Director Server
Application Logic
Database

Management Console(s)
Web Interface

IBM Systems Director Agents & Managed Systems
Operating Systems, Logical Partitions
Servers, Desktops, Laptops, SNMP devices, CIM devices

IBM® Systems Director
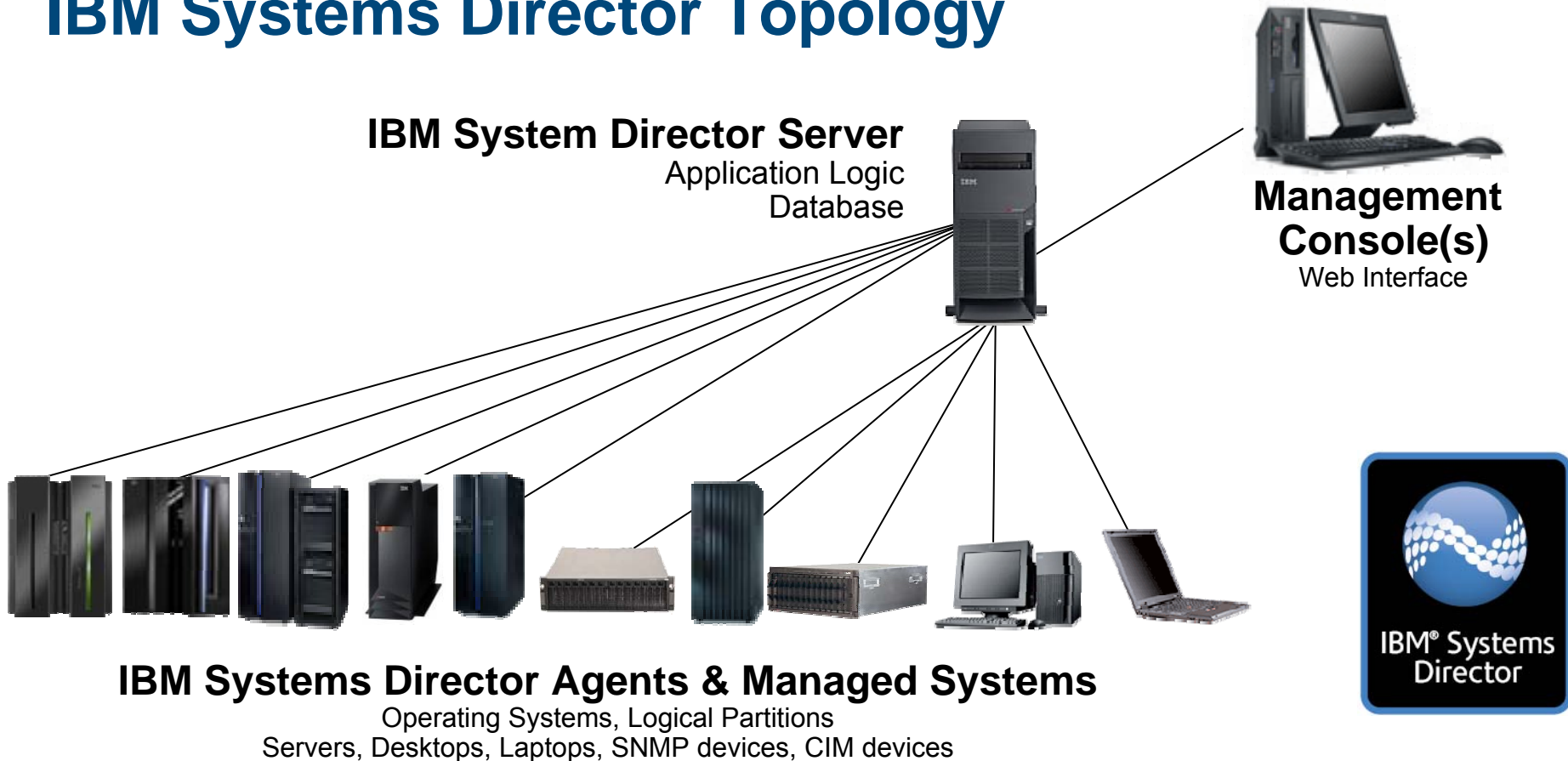
- ■ **Three-tiered architecture**
- ■ **Thousands of managed nodes**
- ■ **Upward Integration modules supporting**
  - • Tivoli, Computer Associates, Hewlett Packard, Microsoft

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Adv. Topology - Hierarchical Management Servers

- 6.2.x Servers only
- Remove objects from Domain
- Useful for
  - multiple locations
  - separate admin domains
  - appliances
- Two tier only (not higher)
- Current tested maximums:
  - 5 Domain servers
  - 10K total endpoints

Global Server

Domain Servers

Director Server (Power)

Director Appliance

Director Server (x86)

IBM® Systems Director

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Agent Capabilities for Operating Systems

Function	Agentless	Platform Agent	Common Agent
System Discovery	Y	Y	Y
Inventory	Basic	Basic	Comprehensive
Deploy Platform Agent	Y	n/a	n/a
Remote Access	Limited	Limited	Full
Remote Restart	Limited	Limited	Full
Monitor Health & Status		Y	Y
Manage Alerts		Y	Y
Deploy Common Agent	Y	Y	n/a
Power Management			Y
Monitor Processes			Y
Manage Updates			Y

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Managed Devices

- Power Systems
  - POWER5™, POWER6™ and POWER7™ servers
  - Hardware Management Consoles, IVM, Virtual I/O Server
  - AIX, pLinux, IBM i (LPARs and OS instances)
- BladeCenter® and System x®
  - BladeCenter, Blade servers, I/O modules, System x servers
  - VMware ESX Server/ESXi/vCenter, MS Hyper-V, Xen
  - Windows®, xLinux, pLinux, AIX, IBM i
- Mainframe Systems
  - Linux on zSeries®, z/VM®
- Non-IBM x86 servers*
- SNMP-based devices
  - Network, Intelligent PDUs, etc.
- Generic CIM-based devices
  - CIM = Common Information Model
- Selected Storage resources (with no additional plug-ins)
  - LSI (IRC), DS3000, DS4000, DS5000, DS6000
  - SAS Switch, Brocade FC Switch, Qlogic FC Switch
  - High-end storage requires Storage Control

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- Systems Management environment

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- **IBM Systems Director Features**

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Getting Started

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IBM Systems Director Task Sampler

- HMC, server and virtual servers discovery

- Navigation and topology

- Users and roles

- Processes

- Monitors

- Events

- Health Summary

- Scheduled tasks

- Automation plans

- Integration of the HMC and OS browser-based management tools

- Software / firmware release management

IBM® Systems Director

View: [All tasks ▼]

- Welcome
- My Startup Pages
- Find a Task
- Find a Resource
- Navigate Resources

⊞ Automation

⊞ Availability

⊞ Inventory

⊞ Energy

⊞ Release Management

⊞ Security

⊞ System Configuration

⊞ System Status and Health

⊞ Task Management

⊟ Settings
  - Active Energy Manager
  - Agent Manager Configuration
  - Manage MIBs
  - Encryption Preferences
  - Navigation Preferences
  - Event Log Preferences
  - Server Preferences
  - Auto Rename
  - Credential Store
  - Console Logging and Tracing

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Resources and Relationships in Systems Director

- Managed Resources
  - ➤ Hardware: Servers (CECs) / Blades
  - ➤ HMC / IVM / BladeCenter
  - ➤ Virtual Servers (LPARs)
  - ➤ OS instances – IBM i / AIX / Linux / Windows
  - ➤ Software / firmware
  - ➤ Networks / storage / energy & environment
- Relationships
  - ➤ Contains
  - ➤ Runs on
  - ➤ Installed on
  - ➤ Group membership – static / dynamic
- Properties
  - ➤ Status
  - ➤ Monitored attributes
  - ➤ Inventory attributes
  - ➤ Capabilities

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Discover Power Systems Virtual Resources
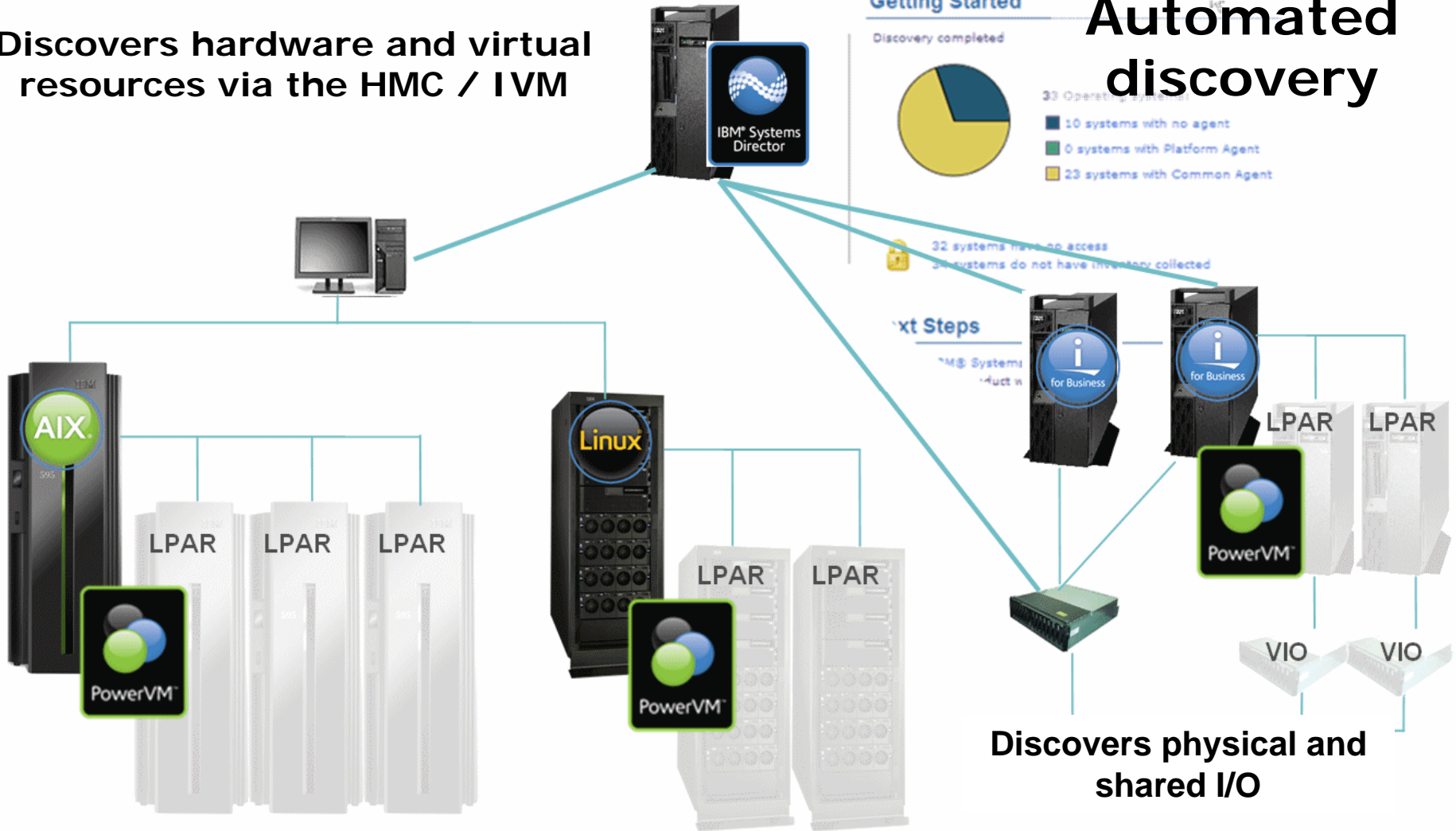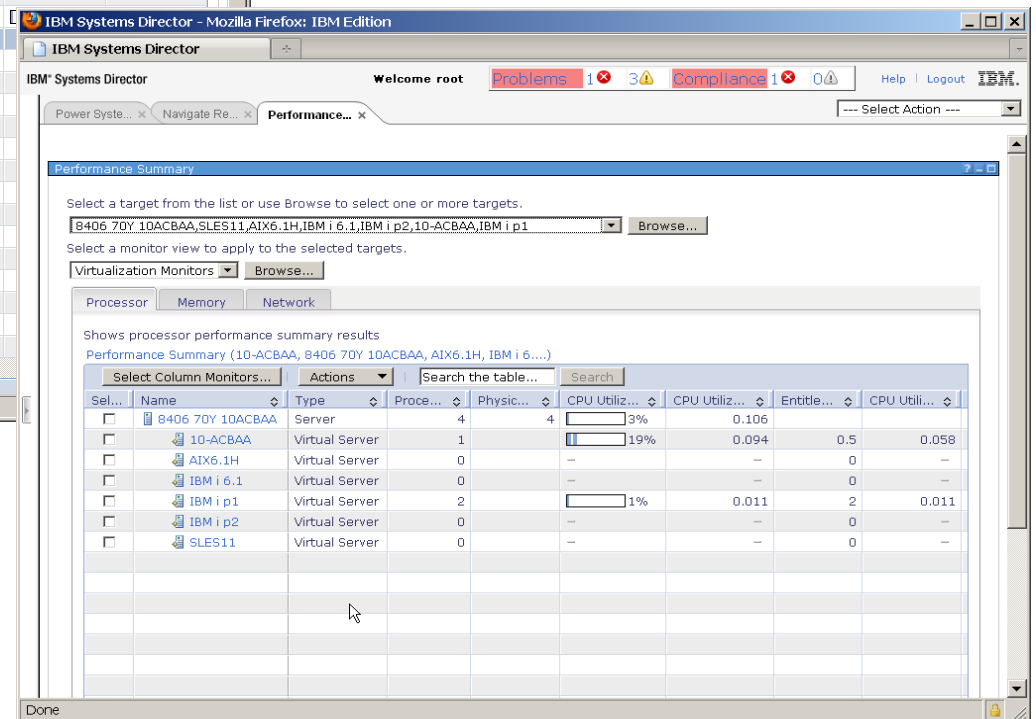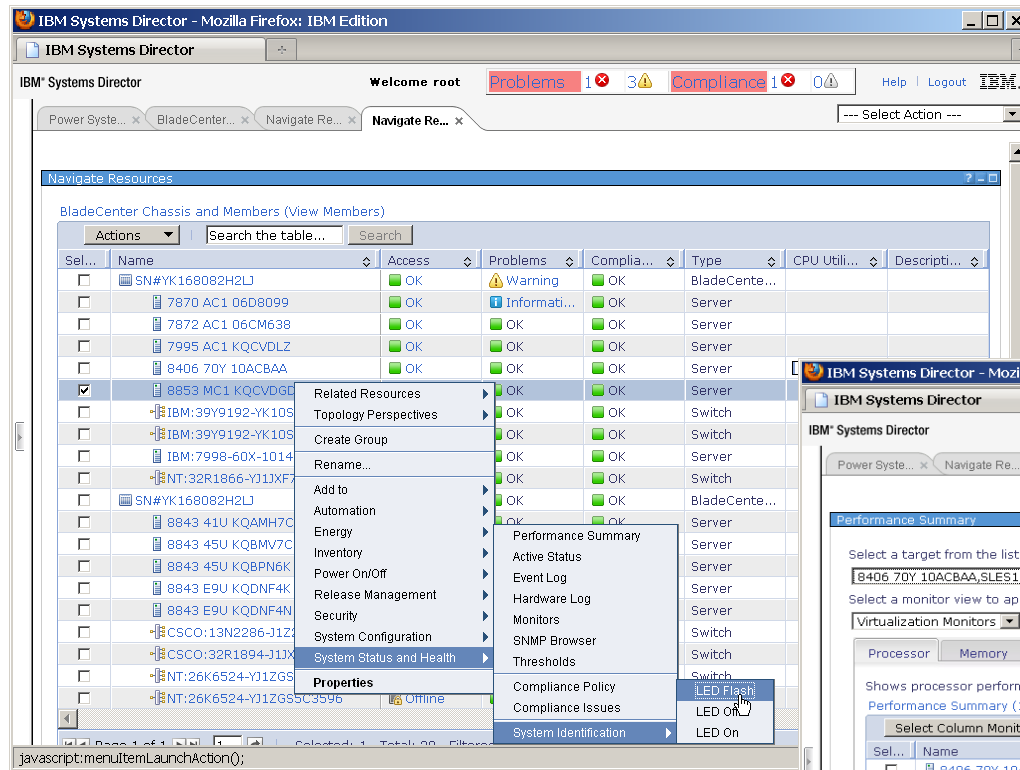
Power Systems Management View

HMC Navigation View

- **Nested relationships**

- **Customizable columns**

- **Roll-up CPU utilization**
  - Enable in HMC
  - All shared processors

- **Tasks / actions**
  - Select
  - Right click

- **Sort / search**

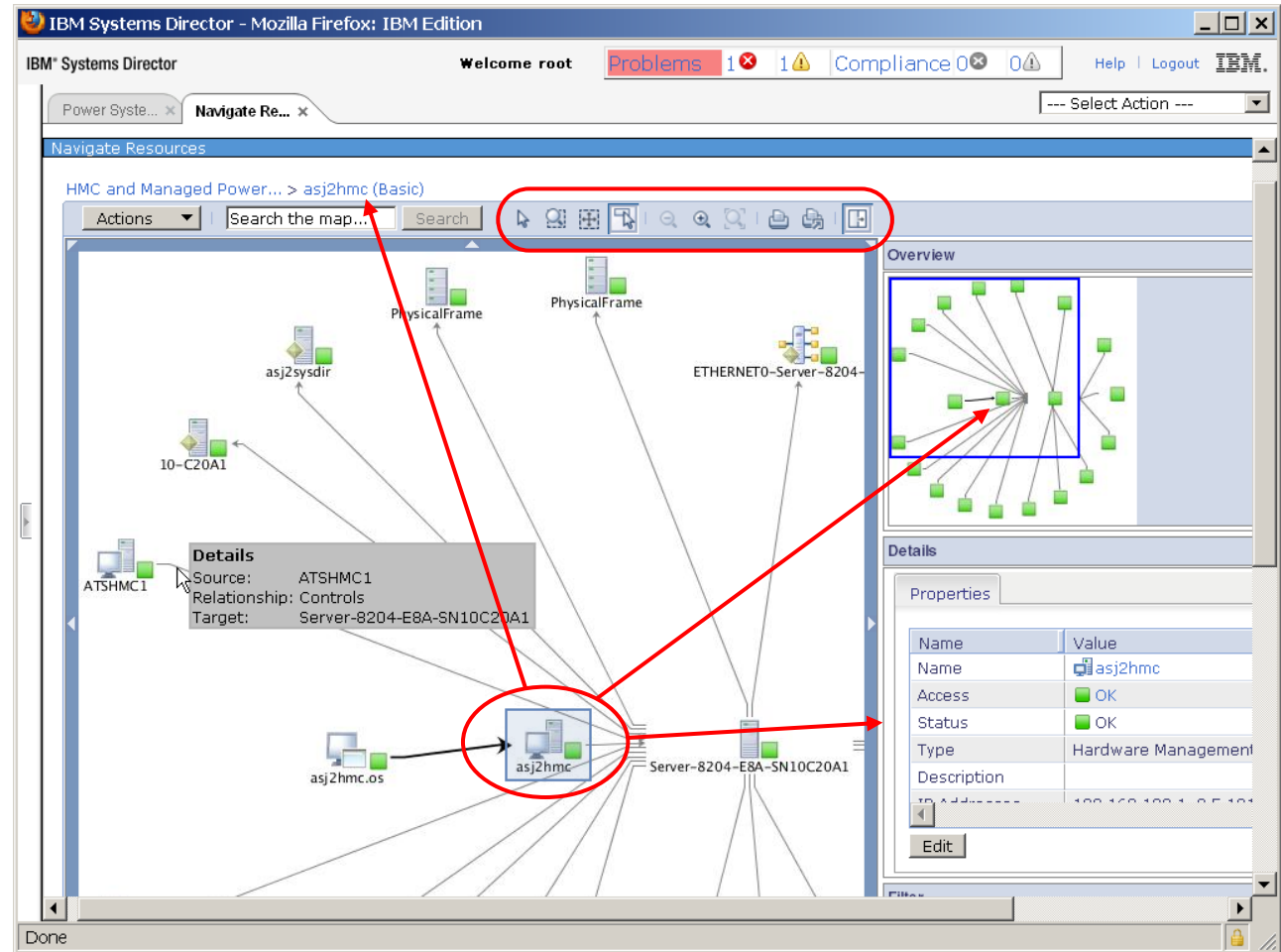# BladeCenter Chassis and Members, Blade Virtualization

- Nested relationships

- Customizable columns

- Context actions

- VIOS virtualization

- Roll-up of CPU utilization

Topology Views

- Rooted in prior navigation

- Breadcrumb

- Options
  - Depth
  - Tree / radial
  - Zoom

- Cursor types

- Properties

- Relationships

- Select tasks

- Printable

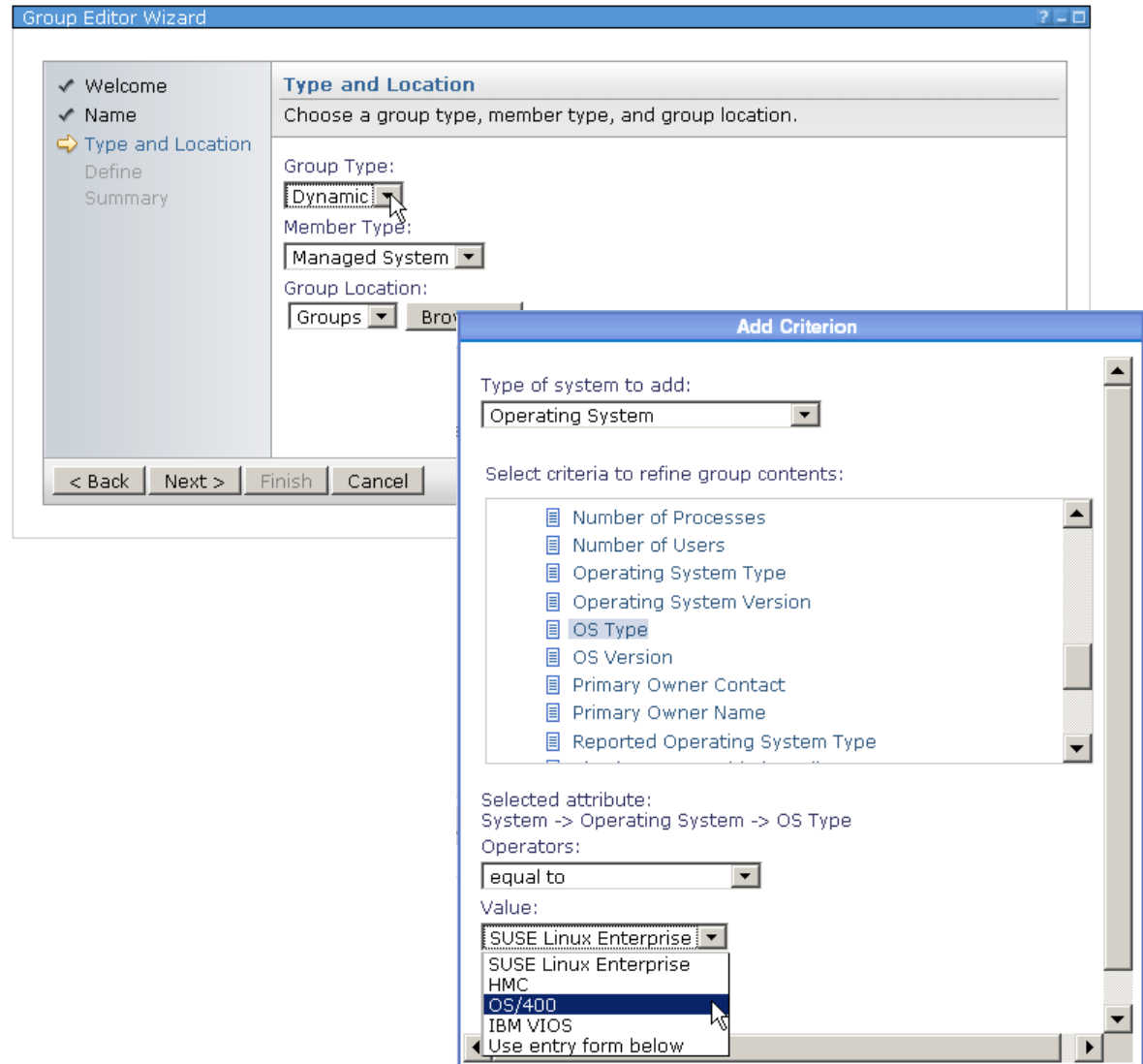# Creating Groups

- **Static**
  - ➤ Geographical
  - ➤ Functional
  - ➤ Nested node or leaf

- **Dynamic**
  - ➤ Property-based
  - ➤ Nested leaf

- **Types**
  - ➤ Managed resource
  - ➤ Updates
  - ➤ Any

Resource Properties

- **General**
  - Name
  - Type
  - Model
  - IP
- **Status**
- **Activities**
  - Inventory
  - Rename
- **Configuration**
- **Events**
- **Inventory**
- **Active Energy**
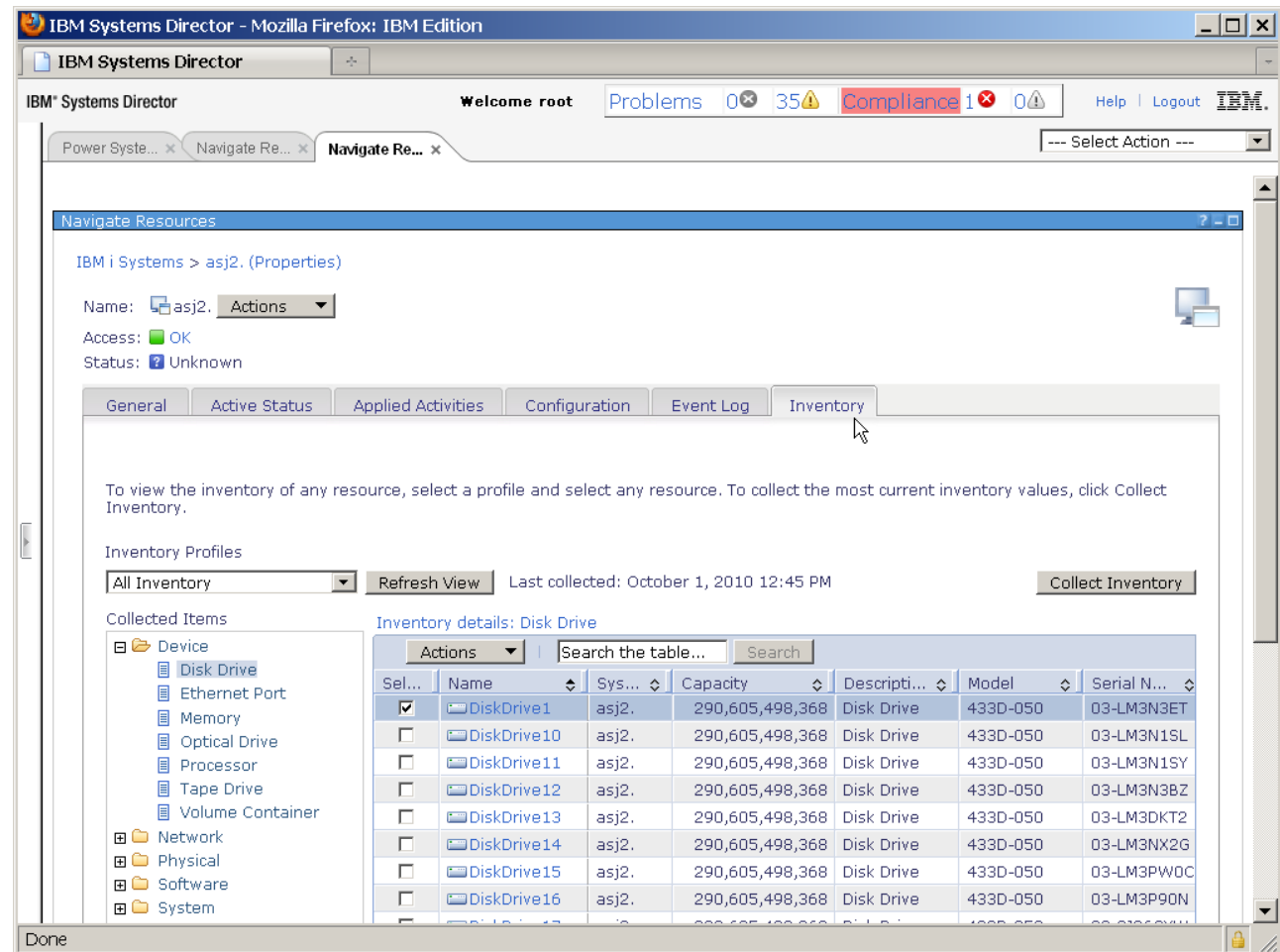
Users and Roles

- IBM Systems Director users are defined in server OS or LDAP directory

- Access granted through host groups

- Roles define a set of tasks

- Assignment of roles defines allowed tasks and resources
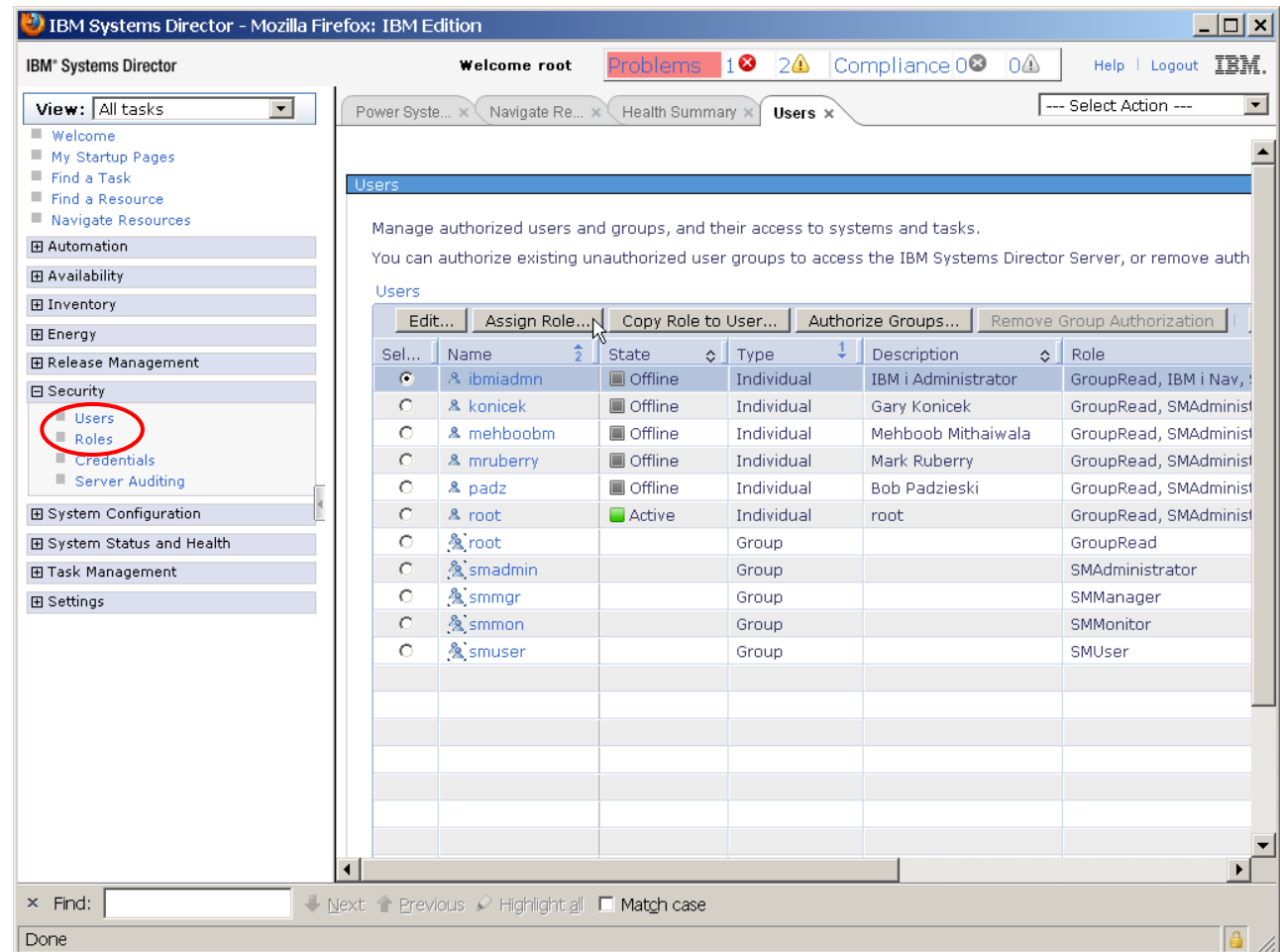
Monitoring / Automation

- Process management

- Monitors

- Thresholds

- Events

- Health Summary

- Command Automation

- Event Actions

- Event Automation Plans
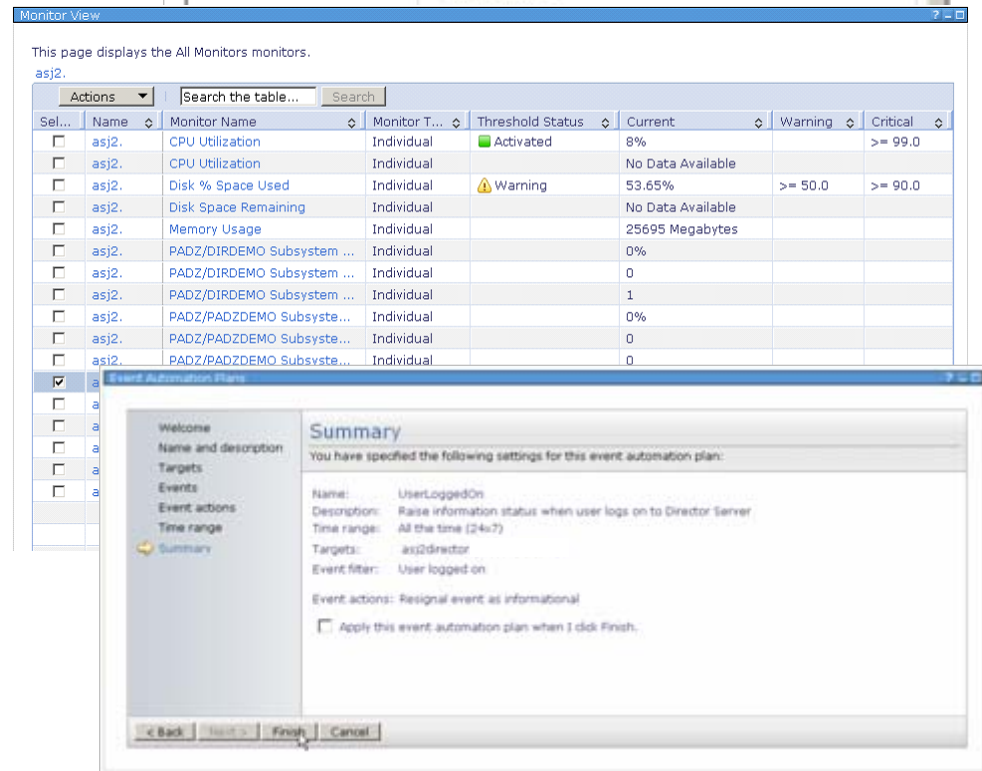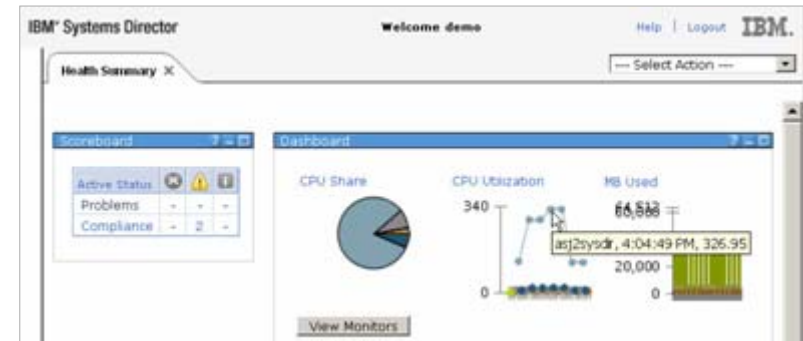
Process Management (AIX process view)

- **Types**
  - ➢ Applications

- **Actions**
  - ➢ Create monitor
  - ➢ Kill process
  - ➢ Terminate Signal
  - ➢ Customize columns
  - ➢ Sort on column

Process Management (IBM i Subsystems view)

- **Types**
  - ➢ Jobs
  - ➢ Subsystems
  - ➢ Servers
- **Actions**
  - ➢ Start / End
  - ➢ Show jobs
  - ➢ Create monitor
  - ➢ Customize columns
  - ➢ Sort on column

Monitors and Thresholds

- **Monitor lists**
  - All
  - Common
  - Column
  - Custom
  - Others
- **Thresholds**
  - Establish
  - Activate / Deactivate
  - Change
  - Track
    - ❖ Graph
    - ❖ Dashboard
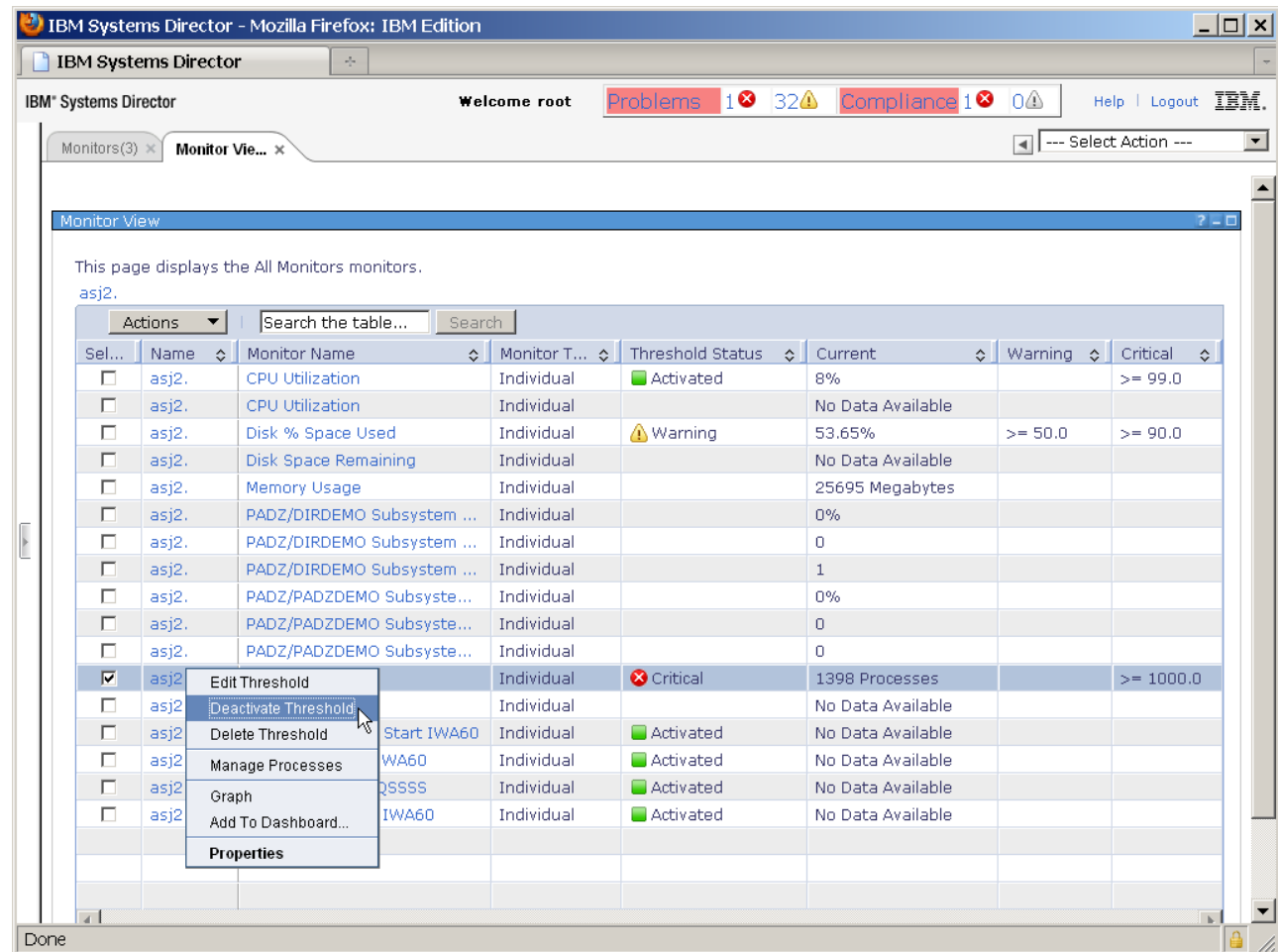
Virtualization Monitors

- **Hosts (Servers)**

  - ➢ CPU Utilization %
  - ➢ CPU Utilization Units
  - ➢ Processors
  - ➢ Memory (MB)
  - ➢ Physical Memory (MB)
  - ➢ Available Memory (MB)
  - ➢ Physical Processor
  - ➢ Available Processors
  - ➢ Available Processing Units

- **Virtual Servers (LPARs)**

  - ➢ CPU Utilization %
  - ➢ CPU Utilization Units
  - ➢ Processors
  - ➢ Memory (MB)
  - ➢ Physical Memory (MB)
  - ➢ CPU Utilization Capped Units
  - ➢ CPU Utilization Uncapped Units
  - ➢ Entitled Processing Units

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AIX Monitors (44 Metrics)

- CPU % Utilization
- CPU Computing Unit (%)
- Active Memory Sharing Enabled
- Active Virtual Memory (4K Pages)
- Memory Mode
- Memory Page Fault (Pages/sec)
- Memory Page Steal (Pages/sec)
- Memory Usage
- Paging Space Total, Used, Remaining & Reserved (MB)
- Total Space of Filesystems: /, /home, /opt, /tmp, /usr & /var (MB)
- Used Space of Filesystems: /, /home, /opt, /tmp, /usr & /var (MB)
- Available Space of Filesystems: /, /home, /opt, /tmp, /usr & /var (MB)
- Available Space and Capacity of /dev/hdisk0 (MB)
- Active Time of /dev/hdisk0 for processing request (%)
- Time for Servicing Transfers in relation to Active Time of /dev/hdisk0 (%)
- Ethernet Kilobytes Received, Transmitted and Throughout Rate (KB/sec)
- Ethernet Packets Transmitted and Received Rate of en3 & lo0 (Packets/sec)

IBM i Resource Monitors (100+ metrics)

- File
- File systems
- List of Directory Contents
- System Statistics
- User statistics
- NetServer™ Statistics
- I/O Processors
- Physical Disks
- Storage Pools
- Subsystems
- Job Queues
- Job Statistics
- Process
- Message Queues
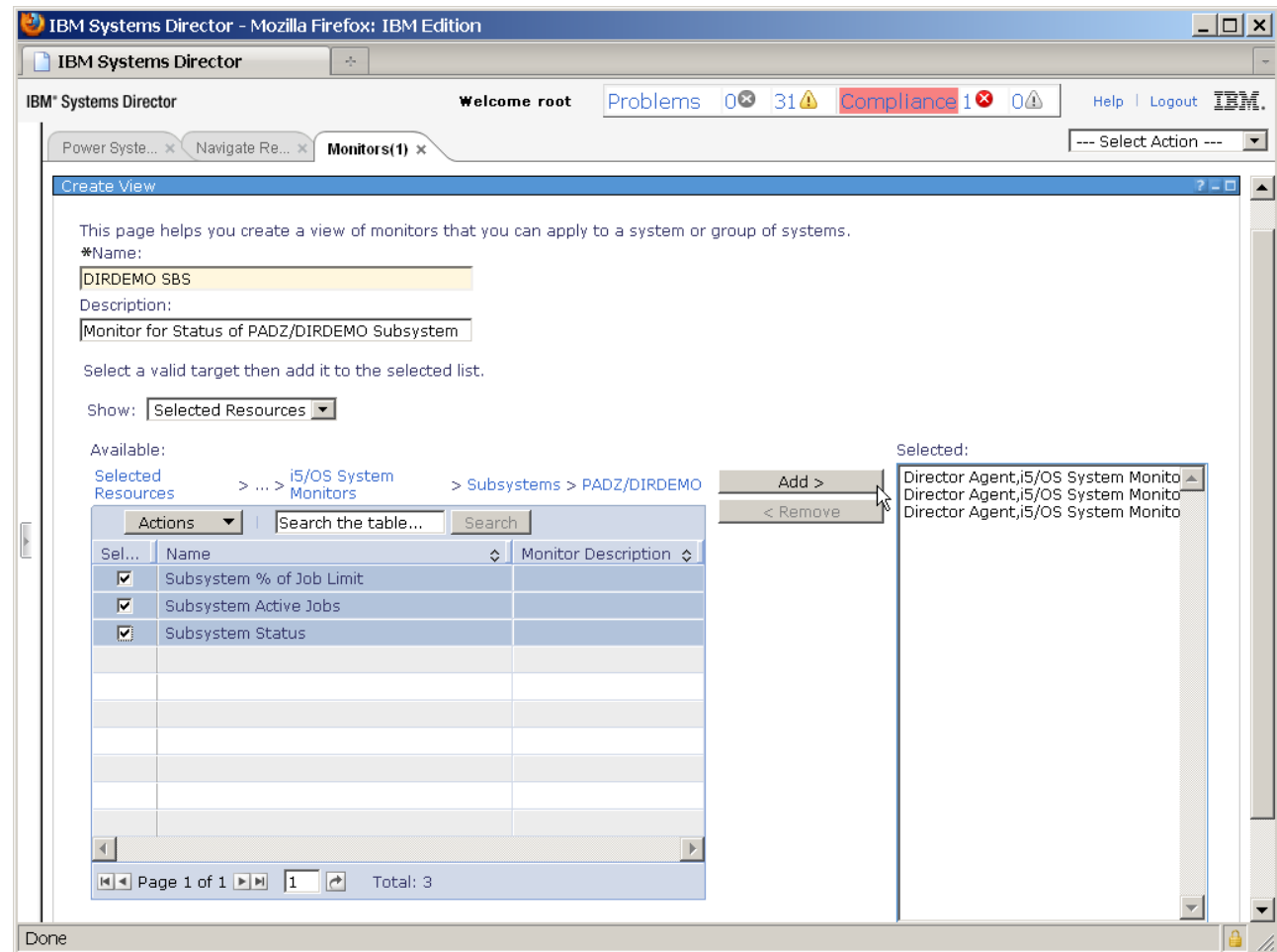
http://publib.boulder.ibm.com/infocenter/director/v5r2/topic/diricinfo_5.20/fqm0_r_i5os_resource_monitor_attributes.html

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IBM i Message Filter

Health Summary

- Scoreboard
- Dashboard
  - System or group monitors
  - Flyover graphs
  - Zoom / export
- Navigation lists
  - Favorites
  - Systems w/problems
  - Any group

Command Automation

- **Command Definition**
  - ➢ Command and parameters
  - ➢ User ID / PW
  - ➢ Name in System Director

- **Run a definition**
  - ➢ Remote SSH
  - ➢ Now / scheduled
  - ➢ System / group
  - ➢ Use in automation plan

- **Results**
  - ➢ High level success / fail
  - ➢ Details in log
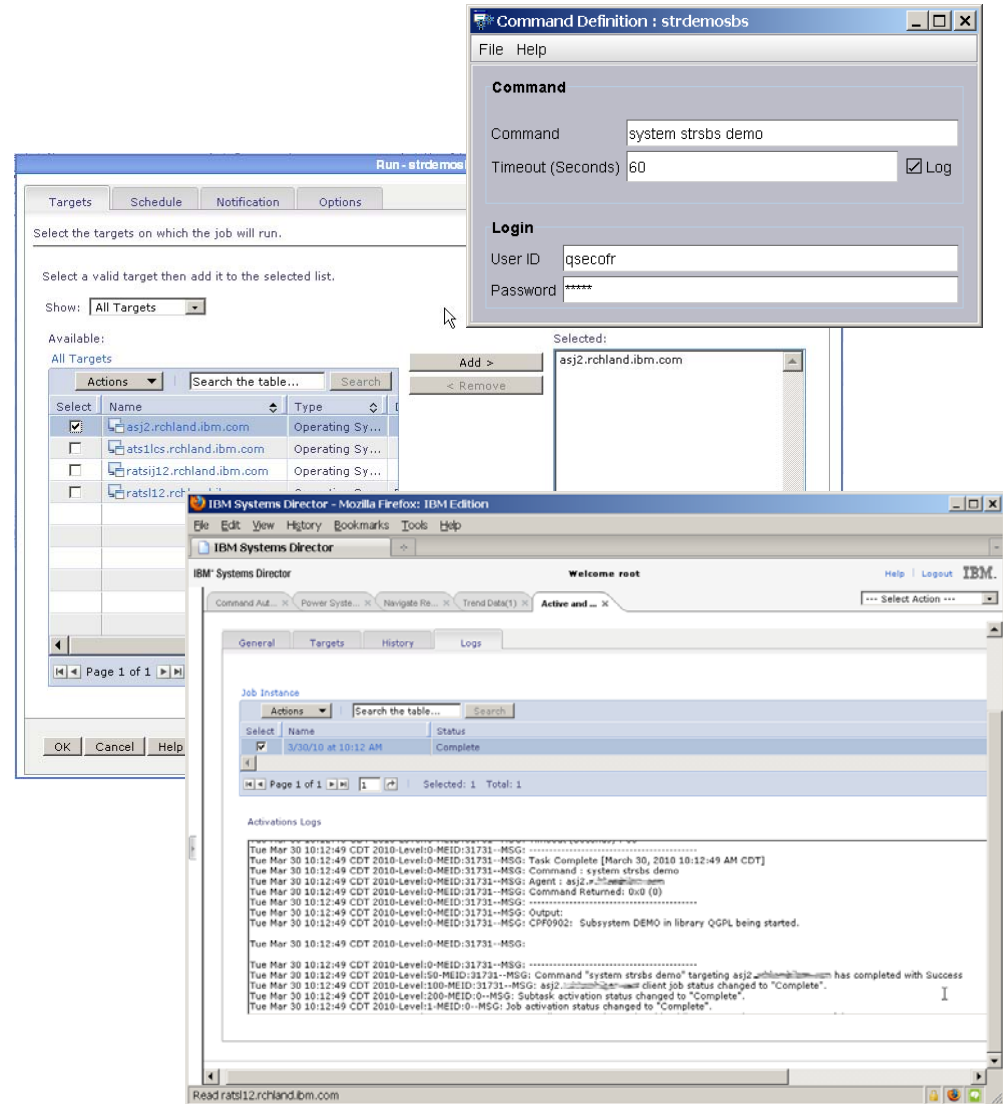
Command Automation with IBM i

- ## Command Definition
  - ➢ QSHELL Command
  - ➢ User Profile / PW
  - ➢ Name in System Director

- ## Run a definition
  - ➢ Remote to QSHELL via SSH
  - ➢ Now / scheduled
  - ➢ System / group
  - ➢ Use in automation plan

- ## Results
  - ➢ High level success / fail
  - ➢ Details in log
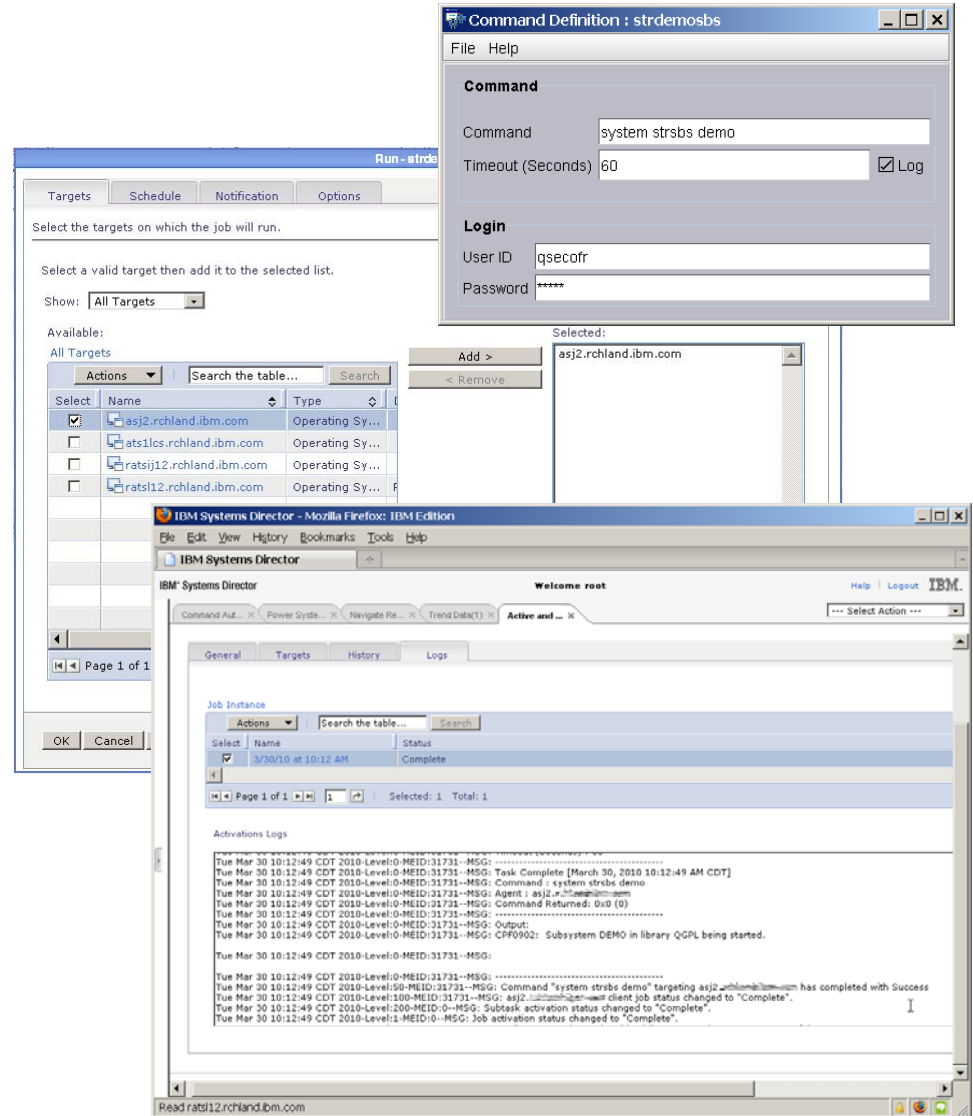
Automate Notification / Actions Based on Events

Monitoring

Event thresholds

Automation

LPAR   LPAR
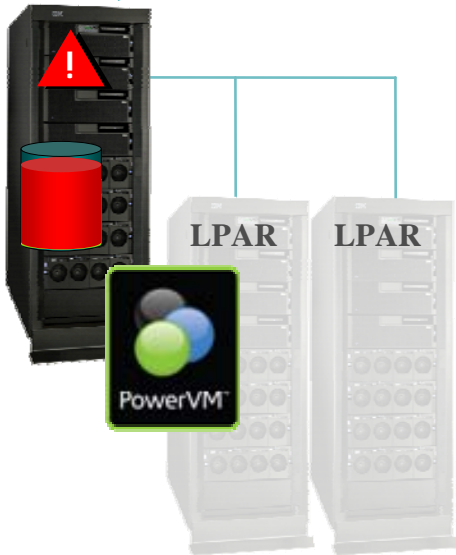
IBM Systems Director functions:

1. Monitor disk capacity

2. If the disk is ≥ 85%:

    a. Execute command to backup delete non-critical files

    b. Log the action

    c. Send a text message to the administrator

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Automation Plan Events - Common

Customizable Event Actions

- Program and tasks
  - Start a program on a system
  - Start a program on the management server
  - Start a program on the system that generated the event
  - Start a task on a specified system
  - Start a task on a system that generated the event
  - Timed alarm that starts a program
- Events
  - Set an event system variable
  - Modify an event and send it
  - Timed alarm that generates an event
- Logging
  - Log to a log file on the server

- Mail and newsgroups
  - Send an e-mail (Internet SMTP)
  - Send an e-mail to a mobile phone
  - Post to a newsgroup (NNTP)
- SNMP and TEC
  - Send an SNMP inform request to an IP host
  - Send an SNMP trap to an IP host
  - Send an SNMP trap reliably to a NetView host
  - Send a Tivoli Enterprise Console event
- Group membership
  - Static group: add or remove the event-generating system
  - Static group: add or remove group members

Customized Text Message Event Action

Event Automation Plan Wizard

- **Name / description**
- **Targets**
  - ➤ Resources
  - ➤ Groups
- **Events**
  - ➤ Common
  - ➤ Existing Filter
- **Event Actions**
- **Time range**
- **Summary and activation**

HMC Tasks Integration

- HMC tasks can be accessed from right-click on an HMC in the GUI

  - Operations

  - Configuration

  - Users

  - Connectivity

  - Serviceability

  - Updates

- With saved credentials, window is opened with no prompting
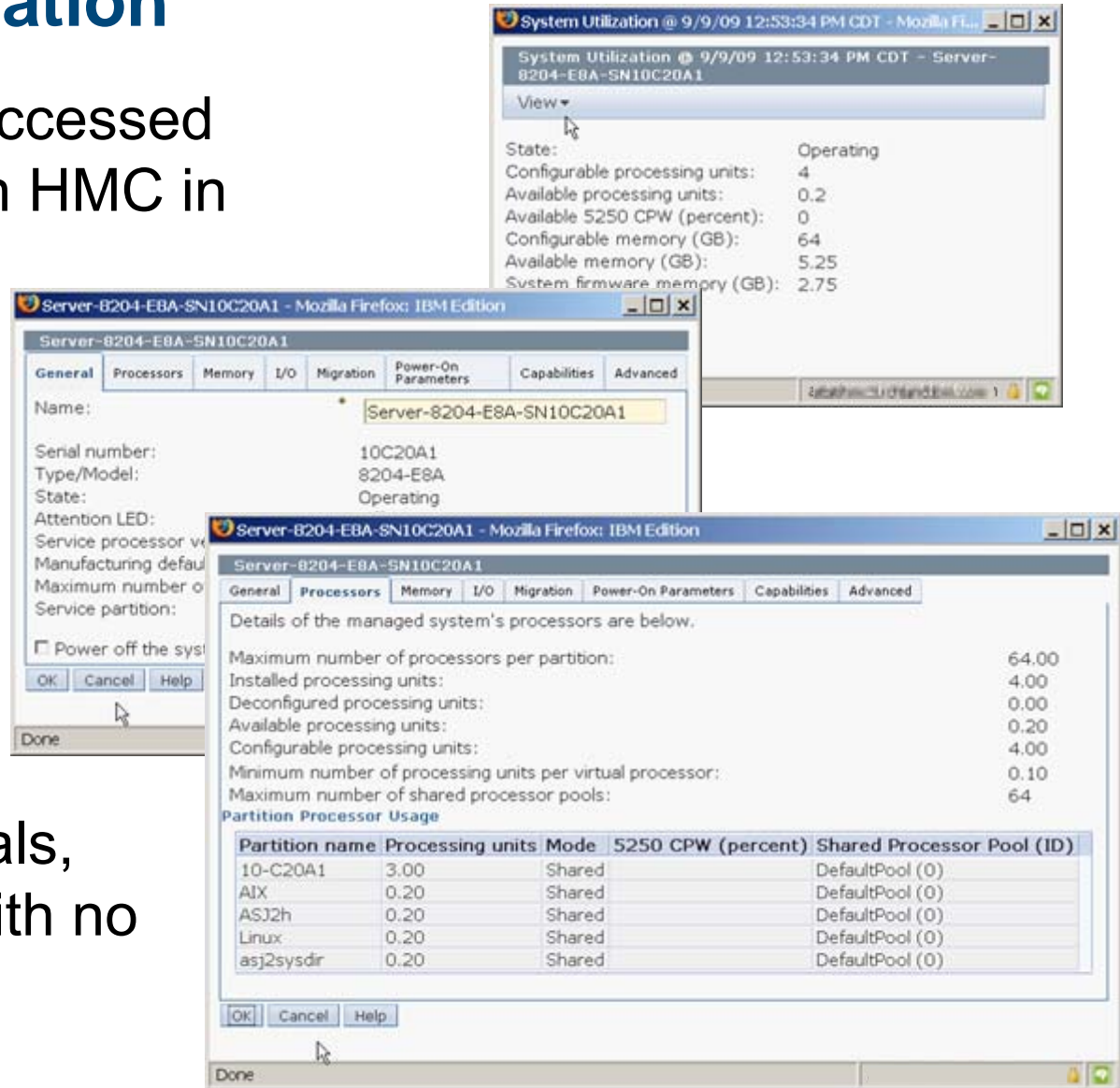
AIX 6/7 Systems Director Console Integration

Navigate Resources

Groups > All Operating Systems > cler05.dfw.ibm.com (Properties)

Name: cler05.dfw.ibm.com   Actions ▼

Access: ■ OK
Status: ■ OK

General   Active Status   ...figuration   Event Log   Inventory

Actions menu	
Related Resources	▶
Topology Perspectives	▶
Create Group	
Remove...	
Rename...	
Add to	▶
AIX Management	▶
Automation	▶
Inventory	▶
Power On/Off	▶
Release Management	▶
Security	▶
System Configuration	▶
System Status and Health	▶

Security and Users
Role Based Access Control
System Environments
Print Spooling
Communications Applications and Services
System Storage Management
Processes and Subsystems
Problem Determination
Performance and Resource Scheduling
Devices
Advanced Accounting
Software Installation and Maintenance
Software License Management
Workload Partition Administration
Cluster Systems Management
Health
System Management Interface Tool (SMIT)

Additional Properties
Location

Type:
Description:
IP Addresses:
IP Hosts:
MAC Addresses:
Agent Time Zone Offset:
Manufacturer:
Machine Type:
Model:
Serial Number: 106B63A
Operating System Type: AIX
Operating System Version: 6.1
Management Software: IBM-IBM Director Core Serv...
Architecture Type: ppc64
Communication State: Communication OK
Protocols:
Query Vital Properties Interval: Every hour
Verify Connection Interval: Every 15 minutes
VMID:

Edit

- At-a-glance status
- All administration commands are accessible
- Consistent management interface

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IBM i Navigator Integration

Update Manager

- Check for latest Fix Central updates

  - ➤ Operating Systems
  - ➤ Firmware
  - ➤ HMC
  - ➤ Systems Director
  - ➤ Others

- Define fix compliance policies

  - ➤ Display status by systems or groups

- Download fixes

- Install fixes

- Immediate or scheduled actions

Summary page for single view

Updates   ? _ □

Update Manager   Settings
                                              Getting started

Manage the firmware and software updates needed by your systems. Start by running a check for updates to ensure you have the latest update information. Then show needed updates or set up compliance policies to ensure your systems remain current.

⑦ Learn more about Update Manager

Update Compliance (monitoring 4 systems)

Update status for 4 monitored systems:

System tasks
Change compliance policies
Show installed updates

- ❌ 1 system
- ⚠️ 0 systems
- ℹ️ 0 systems
- ✅ 3 systems

View All Issues

Updates

	Common tasks
Check for updates	Update IBM® Systems Director
Last check for updates: Oct 4, 2010 1:10:37 PM	Import updates
Next scheduled check for updates: Not scheduled	Export updates

Show needed updates
Show the updates that are needed by a system

Show update groups
Group updates for categorization and compliance policies

Show all known updates
Show all recently acquired updates

Search

Search local updates: [   ] Search

Update Manager groups

- Pre-defined groups

  - All AIX Recommended Updates

  - All Critical IBM System x and BC updates

  - All HMC Recommended updates

  - All IBM i Recommended Updates

  - All IBM Systems Director 6.2 Updates

  - All Power System Firmware Recommended Updates

  - All RHEL Updates

  - All SLES Updates

  - All Updates

  - All UpdateXpress System Packs

  - Latest Virtual I/O Server Upgrades

- User-defined groups comprise of explicit levels

  - compliance policies can be assigned to groups or individual systems

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Maintenance / Currency

- IBM® Systems Director 6.2
- IBM Director 6.1 and V5.20 agents
- IBM i 5.4 and later
  - Cumulative PTF package and PTF Groups
- IBM AIX® 5.3 TL6 SP5 and later
  - Technology levels and service packs
- Linux, Novell Distribution
- Red Hat Enterprise Linux
- Hardware Management Console (HMC) - V7.3.3 SP2 and later
- Power Systems firmware
- VIOS version 1.5.2.1-FP11.1 or later
  - Migration, fix packs, service packs, and interim fixes
- IBM BladeCenter
  - I/O Module Firmware
  - Management Modules, Advanced Management Modules, and Pass-through Modules
- IBM System x servers running Linux or Windows, device driver & firmware updates
- External storage firmware

http://publib.boulder.ibm.com/infocenter/director/v6r2x/topic/com.ibm.director.updates.helps.doc/fqm0_c_um_update_types_and_applicable_resources.html

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Virtualization Support

- **Create virtual server**
  - ➢ CPU, memory, disk (virtual or existing), slots

- **Edit virtual resources**
  - ➢ Dynamic: Memory, CPU
  - ➢ Static: network, disks, slots

- **Relocate virtual servers**
  - ➢ Live relocation:
    - ❖ HMC/IVM
    - ❖ VirtualCenter with ESX
    - ❖ Xen
  - ➢ Static Relocation:
    - ❖ Microsoft® Virtual Server
    - ❖ VMware ESX
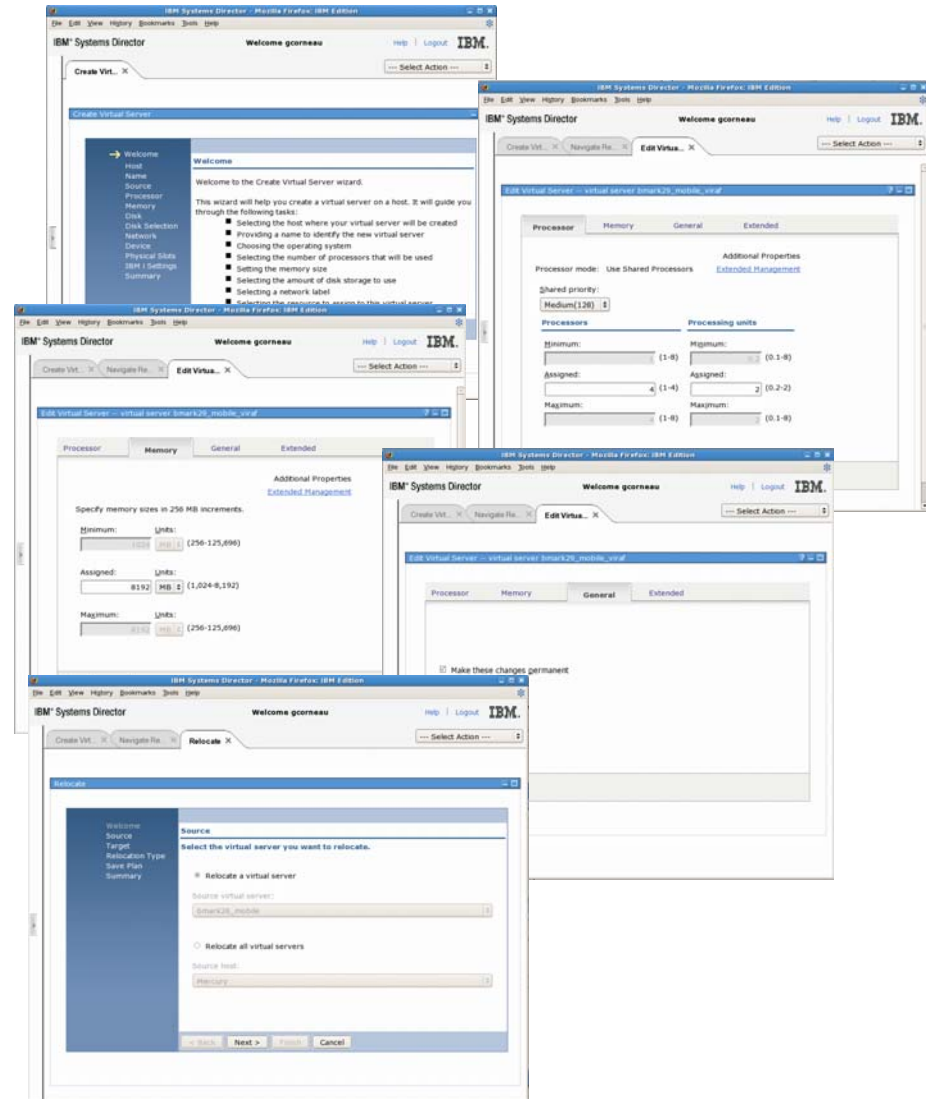
Scheduled Tasks and Jobs

- **Create scheduled tasks**
  - ➢ Single instances
  - ➢ Repetitive
  - ➢ Create from scratch or based on existing task
- **View previously executed task status and results**
- **Re-execute tasks**
- **Suspend / resume running tasks**
- **Works with Command Automation for running commands on individual resources or groups**

Event Log

- **Director and user defined events**
- **Large circular log on server**
- **Set preference for console**
- **Sort, filter and search**
- **Refresh view button**
- **Create event filters from log**
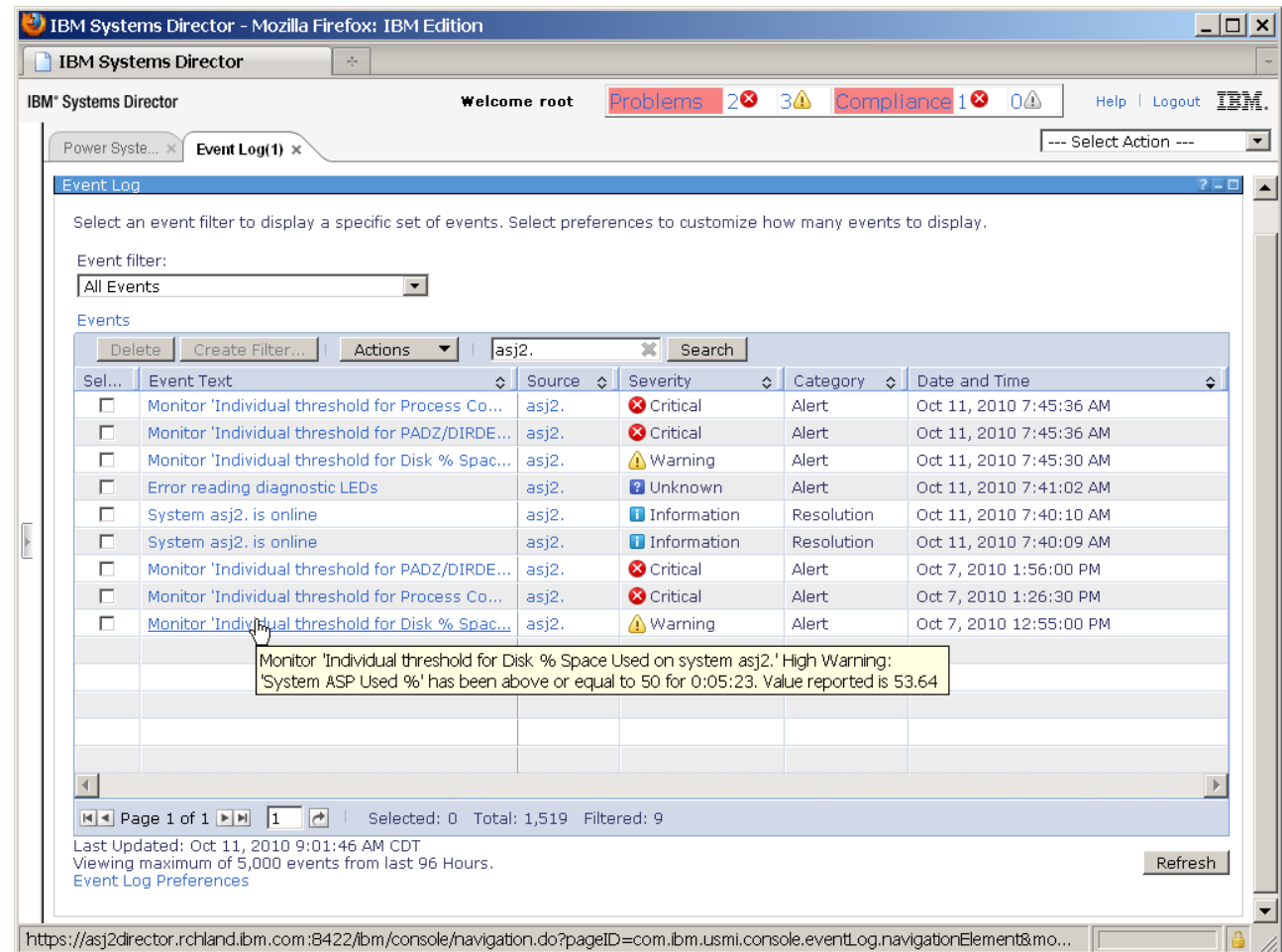
Agenda

- Systems Management environment

- IBM Systems Director Overview

- IBM Systems Director Features

- **IBM Systems Director plug-ins**

- IBM Systems Director Editions

- Power Systems Details for IBM Systems Director 6.2.1

Systems Director Advanced Managers (plug-ins)

- A plug-in to IBM® Systems Director is software that is installed on top of the base

- Delivers key additional functionalities to solve specific IT challenges

- Retains a consistent user experience with the base offering by taking advantage of the common tasks and capabilities

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IBM Systems Director Plug-ins (1 of 3)

✳ IBM Systems Director Active Energy Manager 4.3.1

  ➢ Collects and reports energy data on systems, data center

  ➢ Controls energy use

  ➢ Reports historical energy usage

✳ IBM Systems Director Network Control 1.2.1

  ➢ Discover and manage specific network devices (see InfoCenter for details)

  ➢ Monitor health and status of network devices

  ➢ Launch tasks to manage Brocade devices via IBM Storage DCFM

✳ IBM Systems Director VMControl 2.3.1

  ➢ Manages System and Storage Pools of virtualized resources

  ➢ Manages and deploys virtual server images

  ➢ Clones existing server images

✳ Denotes fee-based

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IBM Systems Director Plug-ins (2 of 3)

⚝ IBM Systems Director Storage Control 4.2.1

➢ Discovery, configuration, monitoring of entry to high-end storage subsystems and Fibre Channel switches

▪ IBM Systems Director Service and Support Manager 6.2.1

➢ Collects and reports serviceable hardware problems

➢ Communicates with IBM using secure SSL

➢ Email notification of problem reporting

➢ Does not call-home for HMC or IVM-managed Power Systems

⚝ IBM Workload Partitions Manager 2.2.1

➢ Cross-system management of WPARs

➢ Global load balancing with application mobility

➢ Monitoring and reporting of WPAR metrics

⚝ Denotes fee-based

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IBM Systems Director Plug-ins (3 of 3)

- **IBM Systems Director PowerHA SystemMirror for AIX 7.1**
  - ➢ Management interface for PowerHA SystemMirror for AIX
  - ➢ Provides both setup and management of your data center HA solution
  - ➢ This no-charge plug-in also supports several new smart assists for popular applications that make it easier to set up and manage application for high availability operations

- **AIX Profile Manager 1.1**
  - ➢ Distributed with AIX Standard Edition and Enterprise Edition
  - ➢ Provides "dashboard" views and runtime configuration profile management over groups of systems
  - ➢ Provides "copy machine" like simplicity for distributing operating system properties to many systems

- **IBM Systems Director Transition Manager for HP SIM 6.2**
  - ➢ Used to smoothly transition systems being managed by HP Systems Insight Manager to managing the systems in IBM Systems Director

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IBM Systems Director Plug-ins ("ala carte")

- **IBM Systems Director Active Energy Manager 4.3.1**
  - ➢ Monitor functions: no charge
  - ➢ Manage functions: per managed processor charge

- **IBM Systems Director Network Control 1.2.2**
  - ➢ Per server and per switch charge

- **IBM Systems Director VMControl 2.3.1**
  - ➢ Express Edition: no charge
  - ➢ Standard & Enterprise Editions: per managed processor charge (no value for IBM i)

- **IBM Systems Director Storage Control 4.2.1**
  - ➢ Per IBM Systems Director server

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IBM Systems Director Plug-ins ("ala carte")

- IBM Systems Director Service and Support Manager 6.2.1

  ➢ No charge (does not support HMC or IVM managed Power Systems)

- IBM Workload Partitions Manager 2.2.1

  ➢ Per managed processor charge (no value for IBM i)

- IBM Systems Director PowerHA SystemMirror for AIX 7.1

  ➢ No charge (requires PowerHA SystemMirror for AIX 7.1)

- AIX Profile Manager 1.1

  ➢ No charge (Avalable with AIX Standard and Enterprise Edition)

http://www-03.ibm.com/systems/software/director/products.html

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IBM® Systems Director Active Energy Manager™

Managing energy usage to reduce costs and maintain service availability in existing energy envelopes

IBM Systems Director Active Energy Manager

- Monitor and manage EnergyScale™ capabilities in certain POWER 6 and all POWER7 servers

  - Power Trending
  - Thermal Trending
  - Effective CPU Trending
  - Power Savings
  - Power Capping

- Monitor and manage other resources using an intelligent Power Distribution Unit (PDU+)

  - Pre-POWER6 systems
  - Power 560 and Power 570 systems
  - I/O drawers and storage devices

- Define relationships between IT and facilities equipment

- Exploit System Director automation for energy events

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Active Energy Manager Trend Data

- Energy trends in upper chart

  - Data are averages over intervals
  - Input & output power
  - Maximums, averages & minimums
  - Power caps
  - Energy events at points in time

- Temperature data in lower chart
  - Data are point-in-time values
  - Plotted against left axis

- Effective CPU speed in lower chart
  - Data are averages over intervals
  - Plotted against left axis
  - May exceed 100%

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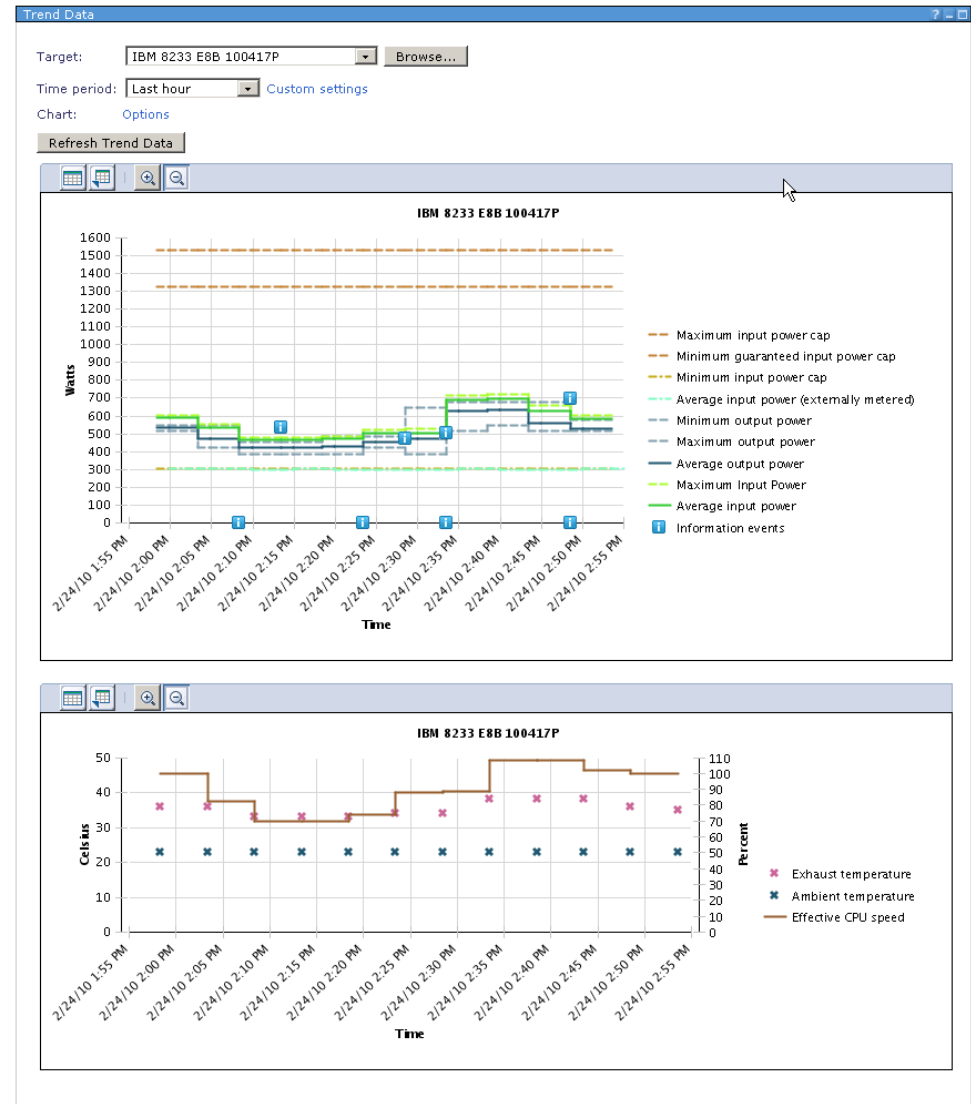
IBM® Systems Director VMControl™

Rapidly deploy and
manage virtual servers

IBM Systems Director VMControl

- Virtual servers
  - ➤ Create, delete, manage and relocate
  - ➤ Performance summary
  - ➤ PowerVM, z/VM ,VMware, Microsoft, Xen

- Virtual appliances
  - ➤ Partition description and software image
  - ➤ Import, capture, manage and deploy

- System pools
  - ➤ Consolidation of resources and workloads into distinct and manageable groups
  - ➤ Targets for virtual appliances
  - ➤ Monitoring the health of the resources and the status of the workloads
  - ➤ Manage by adding hosts or additional storage space

- Editions
  - ➤ Express, Standard and Enterprise

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VMControl Editions

- Express Edition
  - Create and Edit virtual servers
  - Manage and relocate virtual servers
  - Monitor, thresholds, automation

- Standard Edition
  - Discover existing image repositories
  - Import OVF images into repositories as virtual appliances
  - Capture a running virtual server, including OS, applications and server
  - Deploy virtual appliances quickly to create new virtual servers

- Enterprise Edition
  - Create server and storage system pools
  - Deploy virtual appliances into system pools
  - Manage workloads with availability policies

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IBM® Systems Network Control

Simplifying network

IBM Systems Director Network Control

- Basic lifecycle management of network switches
  - ➢ Network system discovery and inventory
  - ➢ View network problems and events
  - ➢ Establish network monitors, thresholds and automation plans
  - ➢ Integration of vendor-based device management tools
  - ➢ Network diagnostics (ping, traceroute)

- Virtual Switch VLAN configuration

- Network device topology collection and visualization (virtual and physical)
  - ➢ View systems according to VLAN
  - ➢ View systems by subnet

- Converged Ethernet network device support (FCoCEE) via native support and vendor tools

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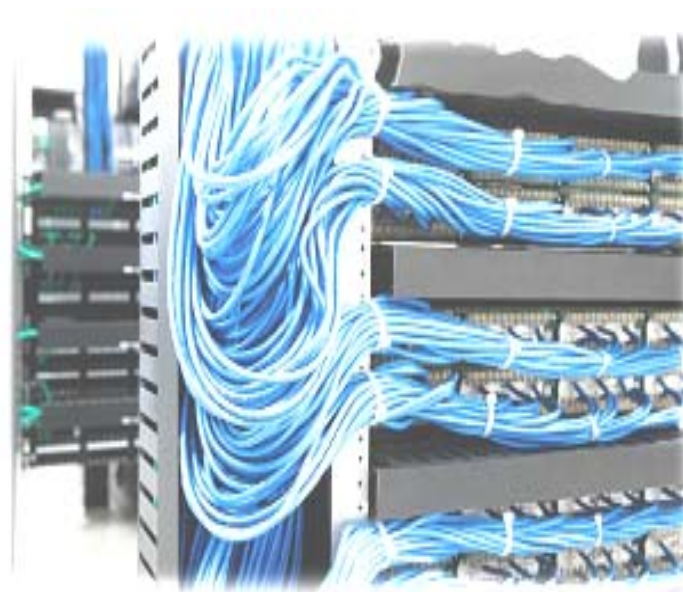
Sample of Supported Network Devices

- IBM BladeCenter supported switches and Blade NICs

- Brocade® Converged Ethernet network switches (FCoCEE), Ethernet switches and routers

- QLogic® converged network adapters

- Cisco® FCoCEE and Ethernet switches

- Juniper® Ethernet switches, routers and appliances

- Virtual switch discovery and inventory for:
  - ➢VMware ESXi and ESX4
  - ➢PowerVM
  - ➢RHEV-H

Agenda

- Systems Management environment

- IBM Systems Director Overview

- IBM Systems Director Features

- IBM Systems Director plug-ins

- **IBM Systems Director Editions**

- Power Systems Details for IBM Systems Director 6.2.1

Editions Overview

- IBM Systems Director Editions defined:

  "An integrated set of tools to help IT organizations address the challenges associated with managing both physical and virtual server infrastructures."

- IBM Systems Director Editions makes it easier and more cost-effective to acquire the capabilities to monitor and manage IBM server systems versus buying individual plug-in features separately. Each Edition bundles related management features that are pretested and updated. Additionally, software maintenance renewal for all features is aligned, reducing the administrative burden of keeping SWMA support up to date.

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IBM Systems Director Editions Content

Product	Express Edition	Standard Edition	Enterprise Edition
IBM Systems Director (Base)	✓	✓	✓
Service and Support Manager	✓	✓	✓
Transition Manager for HP® Systems Insight Manager™	✓	✓	✓
Active Energy Manager Monitoring	✓ (x86 only)	✓	✓
Active Energy Manager Management		✓	✓
VMControl Express Edition	✓	✓	✓
VMControl Standard Edition		✓	✓
VMControl Enterprise Edition			✓
Network Control		✓	✓
IBM Tivoli Monitoring			✓
IBM Tivoli Monitoring for Energy Management			✓
IBM Tivoli Application Dependency Discovery Manager			✓
IBM Tivoli Performance Analyzer			✓
IBM Tivoli Common Reporting for Asset and Performance Management			✓
DB2 Enterprise Server Edition			✓
Software Maintenance (Software Subscription and Support)	✓	✓	✓

- IBM Systems Director Standard and Enterprise Editions are for Power Systems only
- IBM Systems Director Enterprise Edition is included in AIX Enterprise Edition

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Systems Director Express Edition for x86

Products	Express Edition
IBM Systems Director A platform-management tool that streamlines the way you manage physical and virtual systems across a heterogeneous environment.	✔
IBM Systems Director Transition Manager for HP® Systems Insight Manager™ Enables you to discover systems that are being managed by HP Systems Insight Manager and smoothly make the transition to managing the systems in IBM Systems Director.	✔
IBM Systems Director Service and Support Manager Automatically monitors and collects hardware problem information and sends this information to IBM support. It also can collect hardware, software, and system configuration information which may help IBM support assist in diagnosing problems.	✔
IBM Systems Director VMControl Designed to simplify the management of workloads in your IT environment, VMControl, IBM Systems Director VMControl Image Manager, and IBM Systems Director VMControl System Pools allow you to manage virtual servers, virtual appliances, workloads, and system pools across multiple hardware platforms and virtualization environments from one location.	
VMControl Express Edition	✔
IBM Systems Director Active Energy Manager Monitors and manages the power and cooling needs of IBM servers and BladeCenter® systems. Non-IBM systems can also be monitored using metering products, such as power distribution units (PDU), sensors, and integration with facility software.	
Monitoring	✔

Additional components can also be added to the Express Edition – Such as AEM Power Management , Network control & BOFM , by purchasing the Plugin licensing.

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Systems Director Express Edition for Power

Products	Express Edition
IBM Systems Director A platform-management tool that streamlines the way you manage physical and virtual systems across a heterogeneous environment.	✔
IBM Systems Director Transition Manager for HP® Systems Insight Manager™ Enables you to discover systems that are being managed by HP Systems Insight Manager and smoothly make the transition to managing the systems in IBM Systems Director.	✔
IBM Systems Director Service and Support Manager Automatically monitors and collects hardware problem information and sends this information to IBM support. It also can collect hardware, software, and system configuration information which may help IBM support assist in diagnosing problems.	✔
IBM Systems Director VMControl Designed to simplify the management of workloads in your IT environment, VMControl, IBM Systems Director VMControl Image Manager, and IBM Systems Director VMControl System Pools allow you to manage virtual servers, virtual appliances, workloads, and system pools across multiple hardware platforms and virtualization environments from one location.	
VMControl Express Edition	✔

Additional components can also be added to the Express Edition – Such as AEM ,VMC Standard & Enterprise Edition & Network control 1.2, by purchasing the additional licensing.
However IBM Systems Director Standard Edition would be more appropriate if looking to additionally purchase 2/3 out of the following AEM, VMC Standard edition or Network control. As these are all included in the Standard Edition for Power. IBM Systems Director Enterprise Edition is the only one to include VMC Enterprise Edition

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Systems Director Standard Edition for Power

Products	Standard Edition
IBM Systems Director A platform-management tool that streamlines the way you manage physical and virtual systems across a heterogeneous environment.	✓
IBM Systems Director Transition Manager for HP® Systems Insight Manager™ Enables you to discover systems that are being managed by HP Systems Insight Manager and smoothly make the transition to managing the systems in IBM Systems Director.	✓
IBM Systems Director Service and Support Manager Automatically monitors and collects hardware problem information and sends this information to IBM support. It also can collect hardware, software, and system configuration information which may help IBM support assist in diagnosing problems.	✓
IBM Systems Director VMControl Designed to simplify the management of workloads in your IT environment, VMControl, IBM Systems Director VMControl Image Manager, and IBM Systems Director VMControl System Pools allow you to manage virtual servers, virtual appliances, workloads, and system pools across multiple hardware platforms and virtualization environments from one location.	
VMControl Express Edition	✓
VMControl Standard Edition (includes license for VMControl Image Manager)	✓
IBM Systems Director Active Energy Manager Monitors and manages the power and cooling needs of IBM servers and BladeCenter® systems. Non-IBM systems can also be monitored using metering products, such as power distribution units (PDU), sensors, and integration with facility software.	
Monitoring	✓
Management (includes license for power capping and power savings modes)	✓
IBM Systems Director Network Control Provides facilities to discover, inventory, and monitor network devices, and view groups of network devices.	✓
Standard Edition Launch Pad to enable easier installation of all components	✓

Additional components can also be added to the Standard Edition – Such as VMC Enterprise Edition by purchasing the additional licensing.

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Systems Director Enterprise Edition for Power

Products	Enterprise Edition
IBM Systems Director A platform-management tool that streamlines the way you manage physical and virtual systems across a heterogeneous environment.	✓
IBM Systems Director Transition Manager for HP® Systems Insight Manager™ Enables you to discover systems that are being managed by HP Systems Insight Manager and smoothly make the transition to managing the systems in IBM Systems Director.	✓
IBM Systems Director Service and Support Manager Automatically monitors and collects hardware problem information and sends this information to IBM support. It also can collect hardware, software, and system configuration information which may help IBM support assist in diagnosing problems.	✓
IBM Systems Director VMControl Designed to simplify the management of workloads in your IT environment, VMControl, IBM Systems Director VMControl Image Manager, and IBM Systems Director VMControl System Pools allow you to manage virtual servers, virtual appliances, workloads, and system pools across multiple hardware platforms and virtualization environments from one location.	
VMControl Express Edition	✓
VMControl Standard Edition (includes license for VMControl Image Manager)	✓
VMControl Enterprise Edition (includes licenses for VMControl Image Manager and VMControl System Pools)	✓
IBM Systems Director Active Energy Manager Monitors and manages the power and cooling needs of IBM servers and BladeCenter® systems. Non-IBM systems can also be monitored using metering products, such as power distribution units (PDU), sensors, and integration with facility software.	
Monitoring	✓
Management (includes license for power capping and power savings modes)	✓
IBM Systems Director Network Control Provides facilities to discover, inventory, and monitor network devices, and view groups of network devices.	✓
Enterprise Edition Launch Pad to enable easier installation of all components	✓

See next slide for IBM Tivoli products included in Enterprise Edition

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Systems Director Enterprise Edition for Power
IBM Tivoli Components

Products	Enterprise Edition
IBM Tivoli Monitoring V6.2.2 Fix Pack 1 Monitors and manages system and network applications on a variety of operating systems, tracks the availability and performance of your enterprise system, and gets reports to track trends and troubleshoot problems.	✔
IBM Tivoli Common Reporting V1.2.0.1 and Power System reports provides a consistent approach to viewing and administering reports.	✔
IBM DB2 Database Enterprise Server Edition V9.5, Fix Pack 04 Database software that you can use to handle demanding workloads.	✔
IBM Tivoli Application Dependency Discovery Manager V7.2 Automatically creates and maintains application infrastructure maps.	✔
IBM Tivoli Monitoring for Energy Management V6.2.1 Monitors and helps manage energy usage of IT and facility resources for efficient datacenter operations.	✔
Note: Multiple servers would be required to implement all software included with the Enterprise Edition	

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IBM AIX 6 / 7 Enterprise Edition

Pieces and Parts:

- AIX 6 / 7

- IBM Systems Director Enterprise Edition

- IBM PowerVM Workload Partitions Manager V2.2.1

- AIX Profile Manager (also comes with AIX Standard Edition)

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Agenda

- Systems Management environment

- IBM Systems Director Overview

- IBM Systems Director Features

- IBM Systems Director plug-ins

- IBM Systems Director Editions

- **Power Systems Details for IBM Systems Director 6.2.1**

Systems Director Server Resource Requirements

Configuration	Recommended hardware requirements		
	Processor	Memory	Disk Storage
x86 (Windows/Linux)[2]	4 cores, 64–bit processor and OS	12 GB	16 GB
POWER (AIX/Linux)[3]	4 processors, POWER5, POWER6 or POWER7 or for partitioned systems: • Entitlement = 4 • Uncapped • Virtual processors = 8 • Weight = Default	12 GB	16 GB
System z (Linux)[4]	4 processors, IBM System z9 or above	12 GB	16 GB

1. The recommendations are based on running a 64–bit Java™ Virtual Machine (JVM).

2. The processor sizing is based on the latest generation of x86 processors, such as Nehalem. For older family of processors, require at least 3Ghz processors, and may need higher number of cores to match Java performance of newer processors. For a large Windows configuration, it is not recommended to install IBM Systems Director Server to run in a VMware partition.

3. The processor sizing is based on the IBM POWER6 processor. Older processors may need higher number of cores to match the Java performance of newer processors.

4. The processor sizing is based on the IBM System z10 processor. You might require more processors if System z9 EC processors are used. The processor usage by IBM Systems Director Server is high during certain tasks. It is recommended that, if processors are shared, the partition that is used to run IBM Systems Director Server be given a lower partition weight than production partitions.

5. Due to I/O requirements, SCSI adapters and multiple 10K-15K RPM disks are recommended where applicable.

Power Systems ISD Pre-requisites

Minimum requirements for ISD 6.2.1

- Requires a 64-bit kernel for AIX, Linux Management Servers

- HMC Version 7.3.3 SP2, MH00146 or later

  ➢ Latest Service Packs recommended

  ➢ Firmware requirements based on MTM and HMC Version, not Systems Director

- IVM Version 1.5.2.1+ or 2.1.0.10+

  ➢ Latest Service Packs recommended

- VIOS

  ➢ Version 1.5.2.1 for Agentless

  ➢ Version 2.1.0.10 supports the Common Agent

  ➢ Version 2.1.1 includes the Common Agent (manual first time start)

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Systems Director 6.2.1 AIX Filesets

- Agent Filesets

  - DirectorPlatformAgent 6.2.1
  - DirectorCommonAgent 6.2.0
  - cas.agent 1.4.2.2
  - openssl.base 0.9.8.1100+
  - sysmgt.cim.providers.* 1.2.9
  - sysmgt.cim.smisproviders.* 1.2.2
  - sysmgt.cimserver.pegasus.rte 2.9.1
  - tivoli.tivguid 1.3.4.1

- Additional Server filesets

  - DirectorServer 6.2.0.0
  - expect 5.42.1
  - tcl/tk 8.4.7
  - xlC.[aix50].rte 10.1.0.2
  - ICU4C.rte 5.3.9.0
  - (optional) Director.Server.ext.FSPProxy.rte 6.2.1 prereqs csm.hc_utils 1.7.0.13

- AIX 7.1 GA, AIX 6.1 TL3+, and AIX 5.3 TL10+ media includes (and installs) Common Agent with OS installation

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Update Manager Details

- Updates stored in default directory on server
  - For AIX/Linux: /opt/ibm/director/data/updateslib   [can be modified]
  - Default size of repository: 10GB   [can be modified]
  - Subdirectories include:

    AIX (AIX Technology Levels and Service Packs)

    Director

    HMC (Service Packs and fixes)

    pSFW (Power Systems firmware)

    VIOS (2.1 migration, Service Packs)

- AIX Updates require a NIM server for installation
  - Installation stages files to /export/um_lpp_source on NIM server
  - Separate JFS2 file system created if directory not found

- Agent for push
  - Stored on disk in the following directory:
    /opt/ibm/director/packaging/agent/[common|platform]/[OS]

- Updates require a full, valid inventory collection on the object

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VMControl Standard Edition Details for AIX

- AIX NIM server requirements
  - ➤ Already configured as a NIM server, ISD does not configure
  - ➤ Running the Common Agent with latest updates
  - ➤ AIX 6.1.3 or later
  - ➤ Additional filesets required: dsm.core, openssh/openssl
  - ➤ Installed VMControl NIM Subagent installed via Update Manager

- AIX Virtual Appliances (mksysb and OVF-based metadata) are stored in /export/nim/appliances file directory on repository

- Image Manager only captures/deploys from/to Virtual Servers
  - ➤ Only LPARs managed by an HMC or IVM, not standalone

- Systems Director Server must be at 6.2.0 level or later

- POWER5/6: HMC 7.3.5 or IVM 2.1.0.10

- POWER7: HMC 7.7.1 or IVM 2.1.2

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VMControl Enterprise Edition Details for AIX

These requirements are above and beyond what's needed for VMControl Standard Edition

- Appropriate X11 libraries to get through graphical installer

  ➢ If not, then modify the installer.properties file for a silent install

- For predictive failure analysis for automated relocation:

  ➢ HMC 7.3.5, IVM 2.1.2 or later

- For image deployment into a System Pool, you must have IBM Systems Director-managed supported storage

  ➢ External SAN

  ➢ Only LPARs managed by an HMC or IVM, not standalone

- Relocation within a System Pool requires LPM-capable (and licensed) environment

- See Best Practices Wiki for details and hints/tips

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Systems Director Enterprise Edition Details for AIX

- Enterprise Edition requires, at minimum, three LPARs:
  - ➤ One for the main IBM Systems Director Server (not documented, suggested)
  - ➤ One for DB2 and TEPS, optionally TDW
  - ➤ One for TADDM

- Ships on 23 separate pieces of media (CD/DVD)

- Must run the ISD Enterprise Edition Launch pad separately on each system
  - ➤ No saved state between boxes, use a notepad!

- ISD-EE Integration Monitoring Agent installed on TEMS+TEPS

Definitions:

TEPS = Tivoli Enterprise Portal Server

TEMS = Tivoli Enterprise Monitoring Server

TDW   = Tivoli Data Warehouse

TADDM = Tivoli Application Dependency Discovery Manager

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Storage Control V4.2.1

- Based on Tivoli Storage Productivity Center

  ➢ Can upgrade to Tivoli Storage Productivity Center Basic Edition et al

- Requires DB2 ESE V9.7 for the Systems Director database

  ➢ SOD: Migration documentation available in "future"

  ➢ Download of limited-use license for DB2 available with Storage Control plug-in

- Requires Systems Director Server running V6.2.1 on the following operating systems:

  ➢ Windows, RHEL for x86, AIX

- Licensed per Systems Director Server, no client licenses

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Advanced
Technical
Skills

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IBM Systems Director Information Center

http://publib.boulder.ibm.com/infocenter/director/v6r2x/index.jsp

IBM Systems Director V6.2.1 Web References

- Main Systems Director Web Page:
  http://www.ibm.com/systems/software/director/

- InfoCenter
  http://publib.boulder.ibm.com/infocenter/director/v6r2x/index.jsp

- IBM Systems Director Forum:
  http://www.ibm.com/developerworks/forums/forum.jspa?forumID=759

- Follow IBM Systems Director on Facebook:
  http://www.facebook.com/pages/IBM-Systems-Director

- Main Wiki
  http://www.ibm.com/developerworks/wikis/display/WikiPtype/IBM+Systems+Director

- Best Practices Wiki
  http://www.ibm.com/developerworks/wikis/display/WikiPtype/IBM+Systems+Director+Best+Practices+Wiki

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Any Questions?

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Thank you for your time

Don't forget the feedback form 😉👍

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Revised September 26, 2006

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Special notices (cont.)

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Notes on benchmarks and values

The IBM benchmarks results shown herein were derived using particular, well configured, development-level and generally-available computer systems. Buyers should consult other sources of information to evaluate the performance of systems they are considering buying and should consider conducting application oriented testing. For additional information about the benchmarks, values and systems tested, contact your local IBM office or IBM authorized reseller or access the Web site of the benchmark consortium or benchmark vendor.

IBM benchmark results can be found in the IBM Power Systems Performance Report at http://www.ibm.com/systems/p/hardware/system_perf.html .

All performance measurements were made with AIX or AIX 5L operating systems unless otherwise indicated to have used Linux. For new and upgraded systems, AIX Version 4.3, AIX 5L or AIX 6 were used. All other systems used previous versions of AIX. The SPEC CPU2006, SPEC2000, LINPACK, and Technical Computing benchmarks were compiled using IBM's high performance C, C++, and FORTRAN compilers for AIX 5L and Linux. For new and upgraded systems, the latest versions of these compilers were used: XL C Enterprise Edition V7.0 for AIX, XL C/C++ Enterprise Edition V7.0 for AIX, XL FORTRAN Enterprise Edition V9.1 for AIX, XL C/C++ Advanced Edition V7.0 for Linux, and XL FORTRAN Advanced Edition V9.1 for Linux. The SPEC CPU95 (retired in 2000) tests used preprocessors, KAP 3.2 for FORTRAN and KAP/C 1.4.2 from Kuck & Associates and VAST-2 v4.01X8 from Pacific-Sierra Research. The preprocessors were purchased separately from these vendors. Other software packages like IBM ESSL for AIX, MASS for AIX and Kazushige Goto's BLAS Library for Linux were also used in some benchmarks.

For a definition/explanation of each benchmark and the full list of detailed results, visit the Web site of the benchmark consortium or benchmark vendor.

TPC	http://www.tpc.org
SPEC	http://www.spec.org
LINPACK	http://www.netlib.org/benchmark/performance.pdf
Pro/E	http://www.proe.com
GPC	http://www.spec.org/gpc
VolanoMark	http://www.volano.com
STREAM	http://www.cs.virginia.edu/stream/
SAP	http://www.sap.com/benchmark/
Oracle Applications	http://www.oracle.com/apps_benchmark/
PeopleSoft - To get information on PeopleSoft benchmarks, contact PeopleSoft directly	
Siebel	http://www.siebel.com/crm/performance_benchmark/index.shtm
Baan	http://www.ssaglobal.com
Fluent	http://www.fluent.com/software/fluent/index.htm
TOP500 Supercomputers	http://www.top500.org/
Ideas International	http://www.ideasinternational.com/benchmark/bench.html
Storage Performance Council	http://www.storageperformance.org/results

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Notes on HPC benchmarks and values

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For a definition/explanation of each benchmark and the full list of detailed results, visit the Web site of the benchmark consortium or benchmark vendor.

SPEC	http://www.spec.org
LINPACK	http://www.netlib.org/benchmark/performance.pdf
Pro/E	http://www.proe.com
GPC	http://www.spec.org/gpc
STREAM	http://www.cs.virginia.edu/stream/
Fluent	http://www.fluent.com/software/fluent/index.htm
TOP500 Supercomputers	http://www.top500.org/
AMBER	http://amber.scripps.edu/
FLUENT	http://www.fluent.com/software/fluent/fl5bench/index.htm
GAMESS	http://www.msg.chem.iastate.edu/gamess
GAUSSIAN	http://www.gaussian.com
ANSYS	http://www.ansys.com/services/hardware-support-db.htm

Click on the "Benchmarks" icon on the left hand side frame to expand. Click on "Benchmark Results in a Table" icon for benchmark results.

ABAQUS	http://www.simulia.com/support/v68/v68_performance.php
ECLIPSE	http://www.sis.slb.com/content/software/simulation/index.asp?seg=geoquest&
MM5	http://www.mmm.ucar.edu/mm5/
MSC.NASTRAN	http://www.mscsoftware.com/support/prod%5Fsupport/nastran/performance/v04_sngl.cfm
STAR-CD	www.cd-adapco.com/products/STAR-CD/performance/320/index/html
NAMD	http://www.ks.uiuc.edu/Research/namd
HMMER	**http://hmmer.janelia.org/**
	http://powerdev.osuosl.org/project/hmmerAltivecGen2mod

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Notes on performance estimates

rPerf for AIX

rPerf (Relative Performance) is an estimate of commercial processing performance relative to other IBM UNIX systems. It is derived from an IBM analytical model which uses characteristics from IBM internal workloads, TPC and SPEC benchmarks. The rPerf model is not intended to represent any specific public benchmark results and should not be reasonably used in that way. The model simulates some of the system operations such as CPU, cache and memory. However, the model does not simulate disk or network I/O operations.

- rPerf estimates are calculated based on systems with the latest levels of AIX and other pertinent software at the time of system announcement. Actual performance will vary based on application and configuration specifics. The IBM eServer pSeries 640 is the baseline reference system and has a value of 1.0. Although rPerf may be used to approximate relative IBM UNIX commercial processing performance, actual system performance may vary and is dependent upon many factors including system hardware configuration and software design and configuration. Note that the rPerf methodology used for the POWER6 systems is identical to that used for the POWER5 systems. Variations in incremental system performance may be observed in commercial workloads due to changes in the underlying system architecture.

All performance estimates are provided "AS IS" and no warranties or guarantees are expressed or implied by IBM. Buyers should consult other sources of information, including system benchmarks, and application sizing guides to evaluate the performance of a system they are considering buying. For additional information about rPerf, contact your local IBM office or IBM authorized reseller.

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CPW for IBM i

Commercial Processing Workload (CPW) is a relative measure of performance of processors running the IBM i operating system. Performance in customer environments may vary. The value is based on maximum configurations. More performance information is available in the Performance Capabilities Reference at: www.ibm.com/systems/i/solutions/perfmgmt/resource.html

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