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zEnterprise Unified Resource Manager

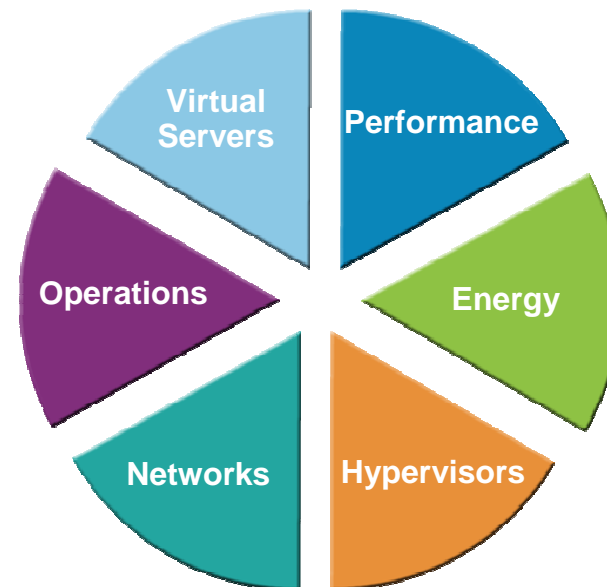
Patty Driever
IBM Systems & Technology Group

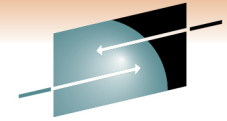
March 2, 2011; 11:00 – 12:00
Session Number 8700



Agenda

- IBM zEnterprise – Objectives & Structure
- Unified Resource Manager
 - What is it? How is it different?
 - Ensemble Structure
 - Overview of Management Components & Related Facilities
- Use Case Scenario





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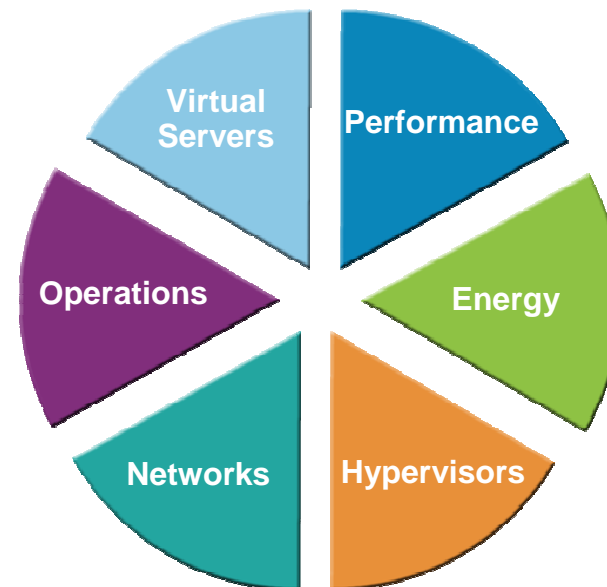
Related Deeper-Dive Sessions

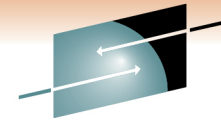
• Wednesday, March 2

- **Unified Resource Manager – Hands-On Lab**
Andreas Bieswanger, IBM Corporation
1:30 p.m. - 2:30 p.m.
- **Energy Management for zEnterprise**
Andreas Bieswanger
3:00 p.m. - 4:00 p.m.

• Thursday, March 3

- **Platform Performance Management Overview**
Hiren Shah , IBM Corporation
8:00 a.m. - 9:00 a.m.





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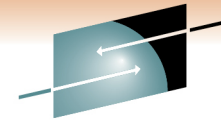
IBM zEnterprise™ Objectives

- Dynamic, Workload Optimized, Infrastructure Management
 - To integrate, monitor, and manage the heterogeneous infrastructure resources as a single, logical, virtualized system
 - To manage the infrastructure resources in accordance with specified business service level objectives associated with the business service workloads
 - To provide dynamic deployment and management of virtual server images and virtualized appliances in a service optimized infrastructure
- Workload Optimizers
 - IBM Smart Analytics Optimizer for DB2 for z/OS, V1.1 (IBM Smart Analytics Optimizer)
 - IBM WebSphere DataPower Integration Appliance XI50 for zEnterprise
 - To extend and accelerate zEnterprise business service workloads
- IBM Blades
 - To incorporate additional “specialty engines” to host applications on their native processor architectures
 - To consolidate and manage a multiple-tier, heterogeneous infrastructure with reduced complexity and lower cost
 - And to enable better application integration with IBM System z transaction processing, messaging, and data serving capabilities

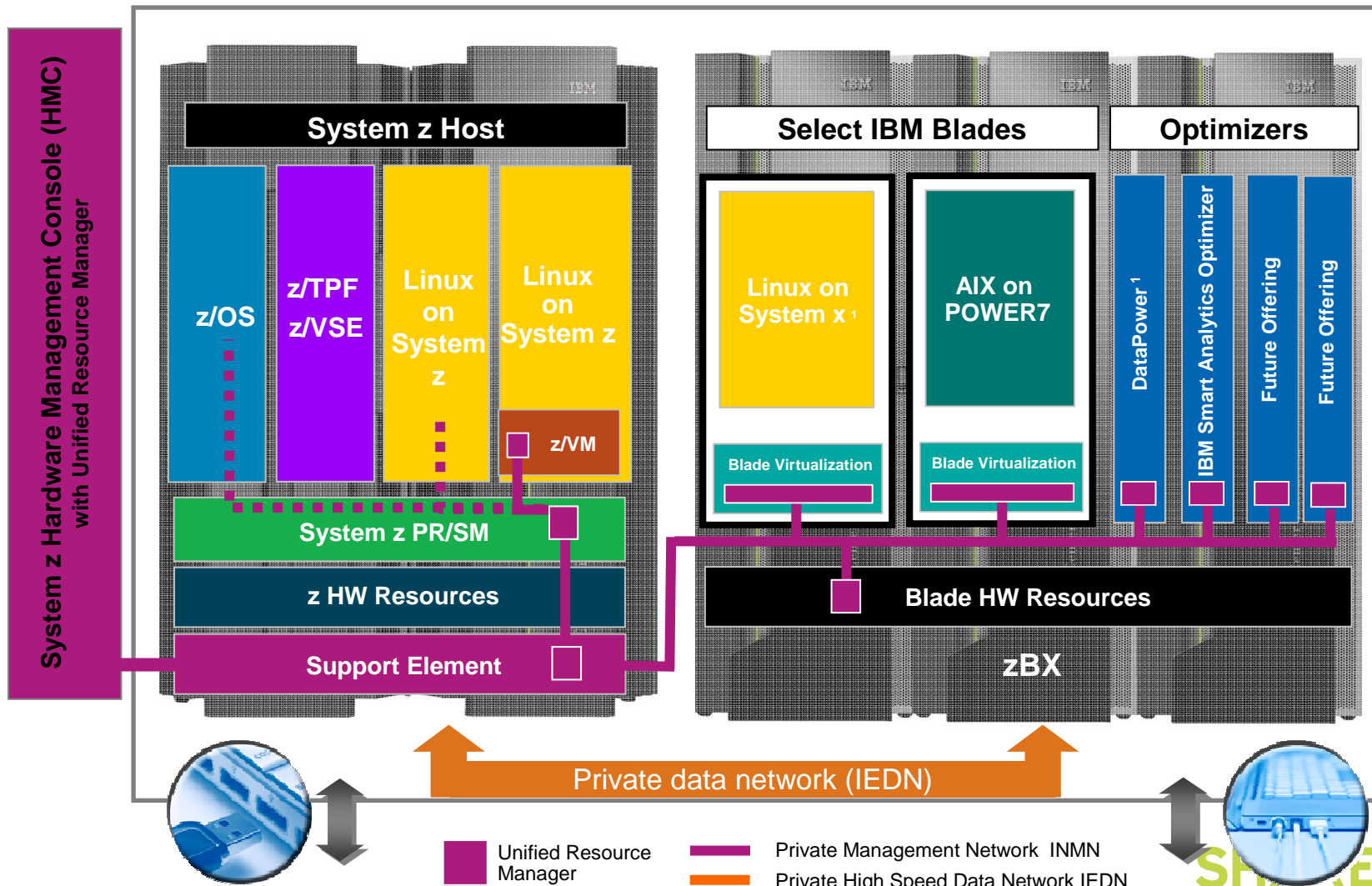
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Putting zEnterprise System to the task

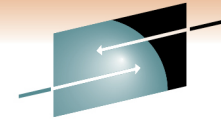
Use the smarter solution to improve your application design



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



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OS Support

- **PR/SM™**
 - All System z operating systems continue to be supported
 - OS Support for connection to IEDN
 - z/OS 1.10 and up (with applicable PTFs on 1.10 and 1.11)
 - Linux
 - Support for Guest Platform Management Provider (GPMP, also know as OS agent)
 - z/OS – Provides enhanced monitoring
- **z/VM®**
 - z/VM 6.1 with applicable PTFs
 - All System z operating systems continue to be supported
 - OS Support for connection to IEDN
 - z/OS 1.10 and up
 - Linux
 - Support for GPMP
 - z/OS – Provides enhanced monitoring
 - Linux – Provides enhanced monitoring
- **IBM Blades (Select IBM POWER7)**
 - AIX 5.3 and up
 - Includes support for connection to IEDN and for GPMP

zEnterprise Unified Resource Manager

Transforming the way resources are managed and deployed

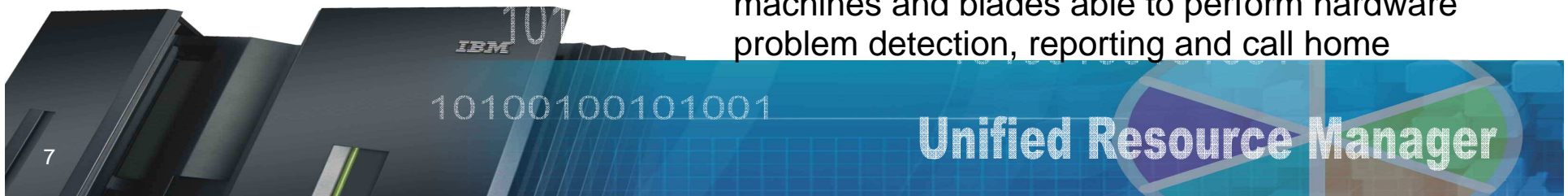


What is it?

*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.*

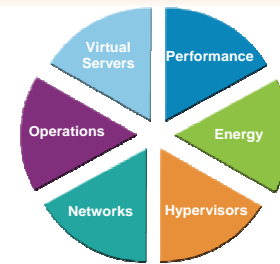
How is it different?

- **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:** Virtual machines and blades able to perform hardware problem detection, reporting and call home



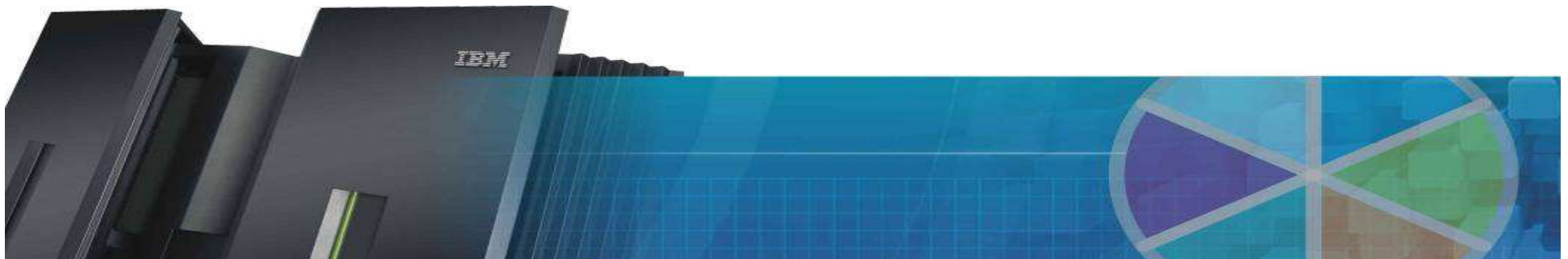
Unified Resource Manager

Two suites of tiered functionality



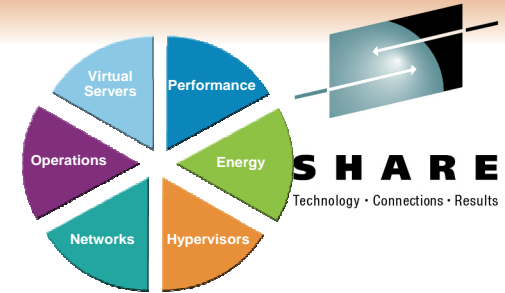
- **Manage**

- Monitor and trend reporting of CPU energy efficiency.
- New dashboard interface enabling a broader view of system resource consumption.
- Integrated hardware / asset management across all elements of the system.
- Private and physically isolated connections for secure support and data sharing.
- Administrative simplification (wizard) for virtual server provisioning and enablement of integrated storage and network across hypervisors.



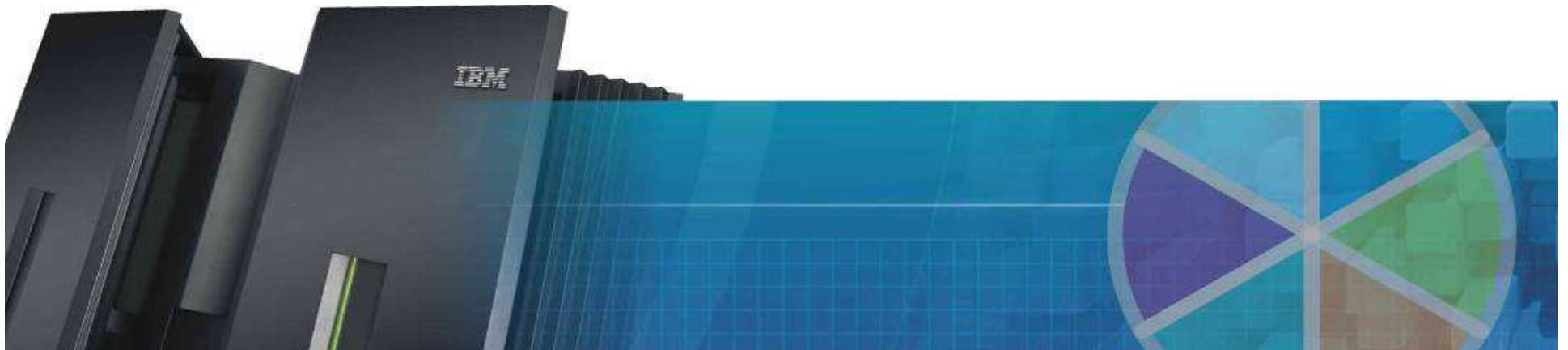
Unified Resource Manager

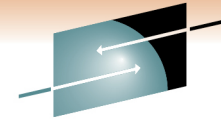
Two suites of tiered functionality



- ***Automate***

- Additional wizard function to set up resources associated with a workload the capability to associate those resources with a named business process.
- Ability to manage to a user defined performance service level policy and enable performance monitoring, reporting and resource optimization.
- Static power savings and energy management capabilities.



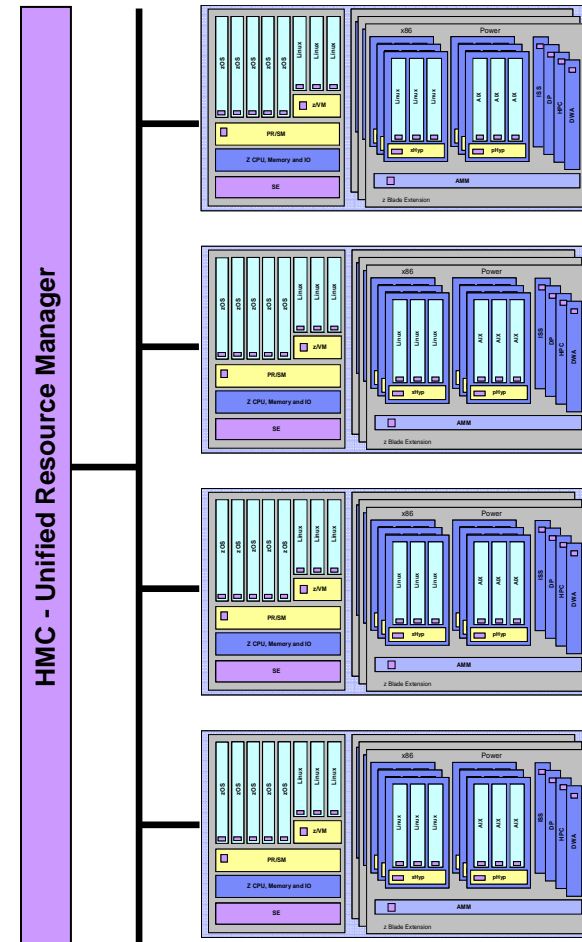


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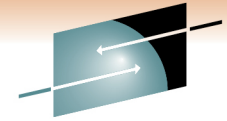
zEnterprise Ensemble

- A zEnterprise Node is a single z CPC with 0 to 4 zBX racks and up to two blade centers per rack
- A zEnterprise Ensemble is a collection of 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
 - Integrated networks and management
 - Workload awareness across the resources
- A primary/alternate pair of HMCs provides the management console for the ensemble



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HMC Controls

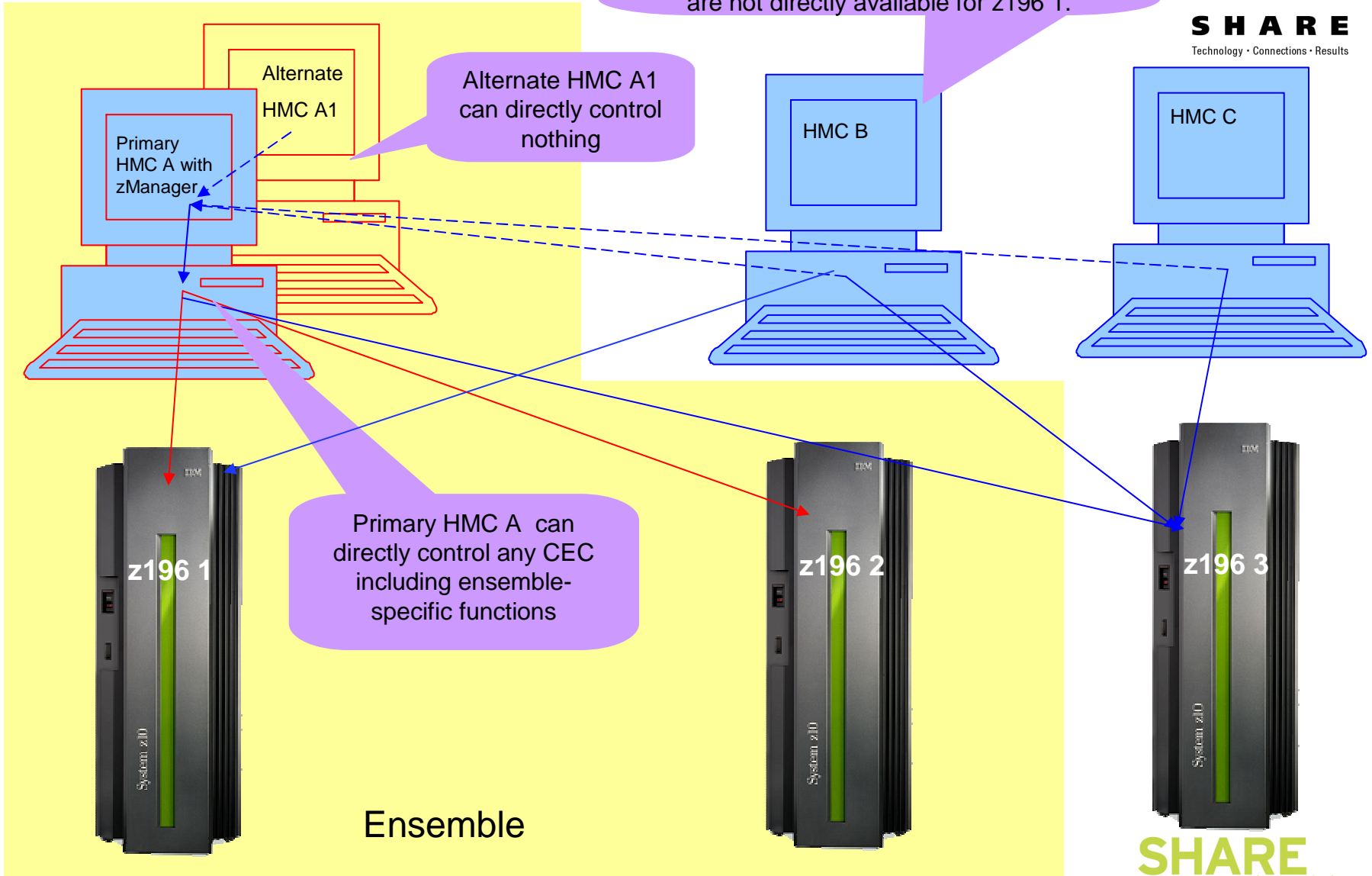


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HMC B can directly control any zEnterprise 196 CEC. The ensemble-specific functions are not directly available for z196 1.

Alternate HMC A1 can directly control nothing

Primary HMC A can directly control any CEC including ensemble-specific functions



Ensemble

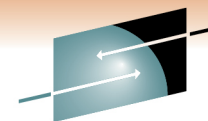
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Ensemble Management Users and Roles

- 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

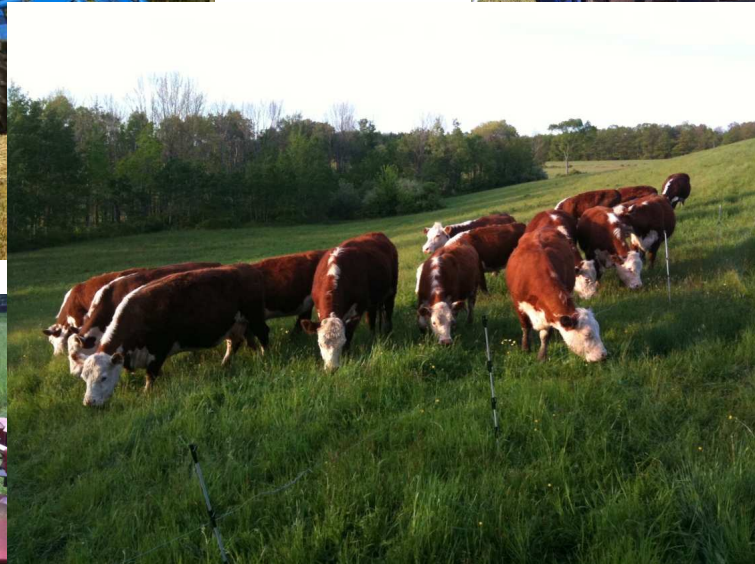
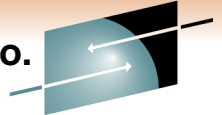


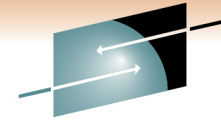
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Use Case Scenario

Scenario based walk-through of Ensemble Management - Weinheimer Agricultural Parts Co.





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Weinheimer Agricultural Parts Company

Requirements

- Web application servers for buyers and suppliers
- Large 24x7 database
- Optimize buyer purchasing during peak periods. Supplier inventory management is less critical during peak periods.
- Graphical analysis of system and business application performance
- Notification when performance objectives not being met.

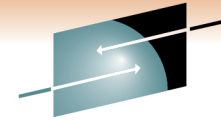
Solution

- Use the Unified Resource Manager to implement the hybrid based parts store.
- IBM Blades (Select IBM POWER7) provide web application front-end for buyers and vendors.
- IBM Smart Analytics Optimizer (ISAOPT) for z/OS DB/2 optimization
- Create virtual resources to represent and run both sets of work
- Use Performance Management to optimize business goals

Prerequisites/Assumptions :

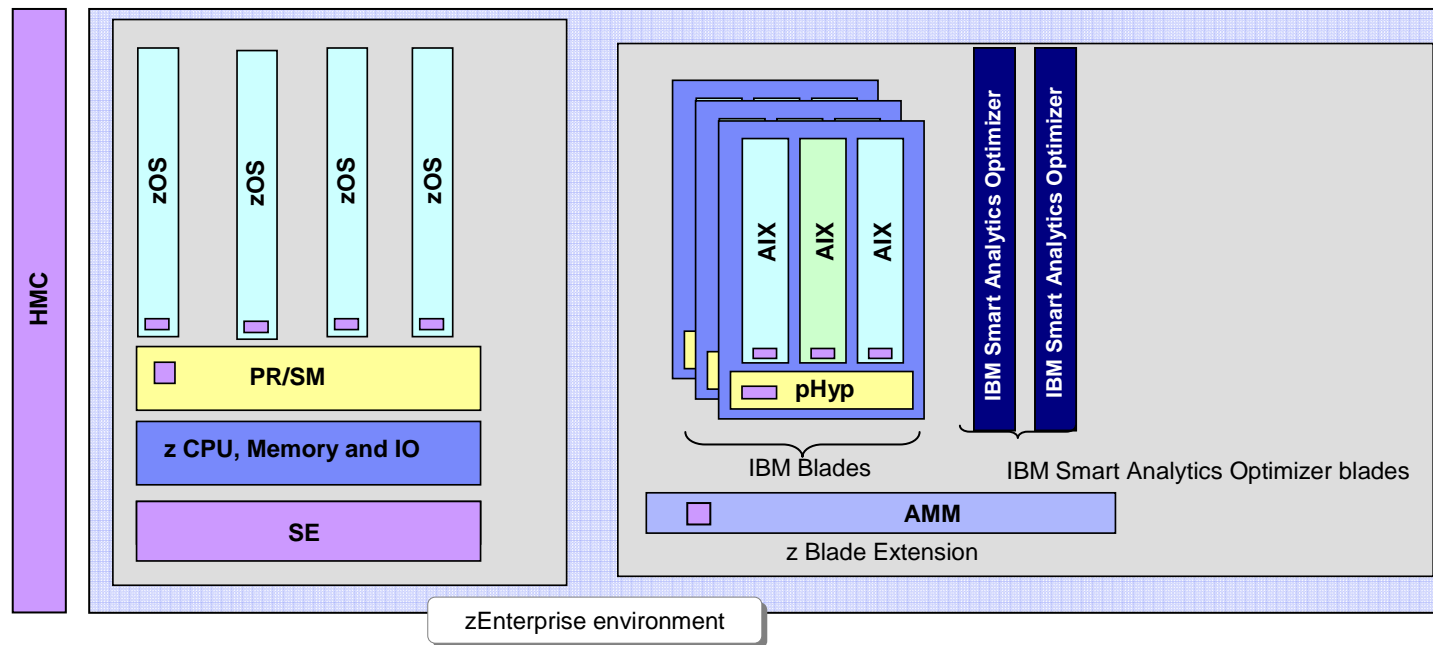
- zManager Automate Suite feature for Performance Management
- z BladeCenter Extensions(zBX) – IBM Blades (Select IBM POWER7)
- z/OS with DB/2
- IBM Smart Analytics Optimizer Blades

zEnterprise Proposed Configuration



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Agricultural Parts Workload Flow:

Request goes into WebServer on AIX

Request passed to DB2 on z/OS

Assume required DB2 IBM Smart Analytics Optimizer Configuration is done, then under the covers, IBM Smart

¹⁶ Analytics Optimizer behaves as a DB2 Component

NEXTGEN: Welcome to the Hardware Management Console (Version 2.11.1) - Mozilla Firefox: IBM Edition

File Edit View History Bookmarks Tools Help

9.60.92.193 https://9.60.92.193/preloginmonitor/index.jsp

Most Visited Communities Wiki HMCs Meetings - Developme... BlueMail Frankfurt Airport, Ger... Integrated Solutions C...

NEXTGEN: Welcome to the Hardwar...

Welcome to the Hardware Management Console (Version 2.11.1)

This web server is hosting the Hardware Management Console application. Click on the link below to begin.

[Log on and launch the Hardware Management Console web application.](#)

You can also [view the online help](#) for the Hardware Management Console.

X System Status
There are one or more objects in an unacceptable state.

Hardware Messages
There are one or more hardware messages.

Operating System Messages
There are no operating system messages.

Done

To get started, log in to the HMC with a userID which has the ensemble administrator role

Launch the Ensemble Management Guide to get started

Hardware Management Console

Ensemble Management

Getting Started

The **Ensemble Management Guide** task assists you with setting up and managing an ensemble. It familiarizes you with the various management tasks for creating and managing aspects of an ensemble. For convenience, the guide task also provides links for launching the ensemble management tasks.

Ensemble Management Guide
Hardware Management Console and Support Element Operations Guide for Ensembles.

Unified Resource Manager (zManager) manages and optimizes a zEnterprise System as a single resource pool. The zManager provides energy monitoring and management, goal-oriented policy management, increased security, virtual networking, and data management for physical and logical resources of a given ensemble. Functions are grouped into two suites of tiered functionality (Manage suite and Automate suite) that enable different levels of capability.

Hypervisor Management

- Integrated deployment and configuration of hypervisors
- Hypervisors (except z/VM) shipped and serviced as firmware
- Manage and control communication between virtual server operating systems and the hypervisor.

Energy Management

- Monitoring and trend reporting of energy efficiency
- Ability to query maximum potential power
- Power saving
- Power capping

Workload Awareness and Platform Performance Management

- Wizard-driven management of resources in accordance with specified business service level objectives
- Monitor resource use within the context of a business workload
- Define workloads and associated performance policies

Virtual Server Lifecycle Management

- Single view of virtualization across platforms
- Ability to deploy multiple, cross-platform virtual servers within minutes
- Management of virtual media (ISO images)
- Management of virtual storage and networks

Operational Controls

- HMC provides a single consolidated and consistent view of resources
- Auto-discovery and configuration support for new resources
- Cross platform hardware problem detection, reporting, and call home
- Physical hardware configuration, backup and restore
- Business management functions: user management, auditing, device status, service network configuration

Network Management

- Creation of virtual networks
- Management of virtual networks including access control

Key

- Manage suite
- Automate suite

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Ensemble Management Guide

Use this guide to assist you with setting up an ensemble. Click any of the links to take you directly to the tasks. Click the notes link to add notes about your ensemble, such as steps completed or number of members added.



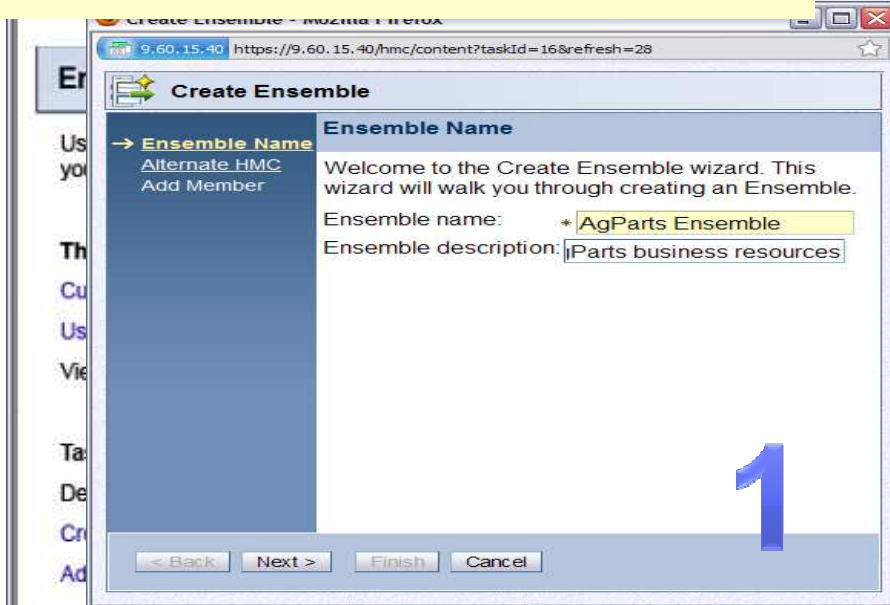
Things to consider:

- [Customize User Controls](#) (Optional) View and manage task and resource roles introduced for ensemble management.
- [User Profiles](#) (Optional) View and manage the EnsembleAdmin and EnsembleOperator users and assign roles.
- [View documentation](#) (Optional) Read on-line documents to assist you in setting up your ensemble.

Task

- | Task | Allows you to... |
|------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Define alternate HMC | Choose another HMC and start the Manage Alternate HMC task to assign it as an alternate HMC. |
| Create Ensemble | Create an ensemble. A HMC can manage only one Ensemble. Learn more... |
| Add Member to Ensemble | Add a member (CPC) to the ensemble. A functional ensemble must have at least one member, but it can have up to eight. Learn more... |
| Entitle zBX blades | Use the Perform Model Conversion task on the Support Element (SE) to entitle your blades. You can use the Single Object Operations task to access the SE console. |
| Manage Storage Resources | Add or remove storage resources and storage groups. |
| Manage Virtual Networks | Add or remove virtual networks. Manage which hosts are connected to virtual networks. |
| New Virtual Server | Create a virtual server on a hypervisor in this ensemble. Learn more... |
| Mount Virtual Media | Install your operating system and applications. If you plan on including this virtual server in a workload you might want to install the guest platform management provider (GPMP). |
| Activate | Activate a virtual server to power it on. |
| Open Text Console | Open a console window to a virtual server. |
| New Workload | Create a workload for this ensemble. A workload helps you manage platform resources based on the requirements of a business application. Learn more... |
| Add Performance Policies | Define the rules associated with workload performance. |
| View Performance Metrics | View performance metrics from the Monitors Dashboard. |
| View Workload Reports | View workload reports from the Monitors Dashboard. |

Create Ensemble Wizard



1

Create Ensemble

→ Ensemble Name

Alternate HMC
Add Member

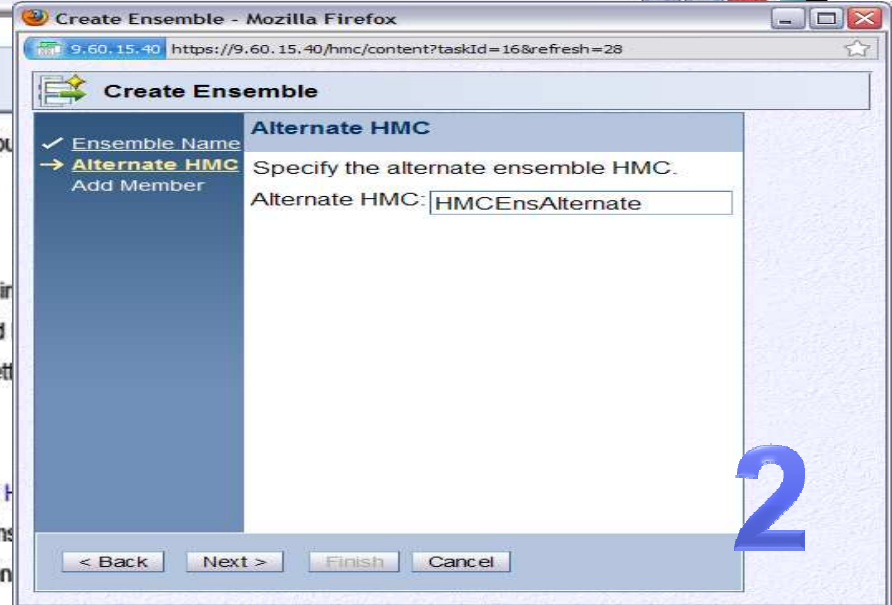
Ensemble Name

Welcome to the Create Ensemble wizard. This wizard will walk you through creating an Ensemble.

Ensemble name: * AgParts Ensemble

Ensemble description: Parts business resources

< Back Next > Finish Cancel



2

Create Ensemble

✓ Ensemble Name

→ Alternate HMC

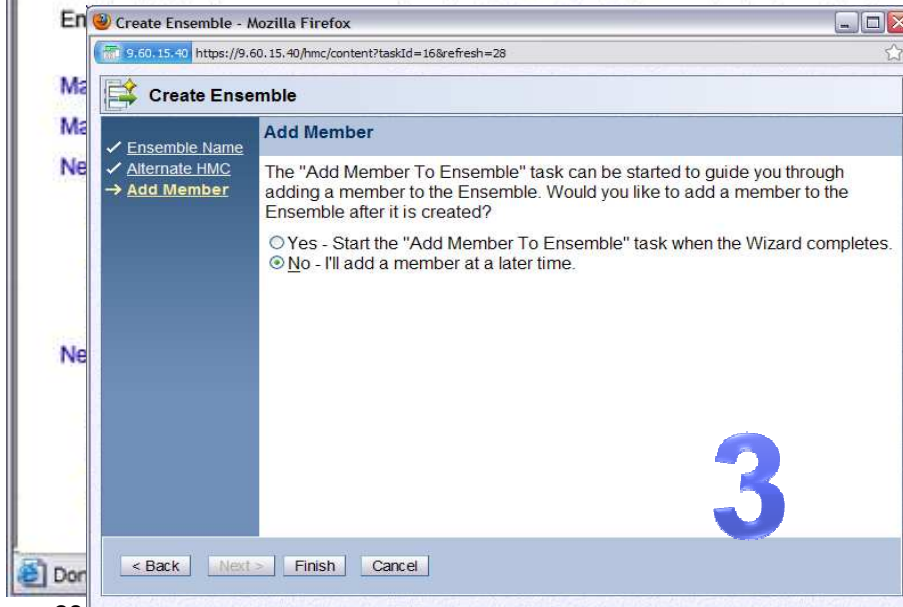
Add Member

Alternate HMC

Specify the alternate ensemble HMC.

Alternate HMC: HMCEnsAlternate

< Back Next > Finish Cancel



3

Create Ensemble

✓ Ensemble Name

✓ Alternate HMC

→ Add Member

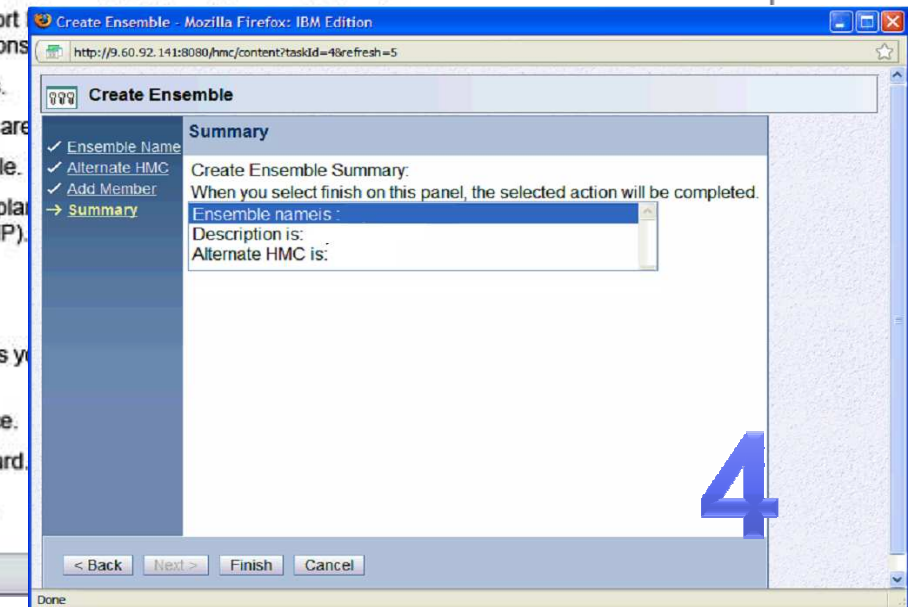
Add Member

The "Add Member To Ensemble" task can be started to guide you through adding a member to the Ensemble. Would you like to add a member to the Ensemble after it is created?

Yes - Start the "Add Member To Ensemble" task when the Wizard completes.

No - I'll add a member at a later time.

< Back Next > Finish Cancel



4

Create Ensemble

✓ Ensemble Name

✓ Alternate HMC

✓ Add Member

→ Summary

Summary

Create Ensemble Summary:

When you select finish on this panel, the selected action will be completed.

Ensemble name is:

Description is:

Alternate HMC is:

< Back Next > Finish Cancel

Ensemble Created

The screenshot displays the IBM Hardware Management Console interface. The main window is titled "Hardware Management Console" and shows the "Ensemble Management" section. The "Ensemble" tab is selected, displaying a table of ensembles. The table has columns for "Name", "Status", "Virtual Servers", "z/VM Processor Management", "PowerVM Processor Management", and "Description". The first row shows "AgParts Ensemble" with a status of "OK". Below the table, it indicates "Max Page Size: 500", "Total: 3", "Filtered: 3", and "Selected: 1".

Selec ^	Name ^	Status ^	Virtual Servers ^	z/VM Processor Management ^	PowerVM Processor Management ^	Description ^
<input checked="" type="checkbox"/>	AgParts Ensemble					
<input type="checkbox"/>	Members	OK				
<input type="checkbox"/>	Workloads					

Tasks: AgParts Ensemble

- Ensemble Details
- Toggle Lock
- Configuration
 - Add Member to Ensemble
 - Delete Ensemble
 - Manage Storage Resources
 - Manage Virtual Networks
 - New Virtual Server
 - New Workload
- Monitor

Status: Exceptions and Messages

Add a Member System to the Ensemble

Ensemble Management Guide

Use this guide to assist you with setting up an ensemble. Click any of the links to take you directly to the tasks. Click the notes link to add notes about your ensemble, such as steps completed or number of members added.

Notes

Things to consider:

- [Customize User Controls](#) (Optional) View and manage task and resource roles introduced for ensemble management.
- [User Profiles](#) (Optional) View and manage the EnsembleAdmin and EnsembleOperator users and assign roles.
- [View documentation](#) (Optional) Read on-line documents to assist you in setting up your ensemble.

Task

Allows you to...

- [Define alternate HMC](#) Choose another HMC and start the [Manage Alternate HMC](#) task to assign it as an alternate HMC.
- [Create Ensemble](#) Create an ensemble. A HMC can manage only one Ensemble. [Learn more...](#)
- [Add Member to Ensemble](#) Add a member (CPC) to the ensemble. A functional ensemble must have at least one member, but it can have up to eight. [Learn more...](#)

[Entitle zBX blades](#) Use the Perform Model Conversion task on the Support Element (SE) to entitle your blades. You can use the [Single Object Operations](#) task to access the SE console.

[Manage Storage Resources](#) Add or remove storage resources.

[Manage Virtual Networks](#) Add or remove virtual networks.

[New Virtual Server](#) Create a virtual server.

[Mount Virtual Media](#) Install your operating system and install the guest platform.

[Activate](#) Activate a virtual server.

[Open Text Console](#) Open a console window.

[New Workload](#) Create a workload for business application.

[Add Performance Policies](#) Define the rules associated with a workload.

[View Performance Metrics](#) View performance metrics for a workload.

[View Workload Reports](#) View workload reports for a workload.

NEXTGEN: Add Member to Ensemble - Mozilla Firefox: IBM Edition

9.60.92.193 https://9.60.92.193/hmc/content?taskId=18&refresh=32

Add Member to Ensemble - Agparts Ensemble

Select	System	Eligible
<input checked="" type="radio"/>	PZBONZAI	Yes
<input type="radio"/>	P0LXSM03	No
<input type="radio"/>	P0016F5A	No

Add Reasons Cancel Help

Add a Member System to the Ensemble – Main UI

The screenshot displays the Hardware Management Console (HMC) main UI. The left sidebar shows the navigation menu with 'Ensemble Management' highlighted. The main content area shows the 'Ensemble Management' section with a table of systems. A dialog box titled 'Add Member to Ensemble - Agparts Ensemble' is open, showing a table of systems with radio buttons for selection. The 'Add' button is highlighted.

In addition to launching the task directly from the Ensemble Management Guide, you may also select the ensemble target in the main UI and then click the **Add Member to Ensemble** task.

Select	System	Eligible
<input checked="" type="radio"/>	PZBONZAI	Yes
<input type="radio"/>	P0LXSM03	No
<input type="radio"/>	P0016F5A	No

Configuration	Monitor
Add Member to Ensemble	Workloads Report
Delete Ensemble	
Manage Ensemble MAC Prefixes	
Manage Storage Resources	
Manage Virtual Networks	
New Virtual Server	
New Workload	

Member PZBONZAI Added to Ensemble

The screenshot shows the Hardware Management Console (HMC) interface. The main window is titled "Hardware Management Console" and displays the "Ensemble Management" section. The interface includes a navigation pane on the left with options like "Welcome", "Systems Management", "Ensemble Management", "HMC Management", "Service Management", and "Tasks Index". The main content area shows a table of ensemble members. The table has columns for "Name", "Status", "Virtual Servers", "z/VM Processor Management", "PowerVM Processor Management", and "Description". The "AgParts Ensemble" is selected, and its members are listed below. The "PZBONZAI" member is currently "Not Operating".

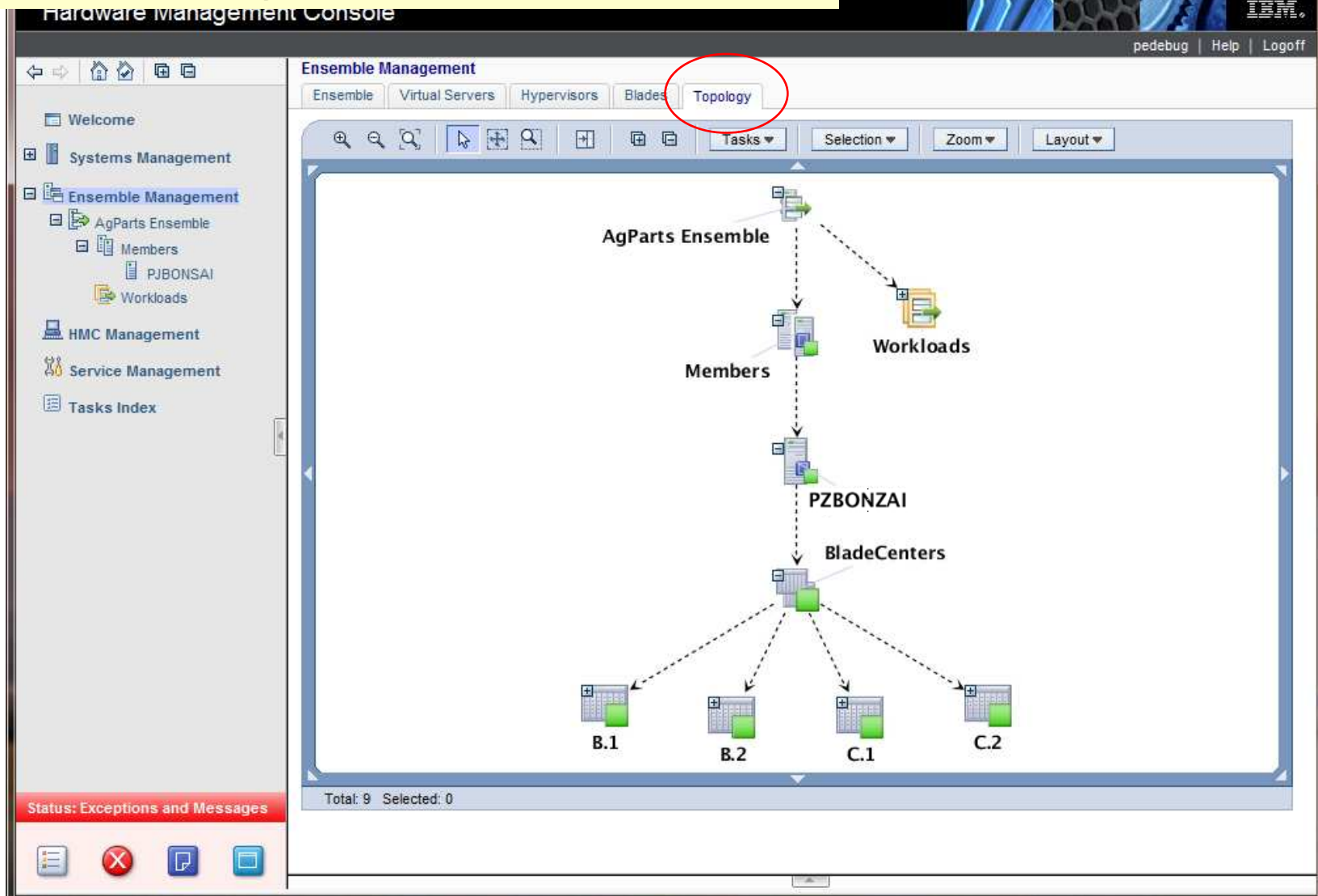
Select	Name	Status	Virtual Servers	z/VM Processor Management	PowerVM Processor Management	Description
<input checked="" type="checkbox"/>	AgParts Ensemble			-	-	
<input type="checkbox"/>	Members	OK				
<input type="checkbox"/>	PZBONZAI	Not Operating				Central Processing
<input type="checkbox"/>	Workloads					

Max Page Size: 500 Total: 4 Filtered: 4 Selected: 1

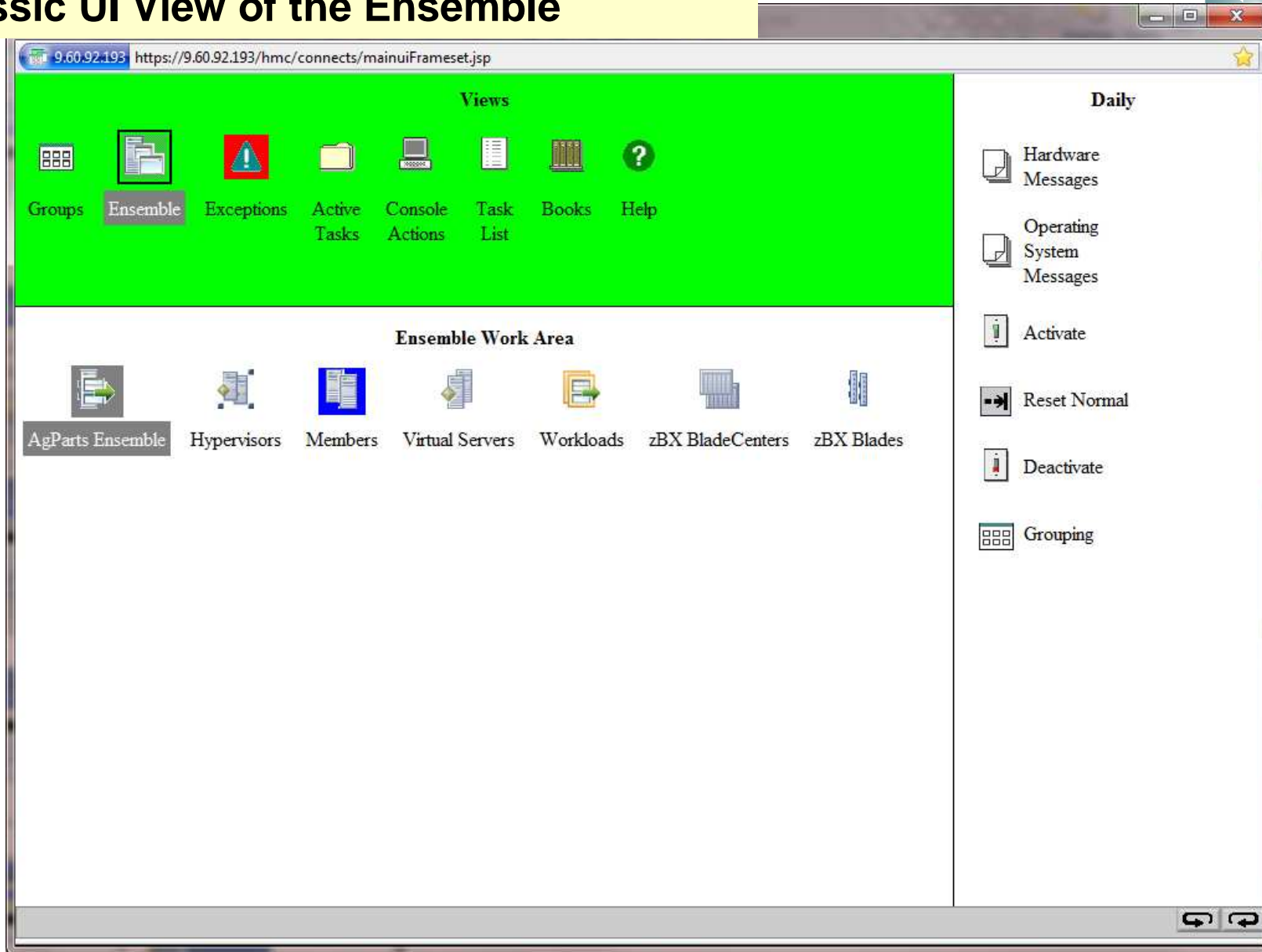
Tasks: AgParts Ensemble

- Ensemble Details
- Toggle Lock
- Configuration
 - Add Member to Ensemble
 - Delete Ensemble
 - Manage Storage Resources
 - Manage Virtual Networks
 - New Virtual Server
 - New Workload
- Monitor

Topology View of AgParts Ensemble (Select Topology Tab)



Classic UI View of the Ensemble



Next Step:

Create the virtual resources required to run the business application server front-end.

- **Storage Resources for Virtual Disks**
- Virtual Networks for Virtual Server Isolation
- Buyer and Vendor Virtual Servers

ly to the tasks. Click the notes link to add notes about

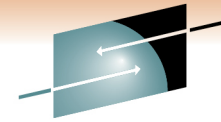
Notes

ed for ensemble management.
bleOperator users and assign roles.
your ensemble.

Task	Allows you to...
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Activate	Activate a virtual server to power it on.
Open Text Console	Open a console window to a virtual server.
New Workload	Create a workload for this ensemble. A workload helps you manage platform resources based on the requirements of a business application. Learn more...
Add Performance Policies	Define the rules associated with workload performance.
View Performance Metrics	View performance metrics from the Monitors Dashboard.
View Workload Reports	View workload reports from the Monitors Dashboard.

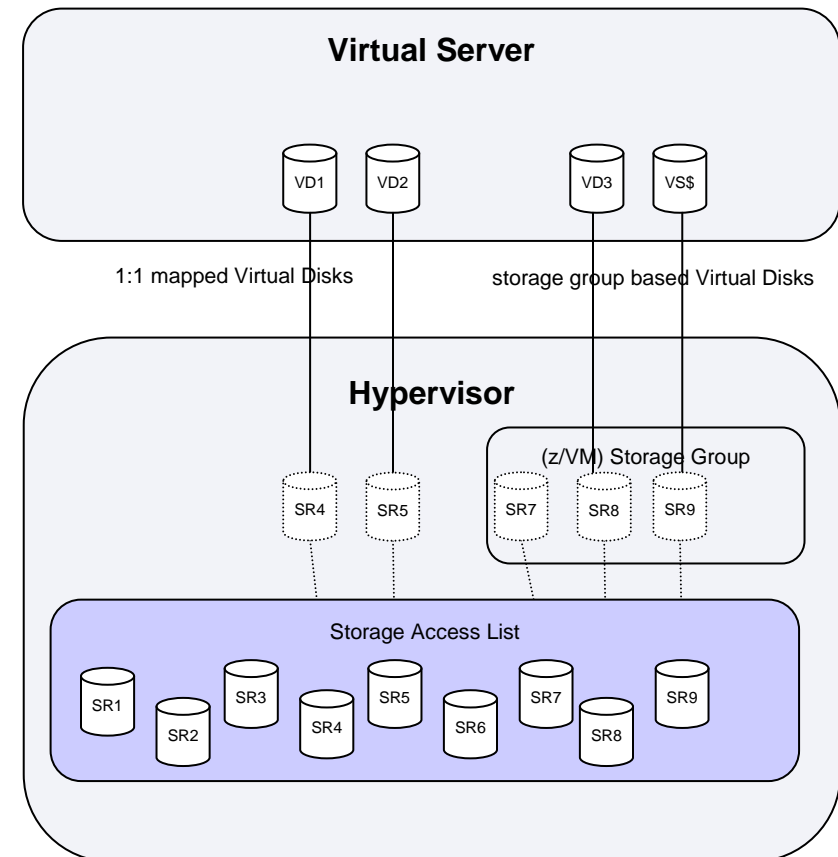
Done Internet

E
ilts



zEnterprise Storage Management

- Objective
 - Provide a single simplified and consistent storage management interface in Unified Resource Manager
 - For ECKD on z/VM and FCP Logical Units across all hypervisor types (zVM and Blades)
 - Supported by a new Storage Virtualization Manager (called SVM)
 - Establishes roles between server and storage admin
- Storage Access List
 - exists per hypervisor
 - defines accessible storage resources



Manage Storage Resources – Add New Storage Resource

View by: **Hypervisors**

Select	Name	Status	Storage Groups	Description
<input type="checkbox"/>	PZBON	No Power		Test Communication with Storage Resources
— Ensemble Actions —				
<input type="checkbox"/>	PZBON			Import Storage Access List...
— Hypervisor Actions —				
<input type="checkbox"/>	PZBON			Add New Storage Resource...
<input type="checkbox"/>	Stora			Remove Storage Resource...
<input type="checkbox"/>	PZBON			Export World Wide Port Number List...
<input type="checkbox"/>	PZBON			Compare Access Lists...
— Table Actions —				
<input type="checkbox"/>	PZBON	No Power		Select All
<input type="checkbox"/>	PZBON	No Power		Deselect All
<input type="checkbox"/>	PZBON	No Power		Configure Columns
<input type="checkbox"/>	PZBON	No Power		ZAT.B.Z.04 PowerVM

Total: 44

Close Help

Status: Exceptions and Messages

- Manage Ensemble MAC Prefixes
- Manage Storage Resources**
- Manage Virtual Networks
- New Workload

Manage Storage Resources – Add Storage Resource task

The screenshot displays the IBM HMC management console interface. A dialog box titled "VTEAMH1: New Virtual Server - Mozilla Firefox: IBM Edition" is open, showing the configuration for a storage resource. The dialog box has a title bar with a star icon and a close button. The main content area is titled "- headless1" and contains the following fields:

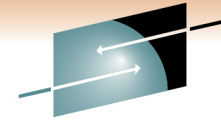
- Name:** * StorageResource731
- Size:** * 80 Gbytes (1024 Mbytes)
- Description:** Storage Resource on 731 b.2.02 hypervisor

Below the description, there is a text instruction: "Define at least one and at most four paths to the storage resource." This is followed by a table with three columns: "Host WWPN", "Controller WWPN", and "Logical Unit Number".

Host WWPN	Controller WWPN	Logical Unit Number
2100-001b-329f-95e4	* 1111-2222-3333-4444	* 1111-2223-3334-5556
2100-001b-329f-95e4		
2100-001b-329f-95e4		
2100-001b-329f-95e4		

At the bottom of the dialog box, there are three buttons: "OK", "Cancel", and "Help".

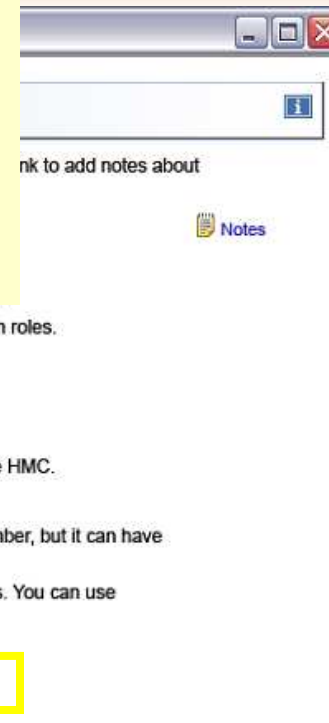
The background shows the HMC management console with a sidebar on the left containing navigation options like "Welcome", "Systems Management", "Ensemble Management", "HMC Management", "Service Management", and "Tasks Index". The main area displays a table of server blades, with the first few rows visible. The status bar at the bottom of the console shows "Status: Exceptions and..." and a task bar with icons for "Manage Virtual Networks" and "New Workload".



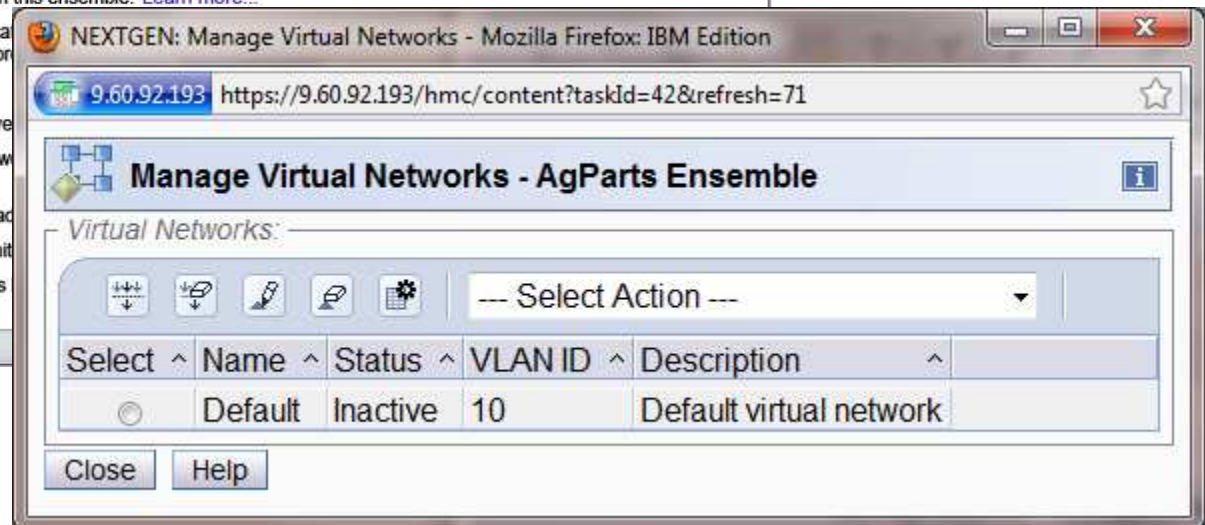
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Technology • Connections • Results

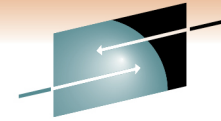
Next Step:

- Storage Resources for Virtual Disks
- **Virtual Networks for Virtual Server Isolation**
- Buyer and Vendor Virtual Servers



User Profiles	(Optional) View and manage the EnsembleAdmin and EnsembleOperator users and assign roles.
View documentation	(Optional) Read on-line documents to assist you in setting up your ensemble.
Task	Allows you to...
Define alternate HMC	Choose another HMC and start the Manage Alternate HMC task to assign it as an alternate HMC.
Create Ensemble	Create an ensemble. A HMC can manage only one Ensemble. Learn more...
Add Member to Ensemble	Add a member (CPC) to the ensemble. A functional ensemble must have at least one member, but it can have up to eight. Learn more...
Entitle zBX blades	Use the Perform Model Conversion task on the Support Element (SE) to entitle your blades. You can use the Single Object Operations task to access the SE console.
Manage Storage Resources	Add or remove storage resources and storage groups.
Manage Virtual Networks	Add or remove virtual networks. Manage which hosts are connected to virtual networks.
New Virtual Server	Create a virtual server on a hypervisor in this ensemble. Learn more...
Mount Virtual Media	Install your operating system and application software on a virtual server and install the guest platform management software.
Activate	Activate a virtual server to power it on.
Open Text Console	Open a console window to a virtual server.
New Workload	Create a workload for this ensemble. A workload is a business application. Learn more...
Add Performance Policies	Define the rules associated with workload monitoring.
View Performance Metrics	View performance metrics from the Monitors.
View Workload Reports	View workload reports from the Monitors.



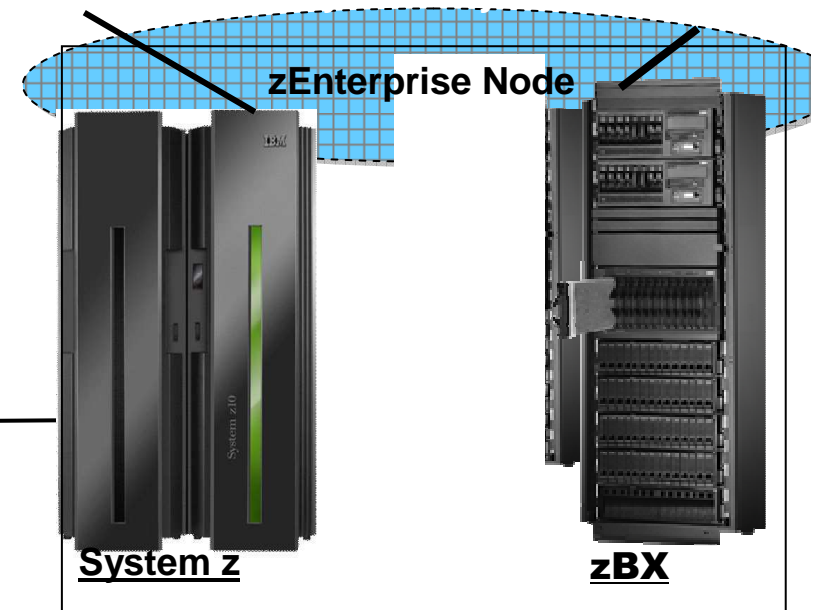
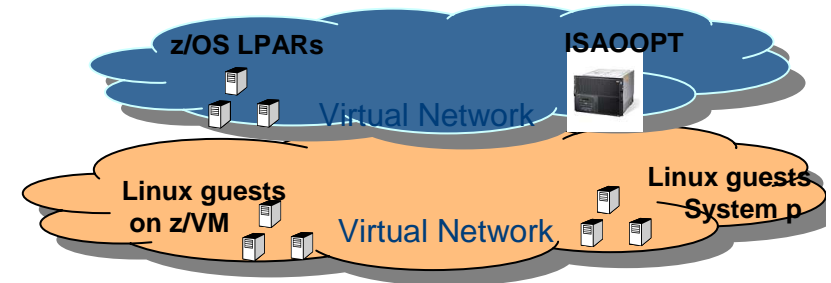


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Network Virtualization

- Access to the IEDN is managed through the Virtual Network Ensemble Management functions in the HMC
- Management of Virtual Networks.
 - Virtual Servers and optimizers must belong to a Virtual Network to communicate on the IEDN
 - Provides network isolation of virtual servers not on same virtual network



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Manage Virtual Networks - New Virtual Network:

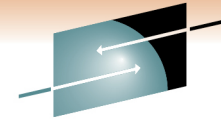
The screenshot displays the Hardware Management Console (HMC) interface. The main window is titled "Manage Virtual Networks - My Ensemble" and shows a table of virtual networks. A context menu is open over the table, with the "New Virtual Network..." option selected. An arrow points from this option to a dialog box titled "Create Virtual Network - AgParts Ensemble".

The dialog box shows the following settings:

- Name: * VendorVirtualNetwork
- Description: All vendor virtual servers on this VLAN
- VLAN ID: * 11 (10-1034)

The background window shows a table of virtual networks with columns for Name and Status. The table contains the following data:

Name	Status
B.2.02	N
B.2.03	N
B.2.04	N
B.2.05	N



Next Step:

- Storage Resources for Virtual Disks
- Virtual Networks for Virtual Server Isolation
- **Create Buyer and Vendor Virtual Servers**

View Documentation (Optional) Read on-line documents to assist you in setting up your ensemble.

Task

Define Alternate HMC Choose another HMC and alternate HMC.

[Create Ensemble](#) Create an ensemble. An H but it can have up to eight.

[Add Member to Ensemble](#) Add a member to the ensemble. Use the Perform Model Co installed. You can use the

Entitle zBX blades Add or remove storage res

[Manage Storage Resources](#) Add or remove virtual netw

[Manage Virtual Networks](#) Create a virtual server on a hypervisor in this ensemble.

[New Virtual Server](#) Install your oper a workload you

[Mount Virtual Media](#) Activate a virtua

[Activate](#) Open a console

[Open Text Console](#) View system vir

[Monitors Dashboard](#) Create a worklo monitored and r

[New Workload](#) Define perform

[New Performance Policy](#) Monitor a worklo

[Workloads Report](#)

Close Help

From the Ensemble Management Guide, click **New Virtual Server**, then select a hypervisor target in the dialog.

HMC1: New Virtual Server - Mozilla Firefox: IBM Edition

http://9.56.198.149:8080/hmc/content?taskId=128&refresh=26

Create Virtual Server - NotZBX14Ensemble

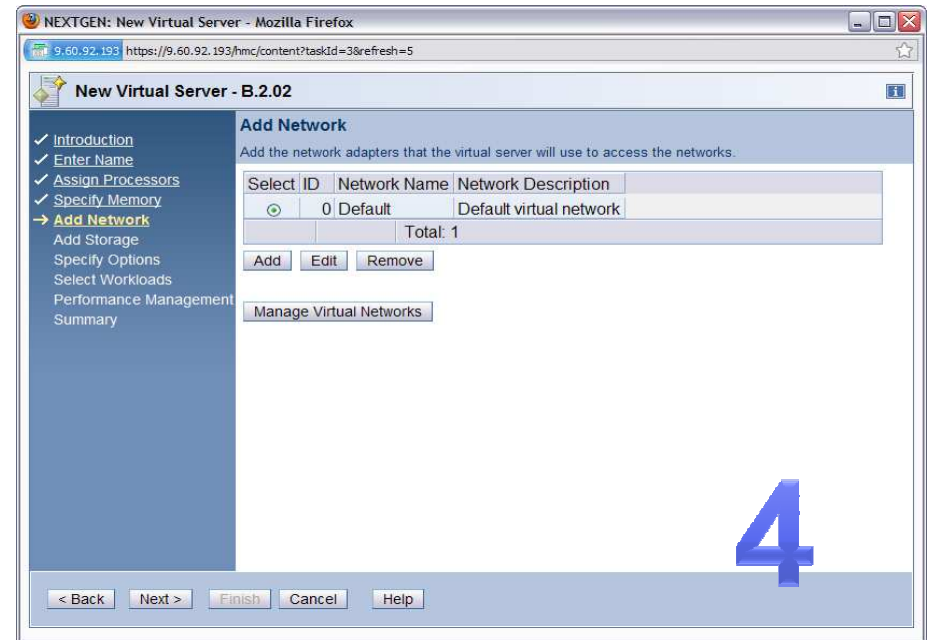
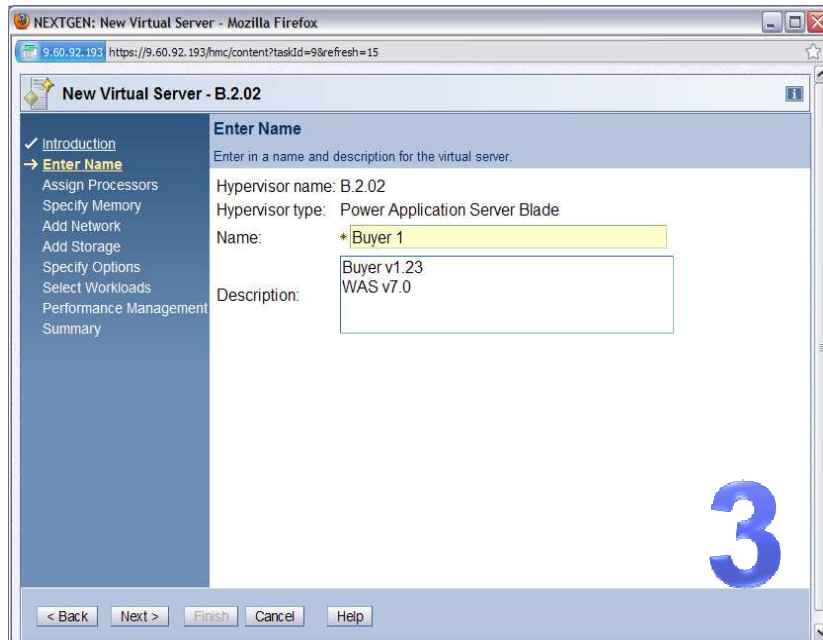
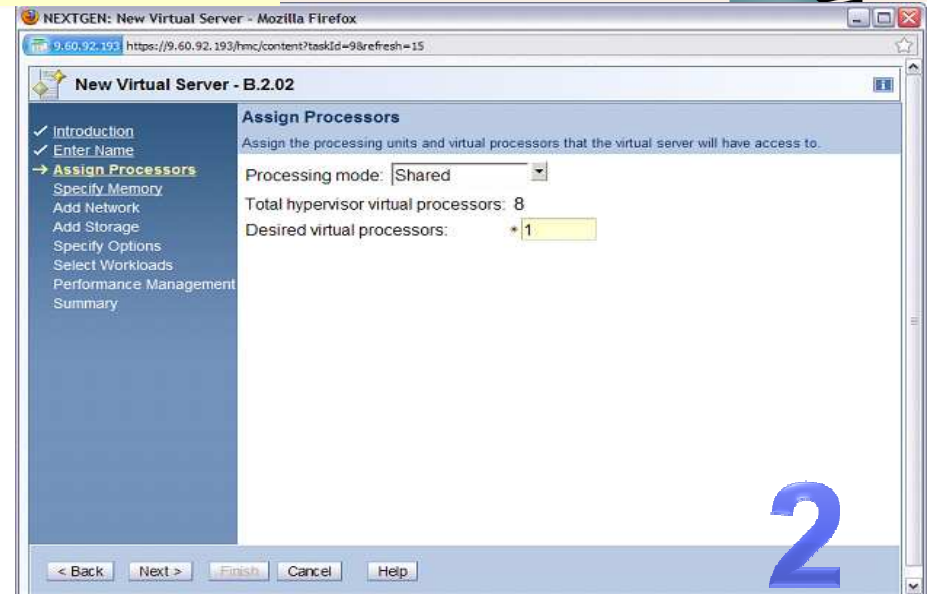
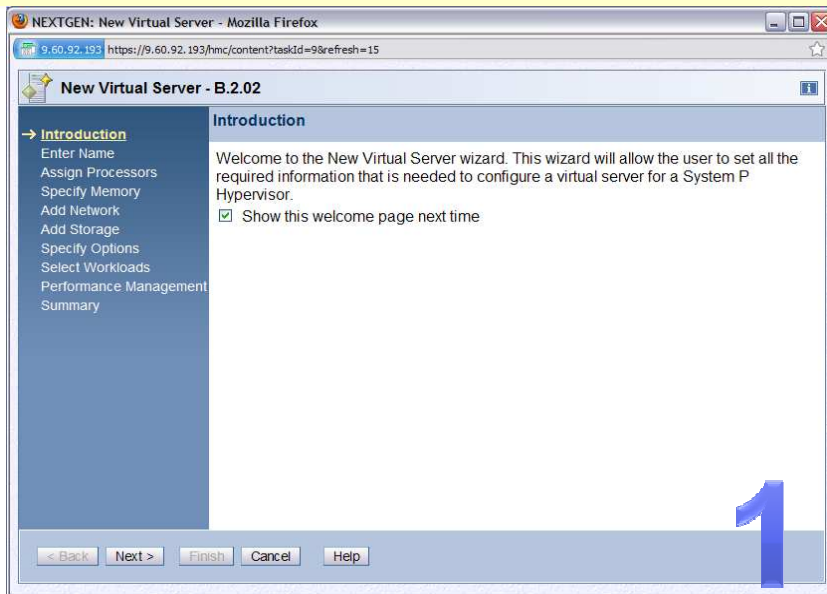
--- Select Action --- Filter

Select	Hypervisor	Status	Virtual Servers
<input type="radio"/>	B.1.01	Operating	6
<input type="radio"/>	B.1.02	Operating	8
<input type="radio"/>	B.1.03	Operating	5
<input type="radio"/>	R06	Operating	29
<input type="radio"/>	VM0B	Operating	3
<input type="radio"/>	ZGG	Operating	0

Total: 6 Filtered: 6 Selected: 0

OK Cancel

New Virtual Server – assigning resources



New Virtual Server – assigning resources (continued)



Click Add to add storage drives previously created with the Manage Storage Resources task.

Add Storage
Add the storage drives that the virtual server will use to access the storage resources.

Select	Drive ID	Name	Description	Shared	Resource Name	Size
Total: 0						

Add Edit Remove

Manage Storage Resources

Enter a label and select a storage resource for the local drive.

Add

ID: 0
Name: + AIX_OS_v61
Description: OS Image
Storage resource:

Select	Name	Description	Size	In Use
<input type="radio"/>	StorageResource731	Storage Resource 731 on hypervisor b.2.02	80 GB	-
<input checked="" type="radio"/>	StorageResource633	Storage Resource 731 on hypervisor b.2.0.2	200 GB	-
<input type="radio"/>	StorageResource732	Storage Resource 732 on hypervisor b.2.02	160 GB	-
Total: 3				

OK Cancel Help

VTEAMH1: New Virtual Server - Mozilla Firefox: IBM Edition

9.12.16.231 https://9.12.16.231/hmc/wcl/T19c1

New Virtual Server - B.2.04

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

Add Storage

Add the storage drives that the virtual server will use to access the storage resources.

Select	Drive ID	Name	Description	Shared	Resource Name	Size
<input checked="" type="radio"/>	0	AIX_OS_v61	OS Image	-	StorageResource633	0
<input type="radio"/>	1	WAS_70	WAS Installation	-	StorageResource732	160 GB
<input type="radio"/>	2	DASD_CELL6	Application Storage	-	StorageResource731	80 GB
Total: 3						

Added three storage drives: For the OS, the web server, and application storage.

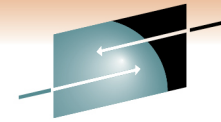
New Virtual Server – boot source options

The image displays three screenshots of the 'New Virtual Server - B.2.04' wizard, illustrating different boot source options. Each screenshot shows a sidebar with navigation options and a main area for specifying boot options.

- Top Left Screenshot:** The 'Boot source' dropdown is set to 'Storage Drive'. Below it, a note states: 'Storage drives will be tried in sequential order based on the storage drive ID.'
- Top Right Screenshot:** The 'Boot source' dropdown is set to 'Network Adapter (ID 0)'. Below it, there are input fields for 'Client IP address', 'Subnet IP address', 'Gateway IP address', and 'Server IP address'.
- Bottom Screenshot:** The 'Boot source' dropdown is set to 'Virtual Media'. Below it, there is a checkbox labeled 'Launch Mount Virtual Media on finish'.

A yellow callout box with a black border is positioned over the bottom screenshot, containing the text: 'Choose the boot source for the virtual server – a Storage Drive, Network Adapter, or Virtual Media'.

New Virtual Server – performance management options



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New Virtual Server - B.2.02

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

Select Workloads

Select the workloads that this virtual server will use.

Use Default workload
 Select workloads

Select	Name	Description
No workloads available		
Total: 0		

New Workload

< Back **Next >** Finish Cancel Help

We will define the workload in the next step; so will use the default workload.

JENKSHMC: New Virtual Server - Mozilla Firefox: IBM Edition

New Virtual Server - B.2.02

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

Performance Management

Enable processor management for your virtual server to achieve the goals set in the active performance policy.

Ensemble processor management: Disabled

Processor management

< Back **Next >** Finish Cancel Help

We want to optimize the performance of this virtual server with performance policies in a later step.

New Virtual Server – summary

New Virtual Server - B.2.02

- ✓ [Introduction](#)
- ✓ [Enter Name](#)
- ✓ [Assign Processors](#)
- ✓ [Specify Memory](#)
- ✓ [Add Network](#)
- ✓ [Add Storage](#)
- ✓ [Specify Options](#)
- ✓ [Select Workloads](#)
- ✓ [Performance Management](#)
- [Summary](#)

Summary

Verify the information below before completing the wizard.

Name:	Buyer 1
Description:	Buyer v1.23 WAS v7.0
Desired virtual processors:	1
Assigned dedicated memory:	1024 MB
Network Devices:	0: Default, Default virtual network
Storage Devices:	0: StorageResource731, Storage Resource on 731 b.2.02 hypervisor 1: StorageResource732, Storage Resource on 732 2: StorageResource633, Storage Resource on 633
Boot Source:	Storage Device: {0}
Workloads:	Default
Processor management:	Enabled

< Back Next > **Finish** Cancel Help

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sults

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Create Buyer 2 (based on Buyer 1)

https://9.60.92.240/hmc/connects/mainuiFrameset.jsp

New Virtual Server

Ensemble Management > AgParts Ensemble

Ensemble Resources Virtual Servers Hypervisors Blades Topology

Sele ^	Name ^	Membe ^	Hypervisc ^	Status ^	Start Automatical ^	Processor Manager ^	Workload(s) ^	Type ^	Description ^
<input checked="" type="checkbox"/>	Buyer 1	UBONSAI	B.2.02	Status Che	-	✓	Default	PowerVI	Buyer v 1.23 WAS v7.0 resour
<input type="checkbox"/>	Payroll Proc	PJBONSAI	B.2.01	Status Che	-	✓	Default	PowerVI	Payroll Processing resources

Max Page Size: 500 Total: 8 Filtered: 2 Selected: 1

You can continue defining virtual servers with the New Virtual Server Wizard or you can create additional virtual servers using the **New Virtual Server Based On** wizard to save time.

Tasks: Buyer 1

- Virtual Server Details
- Daily
 - Activate
 - Deactivate
 - Grouping
- Operational Customization
 - Customize Scheduled Operations
- Configuration
 - Delete Virtual Server
 - Migrate Virtual Server
 - Mount Virtual Media
 - Open Text Console
 - New Virtual Server Based On**

Status: Exceptions and Messages

Use the same Storage Drives used by Buyer 1 for AIX_OS_v61 and WAS_70.

Select a different storage drive for DASD_CELL6 on Buyer 2 for private data .

Select the storage drives for the new virtual servers.

Create virtual disks

Name	Storage Resource Selection	Storage Resource
AIX_OS_v61	Use Same	StorageResource731
Buyer 2	Use Same	
WAS_70	Use Same	StorageResource732
Buyer 2	Use Same	
DASD_CELL6	Custom	StorageResource633
Buyer 2		
Total		StorageResource730 StorageResource733 StorageResource734

< Back Next > Finish Cancel Help

Next:

Install the Buyer and Vendor business applications (O/S, Web Application Server, Web Application)

Things to consider:

- [Customize User Controls](#) (Optional) View and manage task and resource roles introduced for ensemble management.
- [User Profiles](#) (Optional) View and manage the EnsembleAdmin and EnsembleOperator users and assign roles.
- [View documentation](#) (Optional) Read on-line documents to assist you in setting up your ensemble.

Task

Allows you to...

- [Define alternate HMC](#) Choose another HMC and start the [Manage Alternate HMC](#) task to assign it as an alternate HMC.
- [Create Ensemble](#) Create an ensemble. A HMC can manage only one Ensemble. [Learn more...](#)
- [Add Member to Ensemble](#) Add a member (CPC) to the ensemble. A functional ensemble must have at least one member, but it can have up to eight. [Learn more...](#)
- [Entitle zBX blades](#) Use the Perform Model Conversion task on the Support Element (SE) to entitle your blades. You can use the [Single Object Operations](#) task to access the SE console.
- [Manage Storage Resources](#) Add or remove storage resources and storage groups.
- [Manage Virtual Networks](#) Add or remove virtual networks. Manage which hosts are connected to virtual networks.
- [New Virtual Server](#) Create a virtual server on a hypervisor in this ensemble. [Learn more...](#)
- [Mount Virtual Media](#) Install your operating system and applications. If you plan on including this virtual server in a workload you might want to install the guest platform management provider (GPMP).
- [Activate](#) Activate a virtual server to power it on.
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- [View Performance Metrics](#) View performance metrics from the Monitors Dashboard.
- [View Workload Reports](#) View workload reports from the Monitors Dashboard.

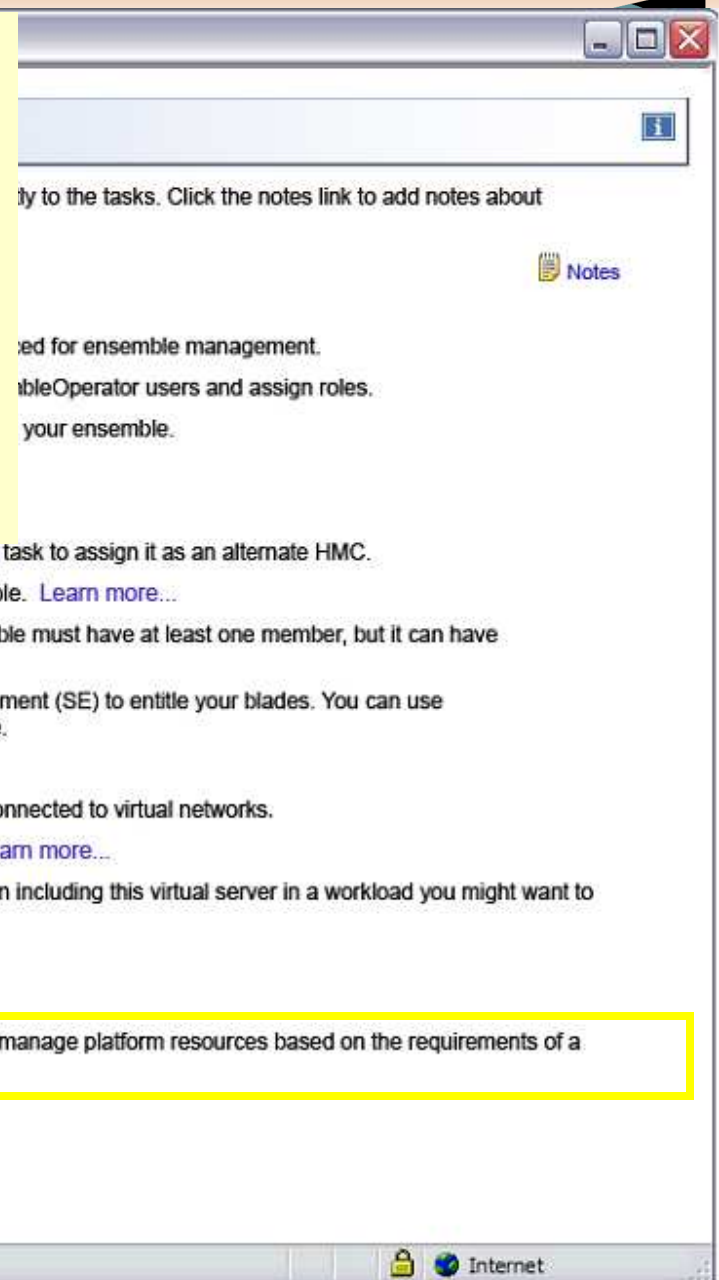
Done

Internet

Next:

Optimize performance of “Buyer” web application servers during peak periods over vendor/supplier when there are constraints.

Define the Workload and Performance Policy for the Buyer and Vendor business application



ly to the tasks. Click the notes link to add notes about

Notes

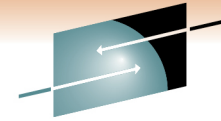
ed for ensemble management.

ibleOperator users and assign roles.

your ensemble.

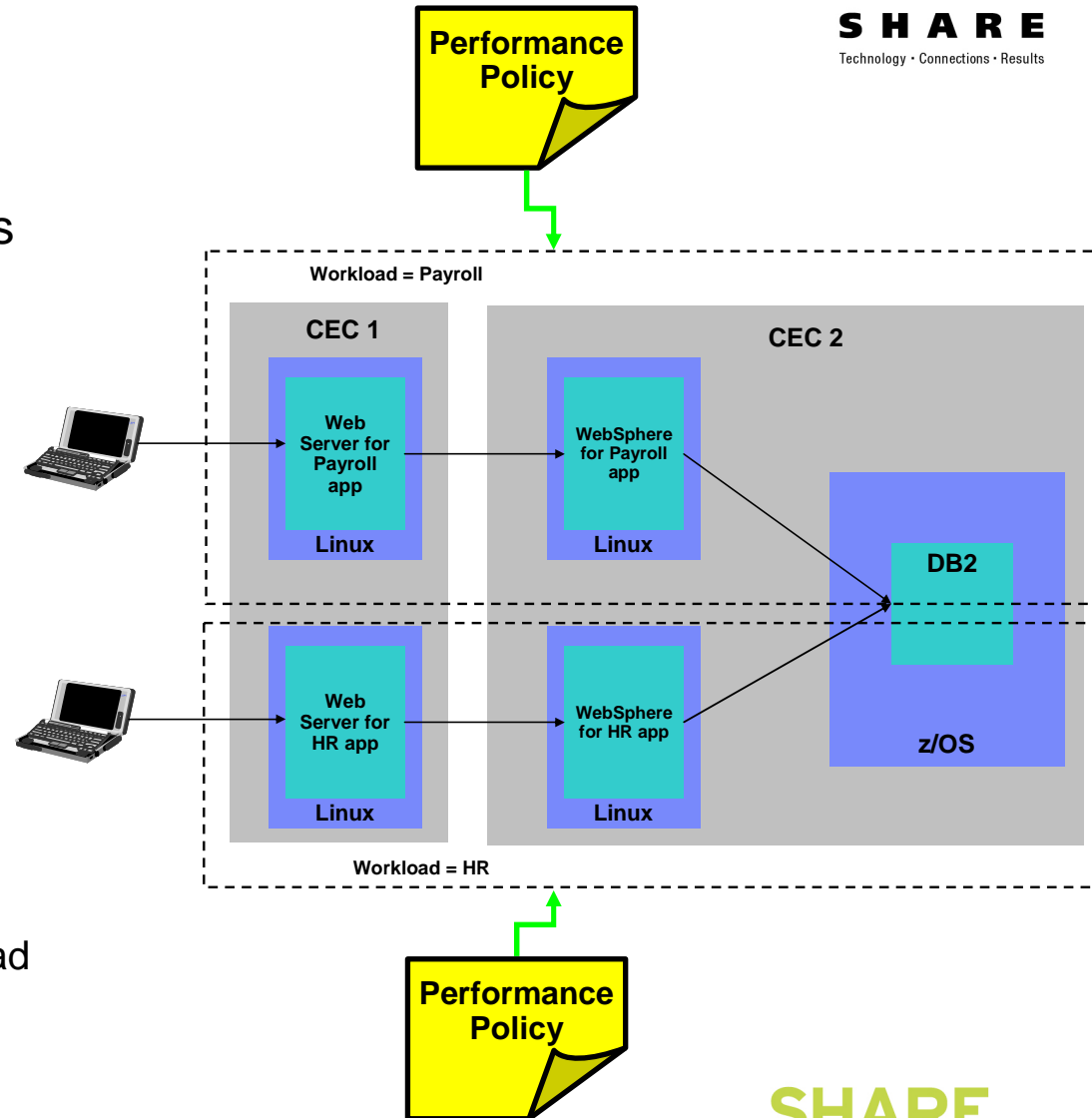
Define alternate HMC	Choose another HMC and start the Manage Alternate HMC task to assign it as an alternate HMC.
Create Ensemble	Create an ensemble. A HMC can manage only one Ensemble. Learn more...
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New Virtual Server	Create a virtual server on a hypervisor in this ensemble. Learn more...
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Add Performance Policies	Define the rules associated with workload performance.
View Performance Metrics	View performance metrics from the Monitors Dashboard.
View Workload Reports	View workload reports from the Monitors Dashboard.

Done Internet



Platform Workload

- A Platform 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
- Management policies are associated to Platform Workload
 - 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



Platform Performance Management (Automate Suite for all but default workload)

- Workload to performance policy relationship:
 - A Workload can have multiple performance policies associated with it
 - Single policy is active at a given time
 - Can dynamically change the policy that is active
 - Through the UI
 - Through a timed based schedule
 - *Example: Day shift policy / night shift policy*
- Platform resource monitoring based on performance policy
 - Ensemble
 - Workload
 - Virtual Server
- Dynamic, goal-oriented resource management
 - Manage CPU across virtual servers within a hypervisor instance
 - Detect that a virtual server is part of a workload not achieving its goals
 - Determine that virtual server 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

NEXTGEN: New Workload - Mozilla Firefox

9.60.92.193 https://9.60.92.193/hmc/content?taskId=14&refresh=36

New Workload - My Ensemble

Welcome

Welcome to the New Workload wizard.

Use this wizard to create a workload. A workload provides you with a resource through which you can manage and monitor the end-to-end work being done by your virtual servers.

This wizard guides you through the following tasks:

- Naming and categorizing the workload
- Defining the virtual servers which perform work
- Creating performance policies to specify performance goals
- Creating service classes to prioritize and classify work within a policy
- Activating a performance policy

Show this welcome page next time

< Back **Next >** Finish Cancel Help

Next, view System and Workload performance metrics:

- Monitors Dashboard
- Workloads Report
- Service Classes Report
 - Virtual Servers Topology Report
- Virtual Servers Report
 - Virtual Servers Resource Adjustment Report

The screenshot shows a web application interface. At the top, there is a header bar with a search icon and a 'Notes' button. Below the header, there is a section titled 'take you directly to the tasks. Click the notes link to add notes about'. This is followed by a list of tasks, each with a description and a 'Learn more...' link. The tasks are:

- [Manage Storage Resources](#): Add or remove storage resources and storage groups.
- [Manage Virtual Networks](#): Add or remove virtual networks. Manage which hosts are connected to virtual networks.
- [New Virtual Server](#): Create a virtual server on a hypervisor in this ensemble. [Learn more...](#)
- [Mount Virtual Media](#): Install your operating system and applications. If you plan on including this virtual server in a workload you might want to install the guest platform management provider (GPMP).
- [Activate](#): Activate a virtual server to power it on.
- [Open Text Console](#): Open a console window to a virtual server.
- [New Workload](#): Create a workload for this ensemble. A workload helps you manage platform resources based on the requirements of a business application. [Learn more...](#)
- [Add Performance Policies](#): Define the rules associated with workload performance.
- [View Performance Metrics](#): View performance metrics from the Monitors Dashboard.
- [View Workload Reports](#): View workload reports from the Monitors Dashboard.

The 'View Performance Metrics' and 'View Workload Reports' items are highlighted with a yellow box. At the bottom of the page, there is a status bar with a 'Done' button, a lock icon, and the text 'Internet 2011'.

NEXTGEN3: Monitors Dashboard - Mozilla Firefox: IBM Edition
 http://9.60.92.197:8080/hmc/wcl/T81c

Monitors Dashboard

Pause Display Open Activity Open Activity Profiles Open Workloads Report

Overview

Select	System	Processor Usage (%)	Channel Usage (%)	Power Consumption (kW) (Btu/hr)	Input Air Temperature (°C) (°F)
<input type="checkbox"/>	R93	<div style="width: 63%;"></div>	63	2 19.683 67,161.183	22.0 71.6

Page 1 of 1 Max Page Size: 100 Total: 1 Filtered: 1 Displayed: 1 Selected: 0

Details

R93

Power Consumption

Select	Name	Power Consumption (kW) (Btu/hr)	Average Voltage
<input type="checkbox"/>	R93	19.683 67,161.183	
<input type="checkbox"/>	zCPC	12.674 43,245.483	
<input type="checkbox"/>	Power cord Z29B-BPEA-J01	1.544 5,268.347	485
<input type="checkbox"/>	Power cord Z29B-BPEB-J01	1.597 5,449.190	482
<input type="checkbox"/>	Power cord Z29B-BPEA-J02	4.673 15,944.938	485

Page 1 of 1 Max Page Size: 100 Total: 36 Filtered: 36 Displayed: 36 Selected: 0

Processors

Select	Name	Processor Usage (%)
<input type="checkbox"/>	CP00	1
<input type="checkbox"/>	CP01	1
<input type="checkbox"/>	CP02	1
<input type="checkbox"/>	CP03	1
<input type="checkbox"/>	CP04	1

Page 1 of 1 Max Page Size: 100 Total: 32 Filtered: 32 Displayed: 32 Selected: 0

Channels

Select	CHPID	LPARs	Total Channel Usage (%)
<input type="checkbox"/>	0.02		1
<input type="checkbox"/>	0.28	Shared	0
<input type="checkbox"/>	0.16	Shared	0
<input type="checkbox"/>	0.12	Shared	0
<input type="checkbox"/>	0.14	Shared	0

Page 1 of 1 Max Page Size: 100 Total: 64 Filtered: 64 Displayed: 64 Selected: 0

Blades

Select	Name	Type	Processor Usage (%)	Memory Usage (%)	Network I/O Usage (%)	Storage (kBytes/second)
<input type="checkbox"/>	B.2.01	ISAOPT	<div style="width: 28%;"></div>	28	19	
<input type="checkbox"/>	B.2.02	ISAOPT	<div style="width: 28%;"></div>	28	19	
<input type="checkbox"/>	B.2.03	ISAOPT	<div style="width: 28%;"></div>	28	19	
<input type="checkbox"/>	B.2.04	ISAOPT	<div style="width: 28%;"></div>	28	19	
<input type="checkbox"/>	B.2.05	ISAOPT	<div style="width: 28%;"></div>	28	19	

Page 1 of 1 Max Page Size: 100 Total: 28 Filtered: 28 Displayed: 28 Selected: 0

Virtual Servers

Select	Name	Processor Usage (%)	Memory Usage (%)
<input type="checkbox"/>			

Logical Partitions

Select	Name	Processor Usage (%)	z/VM Paging Rate (pages/second)
<input type="checkbox"/>	PIA1	<div style="width: 22%;"></div>	22
<input type="checkbox"/>	PIA2	<div style="width: 88%;"></div>	88
<input type="checkbox"/>	PICFA3	<div style="width: 100%;"></div>	100
<input type="checkbox"/>	PICFA4	<div style="width: 100%;"></div>	100
<input type="checkbox"/>	VML1	<div style="width: 100%;"></div>	100

Page 1 of 1 Max Page Size: 100 Total: 10 Filtered: 10 Displayed: 10 Selected: 0

- Metrics for systems including power, temperature, processors, channels, blades, and virtual servers

- Launch point for additional monitoring views such as Workloads Report

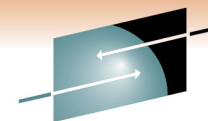
Related Facilities

- Scheduled Operations
 - Allows functions to be performed at designated times on designated days (e.g. activate a specific performance policy at a certain time each day)
- Grouping
 - Allows resources (e.g. virtual servers) to be aggregated so that functions can be performed on them with a single action (e.g. activation)
- Event Monitoring
 - Allows e-mail notifications to designated users when particular circumstances arise (e.g. virtual server failure, performance index of a workload service class exceeds a threshold for a period of time, etc.)

IBM zEnterprise System: A revolutionary change has come to IT

- Redefining IT frameworks to bring change to operational silos and extend System z governance to UNIX and x86
- 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





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Technology • Connections • Results

Thank you

Important terms

- **node.** A single z196 and any optionally attached zBX. A node can be a member of only one ensemble.
- **ensemble member.** A zEnterprise node that has been added to an ensemble using the Hardware Management Console.
- **ensemble.** A collection of one or more zEnterprise nodes (including any optionally attached zBX) that are managed as a single logical virtualized system by the Unified Resource Manager using a Hardware Management Console (HMC).
- **hypervisor.** A program that allows multiple instances of operating systems or virtual servers to run simultaneously on the same hardware device. A hypervisor can run directly on the hardware, can run within an operating system, or can be imbedded in platform firmware. Examples of hypervisors include PR/SM™, z/VM®, and PowerVM™.
- **virtual server.** A logical construct that appears to comprise processor, memory, and I/O resources conforming to a particular architecture. A virtual server can support an operating system, associated middleware, and applications. A hypervisor creates and manages virtual servers.