IBM zEnterprise zBX x86 Blade Integration and Unified Resource Manager Virtualization

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IBM Corporation

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Session 10862
Agenda

• Introduction

• zEnterprise Unified Resource Manager

• zEnterprise zBX System x Blade Integration

• ‘Demo’

• Related SHARE Sessions
IBM zEnterprise System

*Unifies IT for predictable service delivery*

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

- Unifies management of physical and virtual resources
- Provides hardware, platform, and workload management

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

- 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)

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

- Selected IBM POWER7® blades and IBM System x® Blades 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

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

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)
IBM zEnterprise Unified Resource Manager

Building an architectural construct of hardware, software, services

- Unified Resource Manager
- Platform Management
- Hardware Management

Service Management

- APPLICATIONS
- MULTIPLE OPERATING SYSTEMS
  e.g., z/OS, z/TPF, z/VSE, z/VM,
  Linux on z
- MIDDLEWARE
- VIRTUALIZATION
- SYSTEMS
- POWER
- IBM SYSTEM X
- IBM OPTIMIZERS
IBM zEnterprise Unified Resource Manager

Building an architectural construct of hardware, software, services

- **Unified Resource Manager**
- **Platform Management**
- **Hardware Management**

**Service Management**

- Application (APP)
- Middleware (MIDDLEWARE)

**Unified Resource Manager**

- Operating Systems (e.g., z/OS, z/TPF, z/VSE, z/VM, Linux on z)
- AIX
- Linux and Windows on IBM System x Blades

**Platform Management**

- Virtualization (VIRTUALIZATION)
- Firmware (FIRMWARE)

**Hardware Management**

- System z
- Power®
- IBM System x Blades
- IBM Optimizers
zEnterprise Unified Resource Manager

Hardware and Platform Management

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

Operational Controls
- Auto-discovery and configuration support for new resources – including storage resources.
- Cross platform hardware problem detection, reporting and call home.
- Physical hardware configuration, backup and restore.
- Delivery of system activity using new user.

Network Management
- Management of virtual networks including access control

Energy Management
- Monitoring and trend reporting of CPU energy efficiency.
  - Static power savings
  - Ability to query maximum potential power.

Resource Workload Awareness and Platform Performance Management
- HMC provides a single consolidated and consistent view of resources
  - Wizard-driven set up of resources in accordance with specified business process
  - Ability to monitor and report performance
  - Manage to a performance policy

Virtual Server Lifecycle Management
- Single view of virtualization across platforms.
- Ability to deploy multiple, cross-platform virtual servers within minutes
- Management of virtual networks including access control
IBM zEnterprise BladeCenter Extension

A Uniquely Configured Extension

Looks like a rack with BladeCenters but much more...

- zBX is assembled and built at the IBM plant
  - All parts and microcode - tested and shipped as a completed package

- zBX hardware redundancy provides improved availability
  - Redundant switches provide guaranteed connection between z196 and zBX
  - Redundant Power Distribution Units improve availability
  - Extra blowers manage heat dispersion/removal

- zBX provides an isolated and secure network
  - Four top-of-rack switches for connection to the controlling z196
  - Traffic on user networks not affected
  - Provides the foundation for the Unified Resource Manager
zEnterprise BladeCenter Extension

Hardware Management and Controls

Change Management
Configuration Management
Operations Management

Serviceability Management
Problem Management
Service Reporting

10 GbE Switch (2X)
1000BASE-T Switch (2X)
8 Gbps FC Switch (2X)
Advanced Management Module (2X)
Top-of-Rack Switch (2X)
BladeCenter
System x Blade
IBM POWER7 and System x Blades
General purpose processors under one management umbrella

What is it?
The zBX infrastructure can host select IBM POWER7 and IBM 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®, Linux or Microsoft® Windows® on System x 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. Multiple resources (both blade types and optimizers) can reside in a single zBX.

- **Integrated**: Integration with System z brings heterogeneous resources together that can be managed as one.

- **Transparency**: Applications certified to run on AIX 5.3 or 6.1 on POWER7 blades and those certified to run on supported releases of Linux on System x or Windows on the System x blades will run on those blades in a zBX. No changes to deployed guest images.

- **More applications**: Brings larger application portfolio to System z.
IBM System x Blades
- IBM BladeCenter HX5 7873 dual-socket 16-core blades
- Four supported memory configurations for zBX – 64 GB, 128 GB, 192 GB, 256 GB

IBM POWER7 Blades
- IBM BladeCenter PS701 8-core processor 3.0GHz
- Three configurations supported in zBX - 32 GB, 64 GB, 128 GB

Flexibility in ordering – acquired through existing channels, including IBM

Unified Resource Manager will install hypervisor on blades in the zBX
- Integrated hypervisor (KVM-based) for System x blades
- PowerVM Enterprise Edition for POWER7 blades

Up to 112 Blades supported on zBX
- Ability to mix and match blades in the same chassis
- Number of blades supported varies by type

Blades assume System x warranty and maintenance when installed in the zBX
**zEnterprise BladeCenter Extension**

**Operating System Support**

- **Support for Linux and Windows environments on System x blades in zBX**
  - 64-bit version support only
  - Linux: RHEL 5.5, 5.6, 6.0 & Novell SUSE SLES 10 (SP4) and SLES 11 SP1
  - Microsoft Windows Server 2008 R2 and Microsoft Windows Server 2008 (SP2) (for either we recommend Datacenter Edition)

- **Support of AIX environments on POWER7 blades in zBX**
  - AIX: AIX 5.3 Technology Level 12 or higher, AIX 6.1 Technology Level 5 or higher, AIX 7.1

- **Certifications inherited from blades**
  - SAP support for Linux and Windows on x86 blades in the zBX

- **Operating Systems are customer acquired and installed**
Putting zEnterprise System to the Task

System z Hardware Management Console (HMC) with Unified Resource Manager

System z Host
- z/OS
- z/TPF
- z/VSE
- Linux on System z
- Linux on System z
- z/VM

Support Element
- System z PR/SM
- z HW Resources

Select IBM Blades
- Linux on System x
- Windows on System x
- AIX on POWER7

Optimizers
- Blade Virtualization
- Blade Virtualization
- Blade Virtualization

Blade HW Resources
- zBX

Private data network (IEDN)

Customer Network
- Unified Resource Manager
- Private Management Network INMN
- Private High Speed Data Network IEDN

Customer Network
Putting zEnterprise System to the Task
*Operational Controls – System x*

Select IBM Blades

<table>
<thead>
<tr>
<th>Blade HW Resources</th>
<th>Optimizers</th>
</tr>
</thead>
<tbody>
<tr>
<td>z/OS</td>
<td>z/TPF</td>
</tr>
<tr>
<td>z/VSE</td>
<td>z/VM</td>
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</table>

System z Host

- z/OS
- z/TPF
- z/VSE
- z/VM

System z PR/SM

- z HW Resources
- Support Element

Open Storage SAN

Linux on System x or Windows

AIX on POWER7

Linux on System x

Linux on System x

Linux on System x

Linux on System x

AIX on POWER7

Additional Components:

- Private data network (IEDN)
- Private Management Network (INMN)
- Private Management Network (information only)
- Private High Speed Data Network (IEDN)

System z Hardware Management Console (HMC) with Unified Resource Manager

System z Host

- Install new System x blade in zBX

Support Element

Open Storage SAN

Customer Network

- Unified Resource Manager
- Private Management Network
- Private Management Network (information only)
- Private High Speed Data Network (IEDN)

Customer Network
Putting zEnterprise System to the Task

Operational Controls – System x

Select IBM Blades

Optimizers

Client Network

Support Element

System z Host

Install new System x blade in zBX

Linux on System x or Windows

AIX on POWER7

DataPower XI50z

Open Storage SAN

System z Hardware Management Console (HMC) with Unified Resource Manager

z/OS

z/TPF

z/VSE

z/VM

Blade HW Resources

Blade Virtualization

Blade Virtualization

zBX

Private data network (IEDN)

Unified Resource Manager

Private Management Network

INMN

Private Management Network (information only)

Private High Speed Data Network IEDN

Support Element

System z Hardware Management Console (HMC) with Unified Resource Manager

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System z Hardware Management Console (HMC) with Unified Resource Manager
Putting zEnterprise System to the Task

Operational Controls – System x

Select IBM Blades

Optimizers

Blade HW Resources

Unified Resource Manager

Private data network (IEDN)

Customer Network

System z Host

z Hardware Resources

Support Element

Service updates received at Support Element

Updates sent over service network to System x blades and to z196

Linux on System x or Windows

AIX on POWER7

Linux on System z

Linux on System x or Windows

Linux on System x or Windows

Open Storage SAN

System z Hardware Management Console (HMC)

z/OS

z/TPF

z/VSE

z/VM

System x Host

zBX

Support Element

System x Support Element

Service updates

Updates sent over service network to System x blades and to z196

Linux on System x or Windows

AIX on POWER7

Linux on System z

Linux on System x or Windows

Linux on System x or Windows

Private data network (IEDN)

Customer Network

Unified Resource Manager

Private Management Network

Private Management Network (information only)

Private High Speed Data Network (IEDN)

Customer Network

Open Storage SAN

SHARE in Atlanta
Putting zEnterprise System to the Task

Operational Controls – System x

- **Select IBM Blades**
  - **Blade HW Resources**
  - **Optimizers**

- **System z Host**
  - z/OS
  - z/TPF
  - z/VSE
  - Linux on System z
  - Linux on System z
  - z/VM

- **Blade HW Resources**
  - Linux on System x or Windows
  - AIX on POWER7
  - Linux on System z
  - DataPort (DP)

- **Support Element**
  - IBM support

- **HMC**
  - System z Hardware Management Console (HMC) with Unified Resource Manager

- **Private data network (IEDN)**
  - Customer Network
  - Unified Resource Manager
  - Private Management Network (INMN)
  - Private Management Network (information only)
  - Private High Speed Data Network (IEDN)

- **Error on System x blade sent over service network to SE**

- **Open Storage SAN**

- **SE sends out contact for IBM support**

- **zBX**

- **Linux on System x or Windows**
Putting zEnterprise System to the Task

Hypervisor Management and Virtual Server Management – System x

Once a new System x blade installed and verified in zBX – the hypervisor is shipped to the blade over the service network (INMN)

Linux on System x or Windows

AIX on POWER7

DataPower XI50z

DataPower X65z

Blade Virtualization

Blade Virtualization

Blade HW Resources

zBX

System z Host

Select IBM Blades

Optimizers

System z PR/SM

z HW Resources

Support Element

Private data network (IEDN)

Open Storage SAN

System z Hardware Management Console (HMC) with Unified Resource Manager

Support Element

Customer Network

Unified Resource Manager

Private Management Network INMN

Private Management Network (information only)

Private High Speed Data Network IEDN

Customer Network

Private data network (IEDN)
Putting zEnterprise System to the Task
Hypervisor Management and Virtual Server Management – System x

User at HMC defines a workload – virtual servers, virtual LAN, virtual storage – which is managed as one virtualized resource.

System z Host

Select IBM Blades

Optimizers

z/OS

z HW Resources

Support Element

z BX

Linux on System x or Windows

AIX on POWER7

Blade Virtualization

Blade HW Resources

Private data network (IEDN)

Open Storage SAN

System z Hardware Management Console (HMC) with Unified Resource Manager

Unified Resource Manager

Private Management Network INMN

Private Management Network (information only)

Private High Speed Data Network IEDN

Customer Network

Customer Network
System x Blade Entitlement
System x Blade Entitlement
System x Blade Entitlement
System x Blade Entitlement
System x Blade – New Virtual Server
System x Blade – New Virtual Server
System x Blade – New Virtual Server
System x Blade – New Virtual Server
System x Blade – New Virtual Server

Hardware Management Console

New Virtual Server

Add Network

Select Position Network Name Type ID

0 Default Intel(R) PRO1000 PCI

Manage Virtual Networks

Add Storage Specify Boot Options Select Workloads

Summary
System x Blade – New Virtual Server
System x Blade – New Virtual Server
System x Blade – New Virtual Server
System x Blade – New Virtual Server
System x Blade – New Virtual Server
System x Blade – New Virtual Server
System x Blade – Virtual Media
System x Blade – Virtual Media
System x Blade – Virtual Media
System x Blade – Virtual Media
System x Blade – Graphical Console
System x Blade – Monitors Dashboard
System x Blade – Monitors Dashboard
System x Blade – Monitors Dashboard
Related SHARE Sessions

• **10847: HMC Unified Resource Manager Web Services API and User Interface Enhancements**
  • Tuesday, March 13, 2012: 1:30 PM-2:30 PM
  • International Ballroom B (Omni Hotel CNN Center)
  • Speaker: Joe Gdaniec (IBM Corporation)

• **10328: zEnterprise Unified Resource Manager: What's in it for z/VM?**
  • Wednesday, March 14, 2012: 11:00 AM-12:00 PM
  • Magnolia (Omni Hotel CNN Center)
  • Speaker: Scott Loveland (IBM Corporation)
Related Sessions (continued)

• **10658: zManager: Platform Performance Management**
  • Wednesday, March 14, 2012: 11:00 AM-12:00 PM
  • International Ballroom C (Omni Hotel CNN Center)
  • Speaker: Hiren Shah (IBM Corporation)

• **10631: Unified Resource Manager Hands-On Lab - Part 1 of 2**
  • Wednesday, March 14, 2012: 1:30 PM-2:30 PM
  • Pine (Omni Hotel CNN Center)
  • Speaker: Hiren Shah (IBM Corporation)

• **10632: Unified Resource Manager Hands-On Lab - Part 2 of 2**
  • Wednesday, March 14, 2012: 3:00 PM-4:00 PM
  • Pine (Omni Hotel CNN Center)
  • Speaker: Hiren Shah (IBM Corporation)
Questions?

Thank You

Danke

Grazie

Obrigado

Merci

Simplified Chinese

Traditional Chinese

Arabic

Thai

Hindi

Finnish

Russian

Spanish

German

Italian

Portuguese

French

Dutch

Norwegian

Swedish

Japanese

Korean

Tamil

Thai
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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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