IBM Systems Director VMControl V2.2

Glen Corneau
Consulting I/T Specialist

Agenda

- * **VMControl V2.2 Overview** *
- Express Edition
  - Overview and Summary
  - Platform support – Power Systems, x86, z/VM
  - Performance Summary
- Image Manager - Standard Edition
  - Virtual Appliances
  - Capture, deploy, import, versioning
- System Pools - Enterprise Edition
  - Workloads
  - System Pools
  - Resilience Policies
- IBM Systems Director Editions

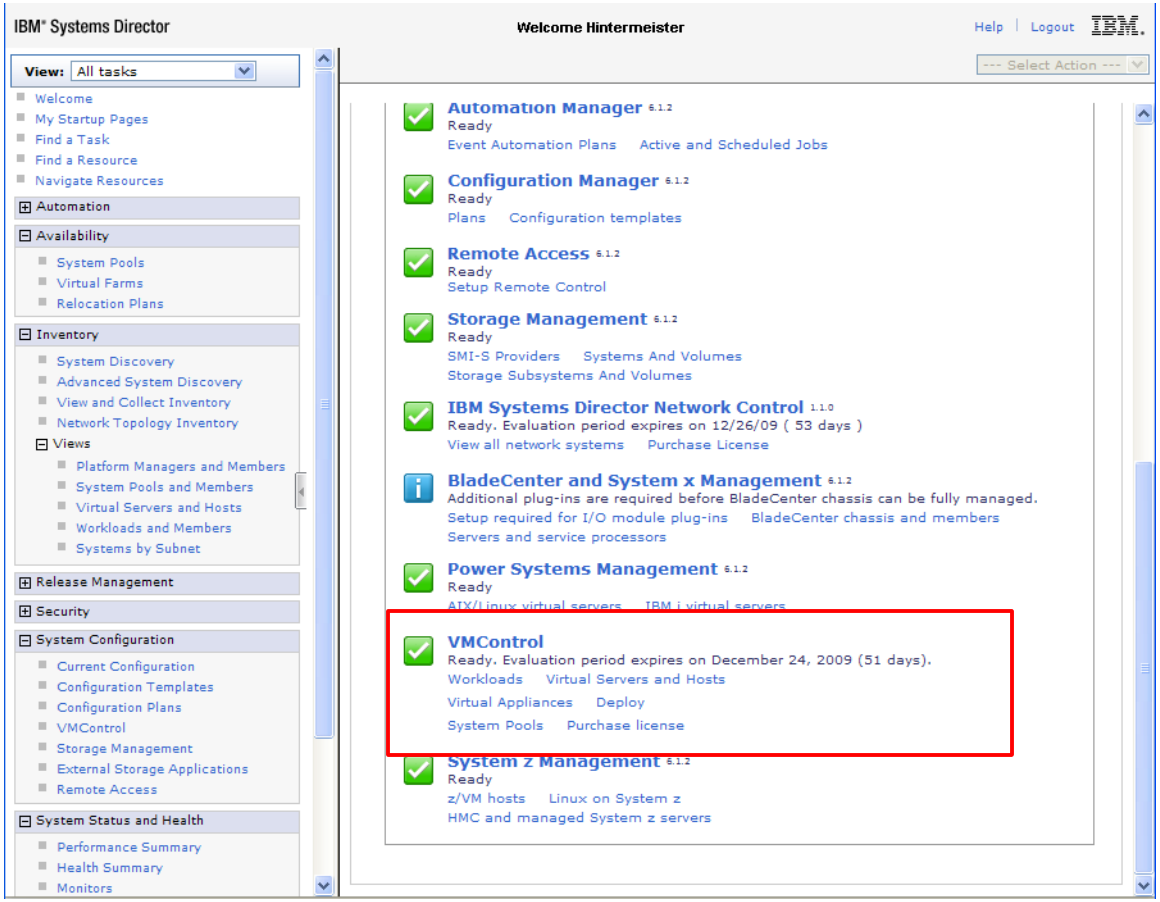
VMControl V2.2

What is IBM Systems Director VMControl V2.2 (VMControl) ?

A plug-in to IBM Systems Director to enhance virtualization management, simplify virtual appliance deployment and pool systems to manage workloads across platforms.

VMControl V2.2 Overview

- **No-charge features**
  - Manage Virtual Servers, hosts, platforms
    - z/VM
    - PowerVM
    - VMware, Microsoft, Xen
  - Performance Summary
- **Chargeable features**
  - Image Management
    - Deploy
    - Capture
    - Import
    - Versioning
  - System Pools
    - Resilience Policy
    - Placement Plans
    - Workloads



VMControl V2.2 Editions

- **Express Edition (no-charge)**
  - Create and Edit virtual servers
  - Manage and relocate virtual servers
  - Monitor, performance summary, thresholds, automation
- **Standard Edition (VMControl Image Manager, chargeable)**
  - Express edition features plus:
  - 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 (VMControl Image Manager+System Pools, chargeable)**
  - Standard Edition features plus:
  - Create system pools
  - Deploy virtual appliances into system pools
  - Manage workloads

VMControl V2.2 Server and Licensing

- **VMControl V2.2 is a plug-in that installs on the IBM Systems Director Server running V6.1.2.1 or later. The following server operating systems are supported:**
  - AIX
  - Linux on Power
  - Linux on System x/BladeCenter
  - Linux on System z
  - Windows
- **It is not required to have a homogenous server and client environment.**
- **VMControl V2.2 Standard and Enterprise Editions are available on a 60-day trial period from the date of installation.**
- **VMControl is licensed based on a per-core metric. A license is required for each server managed by VMControl based on the size of the server.**
  - VMControl Enterprise Edition license includes the Standard Edition license functionality.

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  - Capture, deploy, import, versioning
- Enterprise Edition
  - Workloads
  - System Pools
  - Resilience Policies
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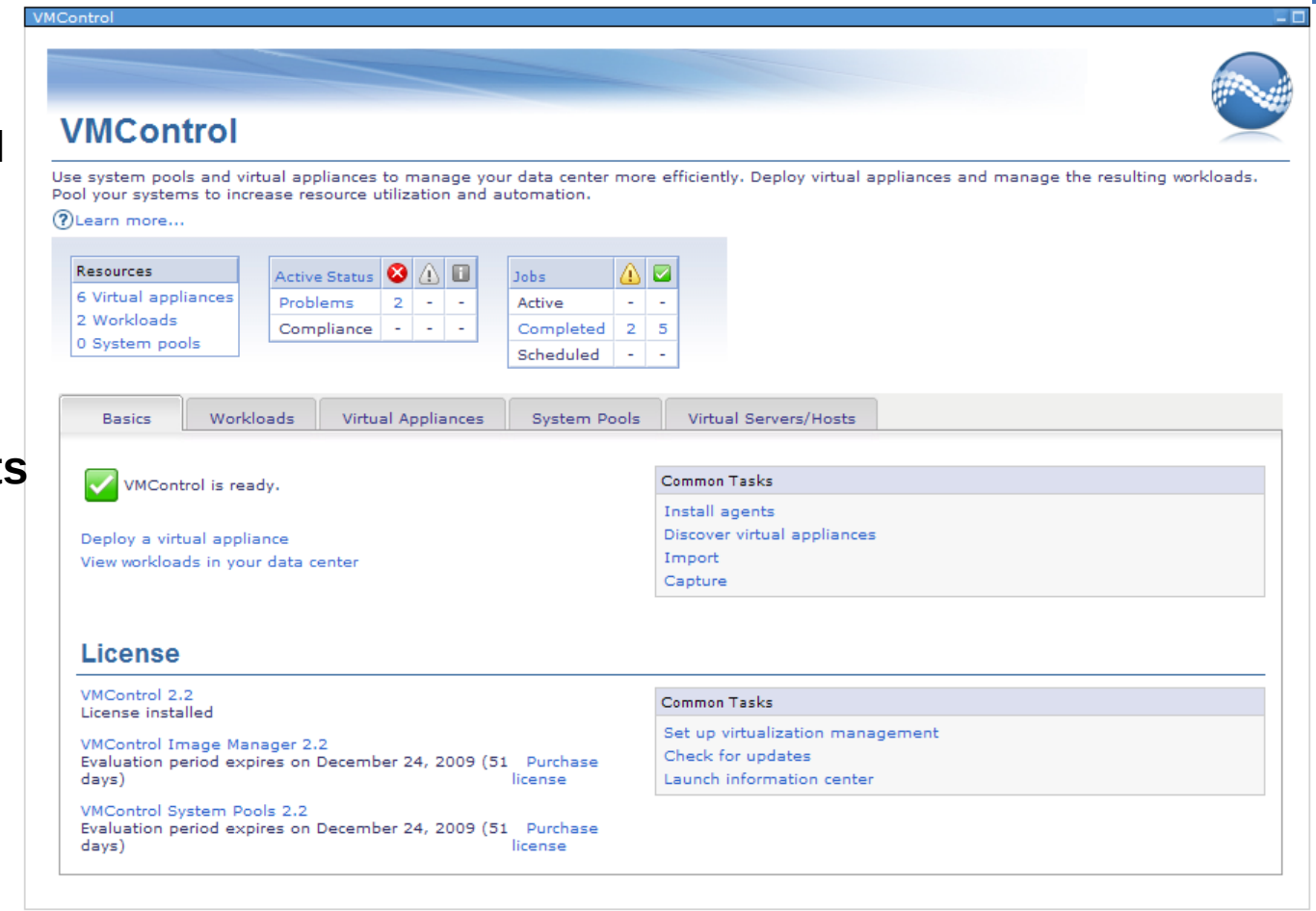
Summary Page

- **Basics**
  - Basic tasks
  - Install agents
  - Setup z/VM, NIM
  - Discover
  - License
  - Learn
- **Virtual Servers/Hosts**

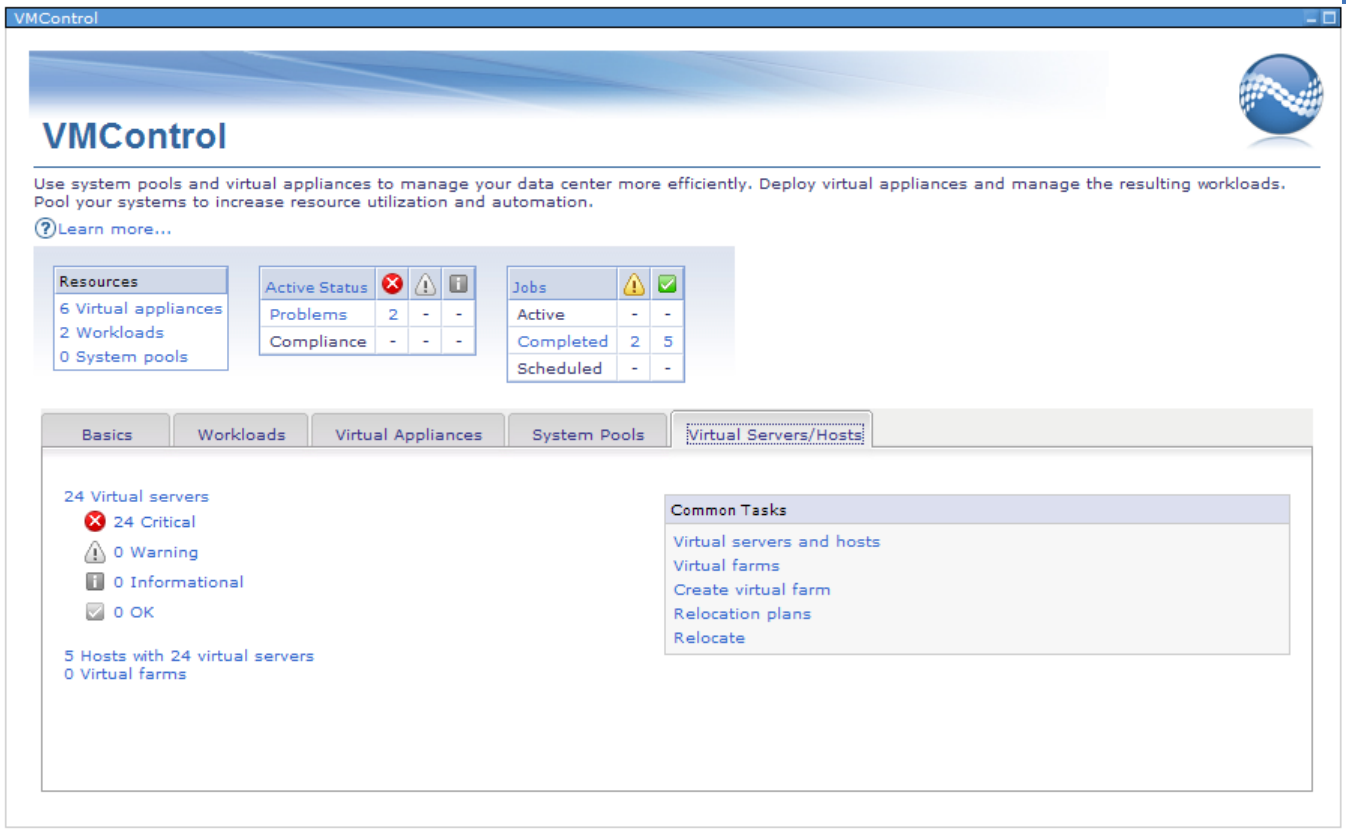


Virtual Servers/Hosts

> **Basics**

> **Virtual Servers/Hosts**

- Status
- Virtual Servers & hosts
- Virtual farms
- Relocation Plans



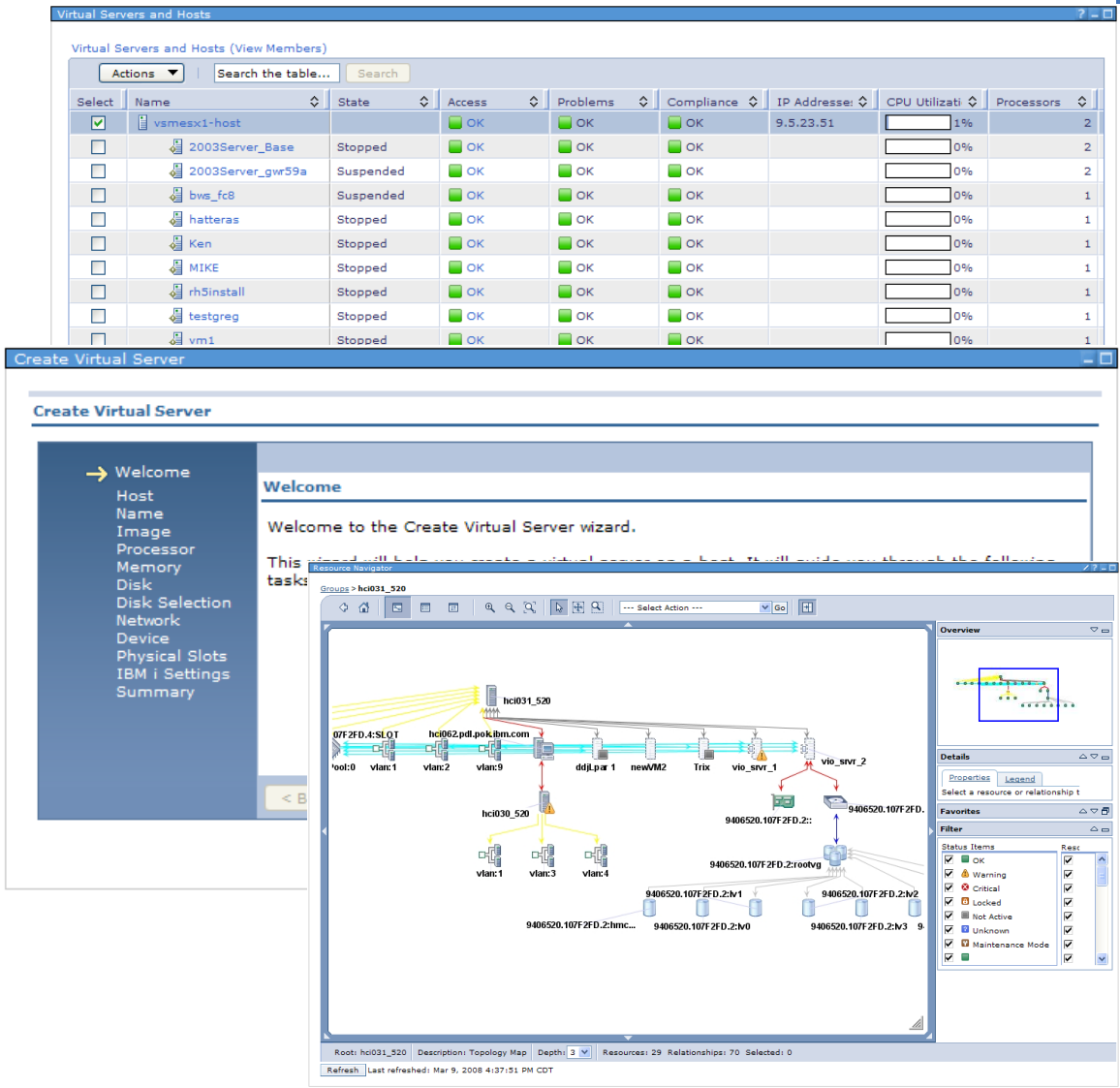
Multiplatform Virtualization Management

> Multi-Platform Management

- Manage virtual servers & hosts
- Manage PowerVM via HMC and IVM
- Manage x86 via VMware, MSVS, MS Hyper-V
- Topology maps
- Deploy/Create empty virtual servers
- Manage z/VM hosts & virtual servers
- Monitoring, automation

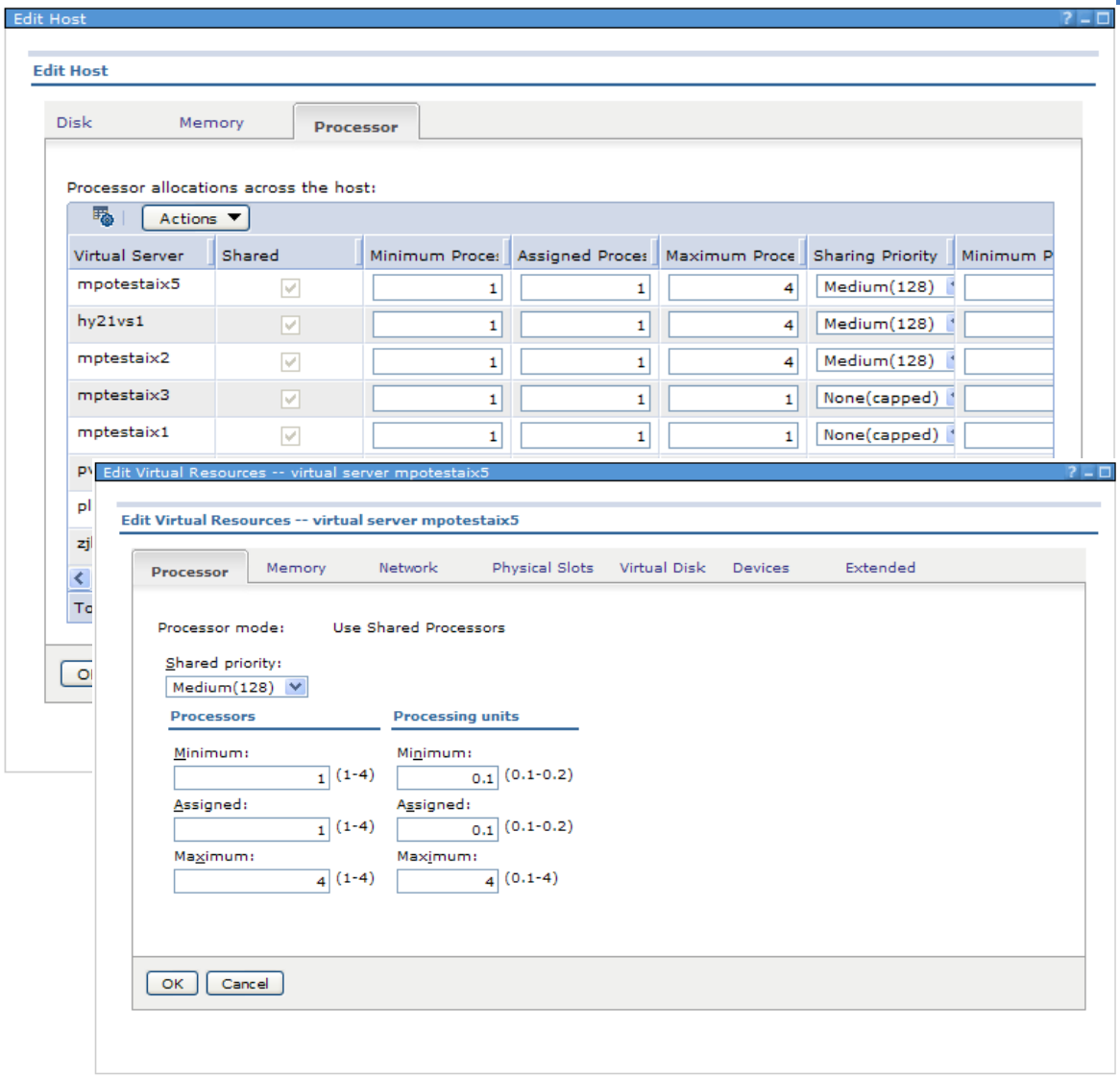
> Edit virtual resources

> Relocate virtual servers



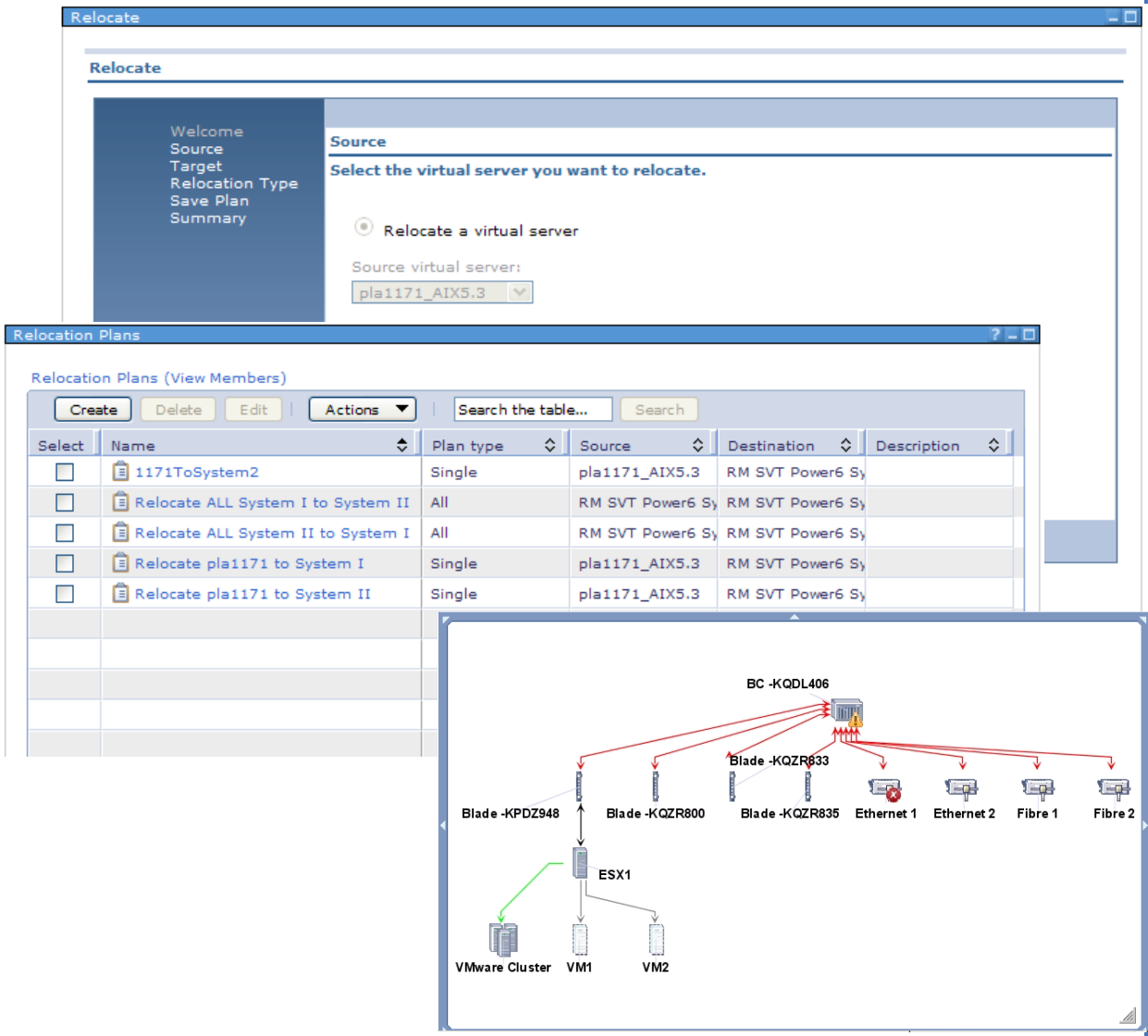
Editing Virtual Resources

- **Multi-Platform Management**
- **Edit virtual resources**
  - Edit hosts
  - Edit virtual servers
  - GUI or command-line
  - Edit z/VM virtual servers
- **Relocate virtual servers**



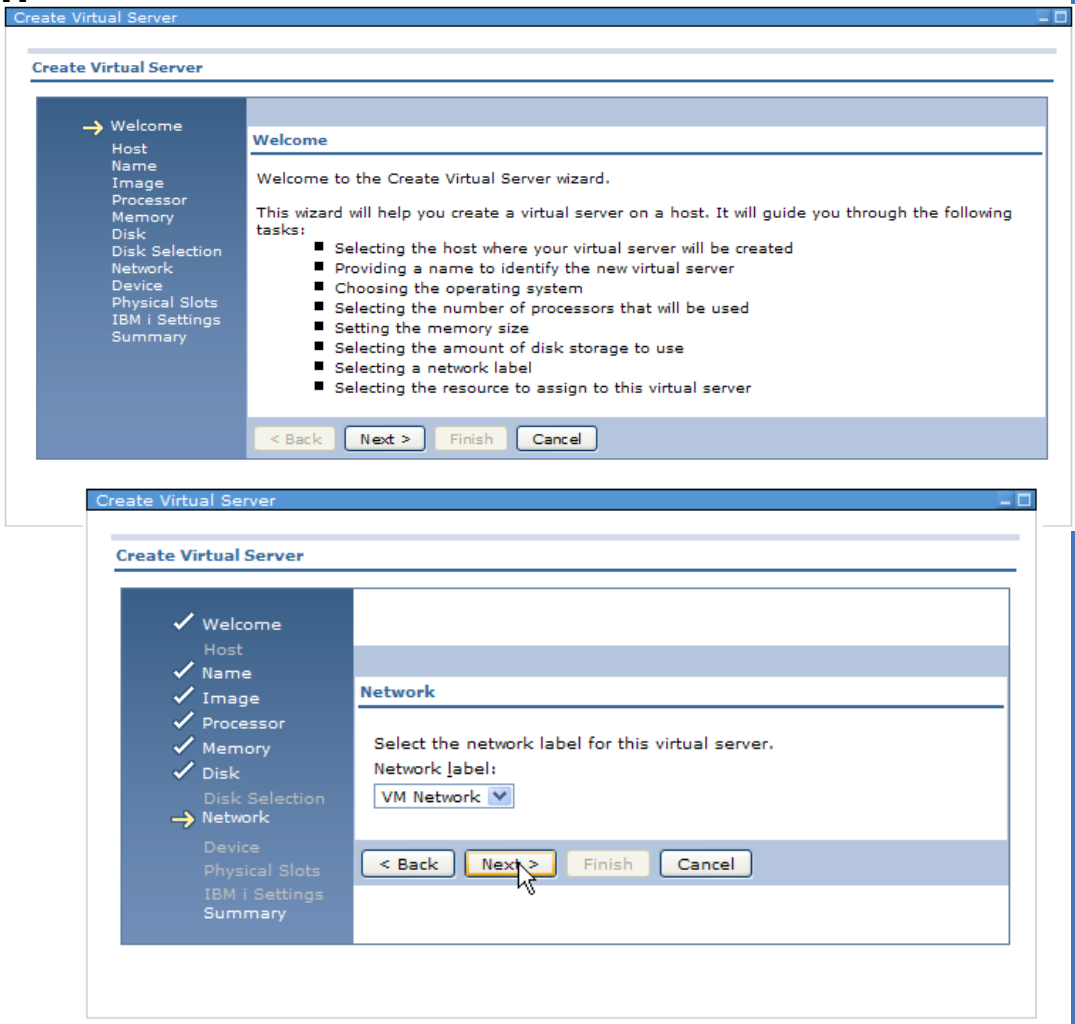
Relocate Virtual Servers

- **Multi-Platform Management**
- **Edit virtual resources**
- **Relocate virtual servers**
  - Virtual Farms
  - Live relocation
    - PowerVM
    - VirtualCenter with ESX
    - Xen
  - Static relocation
    - Microsoft Virtual Server
    - VMware ESX
  - Relocation plans



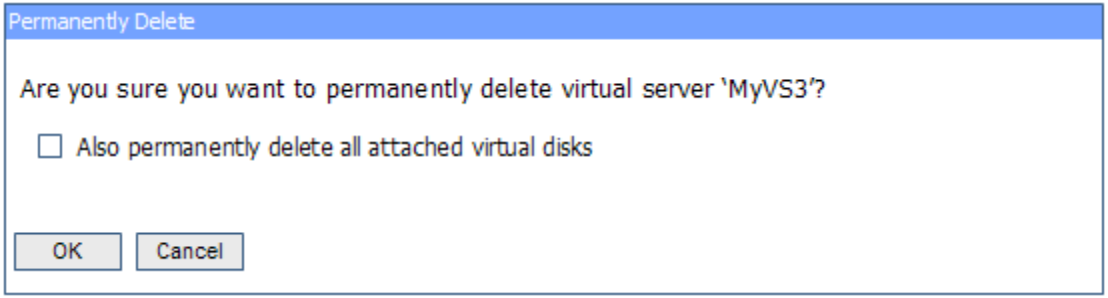
Create Virtual Server

- **Creates a new, empty virtual server**
- **Available from Create Virtual Server task on Host**
- **Based on existing or from scratch**
- **PowerVM:**
  - Virtual CPUs, entitled capacity
  - Memory
  - Disk (existing or new)
  - Network
  - Optical devices
  - Dedicated slots
- **VMware, etc:**
  - Image, processors
  - Memory, disk
  - Network



Delete Virtual Server – Power Systems, VMware, etc.

- Virtual Server must be powered off before it can be deleted
- Deleted server is removed from the HMC/IVM
- Virtual disks are removed if selected
- IBM Systems Director is updated after removal

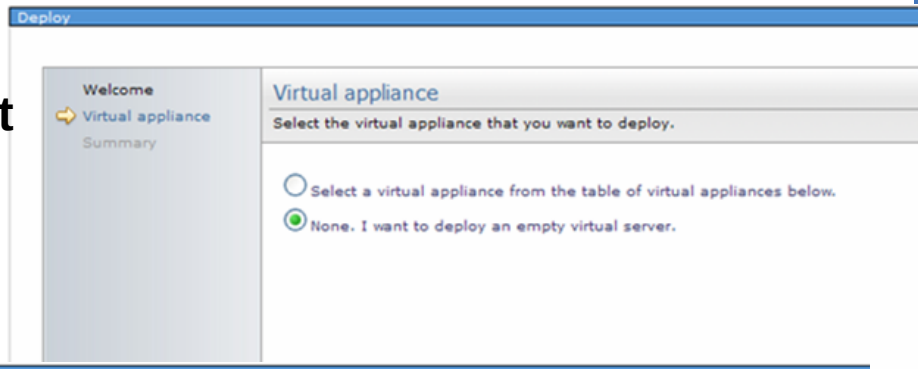


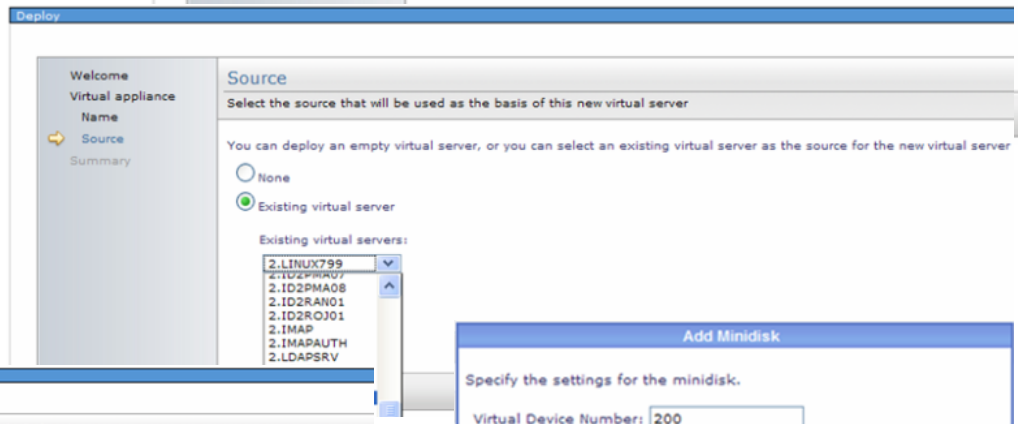
Delete Virtual Server - z/VM

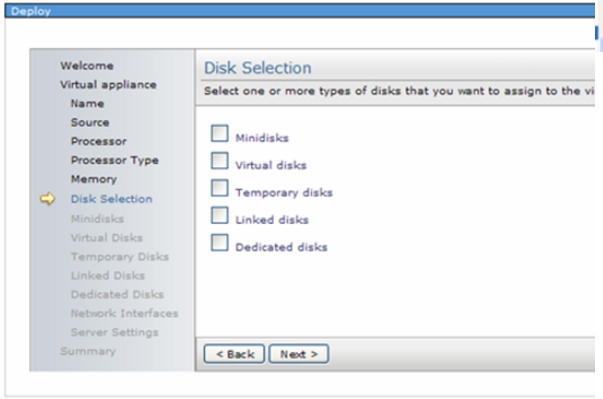
- Virtual Server must be powered off before it can be deleted
- Deleted server is removed from the z/VM User Directory
- Minidisks are recovered by the Directory Manager after all users of the disk have stopped using the disk
- IBM Systems Director is updated after removal

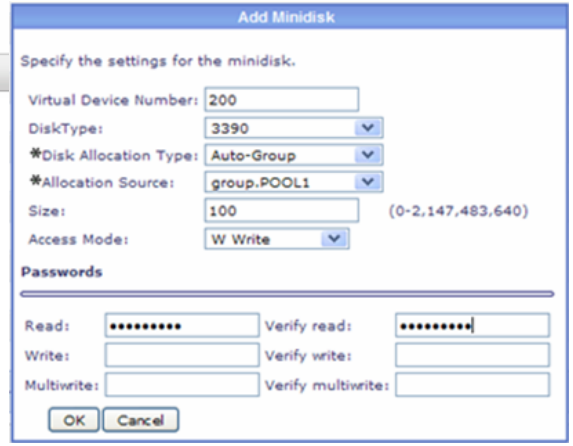
Deploy/Create Virtual Server - z/VM

- **Creates a new, empty virtual server**
- **Available from deploy task on z/VM host**
- **Based on existing or from scratch. Existing server exceptions:**
  - Disk allocation is not set as default
  - Passwords are not set as default
- **Options:**
  - Processor, memory
  - Minidisk, virtual disk
  - Temporary disk, linked disk
  - Dedicated disk, network ports
  - Server related settings



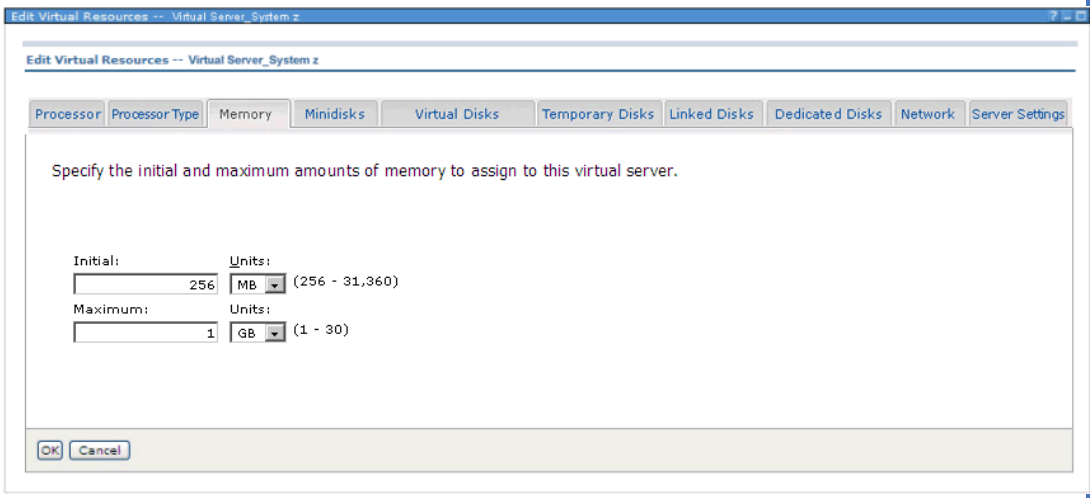






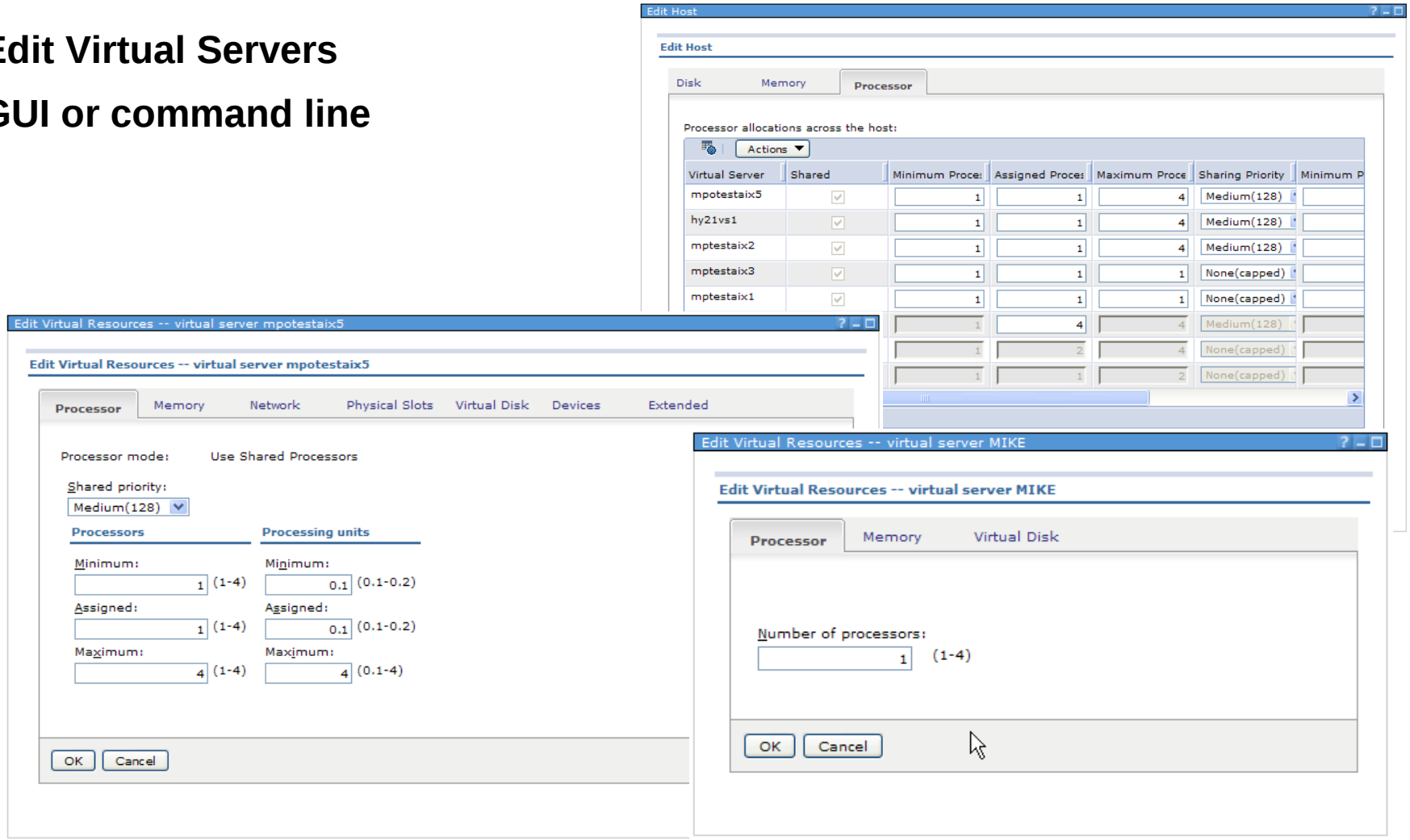
Edit Virtual Server - z/VM

- z/VM User Directory changes
- Allowed to Add / Remove / Delete resources (does not matter if VS is running)
- Not allowed to modify minidisk sizes (this would change physical allocation of disk)



Edit Virtual Server – Power Systems, VMware, etc.

- Edit Hosts
- Edit Virtual Servers
- GUI or command line



Relocation Support – PowerVM, VMware, Microsoft

	Relocation support		
Virtualization environment	**Static relocation within IBM Systems Director virtual farms**	**Live relocation within IBM Systems Director virtual farms**	**Live relocation within VMControl system pools** *
IBM Power Systems® that are under the control of the Hardware Management Console or the Integrated Virtualization Manager	Yes	Yes	Yes
VMware VirtualCenter	Yes	Yes	No
VMware vCenter	Yes	Yes	No
Virtualization manager subagent for VMware VirtualCenter with VMware ESX Server hosts	Yes	Yes	No
Microsoft® Virtual Server	Yes	No	No
Virtualization manager subagent for VMware ESX Server	Yes	No	No
Windows® Server 2008, Enterprise, Standard, and Datacenter x64 Editions with Hyper-V role enabled	No	No	No
Xen	Yes	Yes	No

* Relocation within system pools requires System Pools license

Relocation Differences
Virtual Farms versus System Pools

	Relocation type	
Relocation features	Virtual farm relocation in IBM Systems Director	System pool relocation in VMControl *
Relocate all virtual servers in a host	Yes	Yes
Relocate one or more virtual servers	Yes	Yes
Automatic placement (VMControl determines the target virtual server or host)	No[1]	Yes
Advisory placement (User can approve the relocation before it can occur)	No	Yes
Relocate all virtual servers on predicted failure	No	Yes
Relocation plans	Yes	No
Fixed target (User determines the target virtual server or host)	Yes	No
Relocation automation	Yes	Yes

* Relocation within system pools requires System Pools license

Performance Summary

- Hierarchical Views
- Live data in columns
- Relationships between virtual resources
- Activate thresholds

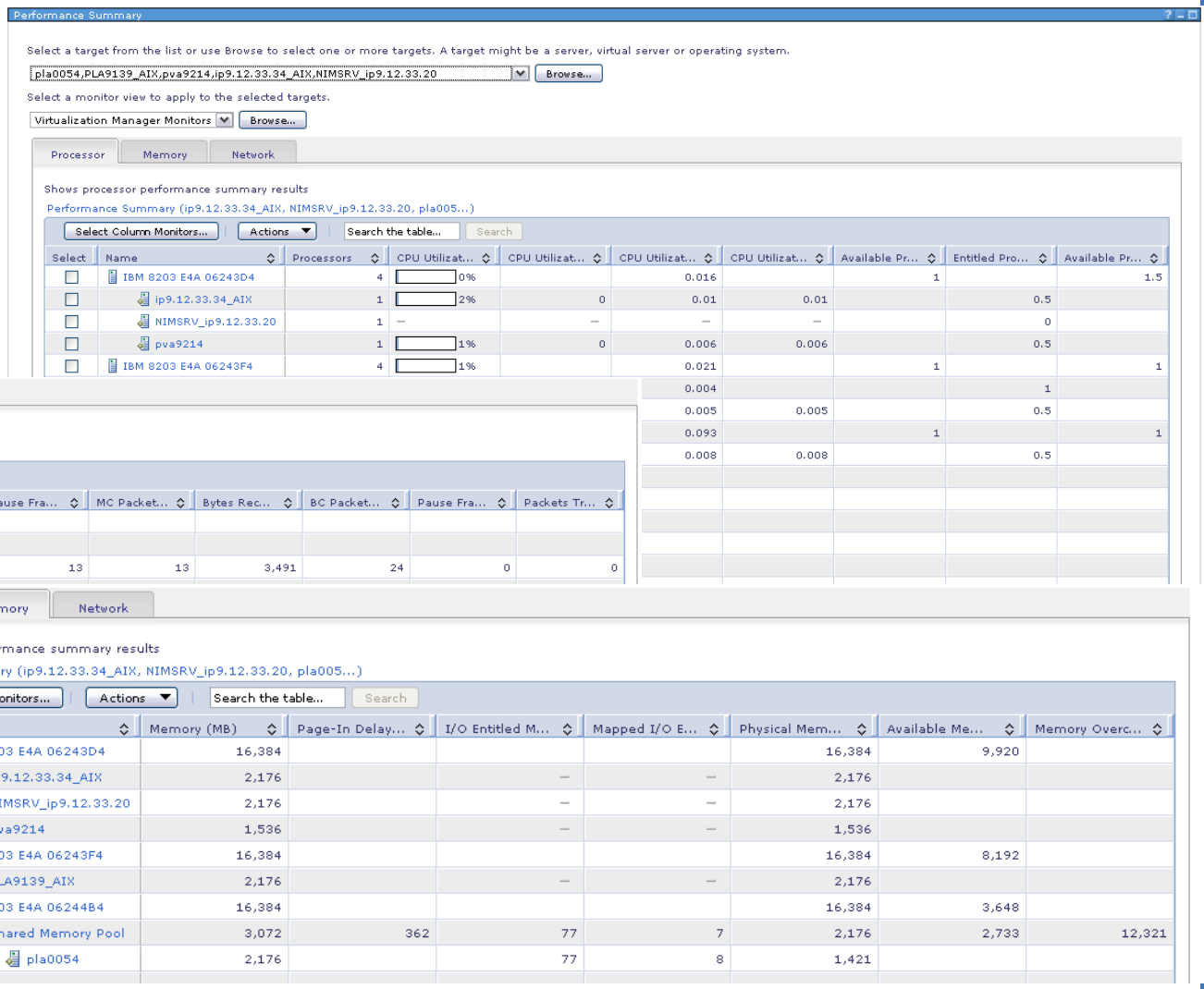


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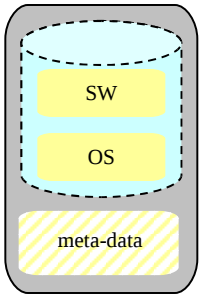
Image Manager Overview

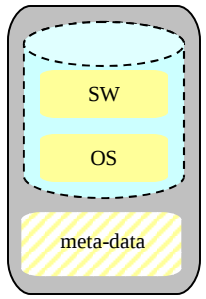


Virtual Appliance

- **Discover**
  - Existing image repositories
- **Capture**
  - A running virtual server that is configured just the way you want, complete with guest operating system, running applications and virtual server definition. Can also capture an existing AIX mksysb or NIM lpp_source resource.
- **Import**
  - Virtual appliance packages that exist in Open Virtualization Format (OVF).
- **Deploy**
  - Virtual appliances quickly to create new virtual servers or into empty virtual servers
- **Versioning**
  - Allows easier management of different levels of virtual appliances

Virtual Appliances

- **Definition:**
  - A package that contains a virtual server definition that meets the requirements to run it's associated image; where the image contains the operating system and installed software

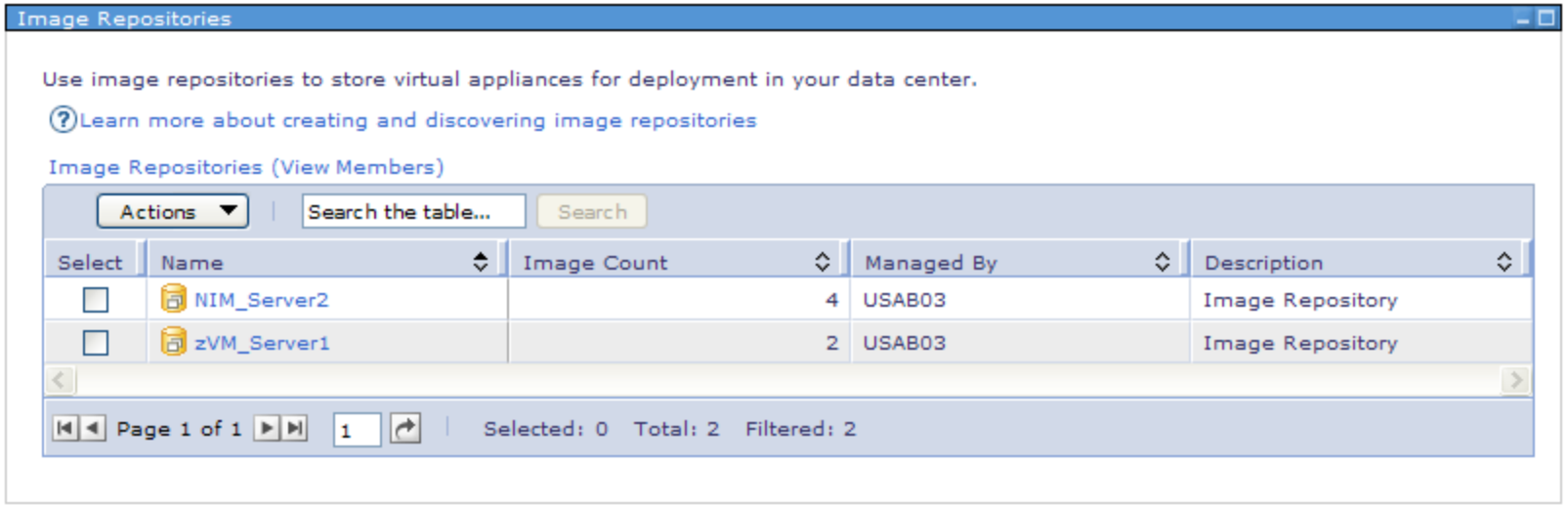


Virtual Appliance

- **Virtual Server image may contain**
  - A supported operating system (AIX or Linux on System z)
  - Any software applications installed in that operating system image
- **The Virtual Appliance is described using the methods described in the Open Virtualization Format (OVF) specification. OVF is an industry standard representation of a virtual server that contains a configured, tested operating system and optionally, middleware and software applications, along with the metadata that describes the virtual server.**
- **AIX virtual appliances can be**
  - A mksysb file and the associated metadata file (XML)
  - An Open Virtualization Archive format (tar file with mksysb+metadata file)

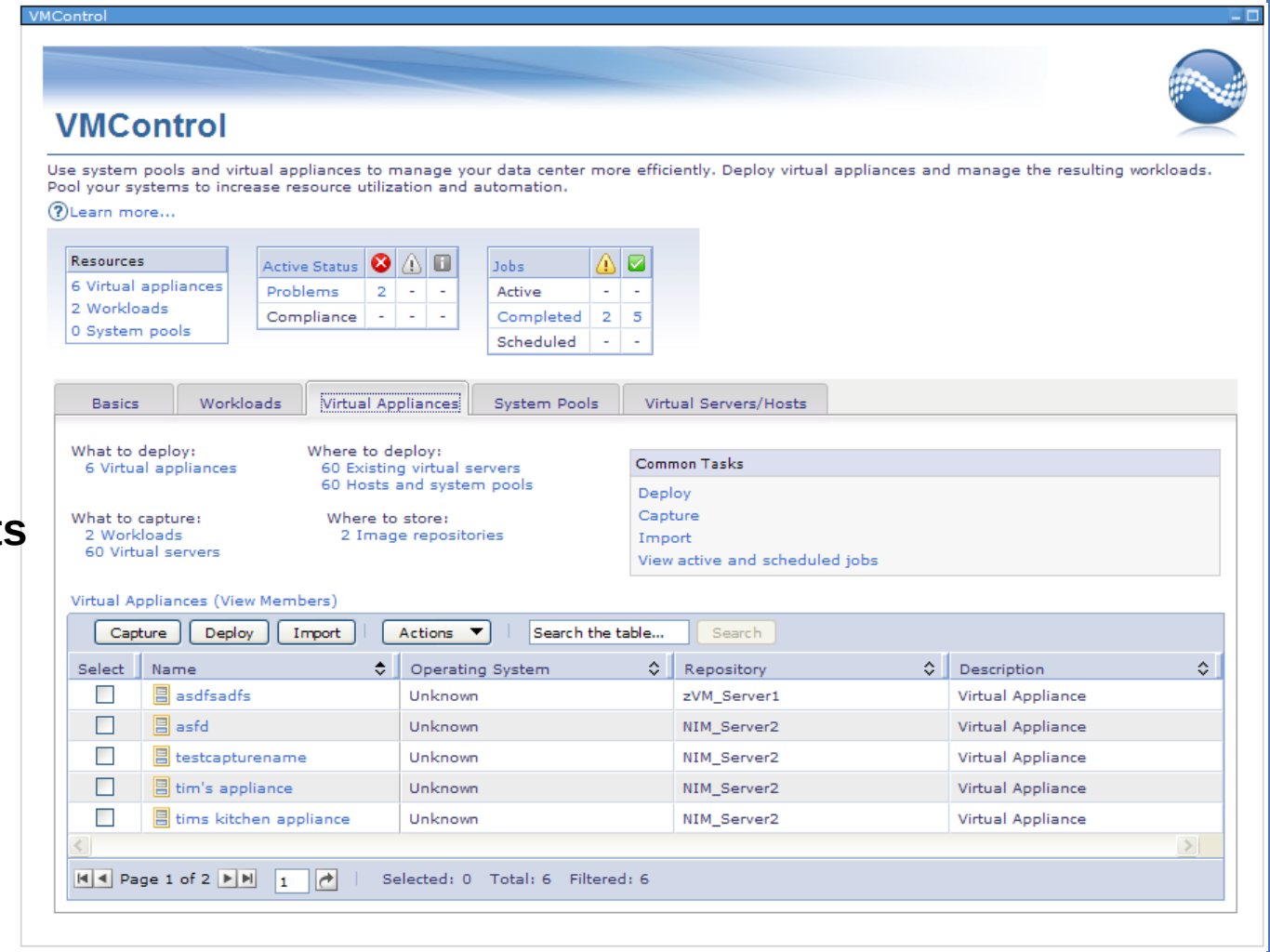
Image Repositories

- **Definition:**
  - Image repositories are the place where the OVF virtual appliances images are stored
- **Requires an sub-agent to be installed on the repository system running the Common Agent**
  - For NIM servers, appliances in /export/nim/appliances directory
- **After discovery of the virtual appliances on the repository, they appear in the virtual appliance list.**



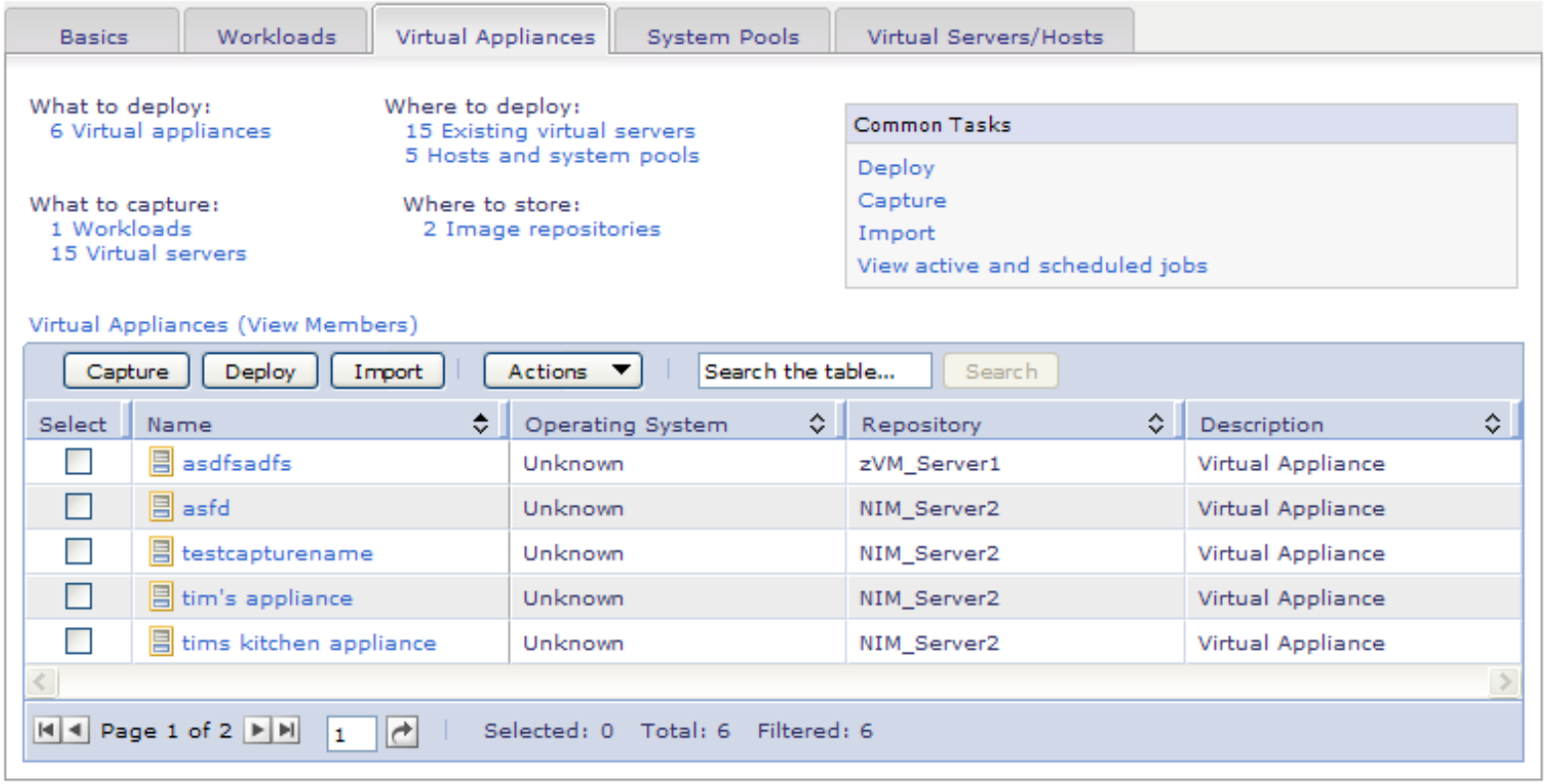
Virtual Appliances – User Interface

- **Basics**
- **Virtual Appliances**
  - What to deploy
  - Where to deploy
  - What to capture
  - Where to store
  - Import
  - Versioning
- **Virtual Servers/Hosts**



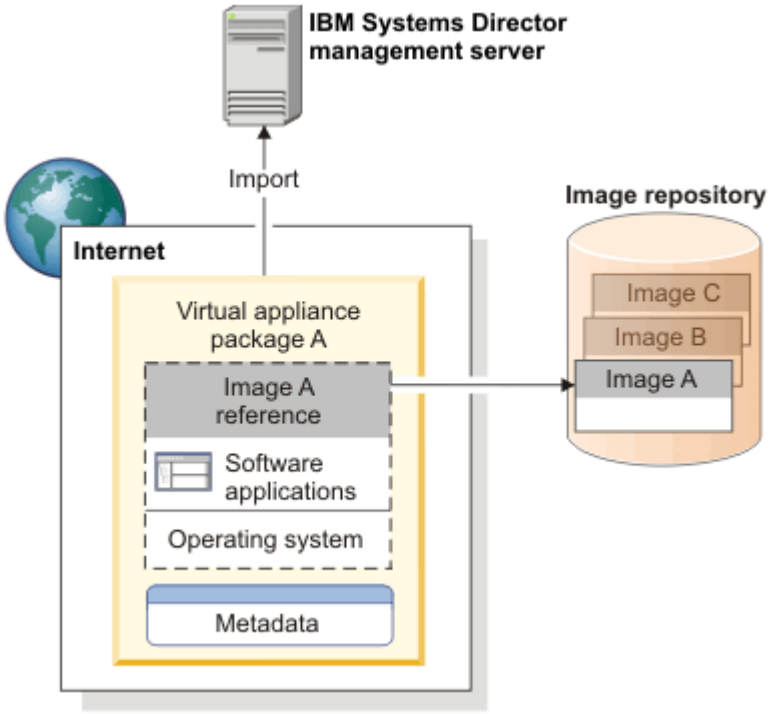
Virtual Appliances – User Interface continued

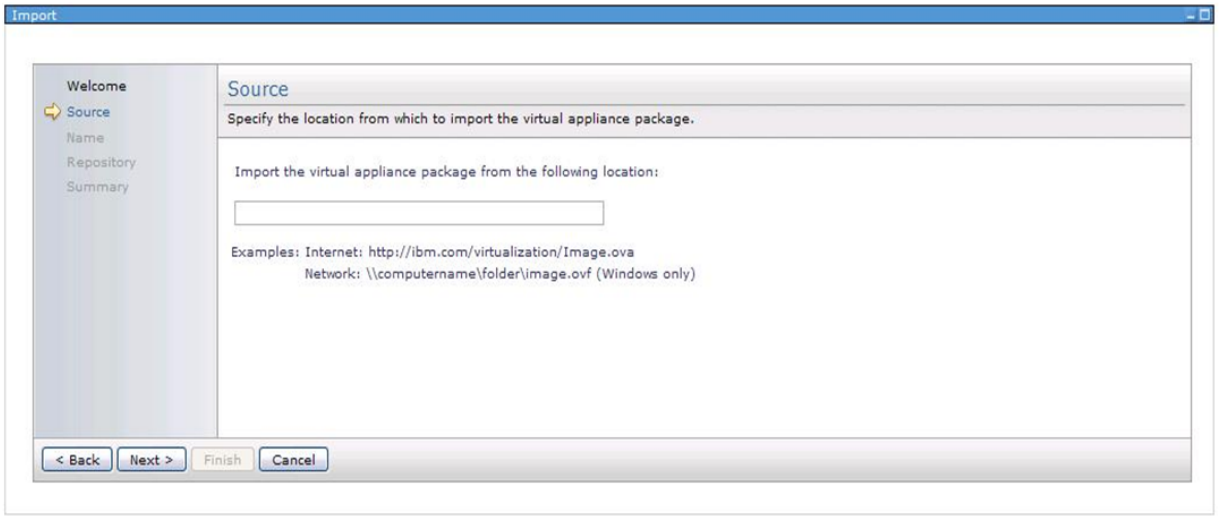
- **Tasks available:**
  - Capture
  - Deploy
  - Import



Importing a Virtual Appliance

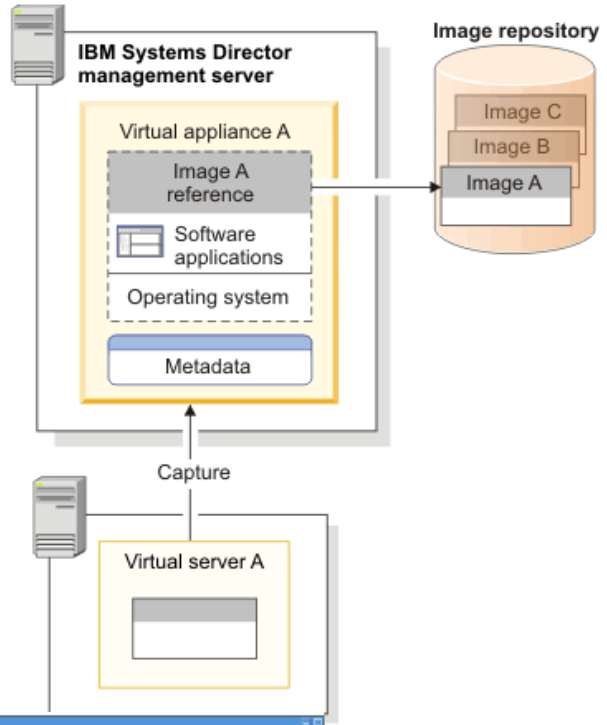
- Import task stores the virtual appliance (VA) package on the designated repository
- Virtual appliance package must be in OVF format.
- Import from the Internet (http), system on the local network (Windows share) or local directory on the Director Server

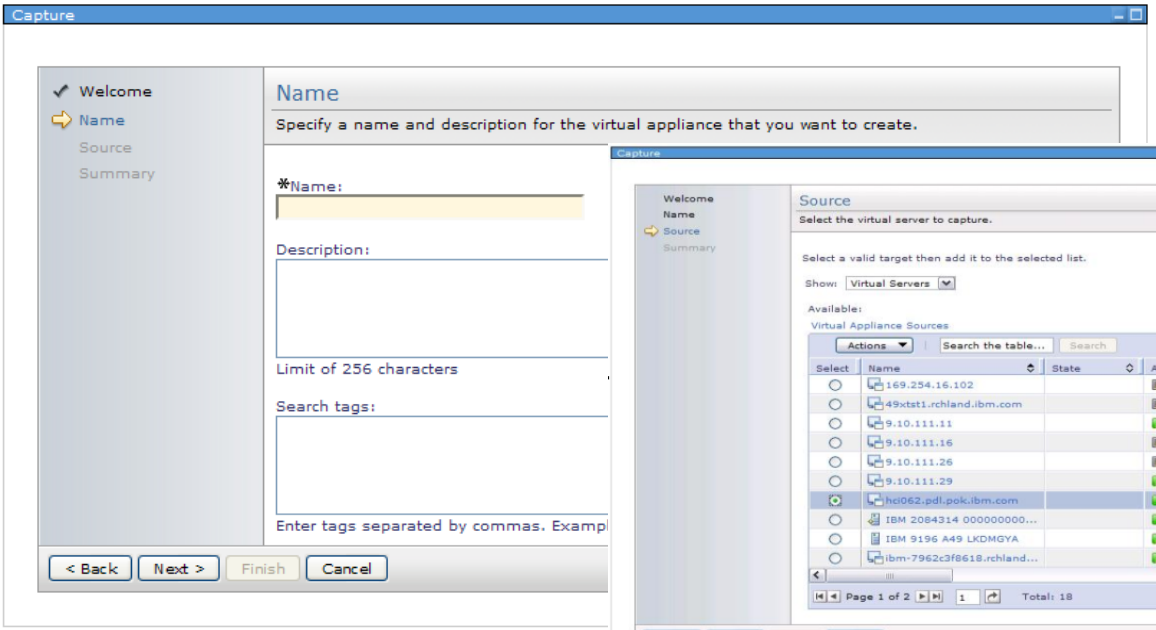


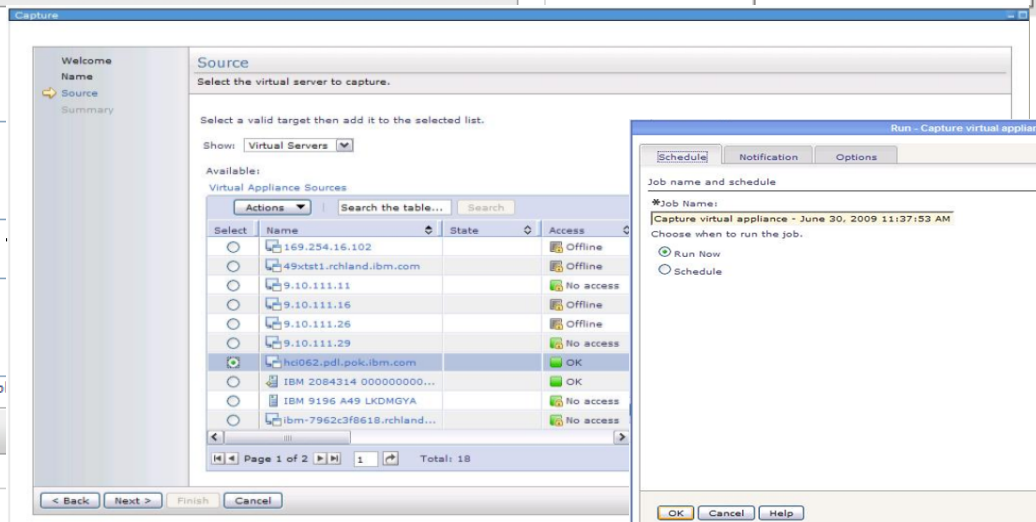


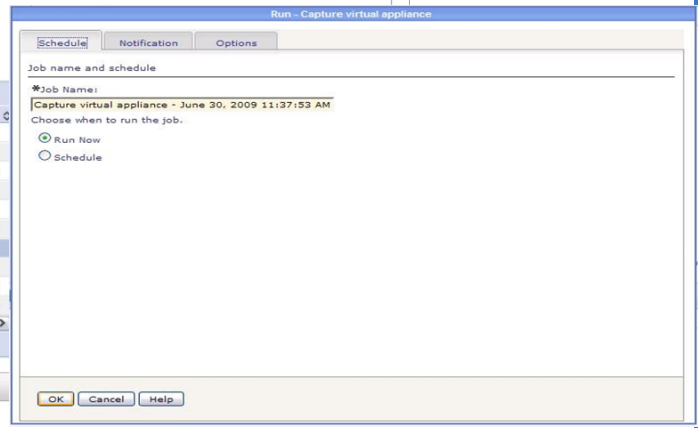
Capturing a Virtual Appliance

- **Capture:**
  - PowerVM virtual server running AIX
  - z/VM virtual server running Linux
  - Existing AIX mksysb image or lpp_source via CLI



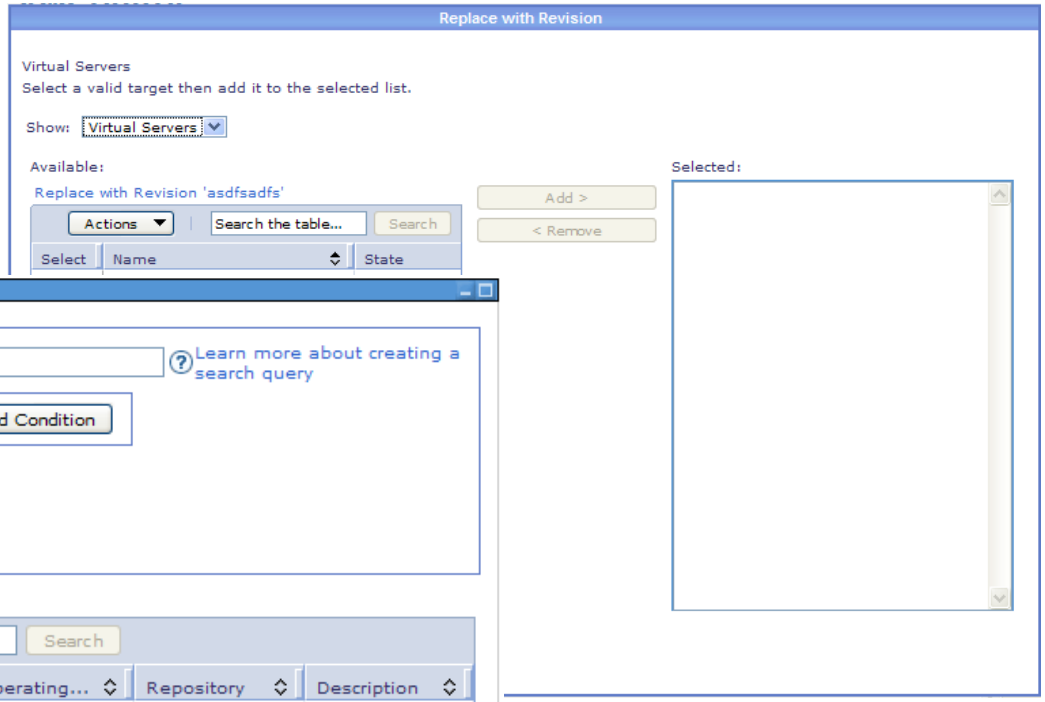






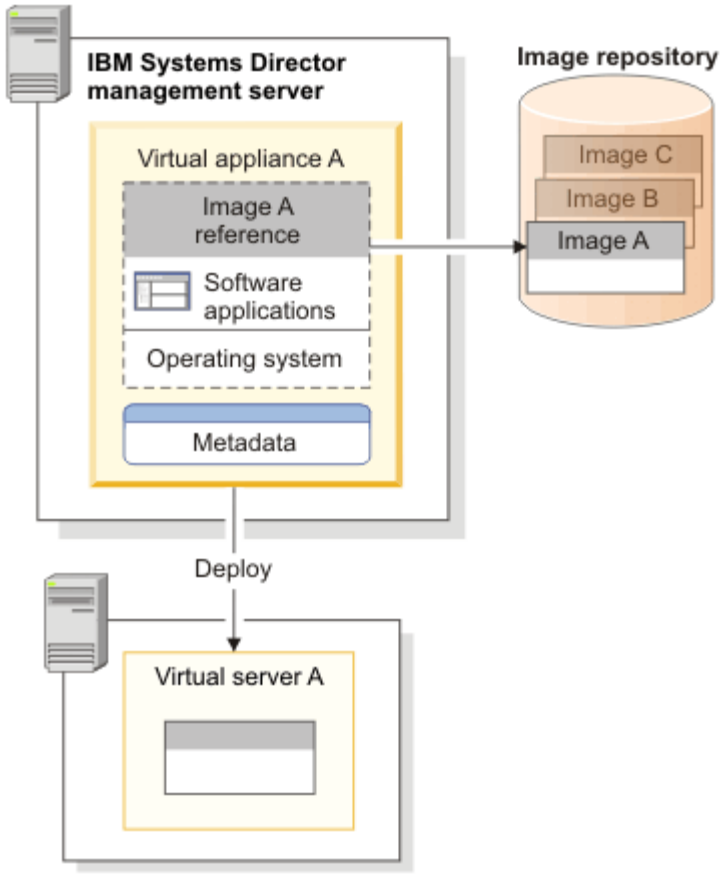
Versioning a Virtual Appliance

- **Versioning**
  - Replace with version
  - Version tagging capability
  - Advanced search



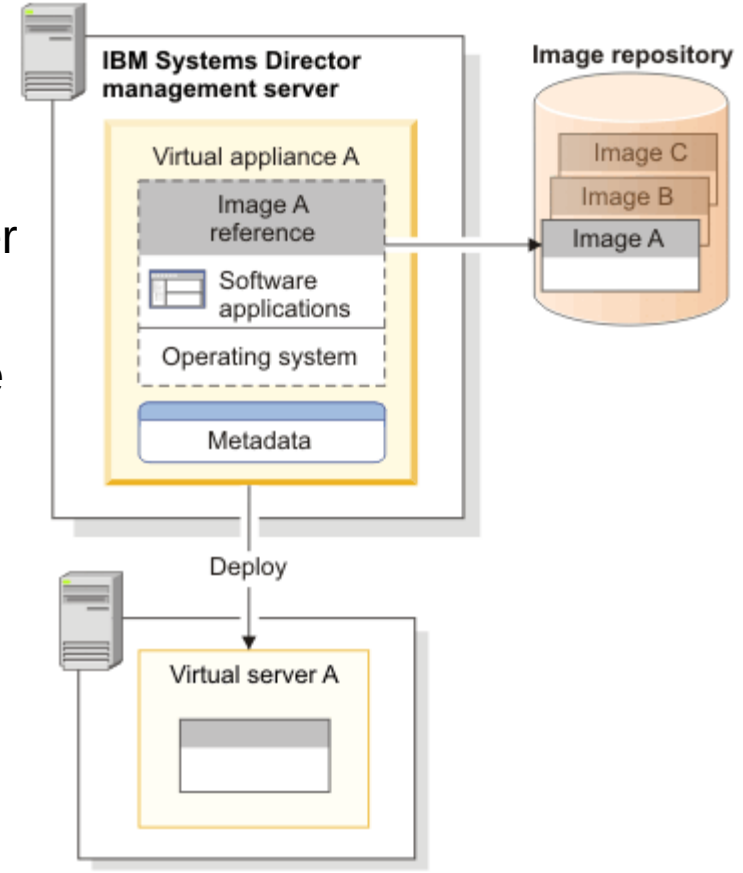
Deploying a Virtual Appliance

- **Deploy a virtual appliance to:**
  - A new virtual server on designated host
  - An existing virtual server (empty or not)
  - A system pool (with VMControl System Pools)
- **Customization of attributes:**
  - Network settings
    - Hostname, IP address
    - Default route, DNS settings
    - Netmask, etc
  - Network mapping
  - Unique NIM customization script
- **Image repository of source virtual appliance must be available**



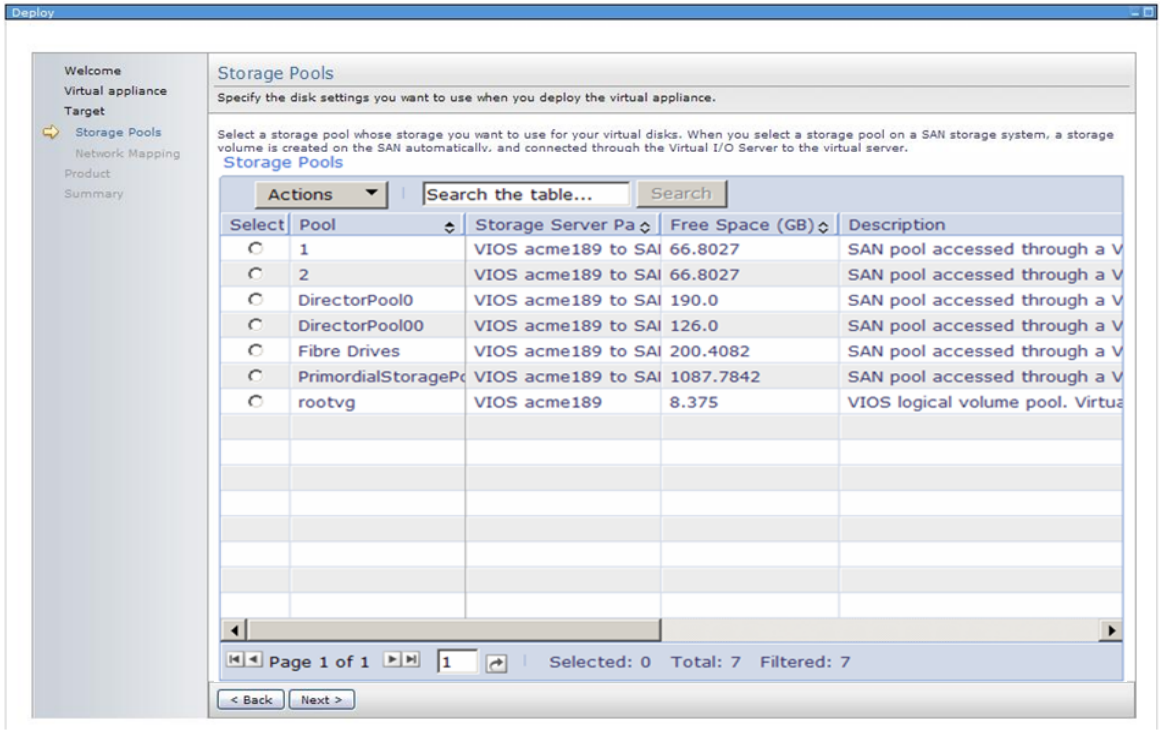
Deploying a Virtual Appliance – PowerVM Details

- **Steps in deployment include:**
  - Reading of the virtual appliance's virtual server metadata for resource information
  - Verification the target host, VS or pool has the required resources available
  - Creation (if new) of the virtual server, possibly including the storage
  - The OS component is installed on the virtual server. NIM performs the netboot via the virtual server's platform manager (HMC or IVM)
  - The virtual server is booted from the installed image



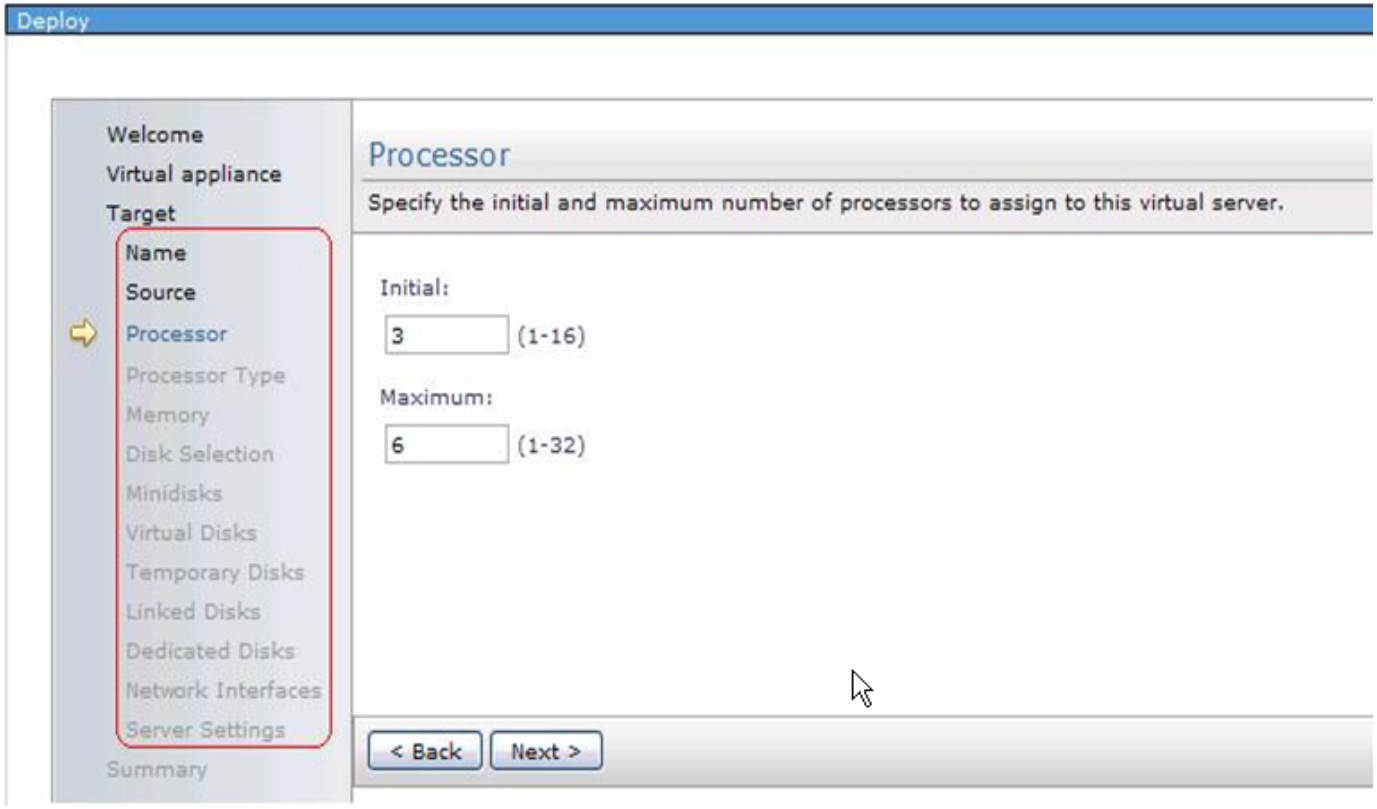
Deploying a Virtual Appliance – PowerVM storage

- **Storage used for new virtual server can be**
  - Allocated from IBM Systems Director-managed SAN storage pool hosted by a Virtual I/O Server
  - Allocated from local storage pool on the VIOS



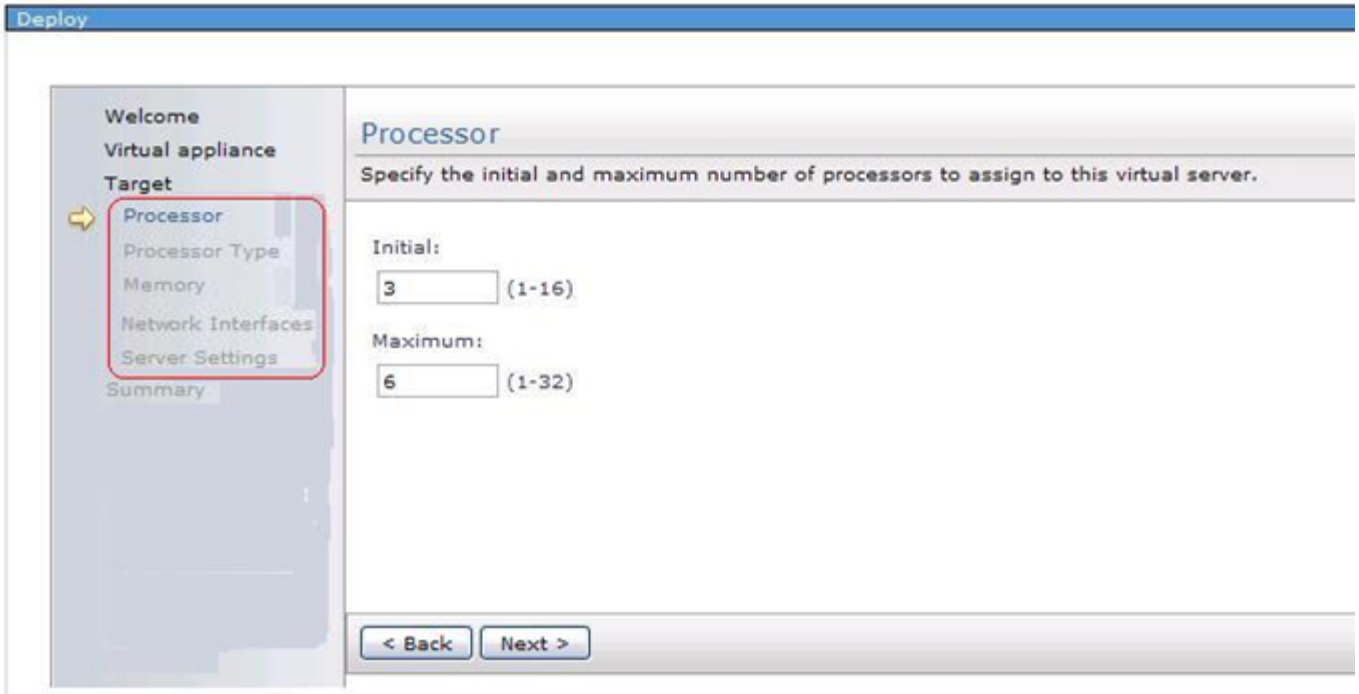
Deploying a Virtual Appliance – z/VM Details

- **Select specifics of z/VM virtual appliance and containing new virtual server**
  - Processor, Processor Type, Memory, Disk pages, Network Interfaces, Server Settings



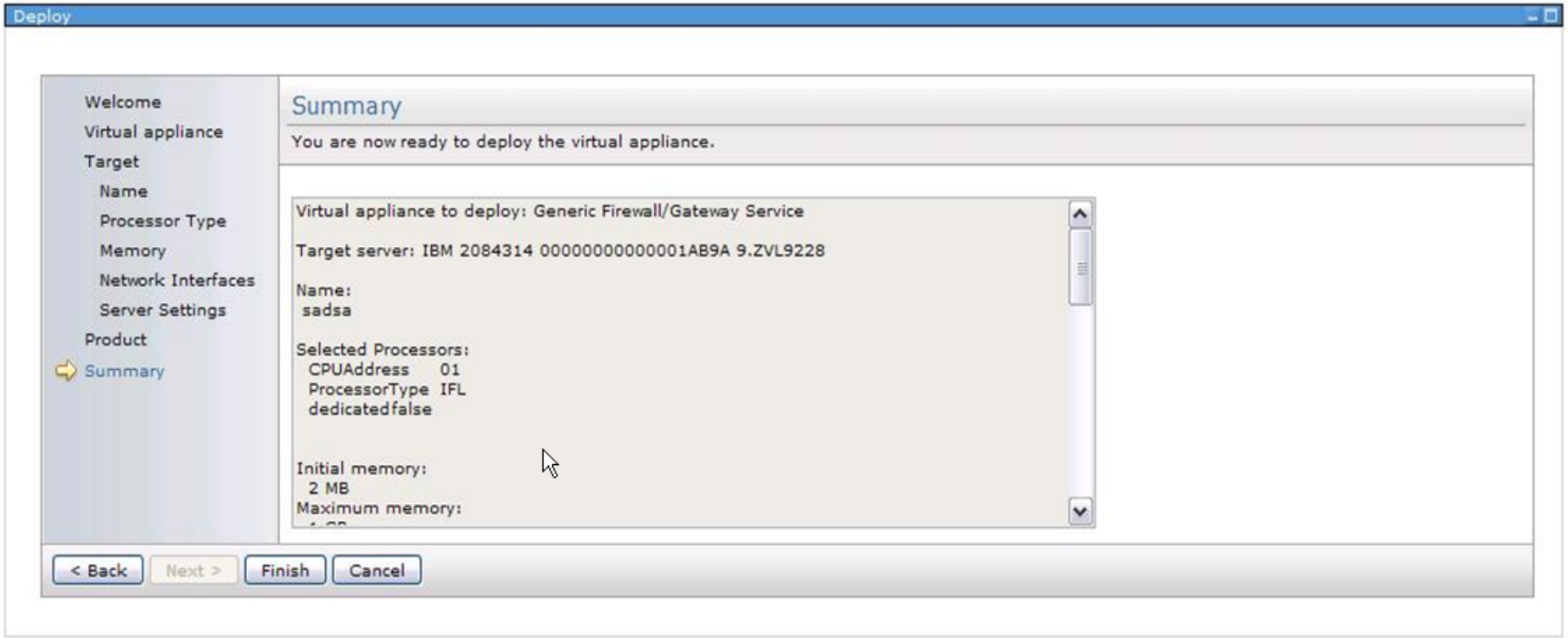
Deploying a Virtual Appliance – z/VM Details cont.

- **Select specifics of z/VM virtual appliance and containing existing virtual server**
  - Processor, Processor Type, Memory, Network Interfaces, Server Settings



Deploying a Virtual Appliance – Summary

- Summary lists all parameters
- Run immediately or schedule for later deployment



VMControl Standard Edition Details - AIX

- **AIX NIM Server requirements:**
  - Already configured as a NIM server
  - Running the Common Agent with latest updates (6.1.2 or later)
  - AIX 5.3 or 6.1.3 (highest level needed for AIX clients)
  - Installed filesets: dsm.core, openssh/openssl
  - Installed VMControl NIM Subagent
- **Virtual Appliances (mksysb and OVF-based metadata) are stored in /export/nim/appliances file directory (recommend a separate file system)**
- **Image Manager only captures/deploys from/to Virtual Servers**
  - Only LPARs managed by an HMC or IVM, not standalone
  - Only LPARs under a VIOS
- **Systems Director Server must be at 6.1.2.1 level or later**
- **Minimum of HMC 7.3.4.2 + MH01181 or IVM 2.1.0.10 required**
- **See ISD Redbook wiki for details and hints/tips**

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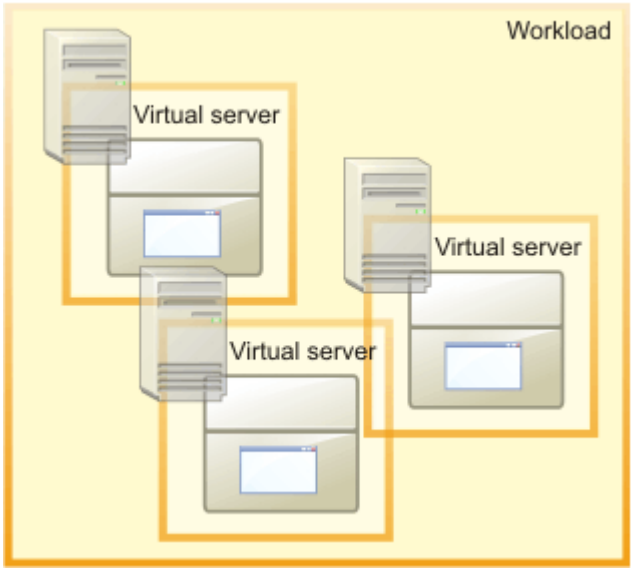
- IBM Systems Director Editions

Workloads



- **Definition:**
  - A deployed virtual appliance that allows you to monitor and manage one or more virtual servers as a single entity
- **Workloads**
  - Created from 'deploy' task
  - Edit
  - Group as Workload
  - Dashboard

Workloads (View Members)

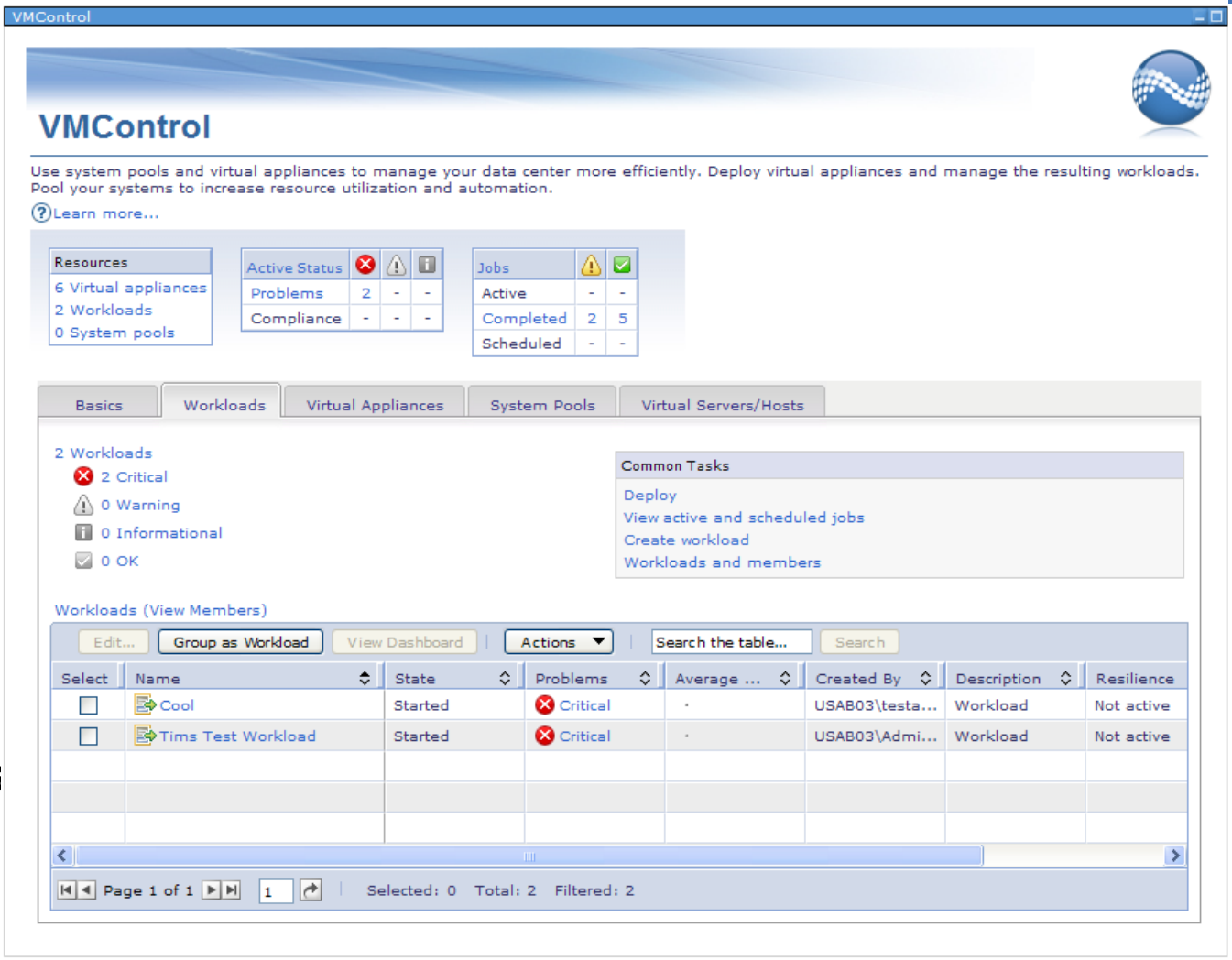
Edit... | Group as Workload | View Dashboard | Actions | Search the table... | Search

Select	Name	State	Problems	Average ...	Peak CPU...	Created By	Description	Re
☐	Cool	Started	Critical	2%	3%	USAB03\testa...	Workload	Not
☐	Tims Test Workload	Started	Critical	...	...	USAB03\Admi...	Workload	Not

Page 1 of 1 | 1 | Selected: 0 Total: 2 Filtered: 2

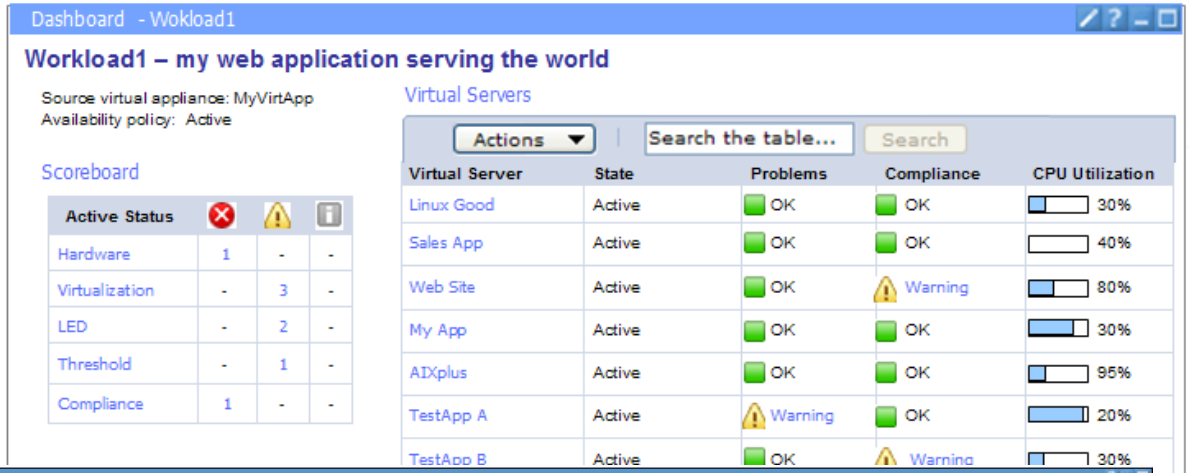
Workloads - User Interface

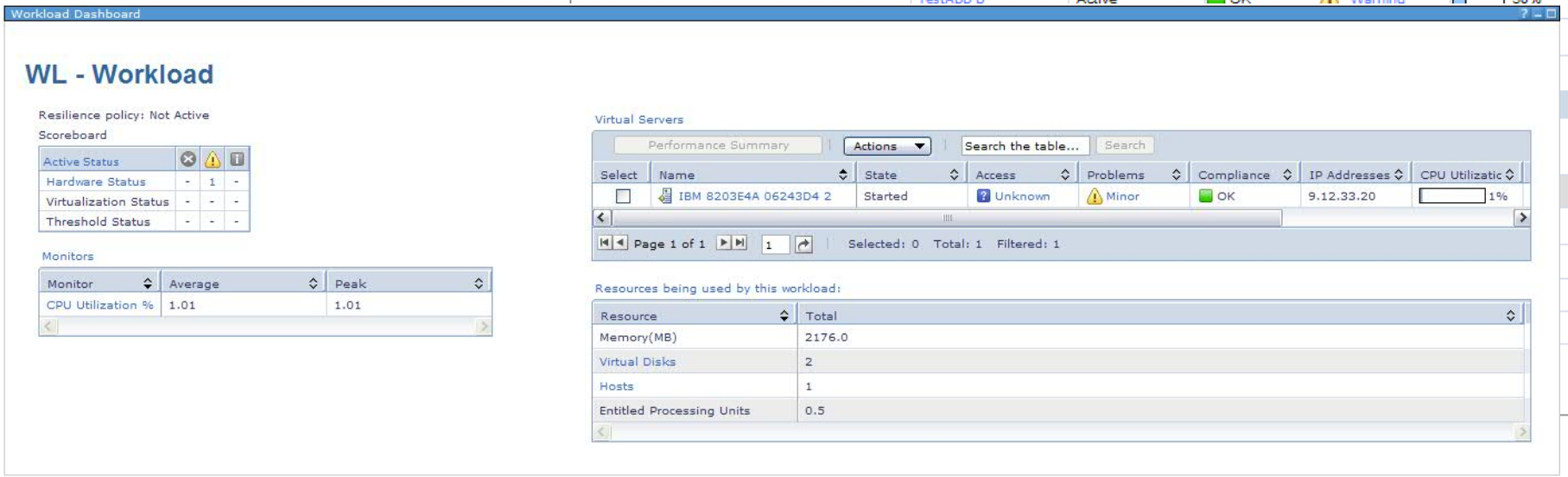
- Basics
- Workloads
  - Status
  - Lists
  - Deploy
  - Group as workload
  - Dashboard
- Virtual Appliances
- System Pools
- Virtual Servers/Hosts



Workload Dashboard

- Grouped virtual servers that contribute to the business
- Summarize resources used
- Aggregated monitoring

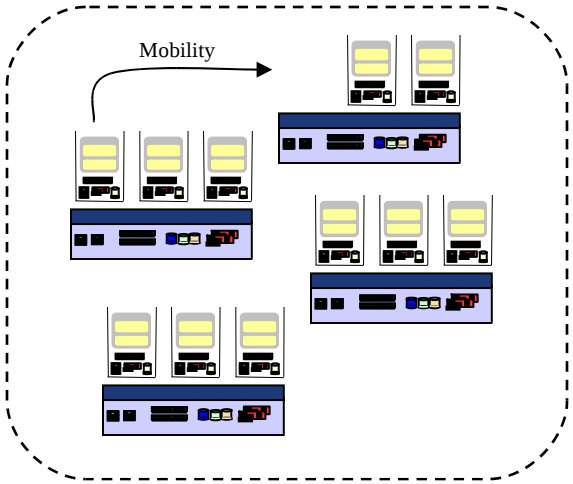




System Pools

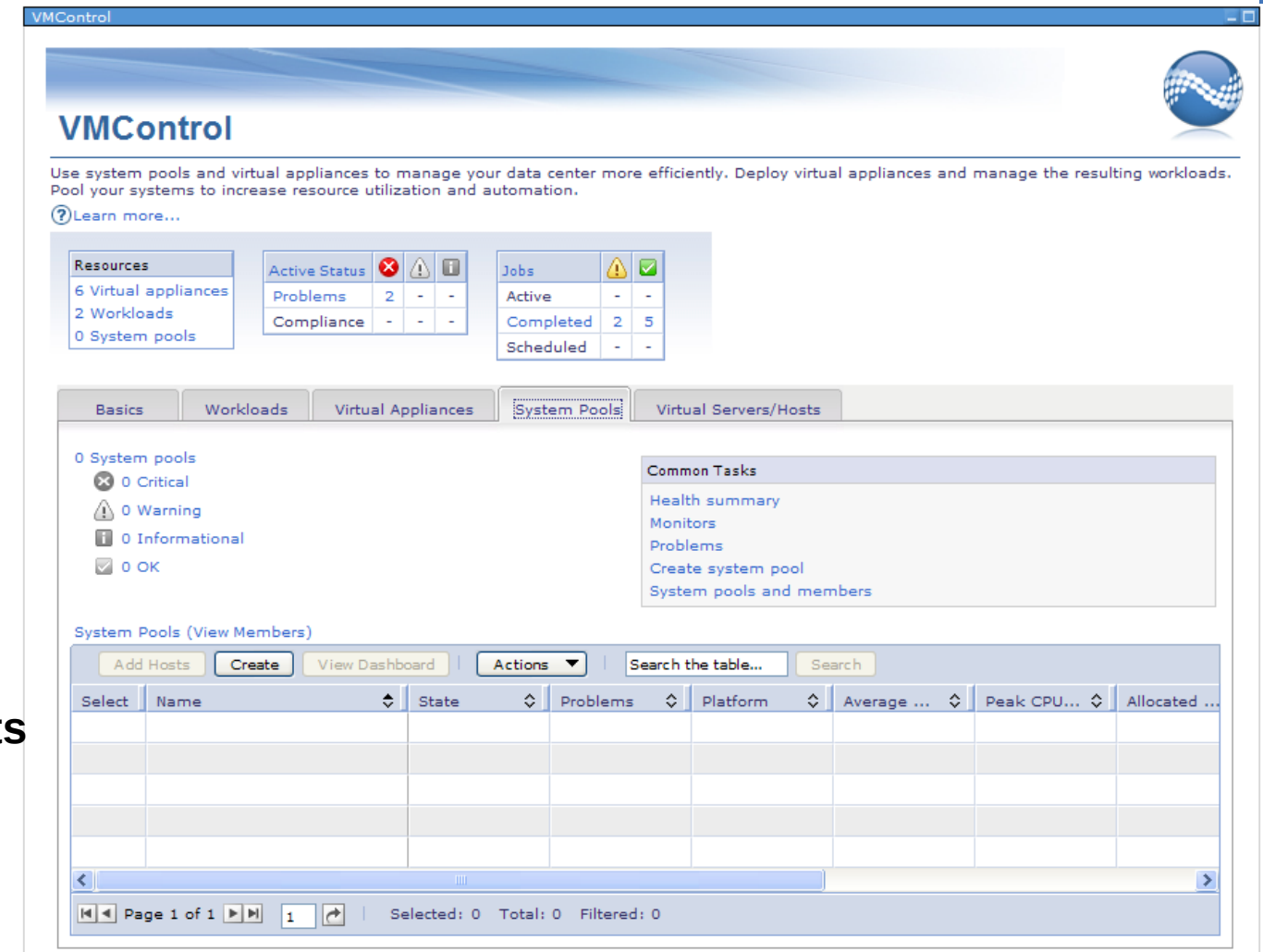
- **Definition:**
  - A logical group of like hosts and their virtual servers with the goal of better resource usage and workload resilience.
- **Capabilities:**
  - Create System Pool
  - Add/remove hosts
  - Monitor resilient workloads
  - Automatic placement during deploy
  - Dashboard

New type of system with IBM System Director, allowing the pool to be managed a single logical entity in the data center



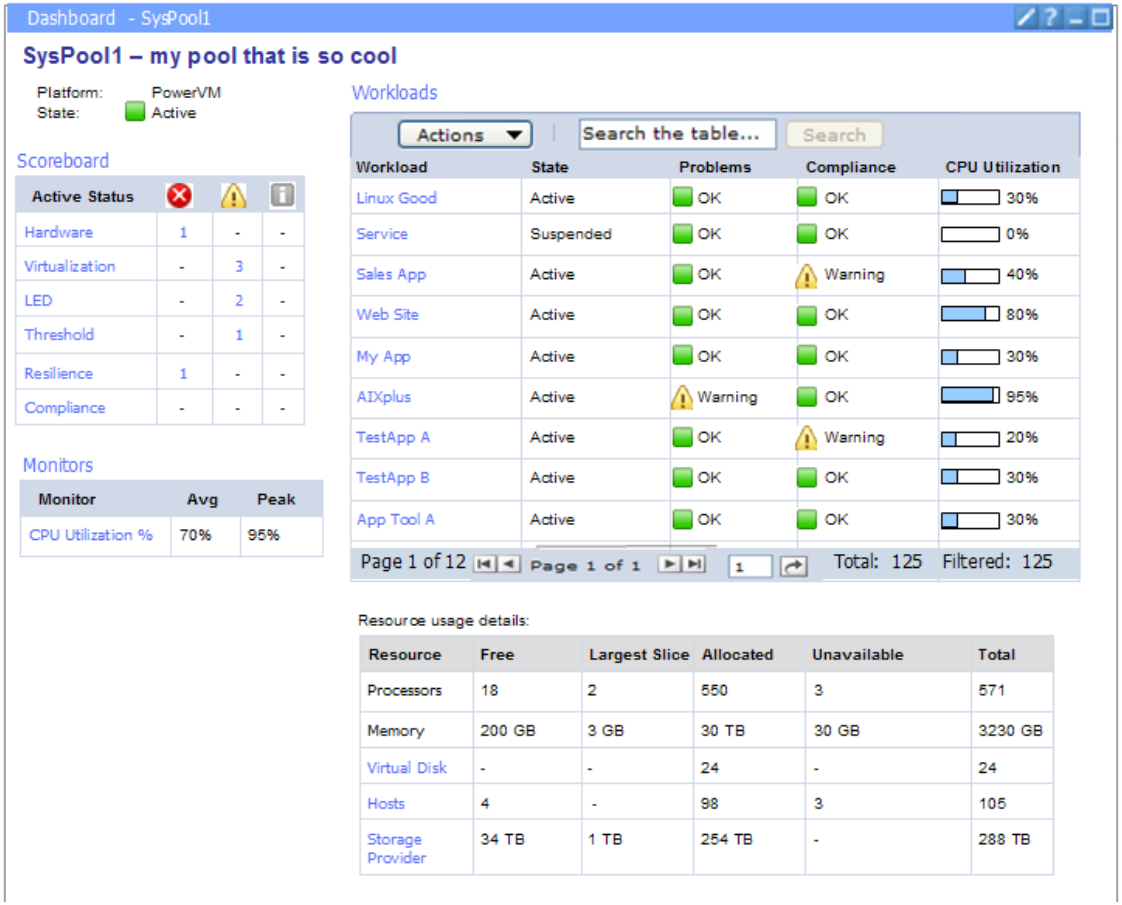
System Pools – User Interface

- **Basics**
- **Workloads**
- **Virtual Appliances**
- **System Pools**
  - Status
  - Lists
  - Create
  - Add Hosts
  - Dashboard
- **Virtual Servers/Hosts**



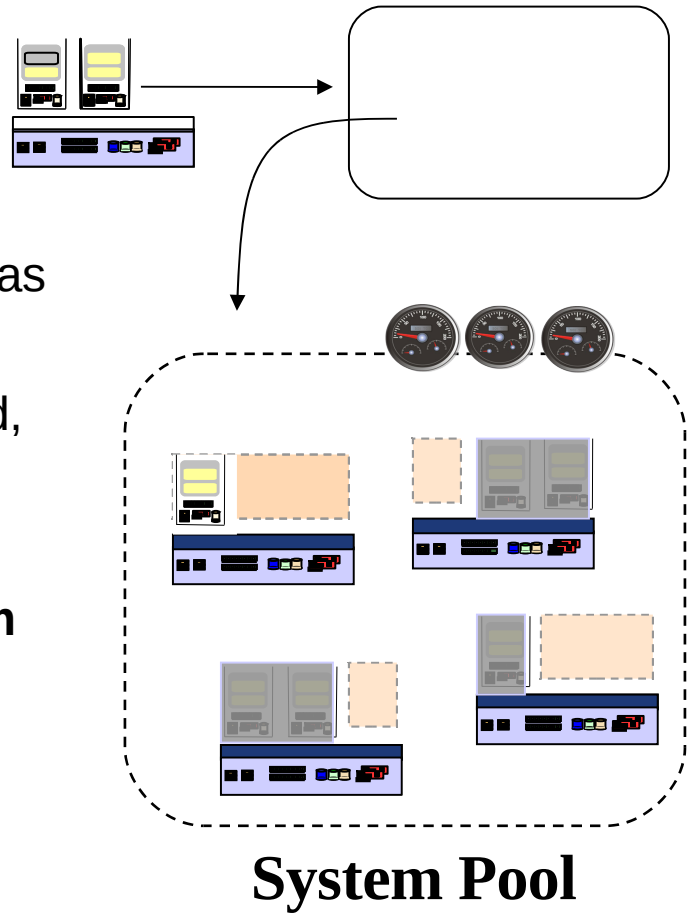
System Pools Dashboard

- Workloads running in a System Pool
- Resources used/available
- Aggregated monitoring
- Aggregated status



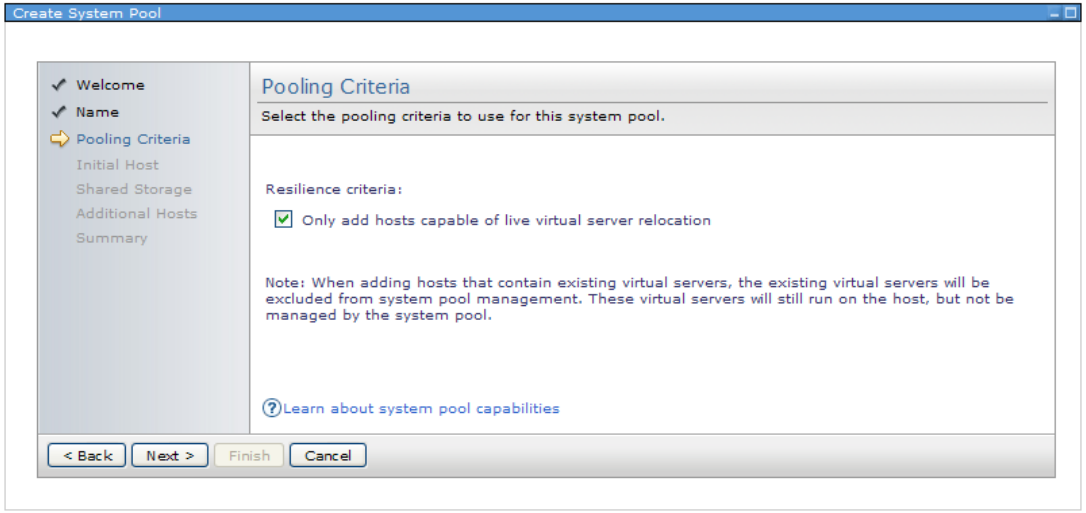
System Pools and Existing Systems

- **System Pools can be defined from a combination of new or existing servers**
  - For new systems, all of the system's capacity is added to the system pool
  - For existing systems, all of the remaining system's capacity is added and managed as part of the system pool
  - Any pre-existing workloads are recognized, but not managed as part of the system pool
- **Existing Workloads can be migrated to a system pool:**
  - Capture the existing virtual appliances
  - Deploy as a workload into a system pool



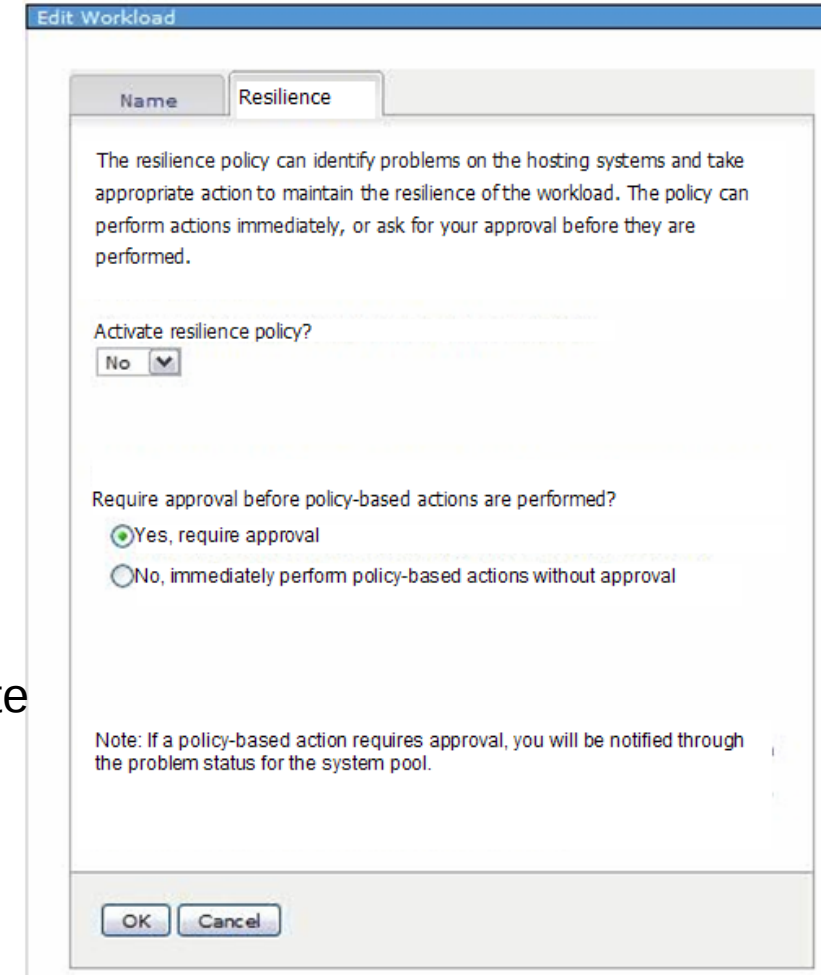
Workload Resilience within a System Pool

- **Resilience Policy can:**
  - Relocate virtual servers between hosts in the Pool
    - Supports both single VS and host evacuation
  - Move virtual servers away from a failing host



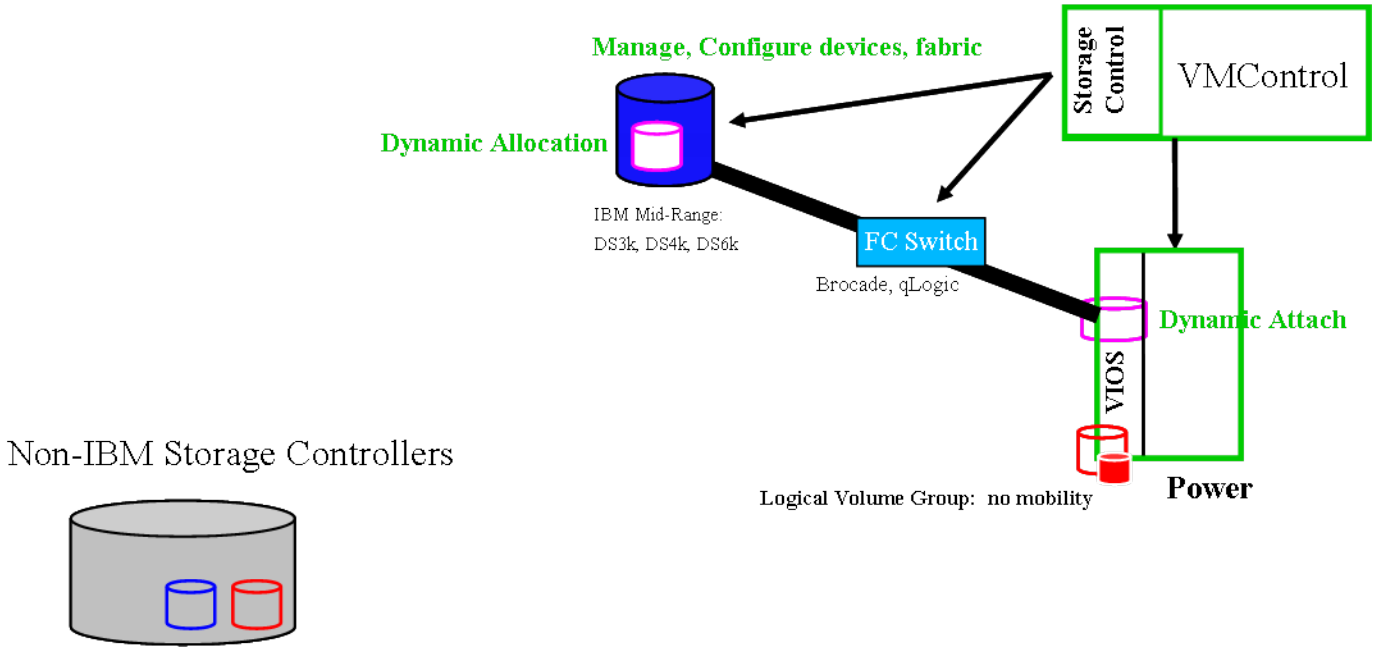
Workload Resilience Policy

- **Resilience Policy associated with the Workload**
  - Provide Workload resilience: yes/no
  - Enables host system monitoring for predictive failures
  - Automates recovery action based on admin choice
  - Users can add automation for customer thresholds
- **Automation Policy associated with the Workload**
  - Automate: require approval / automate
    - Require approval: VMControl makes a recommendation
    - Automate: VMControl takes the action



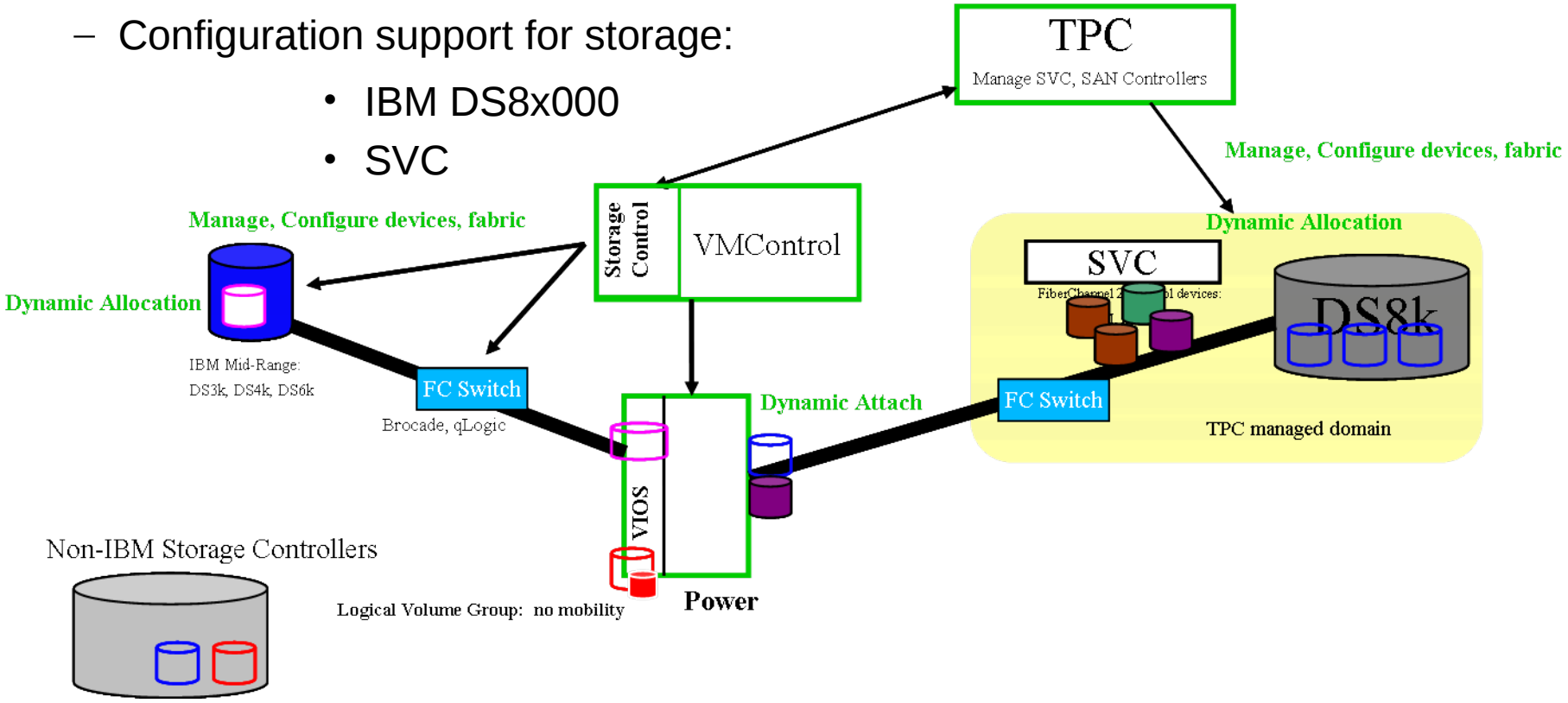
VMControl and Storage: Mid-Range

- **When managing storage with IBM Systems Director + VMControl:**
  - Configuration support for storage fabric/switches inherent to ISD
    - IBM mid-range storage products: DS4000, DS6000, DS3x000, nSeries 3600
    - Various SAN switches (see documentation)



VMControl and Storage: High-End

- **IBM Systems Director + VMControl**
  - Interoperates with Tivoli Storage Productivity Center (TPC) V4.1 or later via API for inventory on and provisioning of storage
  - Provides storage virtualization services for VMControl dynamic storage provisioning for both Image Management and Storage Pools
  - Configuration support for storage:
    - IBM DS8x000
    - SVC



VMControl Enterprise Edition Details for AIX Systems

- **These requirements are above and beyond what's needed for VMControl Standard Edition**
  - IBM Systems Director Server must be at 6.1.2.1 level or later
  - Appropriate X11 libraries to get through graphical installer
    - If not, then modify the installer.properties file for a silent install
  - For predictive failure notification for automated relocation:
    - HMC V7.3.5 or later, IVM 2.1.2 or later
  - For creation of, and deployment into, a System Pool, you must have shared storage managed by IBM Systems Director either directly of via TPC
  - Relocation within a System Pool requires LPM-capable (and appropriate PowerVM licensed) environment

Agenda

- VMControl V2.2 Overview
- Express Edition
  - Overview and Summary
  - Platform support – Power Systems, x86, z/VM
  - Performance Summary
- Standard Edition
  - Virtual Appliances
  - Capture, import, versioning, deploy
- Enterprise Edition
  - Workloads
  - System Pools
  - Resilience Policies
- *** IBM Systems Director Editions ***

IBM Systems Director Editions

Why Systems Director Edition?

Easier-to-order pre-packaged arrangements of some IBM Systems Director, Tivoli and AIX products to target customers with different systems management scope

All Systems Director Editions come with SWMA for the component pieces !

IBM Systems Director Express Edition for Power V6.1.2

Pieces and Parts:

IBM Systems Director products

- IBM Systems Director (ISD) 6.1.2
- ➔ ISD VMControl Express Edition for Power, V2.2
- ➔ ISD Service & Support Manager V6.1.2
- ➔ ISD Transition Manager for HP SIM V6.1

Tivoli products

- None

Note: Arrows indicate plug-ins (not standalone products) to IBM Systems Director

IBM Systems Director Standard Edition for Power V6.1.2

Pieces and Parts:

IBM Systems Director products

- IBM Systems Director (ISD) 6.1.2
- ➔ ISD VMControl Standard Edition for Power, V2.2
- ➔ ISD Service & Support Manager V6.1.2
- ➔ ISD Transition Manager for HP SIM V6.1
- ➔ ISD Active Energy Manager V4.2
- ➔ ISD Network Control V1.1

Tivoli products

- None

Note: Arrows indicate plug-ins (not standalone products) to IBM Systems Director

IBM Systems Director Enterprise Edition for Power V6.1.2

Pieces and Parts:

IBM Systems Director products

- IBM Systems Director (ISD) 6.1.2
- ➔ ISD VMControl Enterprise Edition for Power, V2.2
- ➔ ISD Service & Support Manager V6.1.2
- ➔ ISD Transition Manager for HP SIM V6.1
- ➔ ISD Active Energy Manager V4.2
- ➔ ISD Network Control V1.1

Tivoli products

- IBM Tivoli Monitoring (ITM)
- IBM Tivoli Monitoring for Energy Management
- IBM Tivoli Application Discovery and Dependency Manager (TADDM)
- IBM Systems Director Enterprise Edition Installation Launchpad

Note: Arrows indicate plug-ins (not standalone products) to IBM Systems Director

IBM AIX Enterprise Edition V6.1.1

Pieces and Parts:

IBM Systems Director products

- IBM Systems Director (ISD) 6.1.2
- ➔ ISD VMControl Enterprise Edition for Power, V2.2
- ➔ ISD Service & Support Manager V6.1.2
- ➔ ISD Transition Manager for HP SIM V6.1
- ➔ ISD Active Energy Manager V4.2
- ➔ ISD Network Control V1.1

Tivoli products

- IBM Tivoli Monitoring (ITM)
- IBM Tivoli Monitoring for Energy Management
- IBM Tivoli Application Discovery and Dependency Manager (TADDM)
- IBM Systems Director Enterprise Edition Installation Launchpad

AIX and other products

- AIX 6.1.4
- ➔ PowerVM Workload Partitions Manager V2.1

Express Edition Installation Process

1. **Install Base ISD 6.1.2**
   - Update to 6.1.2.1
2. **Install Service and Support Manager V6.1.2**
3. **Install Transition Manager for HP SIM V6.1 (optional)**
4. **Install VMControl Express Edition**
   - Install V2.2

Standard Edition Installation Process

1. **Install Base ISD 6.1.2**
   - Update to 6.1.2.1
2. **Install AEM**
   - Install V4.2
   - Install permanent key
3. **Install Network Control**
   - Install V1.1
   - Install permanent key
4. **Install Service and Support Manager V6.1.2**
5. **Install Transition Manager for HP SIM V6.1 (optional)**
6. **Install VMControl Standard Edition**
   - Install V2.2
   - Install permanent key

Enterprise Edition Installation Process

1. **Install Base ISD 6.1.2**
   - Update to 6.1.2.1
2. **Install AEM**
   - Install V4.2
   - Install permanent key
3. **Install Network Control**
   - Install V1.1
   - Install permanent key
4. **Install Service and Support Manager V6.1.2**
5. **Install Transition Manager for HP SIM V6.1 (optional)**
6. **Install VMControl Enterprise Edition**
   - Install V2.2
   - Install permanent key
7. **Install the Tivoli Products using the ISD EE Tivoli Install Launchpad**
   - This will cause you to swap DVDs (~23) on multiple systems

Editions Requisite Information

Operating System

AIX 5.3 or 6.1 (levels based on ISD 6.1.2 base code support)

RHEL AS 4, 5 for Power

SLES 9, 10 for Power

Standard Edition requires a NIM Server and all the pre-reqs for VMControl Standard Edition

Enterprise Edition requires two additional LPARs above and beyond the IBM Systems Director Server

These are for the Tivoli Products

Additional References

> IBM Systems Director InfoCenter:

publib.boulder.ibm.com/infocenter/director/v6r1x/index.jsp

> VMControl InfoCenter:

publib.boulder.ibm.com/infocenter/director/v6r1x/topic/vim_220/fsd0_vim_main.html

> IBM Systems Director wiki:

www-01.ibm.com/redbooks/community/display/director/IBM+Systems+Director+6.1

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