

IBM zEnterprise System for z/VM



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Notes:

Performance is in Internal Throughput Rate (ITR) ratio based on measurements and projections using standard IBM benchmarks in a controlled environment. The actual throughput that any user will experience will vary depending upon considerations such as the amount of multiprogramming in the user's job stream, the I/O configuration, the storage configuration, and the workload processed. Therefore, no assurance can be given that an individual user will achieve throughput improvements equivalent to the performance ratios stated here.

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Agenda

- zEnterprise System Overview
- HMC-Based z/VM Management
- New HMC Roles
- zEnterprise Unified Resource Manager
- zEnterprise Synergy with z/VM
- Performance Management
- Conclusion

IBM zEnterprise System – Best in Class Systems and Software Technologies

A system of systems that unifies IT for predictable service delivery



Unified management for a smarter system: **zEnterprise Unified Resource Manager**

- Unifies management of resources, extending IBM System z® qualities of service end-to-end across workloads
- Provides platform, hardware and workload management

The world's fastest and most scalable system:
IBM zEnterprise™ 196 (z196)

Scale out to a trillion instructions per second:
IBM zEnterprise BladeCenter® Extension (zBX)

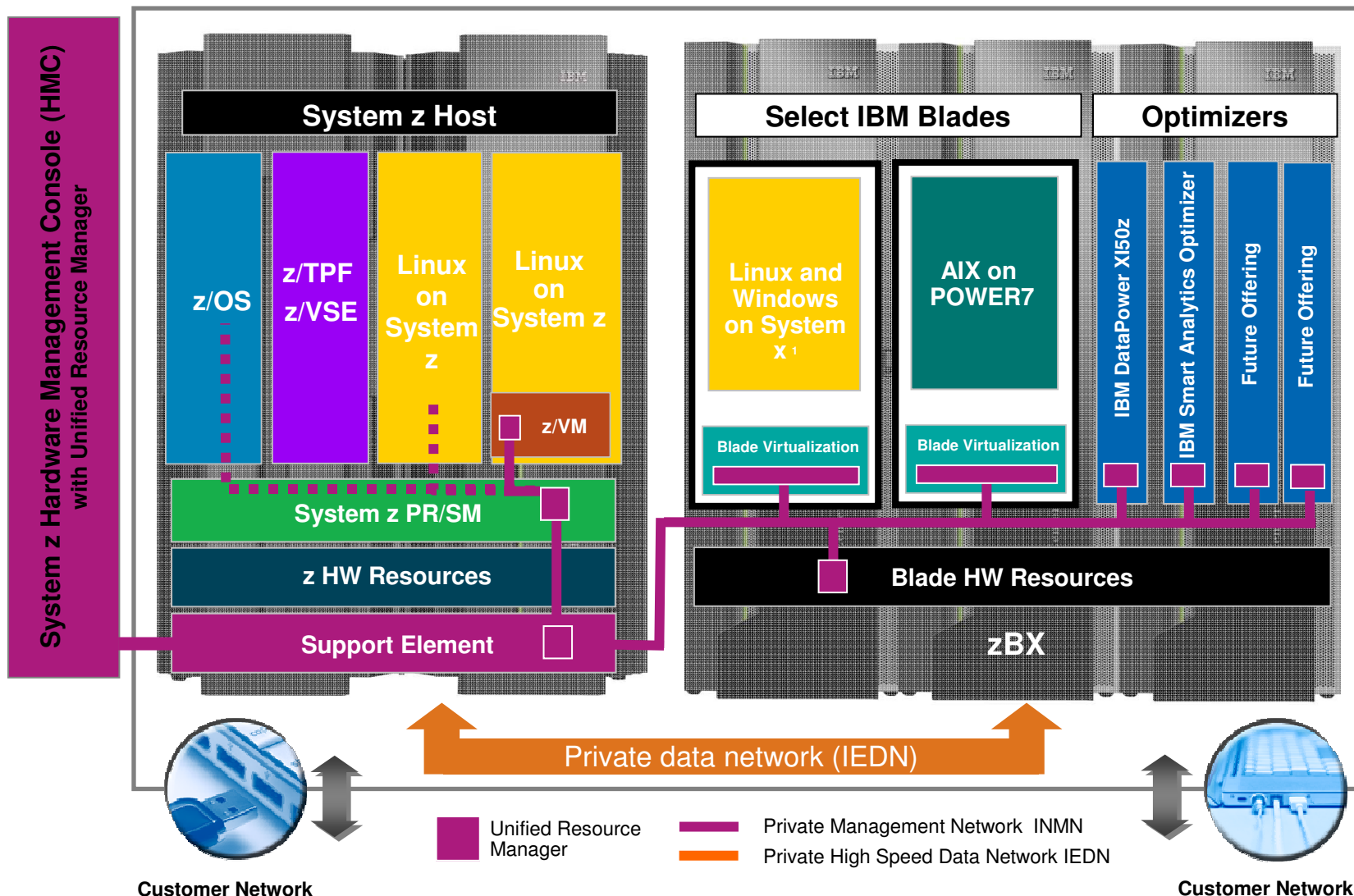
- Selected IBM POWER7® blades and IBM System x® Blades¹ for tens of thousands of AIX® and Linux applications
- High performance optimizers and appliances to accelerate time to insight and reduce cost
- Dedicated high performance private network



- Ideal for large scale data and transaction serving and mission critical applications
- Most efficient platform for Large-scale Linux® consolidation
- Leveraging a large portfolio of z/OS® and Linux on System z applications
- Capable of massive scale up, over 50 Billion Instructions per Second (BIPS)

Putting zEnterprise System to the task

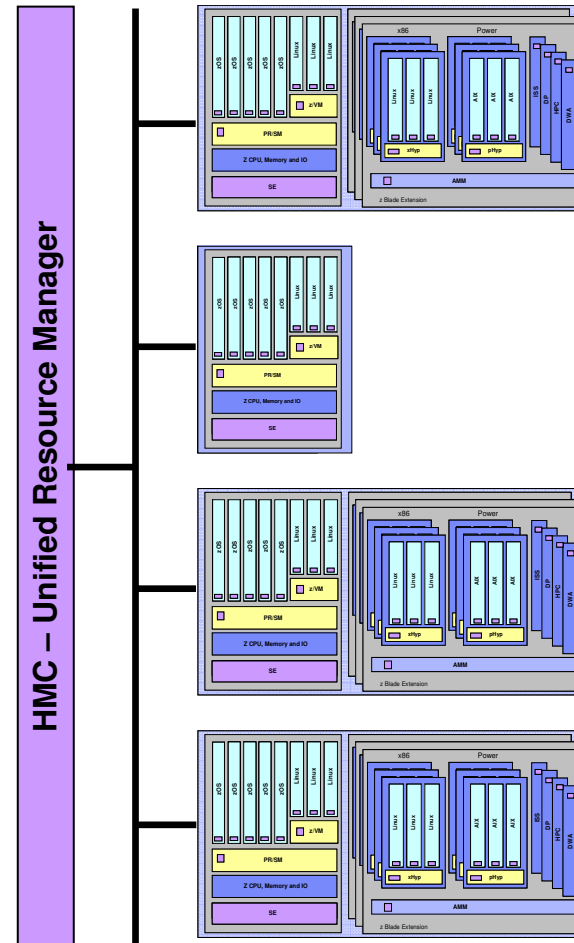
Use the smarter solution to improve your application design



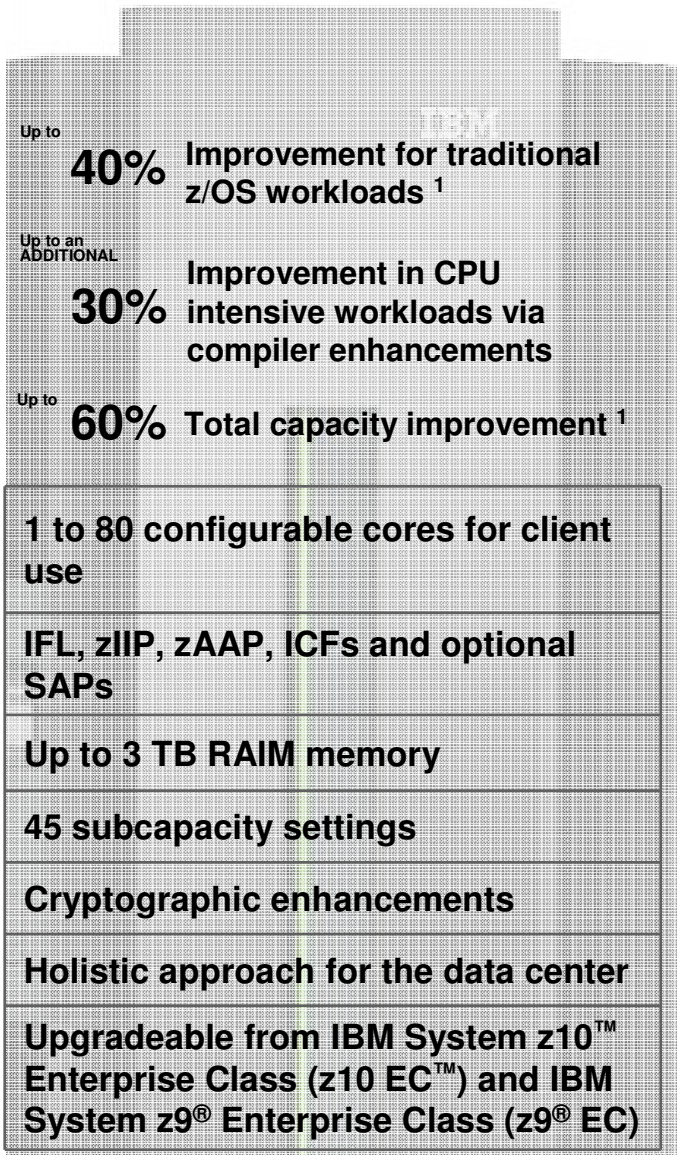
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zEnterprise Ensemble

- A zEnterprise Node is a single zCEC with 0 to 4 zBX racks and up to two blade centers per rack
- A zEnterprise Ensemble is a collection of 1 to 8 zEnterprise Nodes managed as a single virtualized pool of server resources
- A zEnterprise node can be a member of a single ensemble
- An ensemble is the management scope for the Unified Resource Manager
- A primary / alternate pair of HMCs provides the management console for the ensemble
 - The alternate HMC takes over in case the primary fails



The Value Begins At the Heart of z196 ...



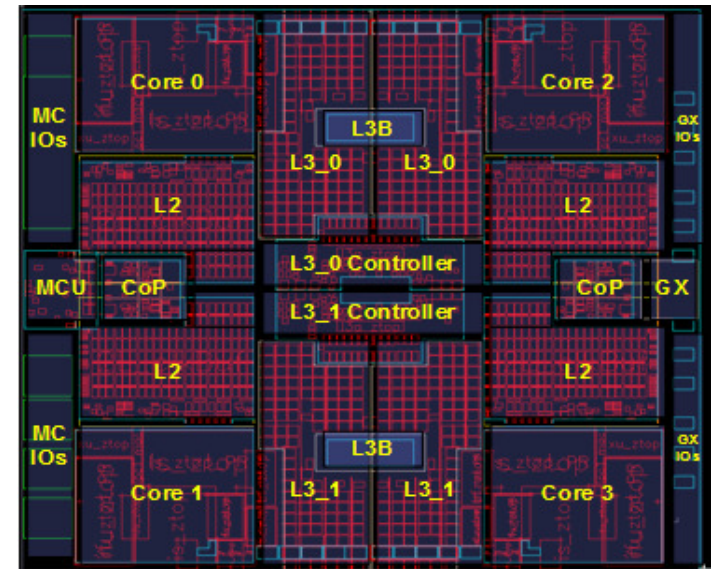
zEnterprise 196 (z196) ***Machine Type: 2817*** ***Models: M15, M32, M49, M66, M80***

- **Improved connectivity**
 - One to four books
 - Hot pluggable I/O drawer
 - InfiniBand Coupling links
- **Focus on the environment**
 - Options to help eliminate hotspots and save on energy
 - Static power savings
 - Query maximum potential power
 - Leadership technology for cooling and power distribution
- **Operating System Flexibility**
 - z/OS, z/VM®, z/VSE™, z/TPF and Linux on System z
- **Security and reliability**
 - Elliptic curve cryptography
 - Concurrent patch update enhancements

¹ For average LSPR workloads running z/OS 1.11.

z196 – IBM Leadership Technology At the Core

- **New 5.2 GHz Quad Core Processor Chip boosts hardware price/performance**
 - 100 new instructions – improvements for CPU-intensive, Java™, and C++ applications
 - Over twice as much on-chip cache as System z10 to help optimize data serving environment
 - Out-of-order execution sequence gives significant performance boost for compute-intensive applications
 - Significant improvement for floating-point workloads
- **Performance improvement for systems with large numbers of cores – improves MP ratio**
- **Data compression and cryptographic processors right on the chip**



z196 – Helping to Control Energy Consumption in the Data Center

- **Better control of energy use and improved efficiency in your data center**
- **New water-cooled option allows energy savings without compromising performance**
 - Maximum capacity server has improved power efficiency of 60% compared to the System z10 and a 70% improvement with the water-cooled option
- **Save input power with optional High-Voltage DC by removing the need for an additional DC to AC inversion step in the data center**
- **Improve flexibility with overhead cabling option while helping to increase air flow in a raised floor environment**
- **z196 is same footprint as System z10 EC¹**



... and the Value Extends To Heterogeneous Platforms ...

IBM zEnterprise BladeCenter Extension (zBX) Machine Type: 2458 – Model 002

- **Integrated IBM Certified Components driven by System z order**
 - Standard parts – TOR switch, BladeCenter Chassis, Power Distribution Units, optional Acoustic Panels
- **System z support**
 - Problem reporting, hardware and firmware updates
- **Expanding operating system support for zEnterprise**
 - AIX, Linux on x86¹
- **Simplified management**
 - Improved time to install and implement new applications
 - Central point of management for heterogeneous workloads
 - No change to applications



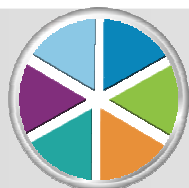
Optimizers

- IBM Smart Analytics Optimizer
- WebSphere® DataPower® XI50z appliance

Select IBM Blades

- BladeCenter PS701 Express
- IBM x86¹

One to four – 42u racks – capacity for 112 blades
No System z software running in zBX – Passport Advantage software licensed to blades
No MIPS/MSU rating
Configured for high availability
Optional rear door heat exchanger



**... managed by the
zEnterprise Unified Resource Manager**

zBX ... Infrastructure to Support More Resources

- **zBX houses the multiplatform solutions key to the zEnterprise System**
 - Optimizers that are dedicated to workloads
 - IBM Smart Analytics Optimizer and WebSphere DataPower XI50z appliance
 - Closed environments with hardware and software included in solution
 - Individualized tools for sizing and customizing – dependent on the optimizer
 - Select IBM POWER7 and System x¹ blades – running *any* application supported by the operating system installed on the blade – with no change
 - Mix Smart Analytics Optimizer with POWER7 and System x blades in same rack
 - Mix XI50z with POWER7 and System x blades in same BladeCenter chassis
 - zBX is a System z machine type for integrated fulfillment, maintenance, and support
- **Secure network connection between zBX and z196 for data and support**
 - Fast 10 Gb Ethernet connection to the data
 - Less latency – fewer ‘hops’ to get to the data and no need for encryption / firewall
 - Traffic on user networks not affected
- **Sharing of resources – up to eight z196 servers can attach to the zBX and have access to solutions**
- **Configuration, support, monitoring, management – all by Unified Resource Manager**

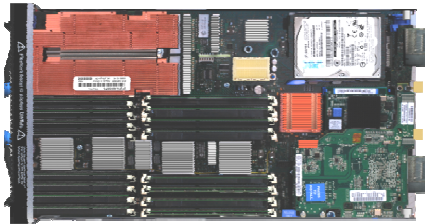


IBM POWER7 and System x¹ Blades

General purpose processors under one management umbrella

What is it?

The zBX infrastructure can host select IBM POWER7 and System x blades. Each blade comes with an installed hypervisor that offers the possibility of running an application that spans z/OS, Linux on System z, AIX on POWER®, or Linux and Windows on System x (SOD) ¹ but have it under a single management umbrella.



How is it different?

- **Complete management:** Advanced management brings operational control and cost benefits, improved security, workload management based on goals and policies
- **Virtualized and Optimized:** Virtualization means fewer resources are required to meet peak demands with optimized interconnection
- **Integrated:** Integration with System z brings heterogeneous resources together that can be managed as one
- **Transparency:** Applications certified to run on AIX, Linux, and Windows will also be certified and run on blades without changes to deployed guest images
- **More applications:** Brings larger application portfolio to System z

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IBM Smart Analytics Optimizer

Capitalizing on breakthrough technologies to accelerate business analytics

What is it?

The IBM Smart Analytics Optimizer is a workload optimized, appliance-like, add-on, that enables the integration of business insights into operational processes to drive winning strategies. It accelerates select queries, with unprecedented response times.



How is it different?

- **Performance:** Unprecedented response times to enable 'train of thought' analyses frequently blocked by poor query performance
- **Integration:** Connects to DB2® through deep integration providing transparency to all applications
- **Self-managed workloads:** Queries are executed in the most efficient way
- **Transparency:** Applications connected to DB2, are entirely unaware of IBM Smart Analytics Optimizer
- **Simplified administration:** Appliance-like hands-free operations, eliminating many database tuning tasks

Faster insights for enabling new opportunities

WebSphere DataPower XI50z Appliance

Purpose-built hardware for simplified deployment and hardened security

What is it?

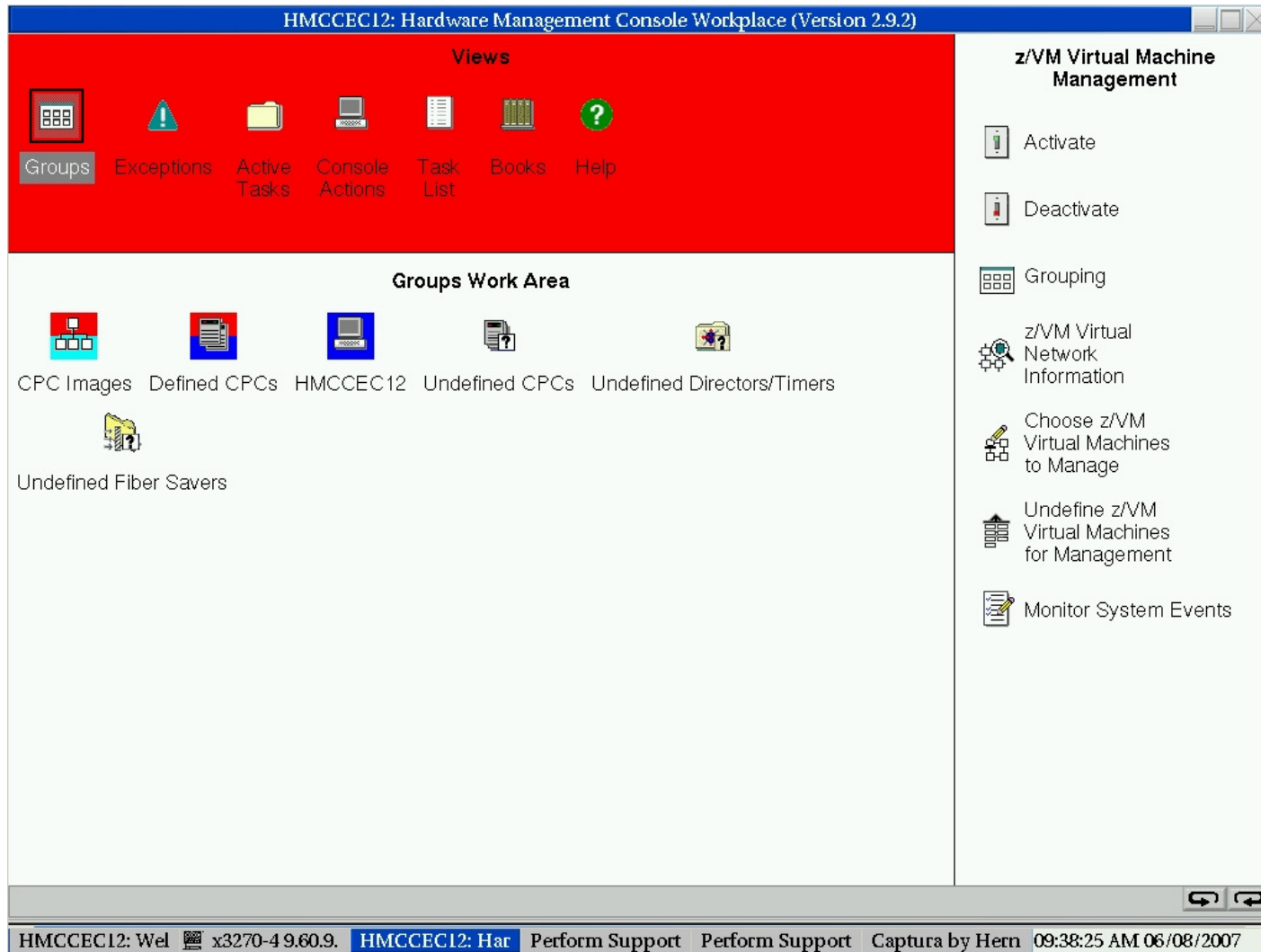
The IBM WebSphere XI50z DataPower appliance integrated in the zEnterprise System can help simplify, govern, and enhance the security of XML and IT services by providing connectivity, gateway functions, data transformation, protocol bridging, and intelligent load distribution.



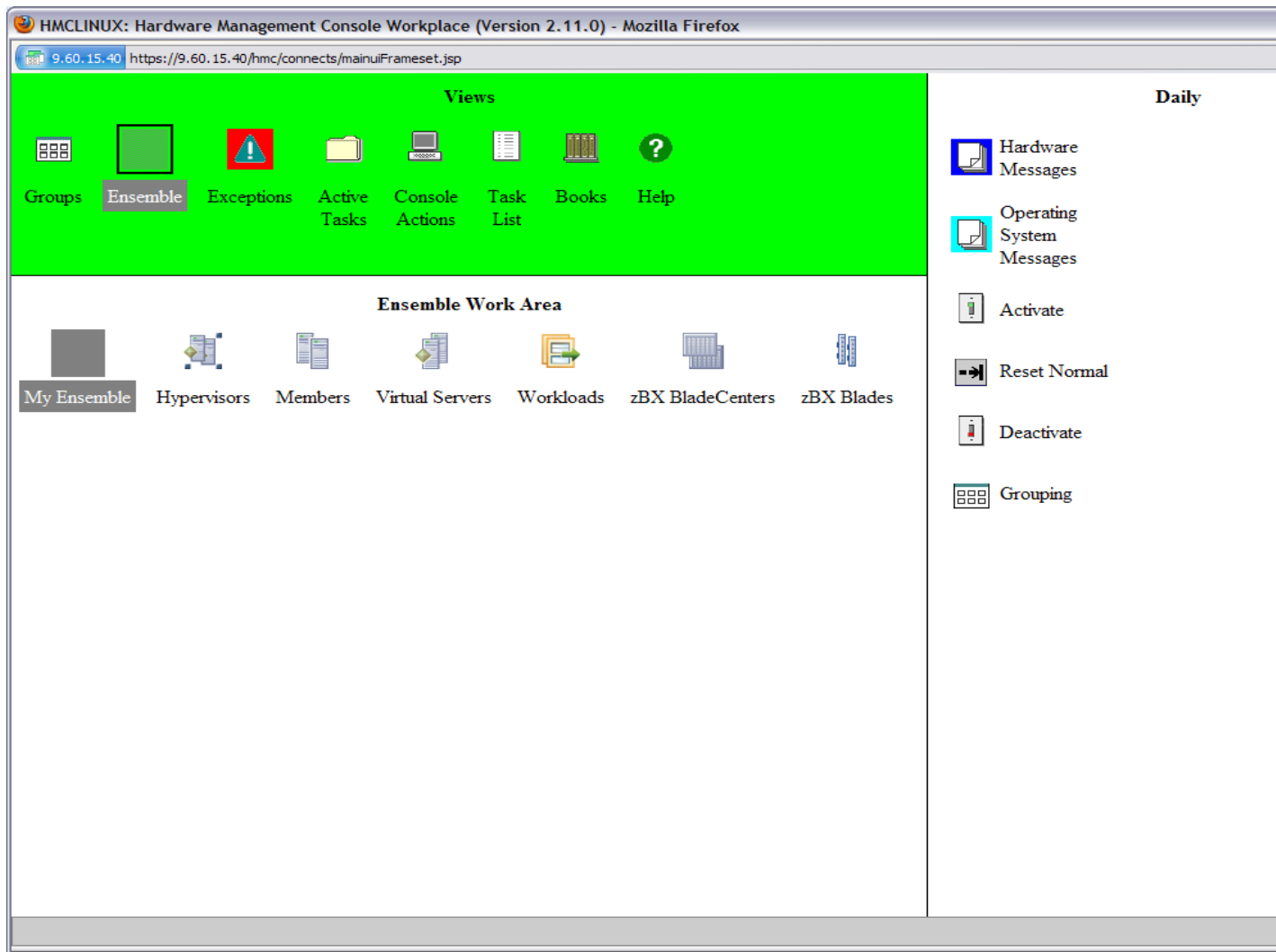
How is it different?

- **Security:** VLAN support provides enforced isolation of network traffic with secure private networks and integration with RACF® security
- **Improved support:** Monitoring of hardware with “call home” for current/expected problems and support by System z Service Support Representative
- **System z packaging:** Increased quality with pre-testing of blades and zBX; upgrade history available to ease growth; guided placement of blades to optimize
- **Operational controls:** Monitoring rolled into System z environment from single console; time synchronization with System z; consistent change management with Unified Resource Manager

System z10 HMC-Based z/VM Management



zEnterprise HMC-Based z/VM Management



NEXTGEN: Hardware Management Console Workplace (Version 2.11.0) - Mozilla Firefox

9.60.92.193 https://9.60.92.193/hmc/connects/mainuiFrameset.jsp

Hardware Management Console

Systems Management > My Ensemble

All Resources | Hypervisors | Virtual Servers

Table | Topology

Select	Name	Status	Description
<input type="checkbox"/>	Members	Exceptions	
<input type="checkbox"/>	PZBONZAI	Communications not active	Central Processing Complex (CPC)
<input type="checkbox"/>	BladeCenters	OK	All zBx BladeCenters of the Server
<input type="checkbox"/>	B.1	Operating	Represents one BladeCenter
<input type="checkbox"/>	B.2	Operating	Represents one BladeCenter
<input type="checkbox"/>	C.1	Operating	Represents one BladeCenter
<input type="checkbox"/>	C.2	Operating	Represents one BladeCenter
<input type="checkbox"/>	Workloads		
<input type="checkbox"/>	Default		The default workload containing all unmanaged virtual servers.
<input type="checkbox"/>	Payroll		Payroll Workload

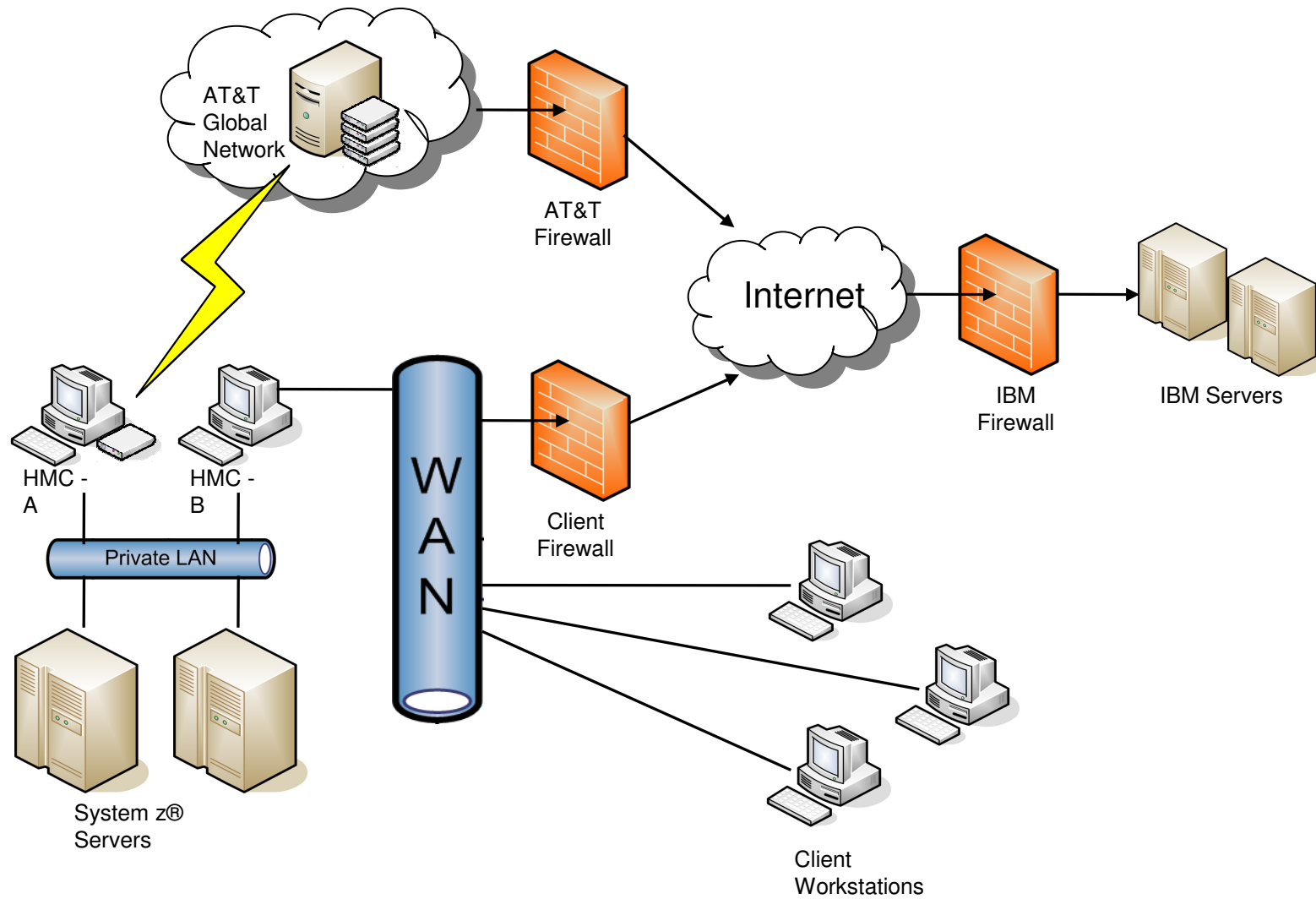
Max Page Size: 500 Total: 10 Filtered: 10 Selected: 0

Status: Exceptions and Messages

Tasks: My Ensemble | Ensemble Details | Toggle Lock | Monitor

The screenshot displays the IBM Hardware Management Console (HMC) interface in a Mozilla Firefox browser window. The browser title is "NEXTGEN: Hardware Management Console Workplace (Version 2.11.0) - Mozilla Firefox" and the address bar shows the URL "https://9.60.92.193/hmc/connects/mainuiFrameset.jsp". The main header of the application is "Hardware Management Console" with an IBM logo on the right. Below the header, there are navigation tabs for "Systems Management > My Ensemble", "All Resources", "Hypervisors", and "Virtual Servers". A left-hand navigation pane contains a tree view with categories like "Welcome", "Systems Management", "My Ensemble", "HMC Management", "Service Management", and "Tasks Index". The main content area shows a topology diagram titled "Table | Topology". The diagram illustrates a hierarchical structure: "Members" at the top, with a sub-member "PZBONZAI" below it. Both are connected to a central "BladeCenters" node. This node is further connected to four individual blade center nodes labeled "B.1", "B.2", "C.1", and "C.2". To the right of the BladeCenters, there is a "Workloads" section with a "Default" workload. The interface includes various toolbars for navigation and actions, and a status bar at the bottom left indicates "Status: Exceptions and Messages".

HMC Connectivity



HMC Security Infrastructure

- Hardware Management Console (HMC) extended to support new management roles
 - Secure SSL based remote access (optional)
 - Full complement of certificate management capabilities
 - Complete user management suite
 - Full-function user definition
 - Highly flexible password rule definition
 - Centralized authentication using LDAP
 - Complete access controls for tasks and resources allowed for each user (i.e., User Roles)
 - Automatic replication of configuration data
 - Full-function embedded firewall

Ensemble Management Users and Roles

- New task and resource roles enable isolation across management disciplines
- New predefined users EnsOperator and EnsAdmin

Role	Description
Ensemble Administrator	Responsible for creating and managing the zGryphon ensemble Create Ensemble, Add Member...
Virtual Network Administrator	Responsible for Managing Virtual Networks, Hosts, and MAC Prefixes Manage Virtual Networks, Add Hosts to Virtual Networks, Create VLAN IDs...
Virtual Server Administrator	Responsible for managing virtual servers New /Modify Virtual Server, Add Virtual Disk, Migrate...
Virtual Server Operator	Responsible for performing and scheduling virtual server activation/deactivation, mounting virtual media Activate, Deactivate, Mount Virtual Media, Console session...
Storage Resource Administrator	Responsible for managing storage resources – Storage Access Lists, WWPNS, z/VM Storage Groups Export WWPNS, Import SAL, Add Storage Resources...
Workload Administrator	Responsible for managing workloads New /Modify workload, Add / Remove Virtual Servers..
Performance Management Administrator	Responsible for managing performance policies New /Modify performance policy, Import policy
Performance Management Operator	Responsible for performing and scheduling policy activations and creating threshold notifications Activate, Export Policy, Monitor System Events
Energy Management Administrator	Responsible for managing power settings including power capping and power savings Set Power Cap, Set Power Savings Mode, Set zBX Power Policy

zEnterprise Unified Resource Manager

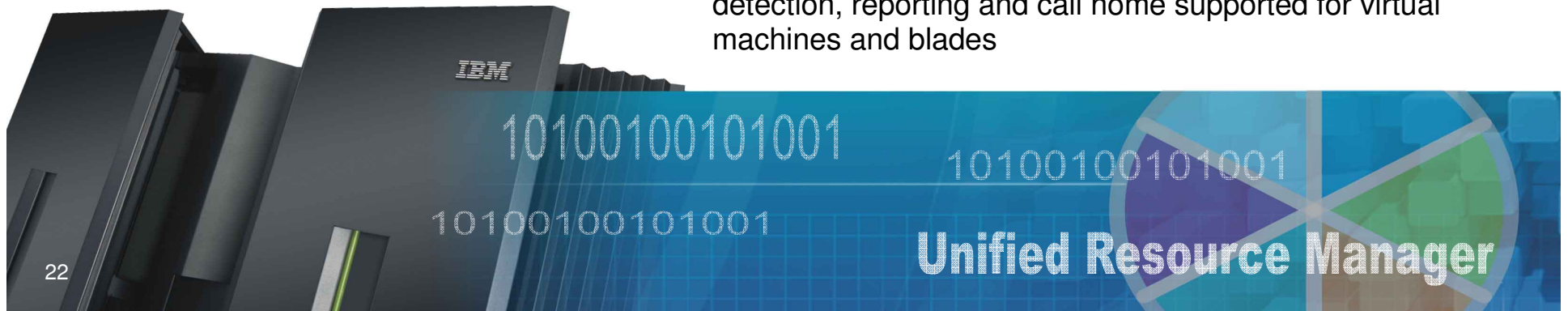
Transforming the way resources are managed and deployed

What is it?

*Unified Resource Manager provides **workload awareness** to optimize the system resources in accordance with understanding the policies assigned to that particular workload. Functions are grouped into two suites of tiered functionality that enable different levels of capability - Manage suite and Automate suite.*

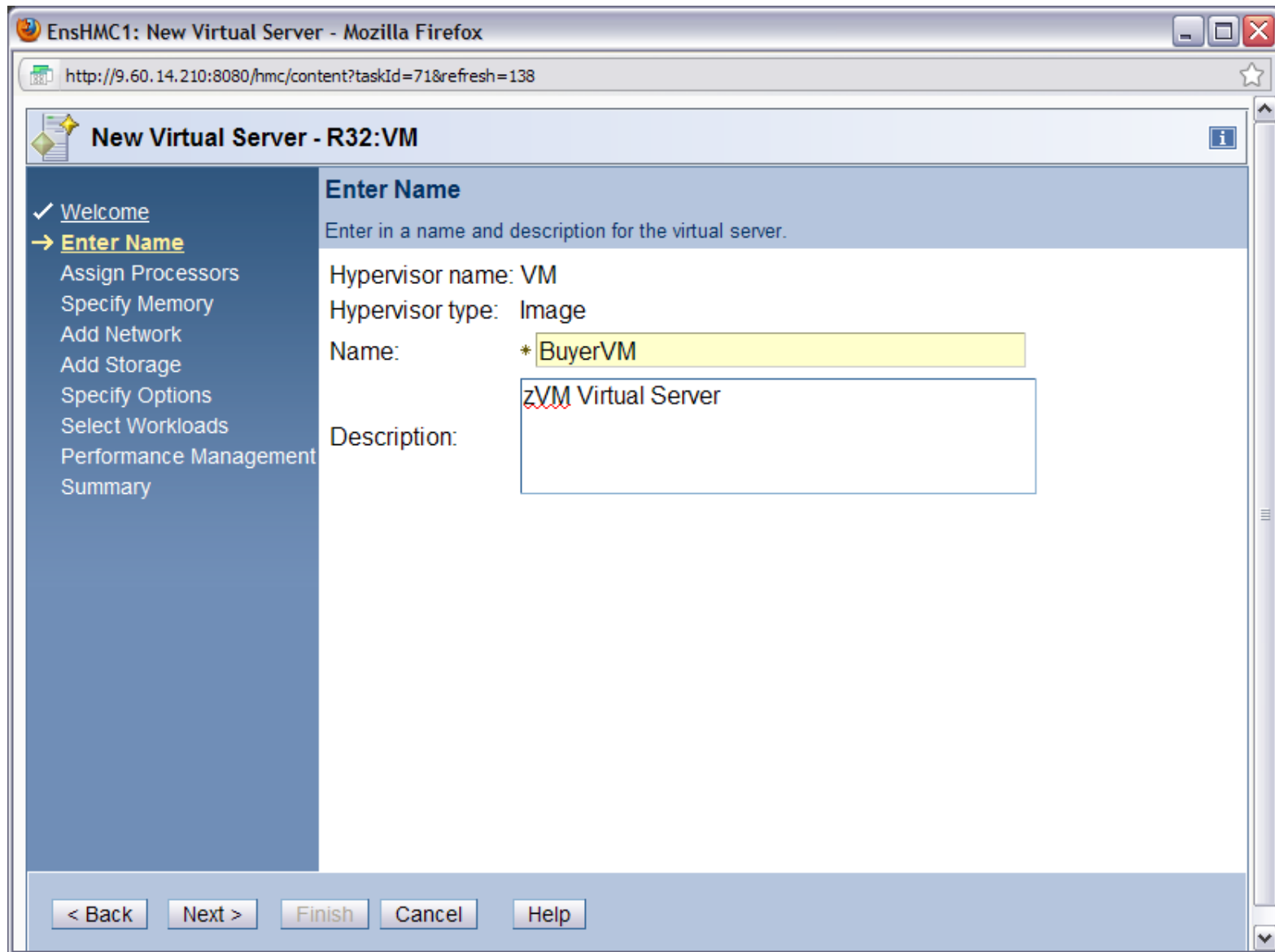
How is it different?

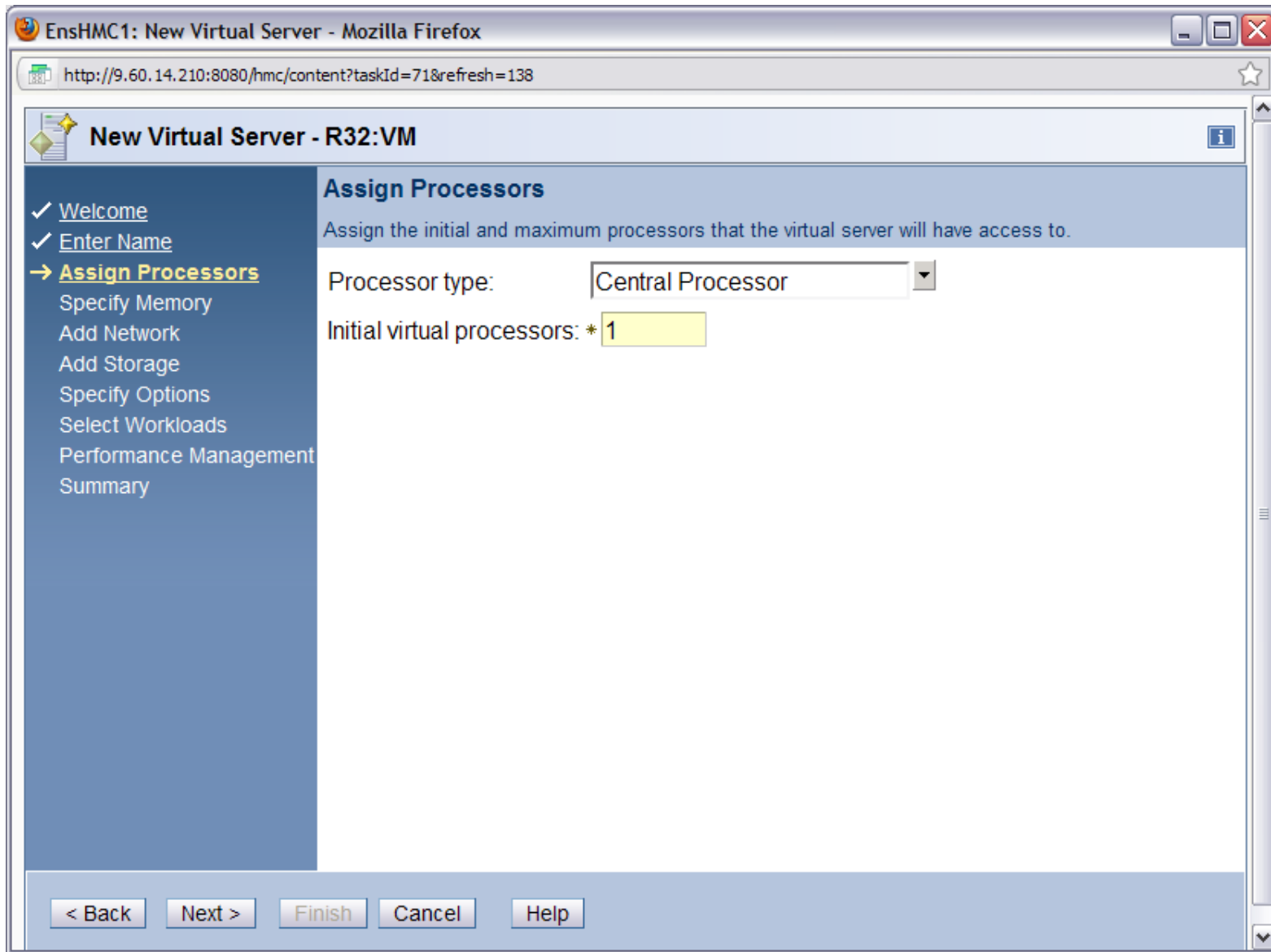
- **Heterogeneous management:** Total systems management across heterogeneous resources
- **Integration:** Single point of control, common skills for resources, reduced complexity of day to day operations
- **Monitoring.** New dashboard for CPU resources and energy management
- **Simplified installation:** Auto discovery and configuration of resources and workloads with single interface
- **Secure:** Improved network security with lower latency, less hops and less complexity. Improved control of access due to management of hypervisors as firmware
- **Service and support management:** Hardware problem detection, reporting and call home supported for virtual machines and blades

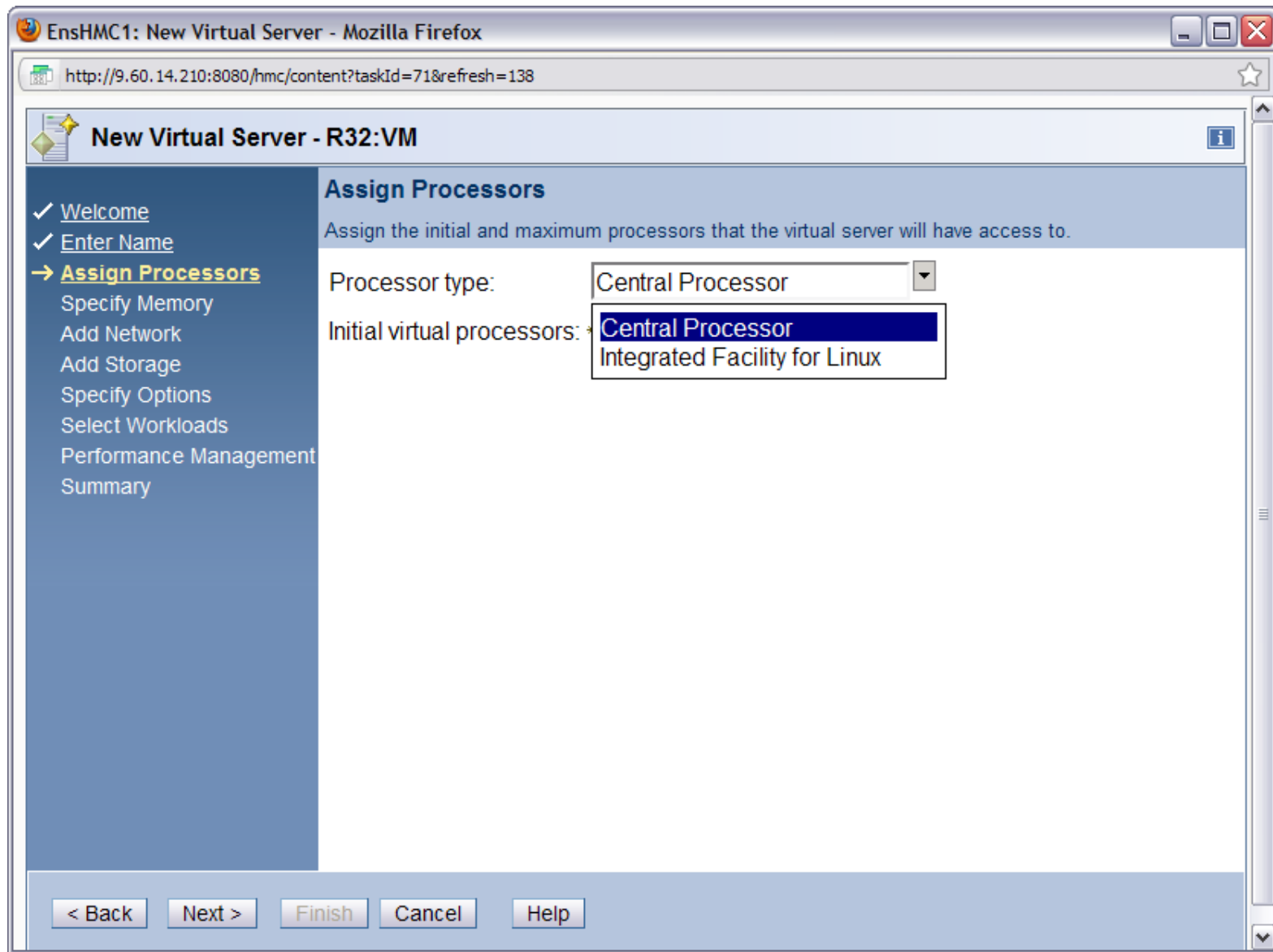


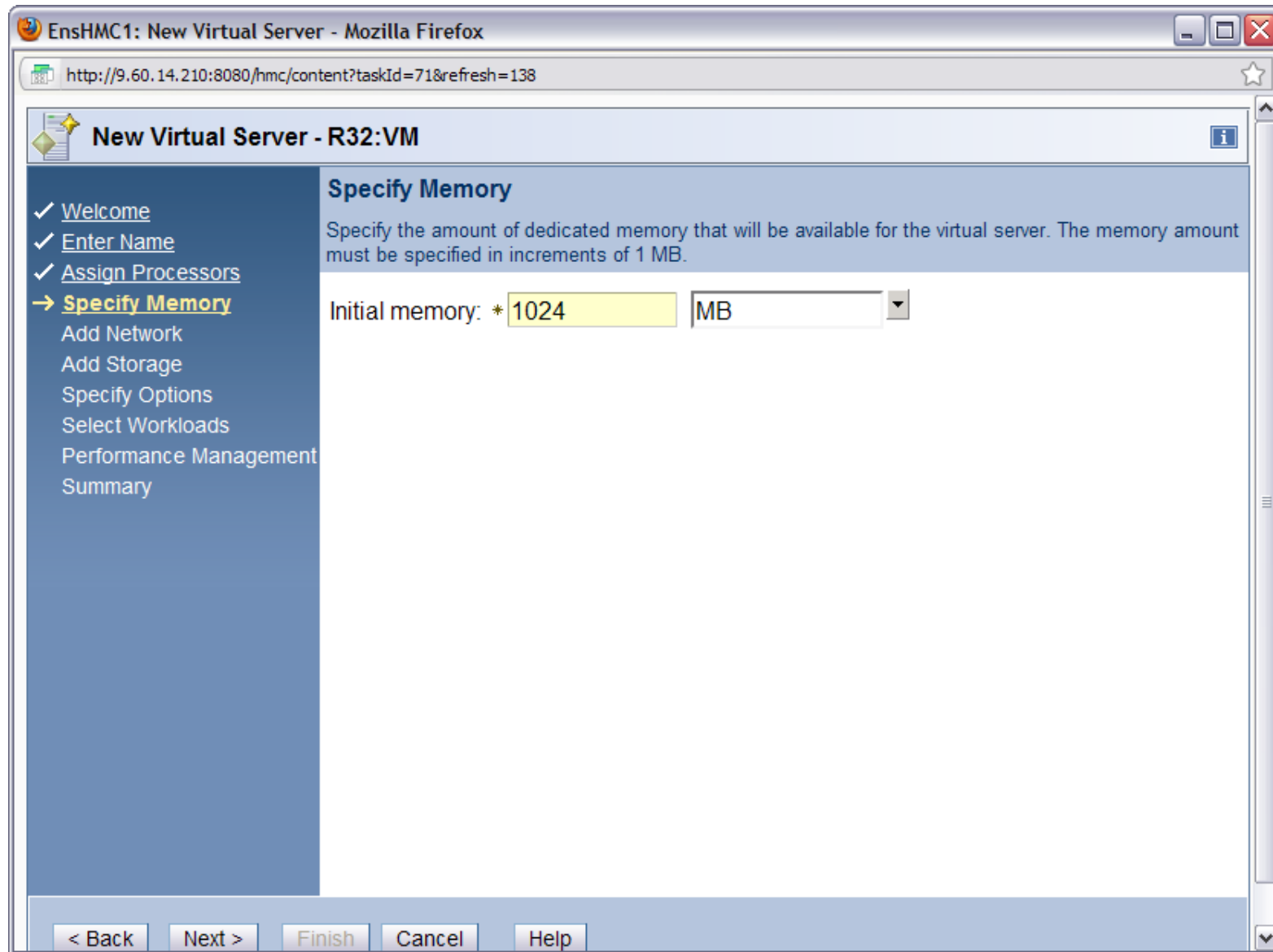
Use Cases

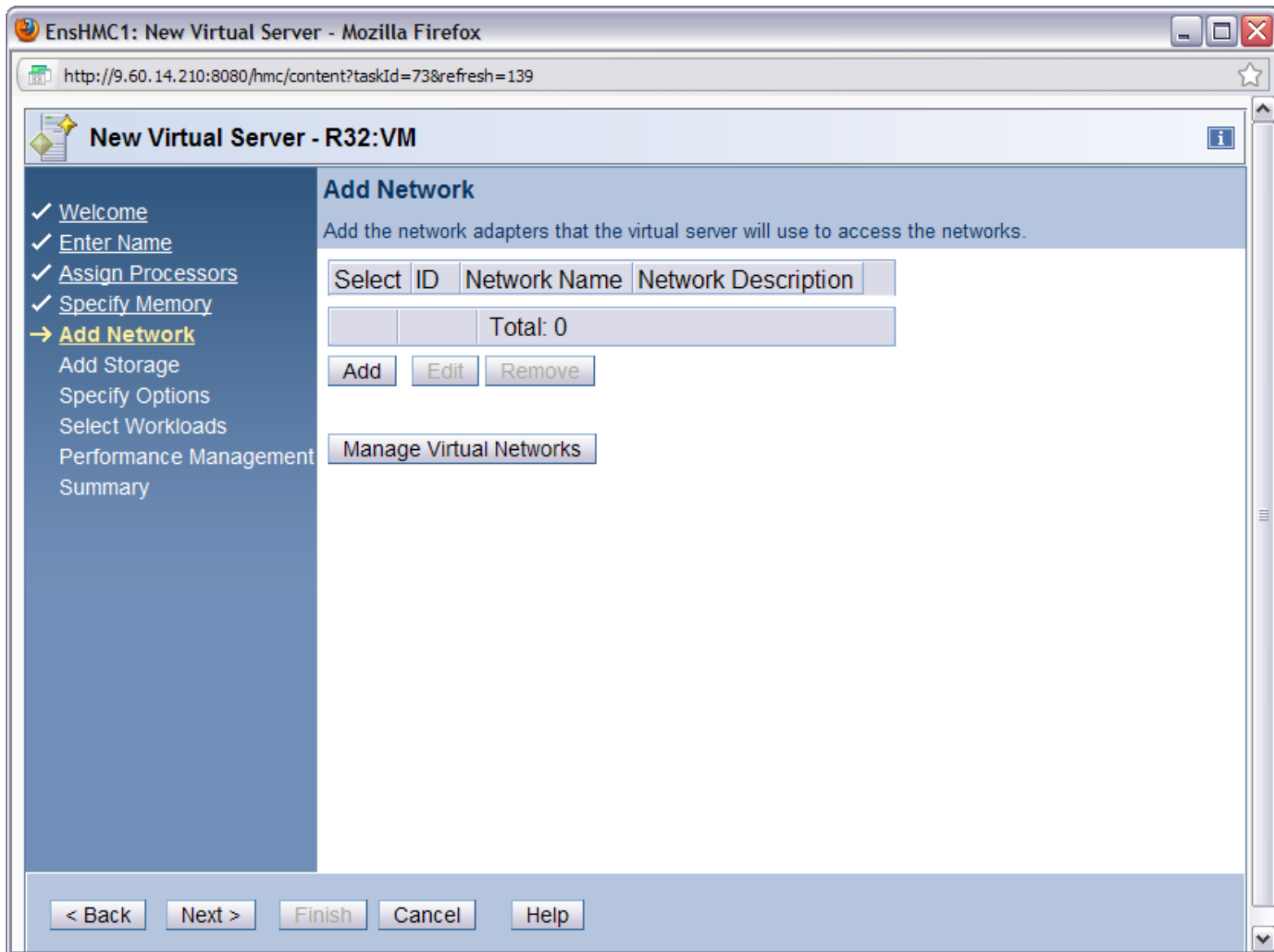
- New virtual server
- Virtual server details
- Create virtual network
- Associate virtual server with virtual network

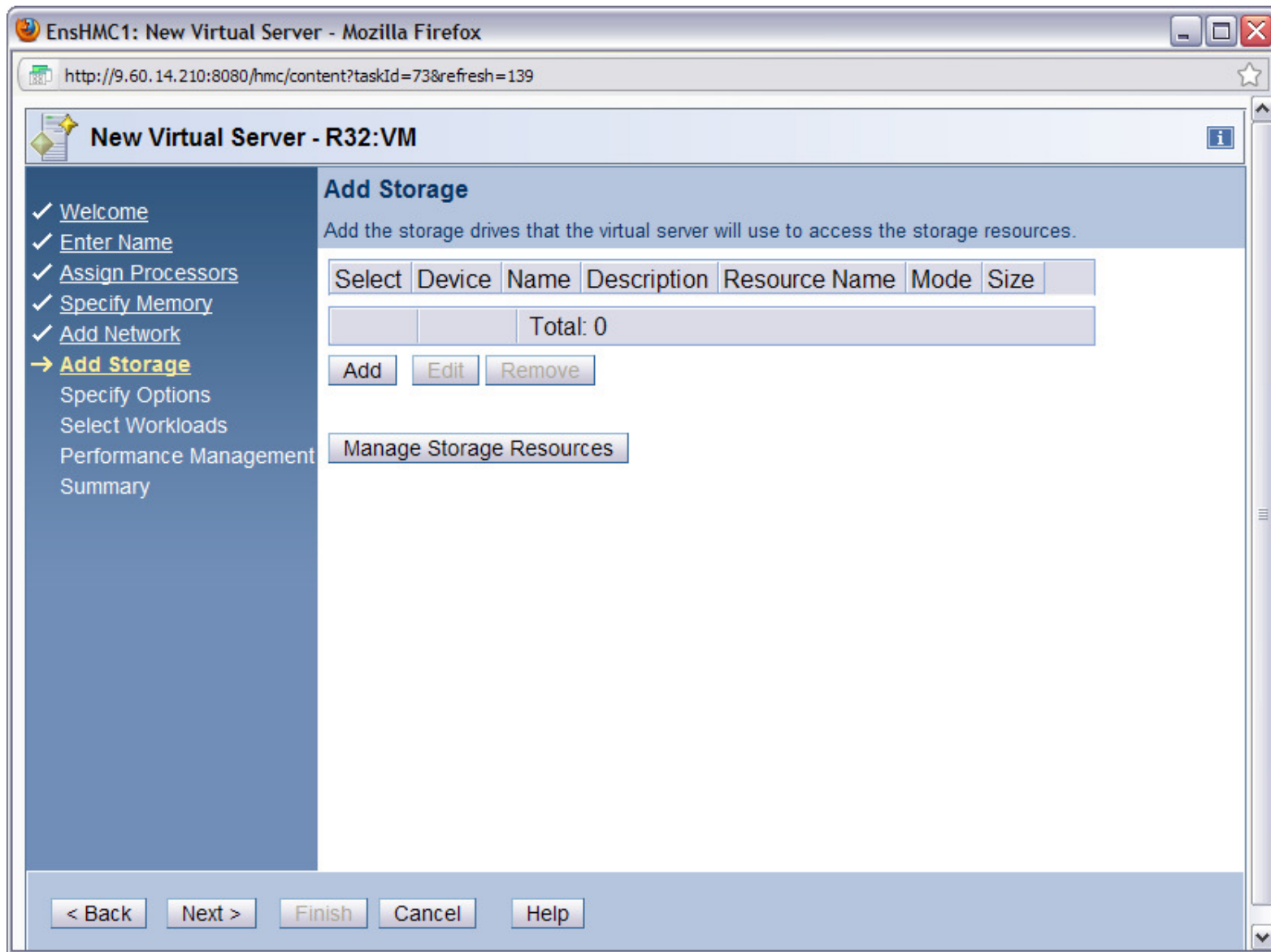












EnSHMC1: New Virtual Server - Mozilla Firefox

http://9.60.14.210:8080/hmc/content?taskId=73&refresh=139

New Virtual Server - R32:VM

- ✓ Welcome
- ✓ Enter Name
- ✓ Assign Processors
- ✓ Specify Memory
- ✓ Add Network
- ✓ Add Storage
- **Specify Options**
- Select Workloads
- Performance Management
- Summary

Specify Options

Choose the boot source for your virtual server.

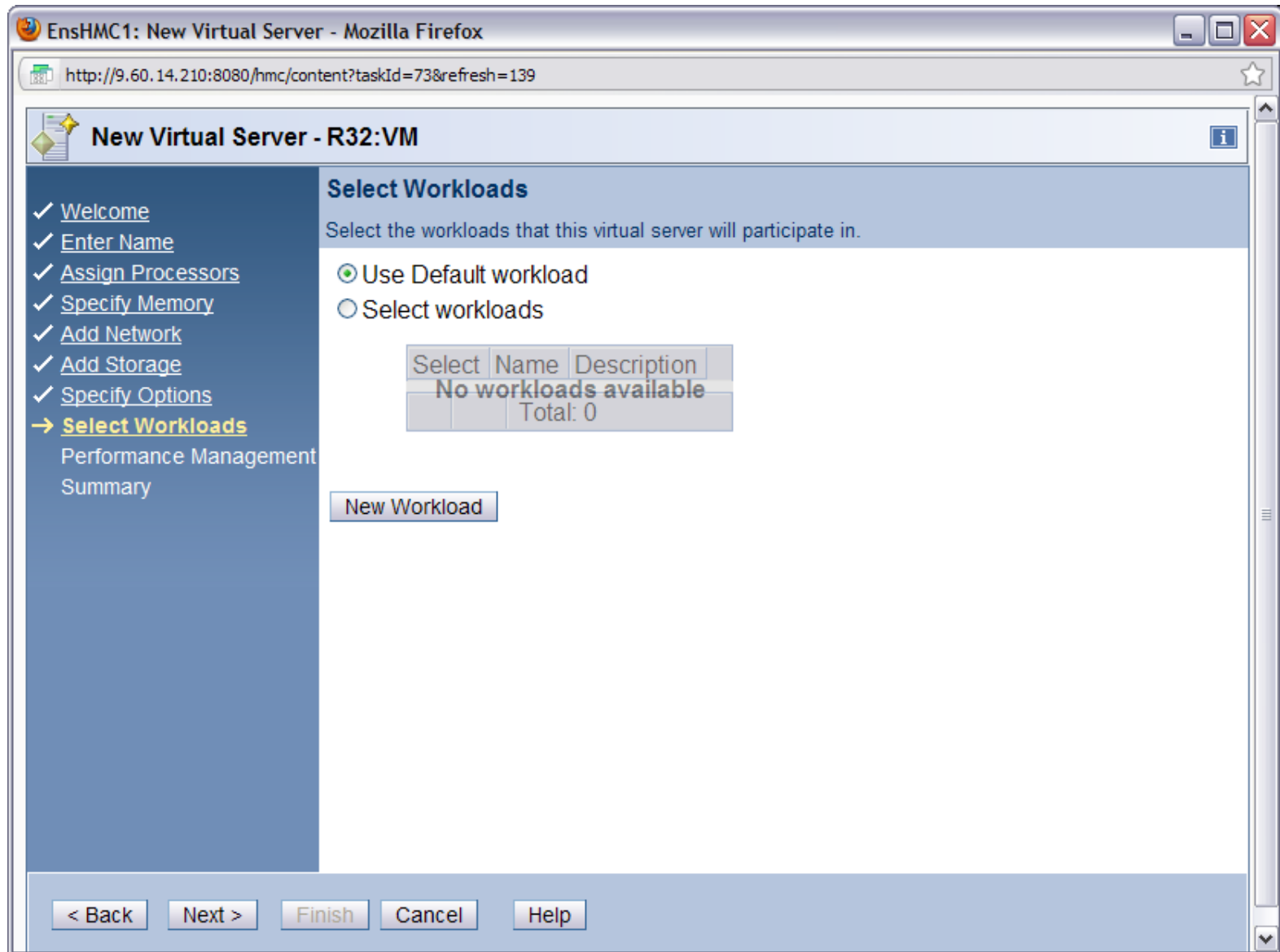
Privilege classes: * G

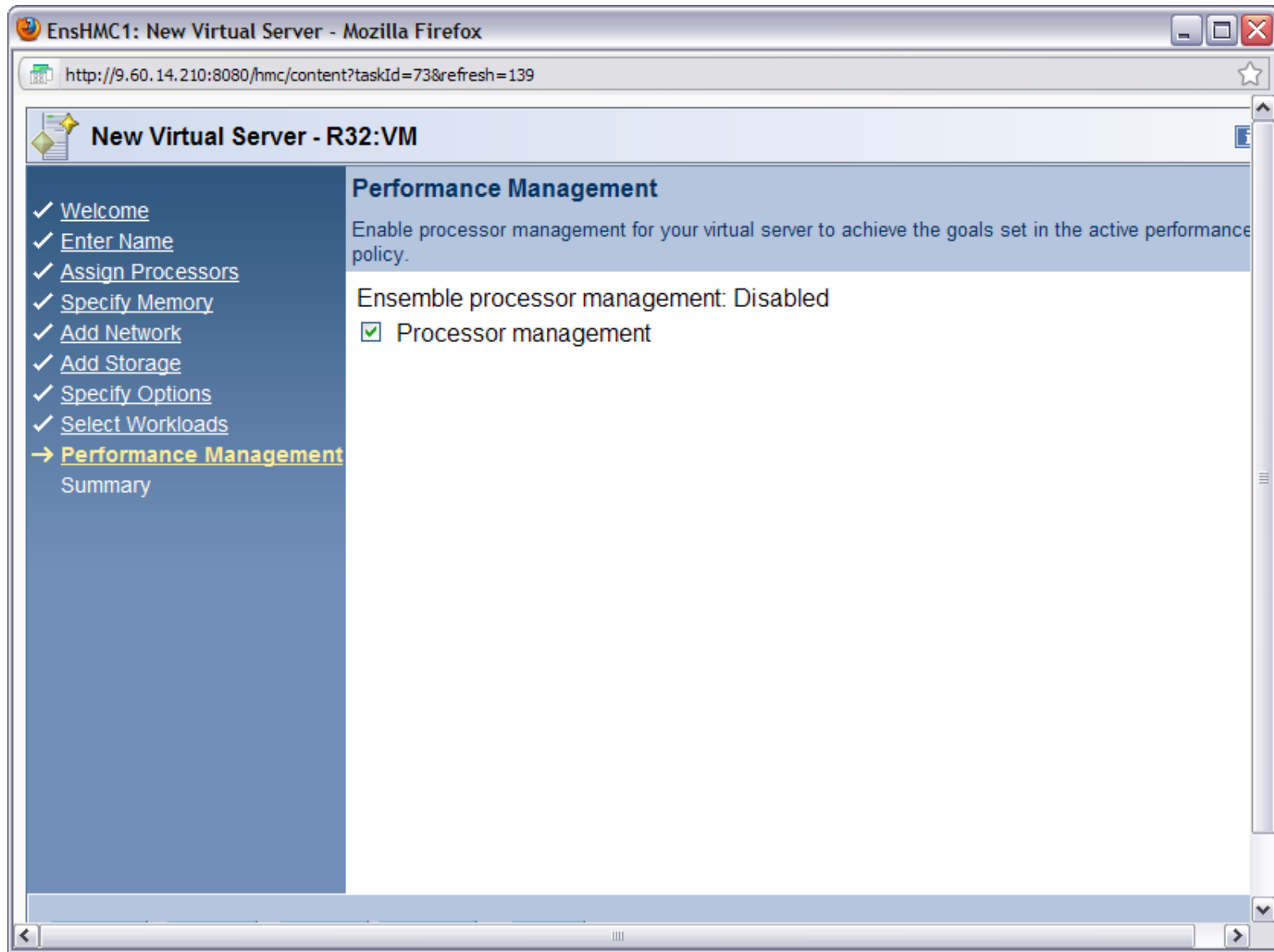
IPL boot device:

IPL parameters:

IPL load parameters:

< Back Next > Finish Cancel Help





The screenshot shows a web browser window titled 'EnsHMC1: New Virtual Server - Mozilla Firefox'. The address bar shows the URL 'http://9.60.14.210:8080/hmc/content?taskId=73&refresh=139'. The main content area is titled 'New Virtual Server - R32:VM' and contains a 'Summary' section. On the left, a navigation pane lists steps: Welcome, Enter Name, Assign Processors, Specify Memory, Add Network, Add Storage, Specify Options, Select Workloads, Performance Management, and Summary (highlighted with a yellow arrow). The Summary section contains a table of configuration details.

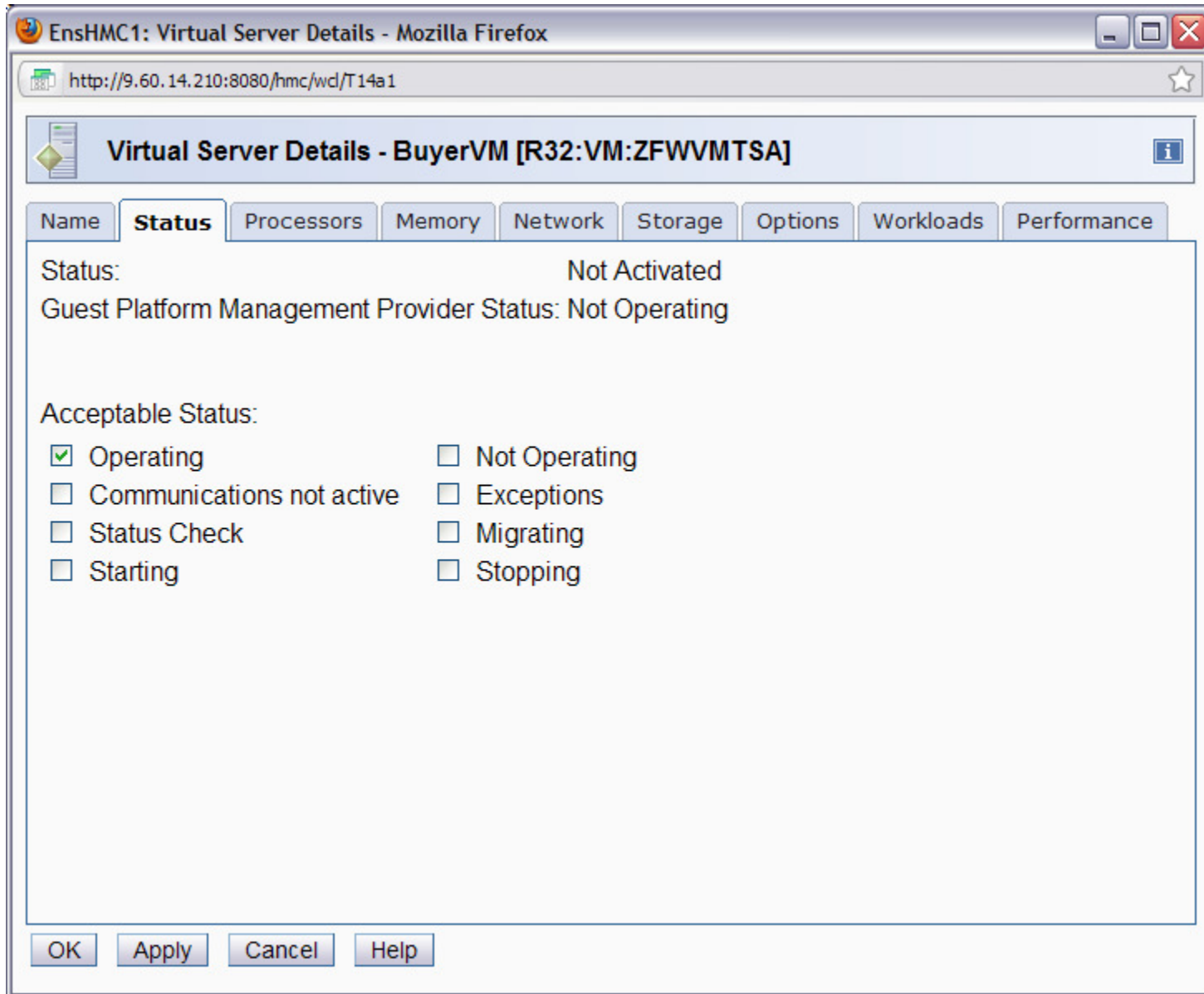
Summary	
Verify the information below before completing the wizard.	
Name:	BuyerVM
Description:	z/VM Virtual Server
Initial virtual processors:	1
Assigned dedicated memory:	1024 MB
Network Devices:	
Storage Devices:	
IPL parameters:	
IPL load parameters:	
Privilege classes:	G
Workloads:	Default
Processor management:	Enabled

At the bottom of the wizard, there are five buttons: '< Back', 'Next >', 'Finish', 'Cancel', and 'Help'.

The screenshot shows a Mozilla Firefox browser window titled 'EnsHMC1: Virtual Server Details - Mozilla Firefox'. The address bar contains the URL 'http://9.60.14.210:8080/hmc/content?taskId=74&refresh=143'. The main content area is titled 'Virtual Server Details - BuyerVM [R32:VM:ZFWVMTSA]' and features a tabbed interface with the following tabs: Name, Status, Processors, Memory, Network, Storage, Options, Workloads, and Performance. The 'Name' tab is active, displaying the following information:

- Hypervisor name: VM
- Hypervisor type: Image
- UUID: 4c3352da-9f37-11df-8cdb-001f163803de
- Name: *BuyerVM (highlighted in yellow)
- Description: (empty text box)

At the bottom of the window, there are four buttons: OK, Apply, Cancel, and Help.



EnsHMC1: Virtual Server Details - Mozilla Firefox

http://9.60.14.210:8080/hmc/wcd/T14a1

Virtual Server Details - BuyerVM [R32:VM:ZFWVMTSA]

Name Status **Processors** Memory Network Storage Options Workloads Performance

Processor type: Central Processor

Initial virtual processors: * 1

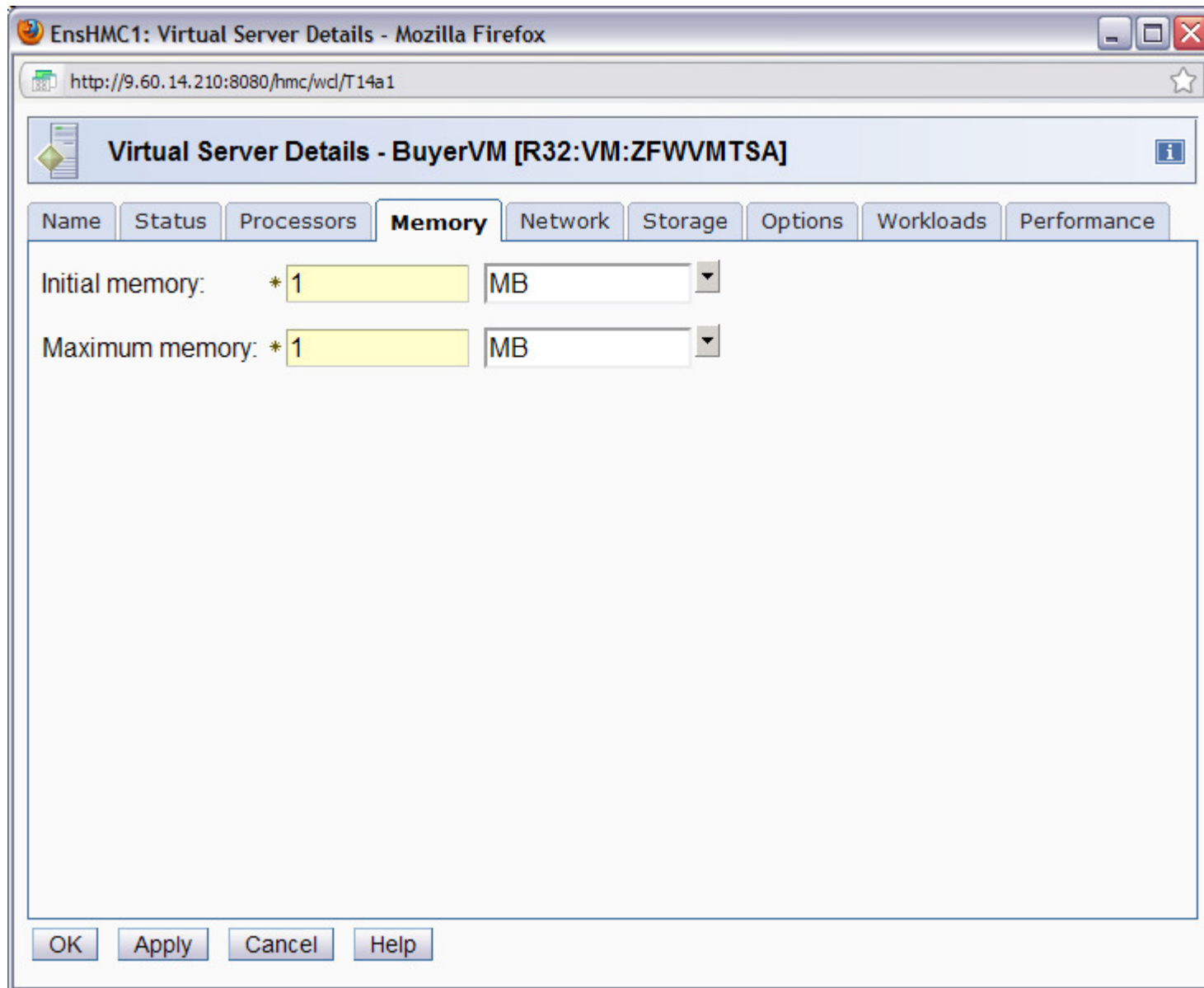
Maximum virtual processors: * 1

Share mode: Relative

Share limit: None

Initial relative shares: * 0

OK Apply Cancel Help



EnsHMC1: Virtual Server Details - Mozilla Firefox

http://9.60.14.210:8080/hmc/wcd/T14a1

Virtual Server Details - BuyerVM [R32:VM:ZFWVMTSA]

Name Status Processors Memory **Network** Storage Options Workloads Performance

MAC Prefix:

Network Adapters:

Select	ID	Network Name	Network Description	MAC Address
Total: 0				

Add Edit Remove

Manage Virtual Networks

OK Apply Cancel Help

Virtual Server Details - BuyerVM [R32:VM:ZFWVMTSA]

Name Status Processors Memory Network **Storage** Options Workloads Performance

Storage Drives:

Select	Device	Name	Description	Resource Name	Mode	Size
Total: 0						

Add Edit Remove

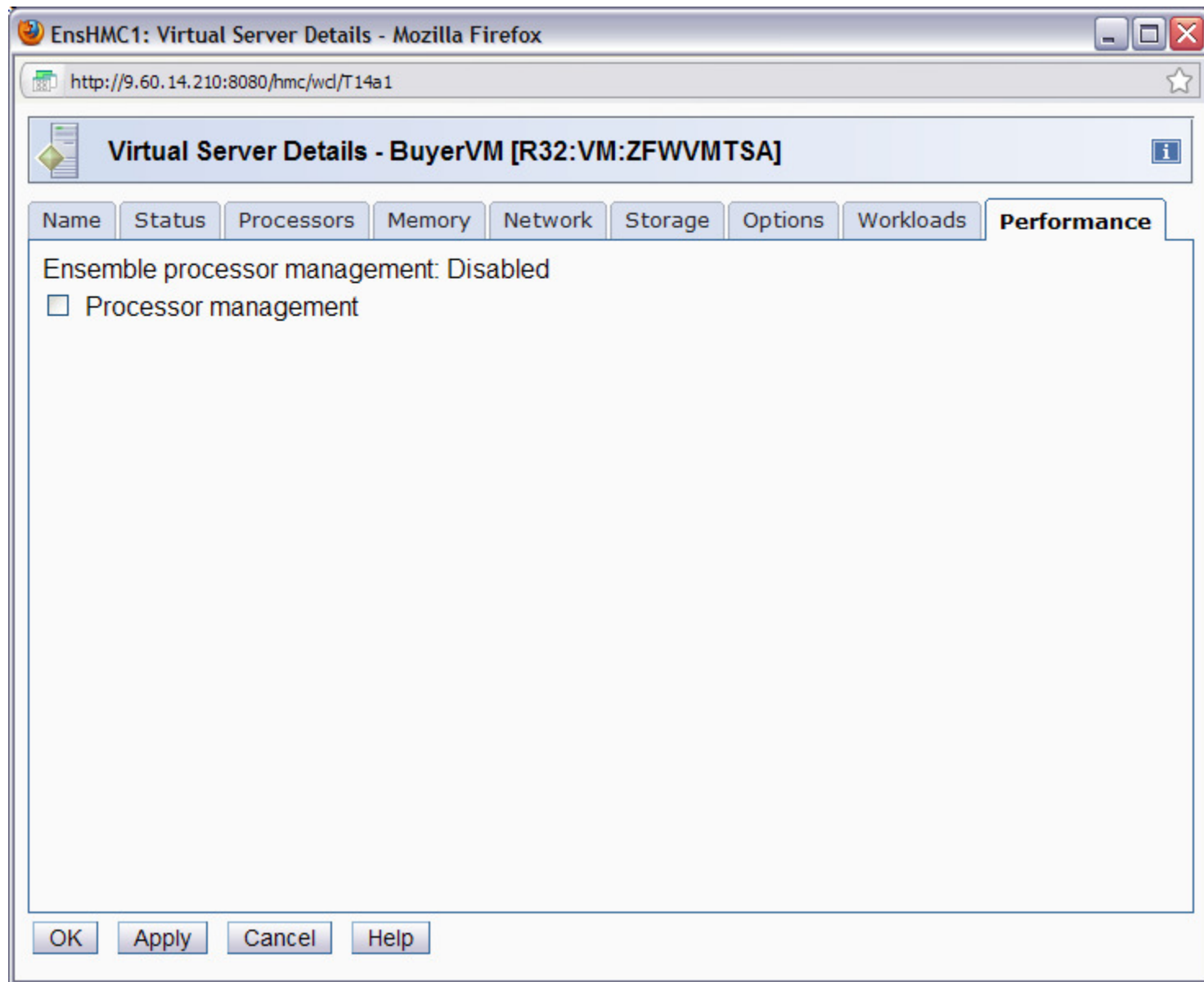
Manage Storage Resources

OK Apply Cancel Help

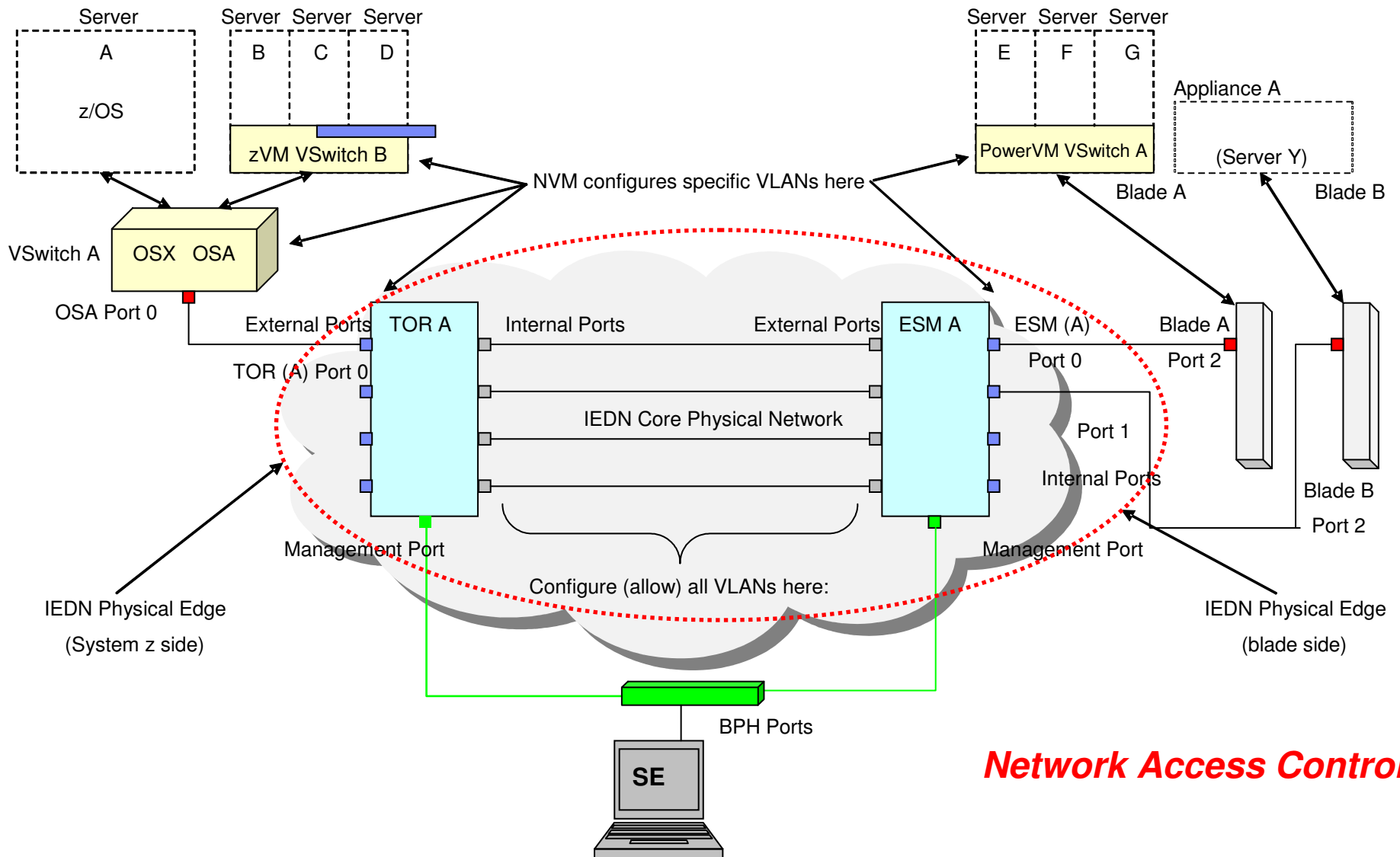
The screenshot shows a web browser window titled "EnsHMC1: Virtual Server Details - Mozilla Firefox". The address bar contains the URL "http://9.60.14.210:8080/hmc/wcd/T14a1". The main content area is titled "Virtual Server Details - BuyerVM [R32:VM:ZFWVMTSA]". Below the title is a navigation bar with tabs: Name, Status, Processors, Memory, Network, Storage, Options, Workloads, and Performance. The "Options" tab is selected. The content of the "Options" tab includes:
Privilege classes: *G
IPL boot device: [text input field]
IPL parameters: [text input field]
IPL load parameters: [text input field]
 Enable Guest Platform Management Provider Support
At the bottom of the window are four buttons: OK, Apply, Cancel, and Help.

The screenshot shows a web browser window titled "EnSHMC1: Virtual Server Details - Mozilla Firefox" with the URL "http://9.60.14.210:8080/hmc/wd/T14a1". The main content area is titled "Virtual Server Details - BuyerVM [R32:VM:ZFWVMTSA]". Below the title is a navigation bar with tabs: Name, Status, Processors, Memory, Network, Storage, Options, **Workloads**, and Performance. The "Workloads" tab is active, showing two radio buttons: "Use Default workload" (selected) and "Select workloads". Below these is a table with columns "Select", "Name", and "Description". The table contains the text "No workloads available" and "Total: 0". A "New Workload" button is located below the table. At the bottom of the window are buttons for "OK", "Apply", "Cancel", and "Help".

Select	Name	Description
No workloads available		
Total: 0		



Virtual Networks and Access Controls



Create Virtual Network

NEXTGEN: Manage Virtual Networks - Mozill...

9.60.92.193 https://9.60.92.193/hmc/wd/T34a#tableTop_4bd44

Create Virtual Network - My Ensemble

General Settings

Name: * VendorVirtualNetwork

Description: All vendor virtual servers on this VLAN

VLAN ID: * 11 (10-1034)

OK Cancel Help

NEXTGEN: Manage Virtual Networks - Mozilla Firefox

9.60.92.193 https://9.60.92.193/hmc/wd/T3df

Manage Virtual Networks - My Ensemble

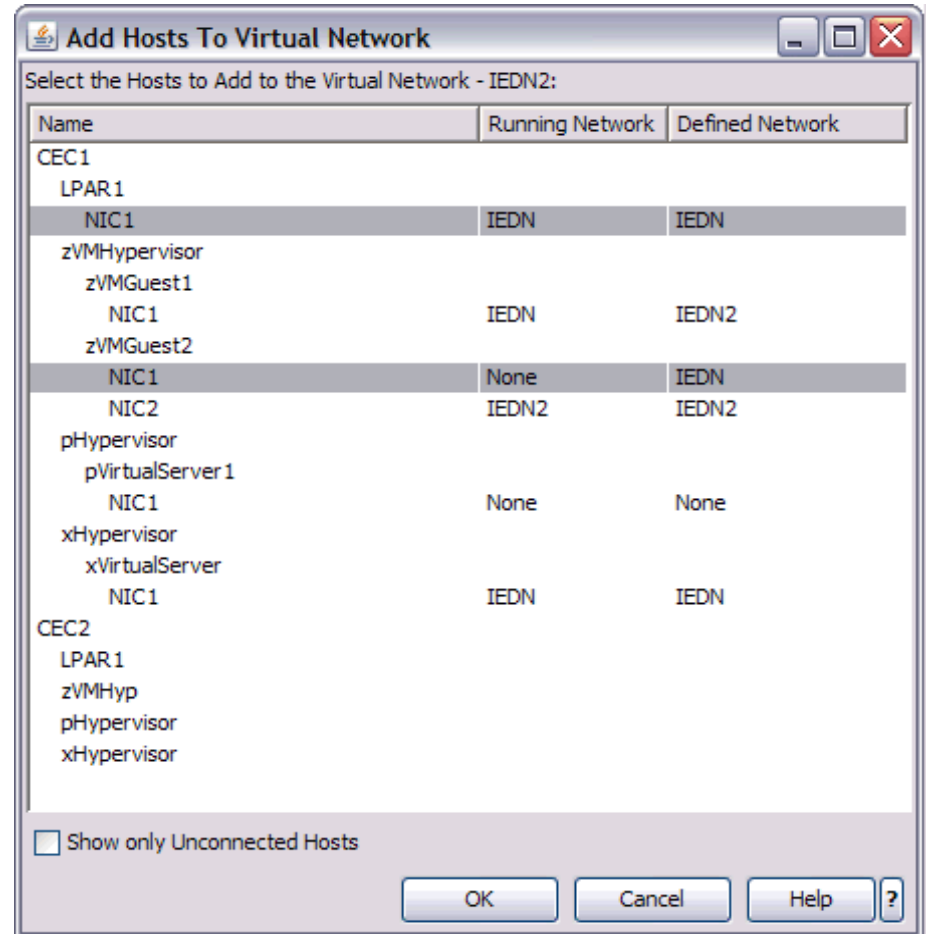
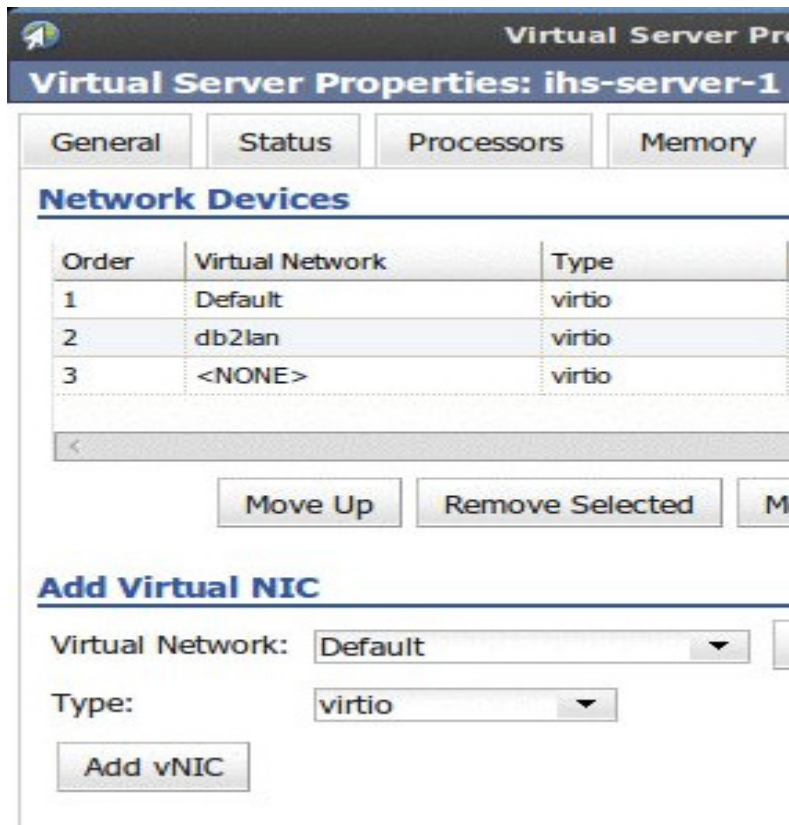
Virtual Networks:

--- Select Action ---

Select	Name	Status	VLAN ID	Description
<input type="radio"/>	Default	Inactive	10	Default virtual network
<input checked="" type="radio"/>	VendorVirtualNetwork	Inactive	11	All vendor virtual servers on th...

Close Help

Associate Virtual Server With Virtual Network



Synergy with z/VM

- Server and application consolidation on System z using Linux and z/VM is the industry leader in large-scale, cost-efficient virtual server hosting
- zEnterprise introduces virtual server provisioning and management for Linux guests running on z/VM
 - Use the Unified Resource Manager to create z/VM virtual machines
 - Simplify the skill level needed to manage a Linux on z/VM environment
- Faster cores and a bigger system cache on the z196 let you do even more with less when running Linux on z/VM
- Integrated blades on zBX offer a new dimension for workload optimization

z/VM and Blades

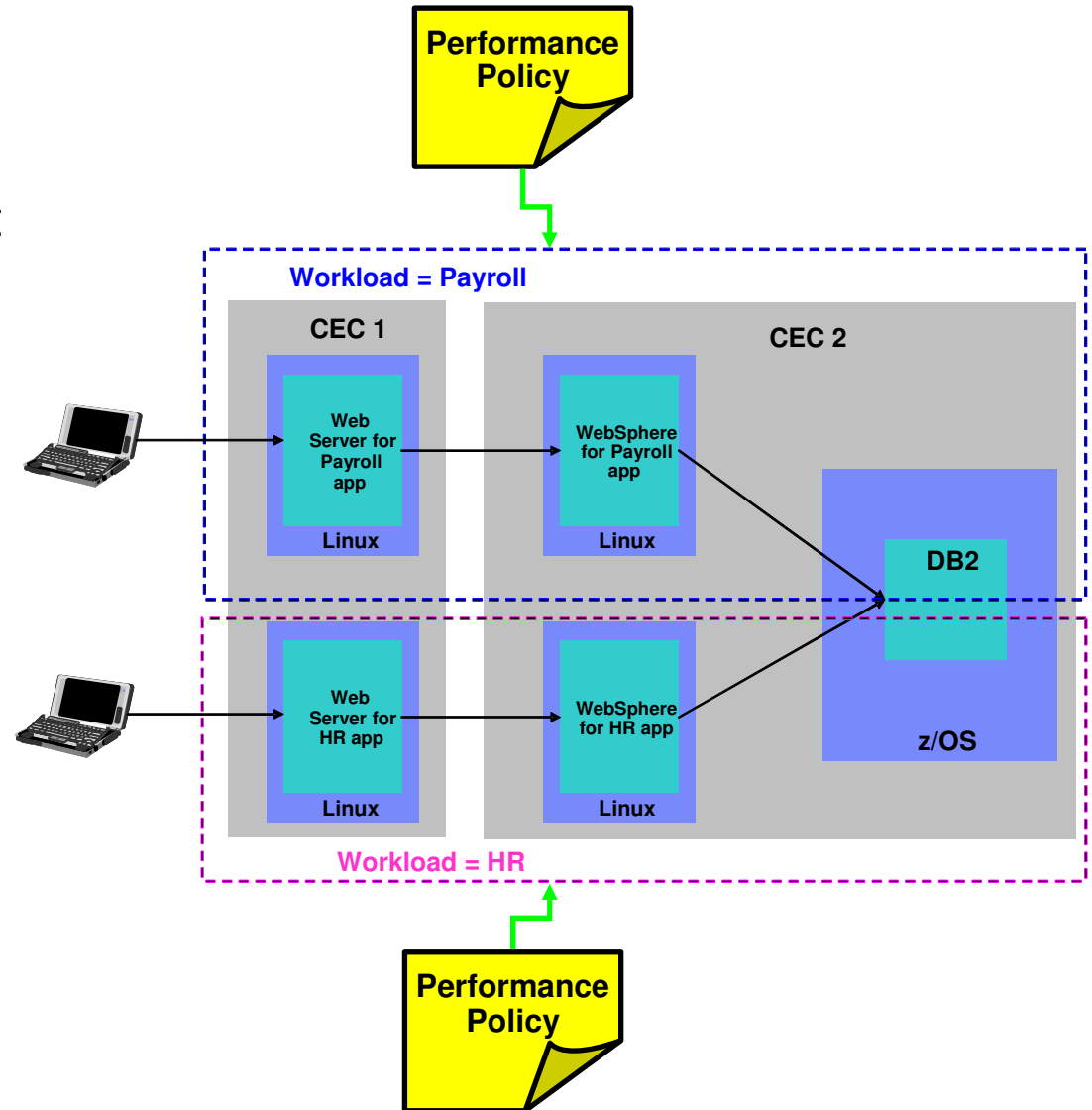
- Support applications that are not appropriate for Linux on System z
 - Not available for Linux on System z
 - Missing function in System z environment
 - e.g., Specialized hardware support
 - Resource requirements not suited for System z
 - e.g., Real-time applications
 - e.g., IBM Smart Analytics Optimizer
- Environments
 - AIX on PowerVM
 - Linux on x86 (SOD)
- Migration
 - Create virtual server on zEnterprise
 - Configure appropriate network and SAN connectivity
 - Point virtual server to existing disk resources
 - Activate virtual server

z/VM and Blades ...

- Management
 - Single point of control
 - Workload context
 - Monitoring, reporting, performance management, workload management
- Data sharing
 - No different than with distributed servers (same SAN)
- Connectivity (Intra-Ensemble Data Network - IEDN)
 - 10Gb flat layer 2 network
 - Access controlled completely by zManager
 - Eliminate firewalls
 - Eliminate encryption
 - Increase throughput and reduce latency

Workload

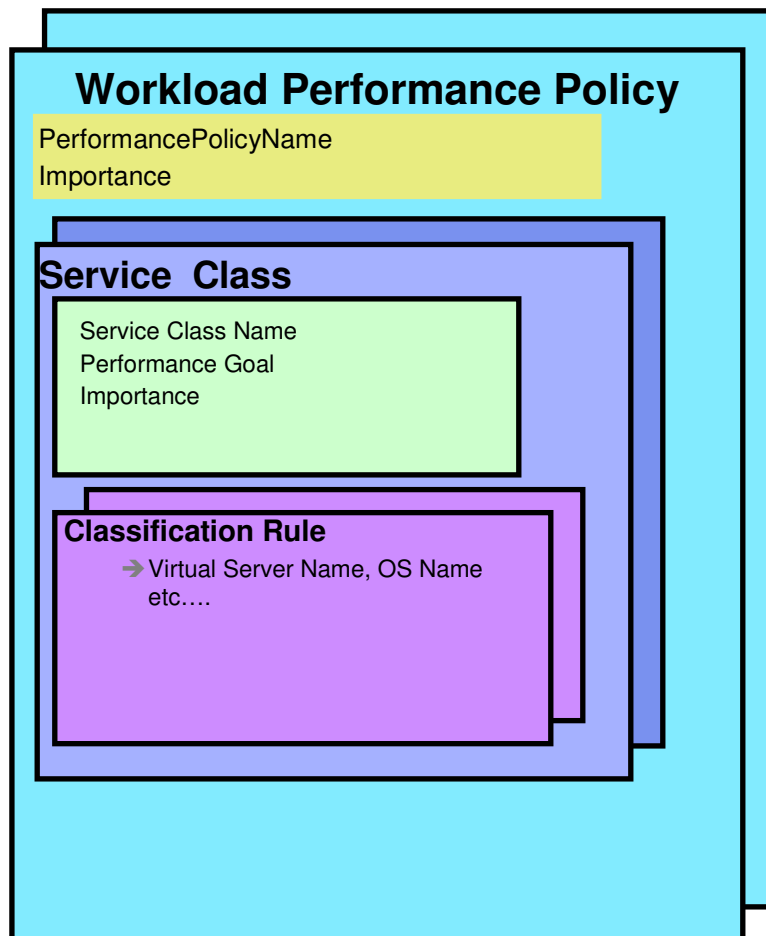
- A Workload is a grouping mechanism and “management view” of virtual servers supporting a business application
- Provides the context within which associated platform resources are presented, monitored, reported, and managed
- Performance policy is associated with Workload



Workload Performance Policy

- Defines performance goals for virtual servers in a workload
 - Conceptually similar to simplified z/OS WLM Policy
- Provides basis for monitoring and managing platform resources used by virtual servers in a Workload
- Workload relationship to performance policy
 - Multiple performance policies associated with a workload
 - A single policy is active at a given time
 - Can dynamically change the active policy
 - Through the UI
 - On a time-based schedule
 - Example: Day shift / night shift policy

Workload Performance Policy...



- Policy structure:
 - Policy contains a set of service classes
 - Classification rules map each virtual server within the workload to a service class
 - A service class assigns a performance goal and importance
- HMC is console for policy creation and editing
 - Wizard for policy creation
 - Repository for policies under development and saved policies
 - Links to workload-based performance reporting

NEXTGEN: Hardware Management Console Workplace (Version 2.11.0) - Mozilla Firefox

9.60.92.193 https://9.60.92.193/hmc/connects/mainuiFrameset.jsp

Hardware Management Console

pedebug | Help | Logoff

Systems Management > **My Ensemble**

All Resources | Hypervisors | Virtual Servers

Table | Topology

Select	Name	Status	Description
<input type="checkbox"/>	Members	Exceptions	
<input type="checkbox"/>	PZBONZAI	Not Operating	Central Processing Complex (CPC)
<input type="checkbox"/>	Workloads		
<input type="checkbox"/>	Default		The default workload containing all unmar

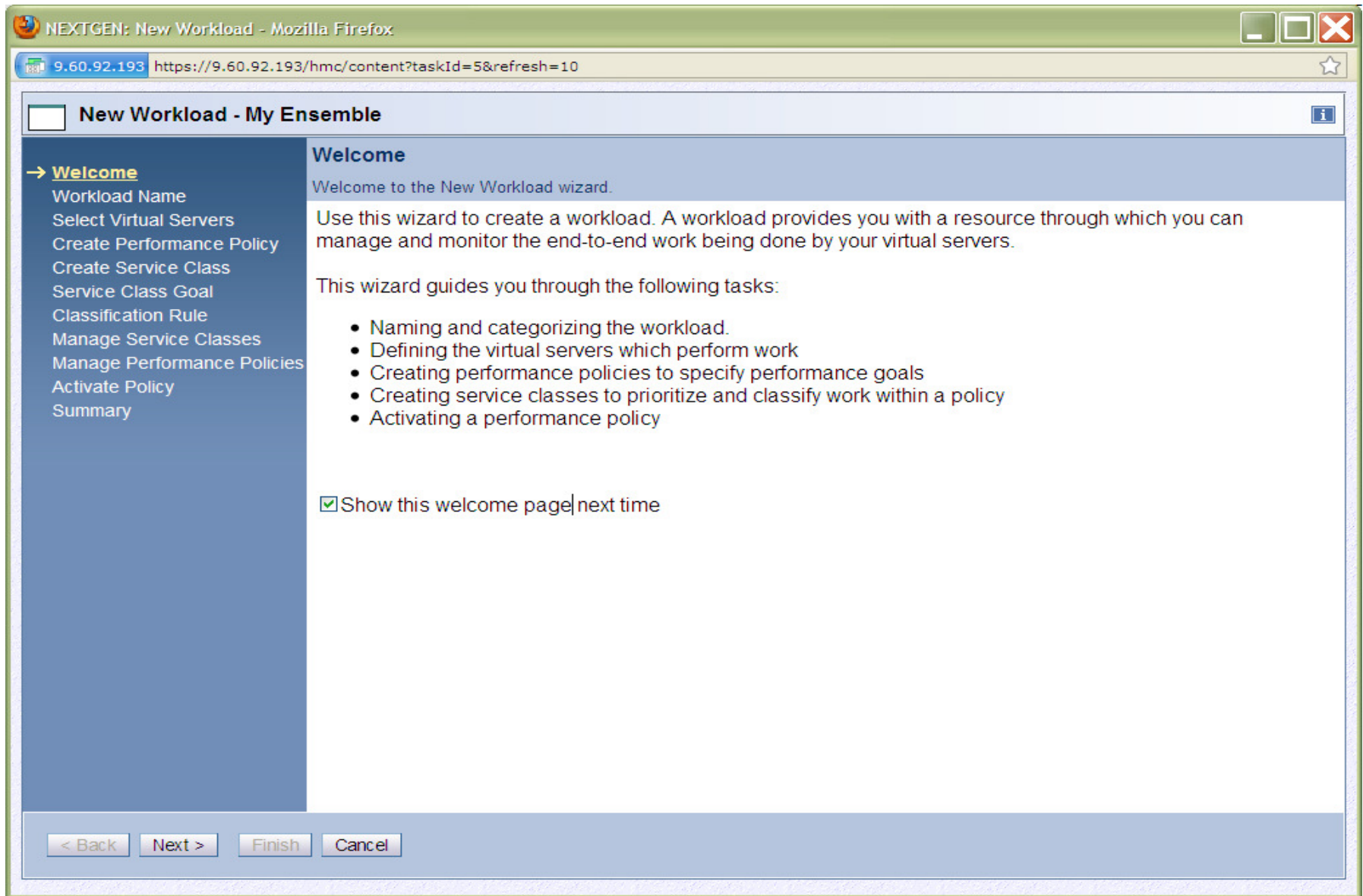
Max Page Size: 500 Total: 4 Filtered: 4 Selected: 0

Click on the Ensemble and then New Workload

Tasks: My Ensemble

- Ensemble Details
 - Toggle Lock
- Configuration
 - Configure Ensemble MAC Prefix
 - Delete Ensemble
 - Manage Storage Resources
 - Manage Virtual Networks
 - New Workload**
 - Reserve MAC Address Prefixes
- Monitor

Status: Exceptions and Messages



New Workload - My Ensemble

- ✓ [Welcome](#)
- **[Workload Name](#)**
- [Select Virtual Servers](#)
- [Create Performance Policy](#)
- [Create Service Class](#)
- [Service Class Goal](#)
- [Classification Rule](#)
- [Manage Service Classes](#)
- [Manage Performance Policies](#)
- [Activate Policy](#)
- [Summary](#)

Workload Name
Enter a name, description, and category for the workload.

Name: *

Description:

Category:

< Back Next > Finish Cancel Help

NEXTGEN: New Workload - Mozilla Firefox

9.60.92.193 https://9.60.92.193/hmc/content?taskId=1&refresh=2

New Workload - My Ensemble

- ✓ Welcome
- ✓ Workload Name
- **Select Virtual Servers**
- Create Performance Policy
- Create Service Class
- Service Class Goal
- Classification Rule
- Manage Service Classes
- Manage Performance Policies
- Activate Policy
- Summary

Select Virtual Servers

Select virtual servers and custom groups to add into the workload. Adding a custom group into the workload adds all virtual servers in the group.

Show:

Available Virtual Servers:

Select	Name	Description	Hypervisor	Type	Workload(s)
<input type="checkbox"/>	Buyer 1	Buyer v1.23 WAS v7.0	PZBONZAI:B.2.01	POWER	
<input type="checkbox"/>	Buyer 2	Buyer v1.23 WAS v7.0	PZBONZAI:B.2.01	POWER	
<input type="checkbox"/>	Vendor 1	Vendor v3.2 WAS v6.1	PZBONZAI:B.2.01	POWER	
<input type="checkbox"/>	Vendor 2	Vendor v3.6 WAS v6.1	PZBONZAI:B.2.01	POWER	
Total: 4 Selected: 0					

Selected:

NEXTGEN: New Workload - Mozilla Firefox

9.60.92.193 https://9.60.92.193/hmc/wcd/T104

New Workload - My Ensemble

- ✓ Welcome
- ✓ Workload Name
- **Select Virtual Servers**
 - Create Performance Policy
 - Create Service Class
 - Service Class Goal
 - Classification Rule
 - Manage Service Classes
 - Manage Performance Policies
 - Activate Policy
 - Summary

Select Virtual Servers

Select virtual servers and custom groups to add into the workload. Adding a custom group into the workload adds all virtual servers in the group.

Show:

Available Virtual Servers:

Select	Name	Description	Hypervisor	Type	Workload(s)
<input checked="" type="checkbox"/>	Buyer 1	Buyer v1.23 WAS v7.0	PZBONZAI:B.2.01	POWER	
<input checked="" type="checkbox"/>	Buyer 2	Buyer v1.23 WAS v7.0	PZBONZAI:B.2.01	POWER	
<input checked="" type="checkbox"/>	Vendor 1	Vendor v3.2 WAS v6.1	PZBONZAI:B.2.01	POWER	
<input checked="" type="checkbox"/>	Vendor 2	Vendor v3.6 WAS v6.1	PZBONZAI:B.2.01	POWER	
Total: 4 Selected: 4					

Selected:

Buttons: Add > < Remove

Navigation: < Back Next > Finish Cancel Help

NEXTGEN: New Workload - Mozilla Firefox
 9.60.92.193 https://9.60.92.193/hmc/wd/T104

New Workload - My Ensemble

- ✓ Welcome
- ✓ Workload Name
- **Select Virtual Servers**
- Create Performance Policy
- Create Service Class
- Service Class Goal
- Classification Rule
- Manage Service Classes
- Manage Performance Policies
- Activate Policy
- Summary

Select Virtual Servers

Select virtual servers and custom groups to add into the workload. Adding a custom group into the workload adds all virtual servers in the group.

Show:

Available Virtual Servers:

Select	Name	Description	Hypervisor	Type	Workload(s)
<input type="checkbox"/>	Buyer 1	Buyer v1.23 WAS v7.0	PZBONZAI:B.2.01	POWER	
<input type="checkbox"/>	Buyer 2	Buyer v1.23 WAS v7.0	PZBONZAI:B.2.01	POWER	
<input type="checkbox"/>	Vendor 1	Vendor v3.2 WAS v6.1	PZBONZAI:B.2.01	POWER	
<input type="checkbox"/>	Vendor 2	Vendor v3.6 WAS v6.1	PZBONZAI:B.2.01	POWER	
		Total: 4 Selected: 0			

Selected:

- Buyer 1
- Buyer 2
- Vendor 1
- Vendor 2

Buttons: Add > (highlighted), < Remove

Navigation: < Back, Next >, Finish, Cancel, Help

NEXTGEN: New Workload - Mozilla Firefox

9.60.92.193 | https://9.60.92.193/hmc/wd/T462

New Workload - My Ensemble

- ✓ Welcome
- ✓ Workload Name
- ✓ Select Virtual Servers
- ✓ Create Performance Policy
- **Create Service Class**
 - Service Class Goal
 - Classification Rule
 - Manage Service Classes
 - Manage Performance Policies
 - Activate Policy
 - Summary

Create Service Class - Peak Period

You may create a service class for the performance policy now or use the default service and create a service class later.

***Create Option**

Default

New

New based on:

Service Class Details

Workload: Weinheimer Agricultural parts

Performance policy: Peak Period

Name: *

Description:

< Back Next > Finish Cancel Help

NEXGEN: New Workload - My Ensemble

9.60.92.193 https://9.60.92.193/hmc/wd/T462

New Workload - My Ensemble

- ✓ Welcome
- ✓ Workload Name
- ✓ Select Virtual Servers
- ✓ Create Performance Policy
- ✓ Create Service Class
- **Service Class Goal**
- Classification Rule
- Manage Service Classes
- Manage Performance Policies
- Activate Policy
- Summary

Service Class Goal - Peak Period:Buyers

Select the performance goal and business importance for this service class.

Performance Goal

Velocity

Discretionary

Business importance

< Back Next > Finish Cancel Help

NEXTGEN: New Workload - Mozilla Firefox
 https://9.60.92.193/hmc/wd/T462

New Workload - My Ensemble

- ✓ Welcome
- ✓ Workload Name
- ✓ Select Virtual Servers
- ✓ Create Performance Policy
- ✓ Create Service Class
- ✓ Service Class Goal
- **Classification Rule**
- Manage Service Classes
- Manage Performance Policies
- Activate Policy
- Summary

Classification Rule - Peak Period:Buyers

De Rule Builder: Filter Type

The rule builder allows you to construct your classification rule by constructing clauses that are ANDed or ORed together. Click the first entry and select the property upon which your rules' first clause will filter. For instance, select "PPM:Hostname" to filter on the virtual server's host name.

PPM:Hostname == ?

- PPM:Hostname
- PPM:Server Name
- PPM:OS Platform
- PPM:OS Level
- PPM:System Name

< Back Next > Finish Cancel Help

NEXTGEN: New Workload - Mozilla Firefox

9.60.92.193 https://9.60.92.193/hmc/wcd/T462

New Workload - My Ensemble

Classification Rule - Peak Period:Buyers

Define the service class's classification rule using the rule builder.

Classification rule:

Logical Operators

AND OR

PPM:Hostname == Buyer1

AND OR

< Back Next > Finish Cancel Help

NEXTGEN: New Workload - Mozilla Firefox

9.60.92.193 https://9.60.92.193/hmc/wcd/T462

New Workload - My Ensemble

- ✓ Welcome
- ✓ Workload Name
- ✓ Select Virtual Servers
- ✓ Create Performance Policy
- ✓ Create Service Class
- ✓ Service Class Goal
- **Classification Rule**
- Manage Service Classes
- Manage Performance Policies
- Activate Policy
- Summary

Classification Rule - Peak Period:Buyers

Define the service class's classification rule using the rule builder.

Classification rule:

Logical Operators

AND OR

Rule Builder

Continue adding clauses to build your classification rule.

<Select Filter Type> == ?

OK

< Back Next > Finish Cancel Help

NEXTGEN: New Workload - Mozilla Firefox
9.60.92.193 | https://9.60.92.193/hmc/wd/T462

New Workload - My Ensemble

- ✓ Welcome
- ✓ Workload Name
- ✓ Select Virtual Servers
- ✓ Create Performance Policy
- ✓ Create Service Class
- ✓ Service Class Goal
- **Classification Rule**
- Manage Service Classes
- Manage Performance Policies
- Activate Policy
- Summary

Classification Rule - Peak Period:Buyers

Define the service class's classification rule using the rule builder.

Classification rule:

Logical Operators

AND OR

PPM:Hostname == Buyer1

PPM:Hostname == Buyer2

OR

< Back Next > Finish Cancel Help

NEXTGEN: New Workload - Mozilla Firefox

9.60.92.193 https://9.60.92.193/hmc/wd/T166

New Workload - My Ensemble

- ✓ [Welcome](#)
- ✓ [Workload Name](#)
- ✓ [Select Virtual Servers](#)
- ✓ [Create Performance Policy](#)
- ✓ [Create Service Class](#)
- ✓ [Service Class Goal](#)
- ✓ [Classification Rule](#)
- **[Manage Service Classes](#)**
 - Manage Performance Policies
 - Activate Policy
 - Summary

Manage Service Classes - Peak Period

Create, delete, edit, or re-order service classes for this policy.

--- Select Action ---

Select	Service Class	Performance Goal	Business Importance	Description
<input type="radio"/>	Buyers	Velocity - Fastest	Highest	Represents work of the buyer virtual servers
<input type="radio"/>	Default	Velocity - Moderate	Medium	The default workload performance policy ser
		Total: 2 Selected: 0		

< Back Next > Finish Cancel Help

NEXTGEN: New Workload - Mozilla Firefox

9.60.92.193 https://9.60.92.193/hmc/wd/T166

New Workload - My Ensemble

- ✓ [Welcome](#)
- ✓ [Workload Name](#)
- ✓ [Select Virtual Servers](#)
- ✓ [Create Performance Policy](#)
- ✓ [Create Service Class](#)
- ✓ [Service Class Goal](#)
- ✓ [Classification Rule](#)
- ✓ [Manage Service Classes](#)
- **Manage Performance Policies**
- [Activate Policy](#)
- [Summary](#)

Manage Performance Policies

Use the table below to edit or delete a defined performance policy or create another performance policy.

Select	Performance Policy	Business Importance	Description
<input type="radio"/>	Peak Period	Medium	Provide best performance for buyers at peak
<input type="radio"/>	Default	Medium	The default workload performance policy
		Total: 2 Selected: 0	

NEXTGEN: New Workload - Mozilla Firefox

9.60.92.193 https://9.60.92.193/hmc/wd/T17b

New Workload - My Ensemble

- ✓ Welcome
- ✓ Workload Name
- ✓ Select Virtual Servers
- ✓ Create Performance Policy
- ✓ Create Service Class
- ✓ Service Class Goal
- ✓ Classification Rule
- ✓ Manage Service Classes
- ✓ Manage Performance Policies
- **Activate Policy**
- Summary

Activate Policy

Select the performance policy to activate when the workload is created.

--- Select Action ---

Select	Performance Policy	Business Importance	Description
<input type="radio"/>	Peak Period	Medium	Provide best performance for buyers at peak
<input checked="" type="radio"/>	Default	Medium	The default workload performance policy
		Total: 2	

Launch Customize Scheduled Operations after the workload has been created.

< Back Next > Finish Cancel Help

NEXTGEN: New Workload - Mozilla Firefox

9.60.92.193 https://9.60.92.193/hmc/wd/T166

New Workload - My Ensemble

- ✓ Welcome
- ✓ Workload Name
- ✓ Select Virtual Servers
- ✓ Create Performance Policy
- ✓ Create Service Class
- ✓ Service Class Goal
- ✓ Classification Rule
- ✓ Manage Service Classes
- ✓ Manage Performance Policies
- ✓ Activate Policy
- **Summary**

Summary

Click Finish to create the workload, its performance policies and their service classes and activate the selected policy.

Workload

Name: Weinheimer Agricultural Parts
 Active performance policy: Default
 Description: Tractor parts sales hub for buyers and suppliers
 Category: Tractors
 Virtual servers: Vendor 1
 Buyer 1
 Vendor 2
 Buyer 2
 Custom groups:

Performance Policies

Default

Description: The default workload performance policy
 Business importance: Medium

Service Classes

Default

Description: The default workload performance policy service class.
 Performance goal: Velocity - Moderate
 Business importance: Medium
 Classification rule: (*) == "(*)"

Peak Period

< Back Next > Finish Cancel Help

Hardware Management Console

Systems Management > **My Ensemble**

All Resources | Hypervisors | Virtual Servers

Select	Name	Status	Description
<input type="checkbox"/>	Members	Exceptions	
<input type="checkbox"/>	PZBONZAI	Not Operating	Central Processing Complex (CPC)

NEXTGEN: New Workload - Mozilla Firefox

9.60.92.193 https://9.60.92.193/hmc/wd/T893

Workload Created - My Ensemble

Workload "Weinheimer Agricultural Parts" has been created. Launch [Workload Details](#) to view performance policy activation progress. Launch [Workload Report](#) to monitor the workload.

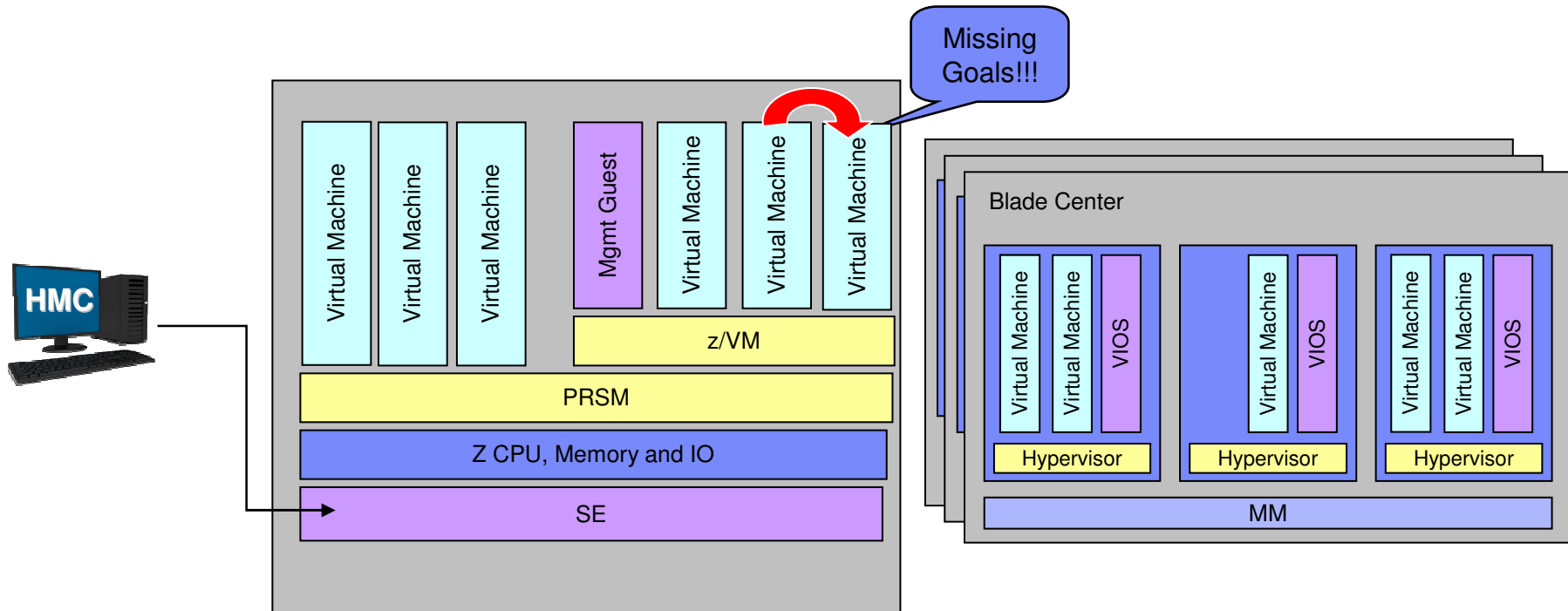
OK

Tasks: My Ensemble

- Ensemble Details
 - Toggle Lock
- Configuration
 - Configure Ensemble MAC Prefix
 - Delete Ensemble
 - Manage Storage Resources
 - Manage Virtual Networks
 - New Workload
 - Reserve MAC Address Prefixes
- Monitor
 - Load Balancing Report
 - Workload Report

Status: Exceptions and Messages

Managing Resources across z/VM Virtual Machines



- Manage CPU resources across z/VM virtual machines
 - Detect that a virtual machine is part of a workload not achieving its goals
 - Determine that virtual machine performance can be improved with additional resources
 - Project effect on all relevant Workloads of moving resources to virtual machine
 - If good trade-off based on policy, redistribute resources

lavinjr: Monitors Dashboard - Mozilla Firefox
 http://9.60.73.65:8080/hmc/content?taskId=2&refresh=2

Monitors Dashboard

System Assist Processors

Name	Processor Usage (%)
SAP00	56
SAP01	39
SAP02	64
SAP03	50
SAP04	22
Total: 31	

Logical Partitions

Name	Processor Usage (%)
VMNAME01	0
VMNAME02	100
VMNAME03	100
VMNAME04	100
VMNAME05	100
Total: 9	

Channels

CHPID	LPARs	Total Channel Usage (%)
0.00		49
0.01		5
0.02		15
0.03		87
0.04		38
Total: 114		

Blades

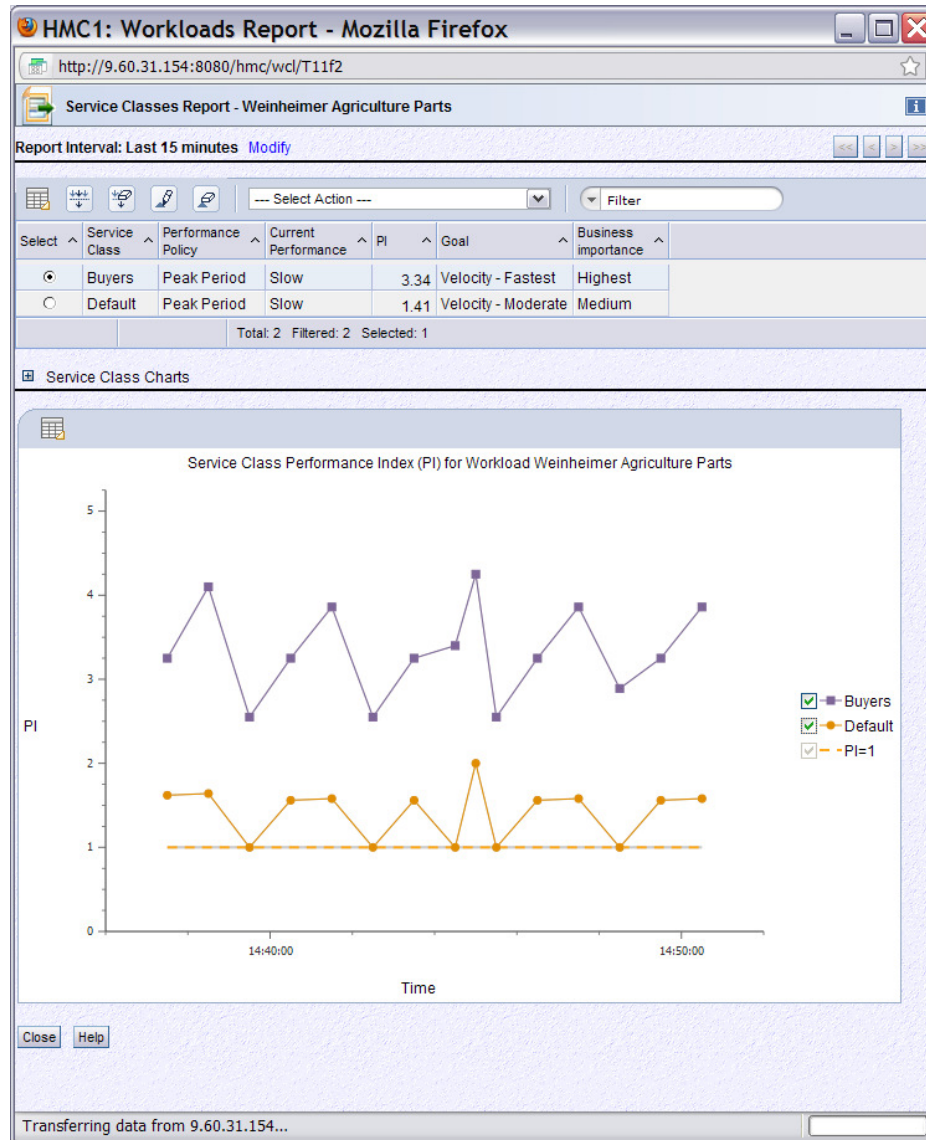
Name	Type	Processor Usage (%)	Memory Usage (%)	Network I/O Usage (%)	Storage (kBytes/second)
B.0.00		100	20	0	1,000,000
B.0.01		99	21	1	1,000,100
B.0.02		98	22	2	1,000,200
B.0.03		97	23	3	1,000,300
B.0.04		96	24	4	1,000,400
Total: 65					

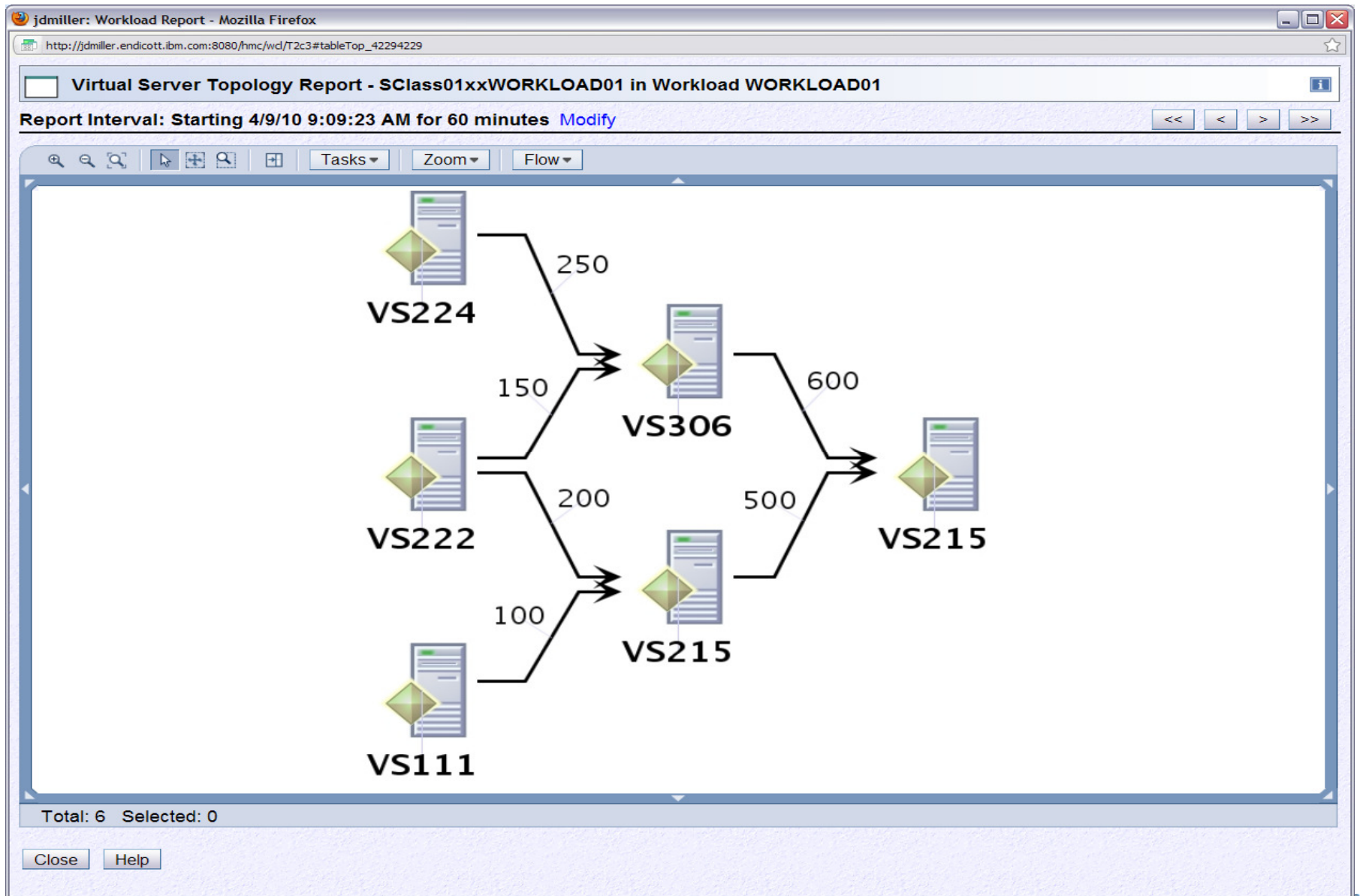
Virtual Servers

Name	Hypervisor	Processor Usage (%)	Memory Usage (%)
Buyer1	LP01	1	99
Buyer2	LP01	2	98
Vendor1	LP01	3	97
Vendor 2	LP01	4	96
VMGN001	LP01	5	95
Total: 100			

Close Help

Done





HMC1: Workloads Report - Mozilla Firefox
 http://9.60.31.154:8080/hmc/wcd/T1325#tableTop_1d521d52

Hypervisor Report - Weinheimer Agriculture Parts
 Report Interval: Last 15 minutes [Modify](#)

Hypervisor Details

Hypervisor:	PYocom.hpmx2	Hypervisor type:	PowerVM
Processor count:	5	Total CPU consumption:	80.6%
Total memory allocated for LPARs:	5,120 MB	Total memory:	2,048 MB
Total processor entitlement:	2.50		

Virtual Servers

Virtual Server	Processor Management Status	Processor Management Reason	Virtual Processor Count	Consumed Processors	Hypervisor Processing Unit Delay (%)	Allocated Memory (MB)	LPAR Capped	Uncapped Weight	Current Entitled Capacity	Defined Entitled Capacity	Min Entitled Capacity	M E C
Buyer 1	Not Active	Disabled for hypervisor type	1	0.89	94.0	1,024	-	55	50	50	10	
Buyer 2	Not Active	Disabled for hypervisor type	1	0.84	67.8	1,024	-	55	50	50	10	
Payroll App	Not Active	Disabled for hypervisor type	1	0.79	67.8	1,024	-	55	50	50	10	
Vendor 1	Not Active	Disabled for hypervisor type	1	0.84	67.8	1,024	-	55	50	50	10	
Total: 5 Filtered: 5												

Successful Adjustments

Receiver Virtual Servers	Receiver Workload	Receiver Service Class	Receiver Processing Units After (Before)	Donor Virtual Servers	Donor Workload	Donor Processing Units After (Before)	Time
Total: 0 Filtered: 0							

Failed Adjustments

Receiver Virtual Servers	Receiver Workload	Receiver Service Class	Failure Reason	Time
Total: 0 Filtered: 0				

Close Help

Done

HMC1: Workloads Report - Mozilla Firefox

http://9.60.31.154:8080/hmc/wcl/T14d0

Virtual Server Resource Adjustments Report - Buyer 1

Report Interval: Last 15 minutes [Modify](#)

Successful Adjustments

Receiver Virtual Servers ^	Receiver Workload ^	Receiver Service Class ^	Receiver Processing Units After (Before) ^	Donor Virtual Servers ^	Donor Workload ^	Donor Processing Units After (Before) ^	Time ^
Buyer 1	Weinheimer Agriculture Parts	Buyers	0.52 (0.50)	Payroll App	Payroll	0.49 (0.50)	Jul 11, 2010 4:13:18 PM
Buyer 1	Weinheimer Agriculture Parts	Buyers	0.52 (0.50)	Vendor 1	Weinheimer Agriculture Parts	0.49 (0.50)	Jul 11, 2010 4:13:18 PM
		Total: 2	Filtered: 2				

Failed Adjustments

Receiver Virtual Servers ^	Receiver Workload ^	Receiver Service Class ^	Failure Reason ^	Time ^
Total: 0 Filtered: 0				

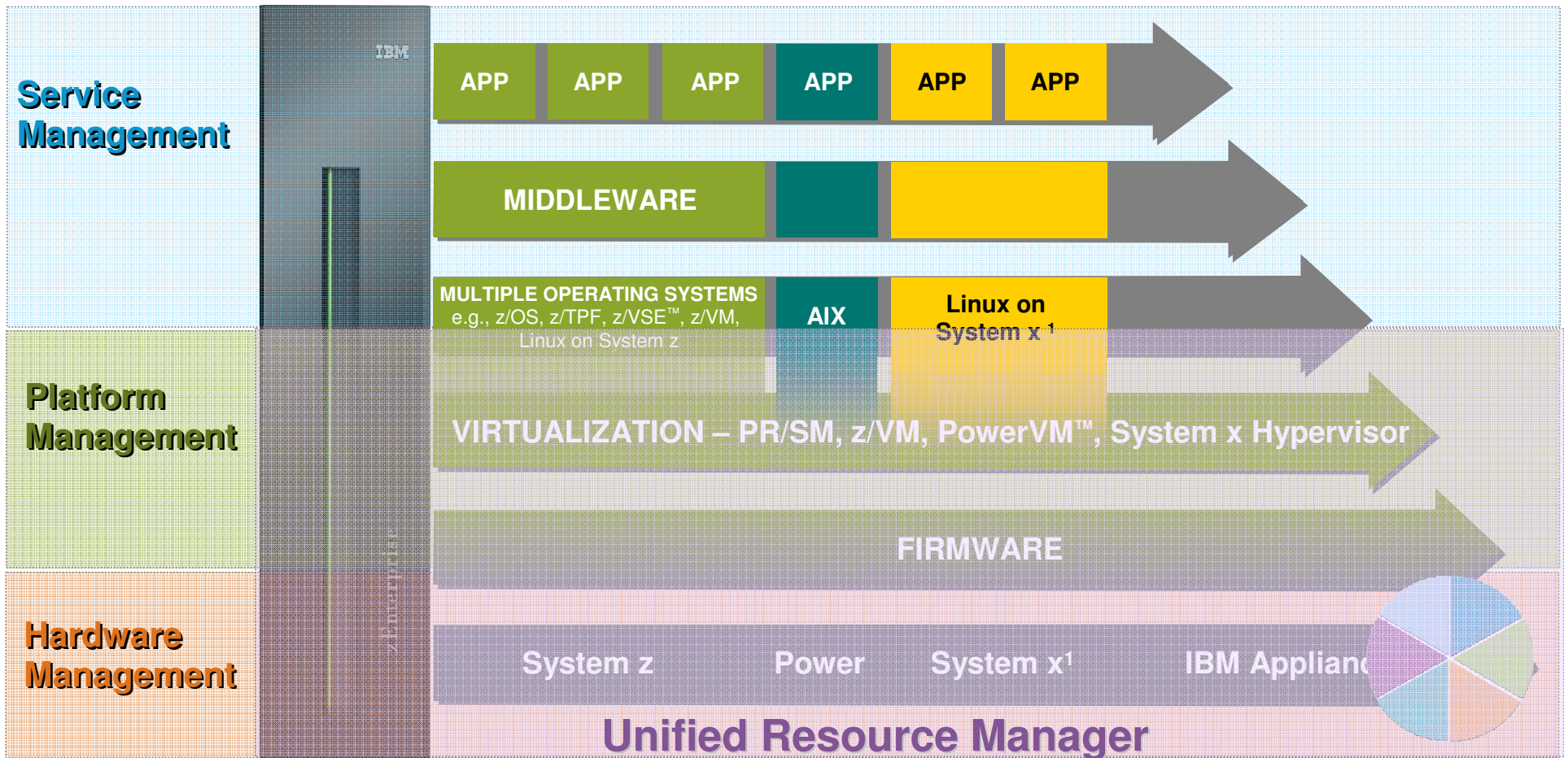
Close Help

Done

Resource Control

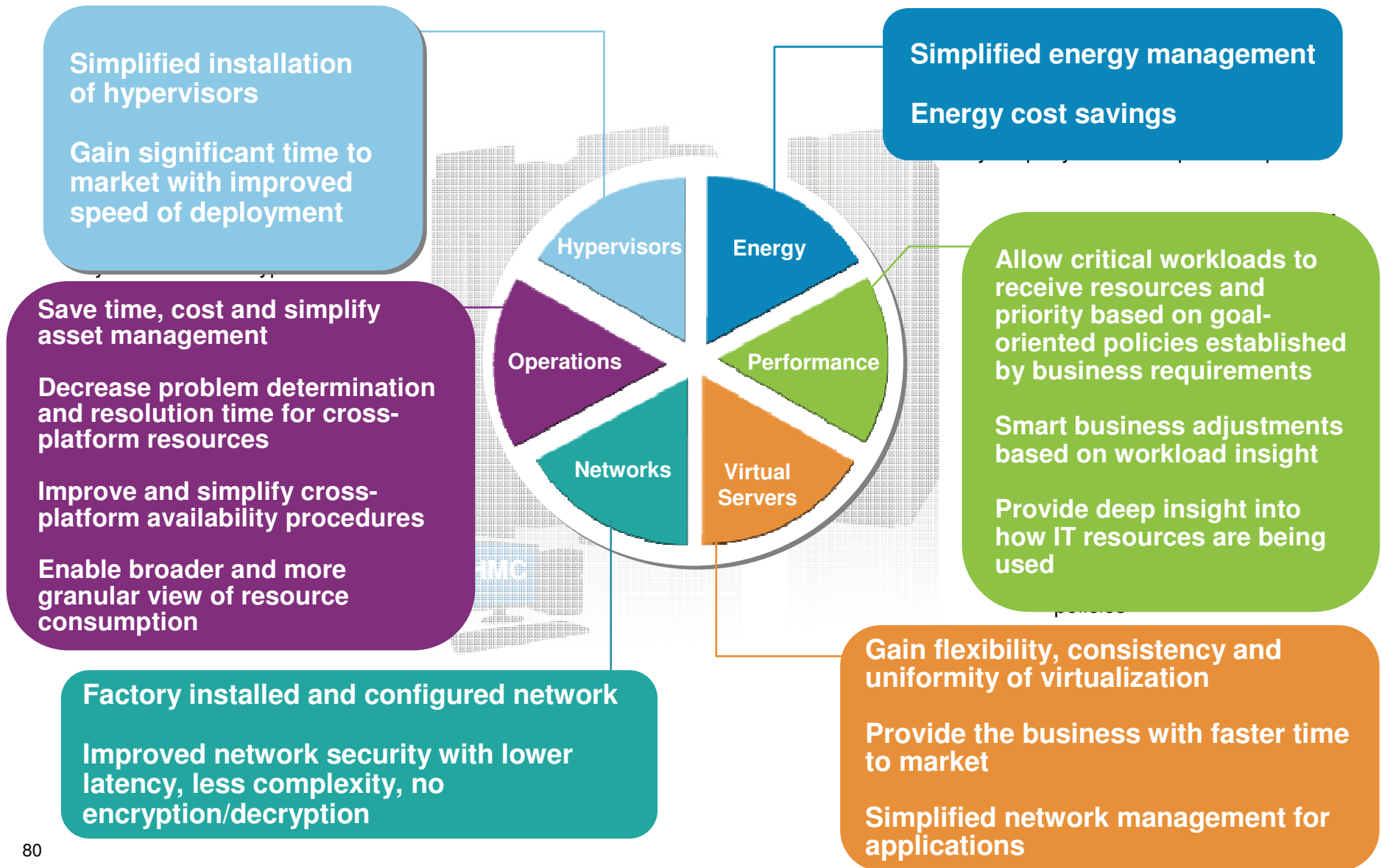
- zManager manages through the hypervisors
- For blades, no direct hypervisor access is provided to customers
 - Closed environments – hypervisors managed as firmware
 - Hypervisor is (just) a management control point
- For z/VM, direct hypervisor access is permitted (e.g., via the CLI)
 - Difficult to take away
 - Allows mixing and matching existing capabilities with zManager functions
 - Permits some inconsistency
 - e.g., Virtual server created outside of zManager must be added to managed set via UI to be visible
- Virtual server perspective
 - Hypervisor provides additional interfaces
 - z/VM has a rich set, many of which are intended for SVM use
- Requirement for programmatic interfaces to zManager well understood
 - Will enable support for additional management software at the operating system, middleware, and application layers

Management Stack – Innovation At Every Level



Focused, collaborative innovation
A “complete systems” approach

... Value Made Possible By the Unified Resource Manager



IBM zEnterprise System:

A revolutionary change has come to IT bringing a new dimension in computing

- Redefining IT frameworks to bring change to operational silos and extend System z governance to z/VM virtual machines and blades
- Driving business decisions based on insight rather than hindsight
- Improving agility to compete with consolidation and simplification
- Delivering consistent business controls across applications and platforms
- Focused on integration and collaboration to fuel business growth



¹ All statements regarding IBM future direction and intent are subject to change or withdrawal without notice, and represents goals and objectives only.



Thank you