System z Premier Executive Event

Emerging Technologies – Managing Hybrid Computing Environment

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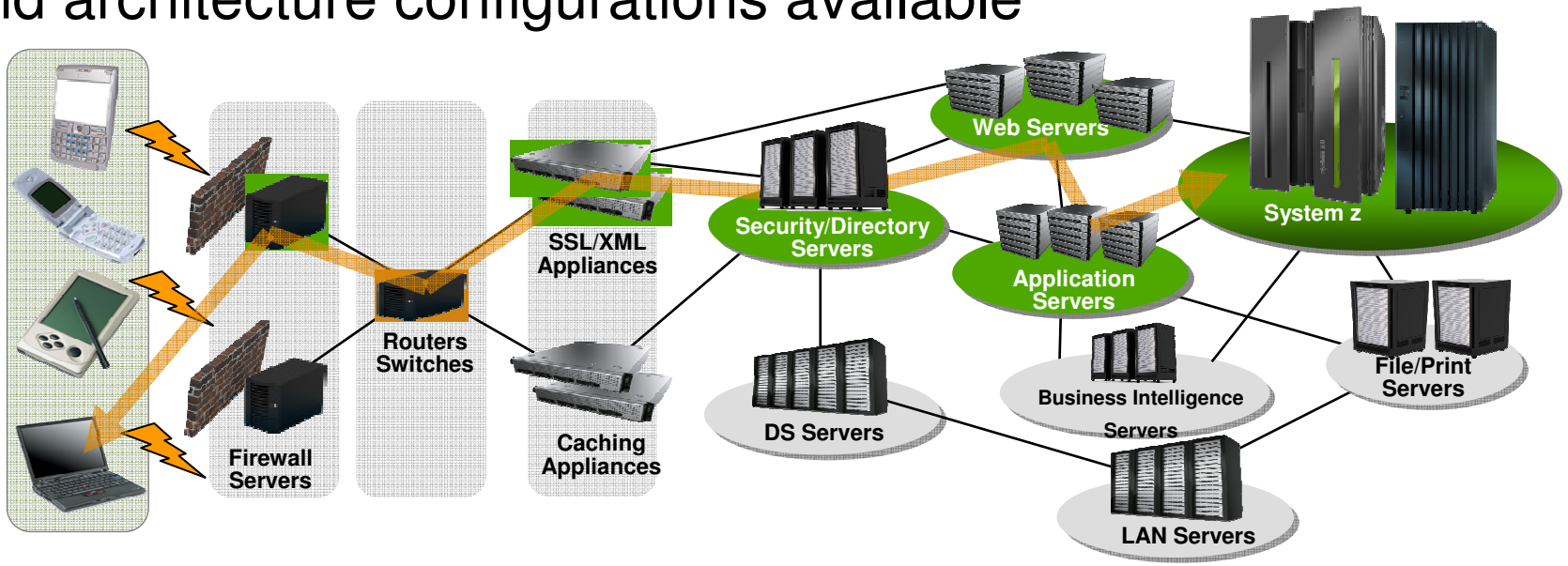
Information technology today is limited by the technology and architecture configurations available



- **Business processes and the applications that support them are becoming more service oriented, modular in their construction, and integrated**
- **The components of these services are implemented on a variety of architectures and hosted on heterogeneous IT infrastructures**
- **Approaches to managing these infrastructures along the lines of platform architecture boundaries cannot optimize: alignment of IT with business objectives; responsiveness to change; resource utilization; business resiliency; or overall cost of ownership**
- **Customers need a better approach: The ability to manage the IT infrastructure and business application as an integrated whole**

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IBM zEnterprise system – Best in class technologies

A system of systems that unifies IT for predictable service delivery

Unified management for a smarter system:

zEnterprise Unified Resource Manager

- **Provides platform, hardware and workload management**
- **Unifies management of resources, extending IBM System z® qualities of service across the infrastructure**

The world's fastest and most scalable system:

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:

zEnterprise BladeCenter® Extension (zBX)

- **Selected IBM POWER7® blades and IBM x86 Blades[1] 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**

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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 System x[1]
- **Simplified management**
  - Improved time to install and implement new applications
  - Central point of management for heterogeneous workloads
  - No change to applications

… managed by the zEnterprise Unified Resource Manager

Optimizers
- IBM Smart Analytics Optimizer
- WebSphere® DataPower® appliance[1]

Select IBM Blades
- BladeCenter PS701 Express
- IBM x86[1]

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

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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 appliance[1]
    - Closed environments with hardware and software included in solution
    - Individualized tools for sizing and customizing – dependant on the optimizer
  - Select IBM POWER7 and IBM x86[1] blades – running any application supported by the operating system installed on the blade – with no change.
  - Mix and match Optimizer and select general purpose POWER7 and IBM x86 blades in the same rack.
  - 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**

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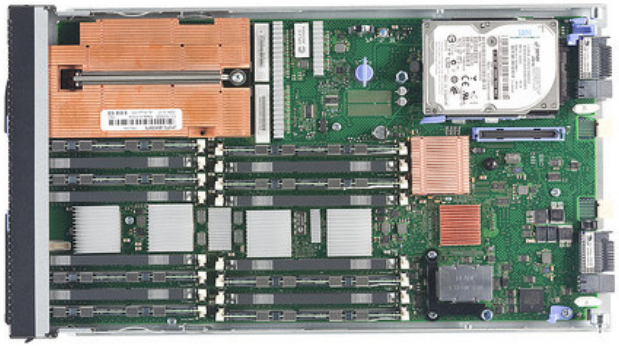
IBM POWER7 and IBM x86[1] Blades

General purpose processors under one management umbrella

What is it?

- **The zBX infrastructure can host select IBM POWER7 and IBM x86 blades[1]. 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 on System x[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 5.3 or 6.1 will also be certified and run on the POWER7 blade. No 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

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WebSphere DataPower[1] Appliance in the zBX

Purpose-built hardware for simplified deployment and hardened security

What is it?

- **The IBM WebSphere DataPower appliance[1] 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 blade 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 coordination with System z. Consistent change management with Unified Resource Manager.

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Management Stack

Building an architectural construct of hardware, software, services

Service Management

- **Visibility, control and automation for applications, transactions, databases and data center resources**
- **End-to end workload management and service level objectives that align IT management with business goals**
- **Common usage and accounting for business accounting**
- **Dynamic/centralized management of application workloads based on policies**
- **Business resilience for multi-site recovery**
- **End-to-end enterprise security**

Platform Management

Hardware Management

Extending with

Unified Resource Manager

- **Hypervisor management and creation of virtual networks**
- **Operational controls, service and support for hardware / firmware**
- **Network management of private and secure data and support networks**
- **Energy monitoring and management**
- **Workload awareness and platform performance management**
- **Virtualization management – single view of virtualization across the platform**

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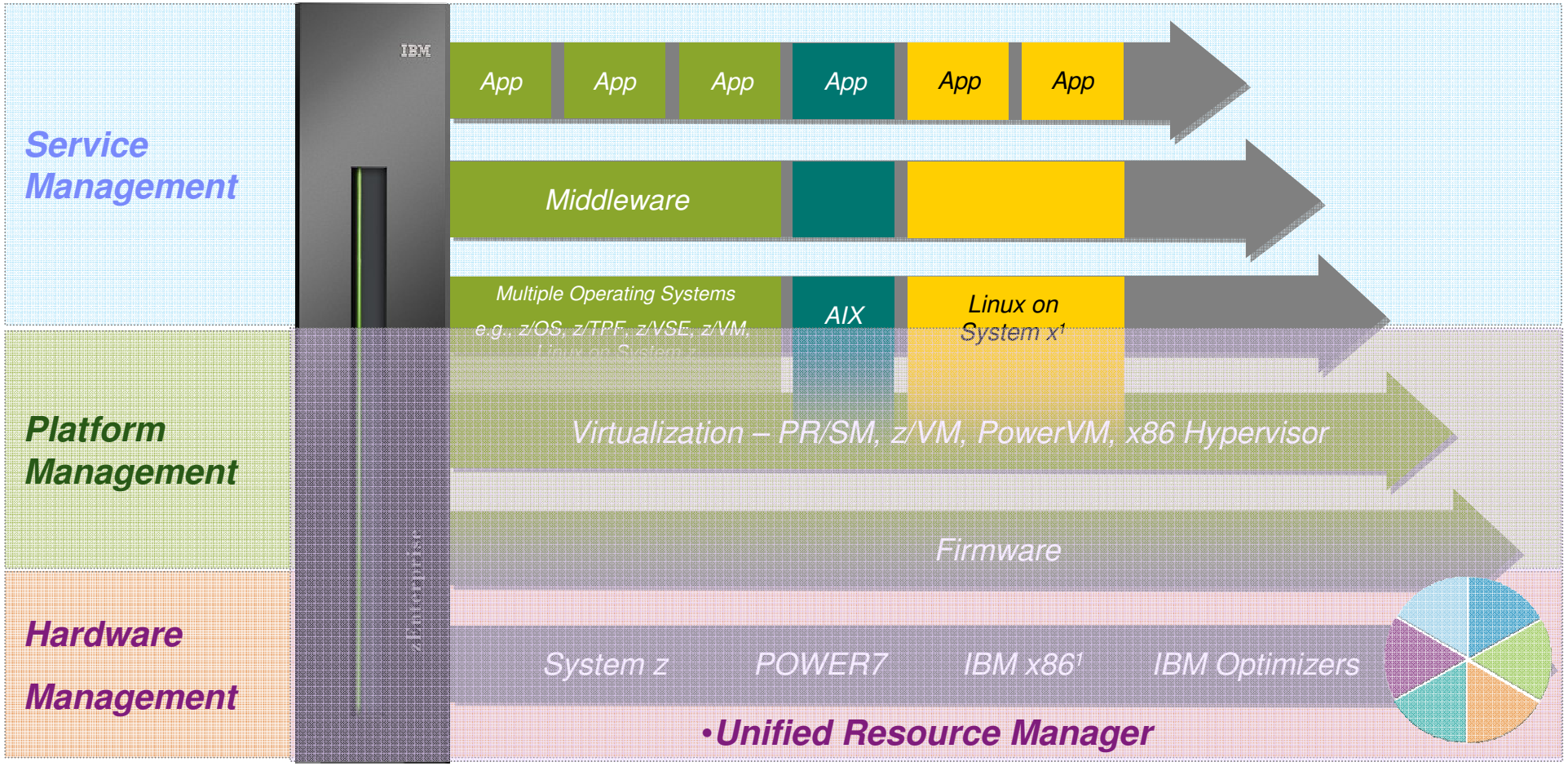
zEnterprise extends Service Management for improved governance



Focused, collaborative innovation – A "complete systems" approach

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zEnterprise Unified Resource Manager (zManager)
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

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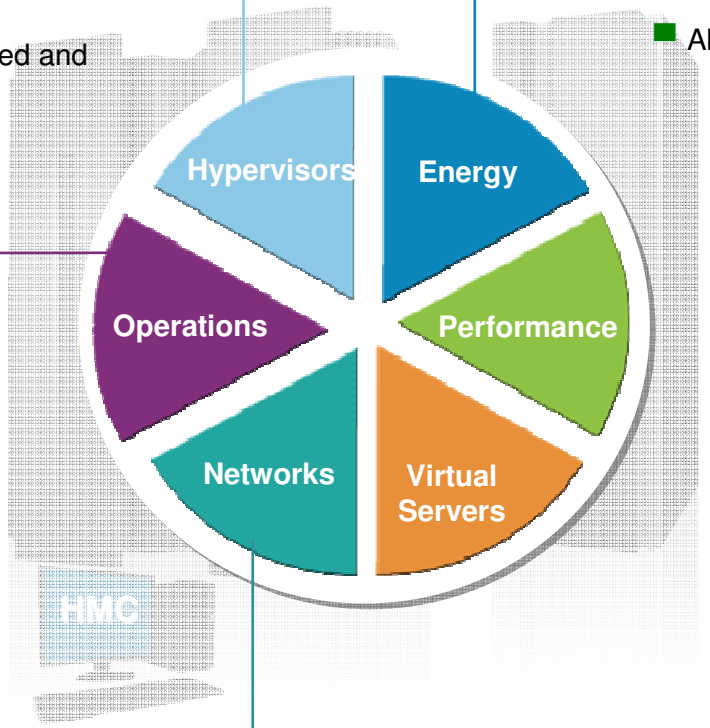
zEnterprise Unified Resource Manager
Hardware Management

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.

Operational Controls

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



Energy Management

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

Network Management

- Management of virtual networks including access control

Key

- Manage suite
- Automate suite

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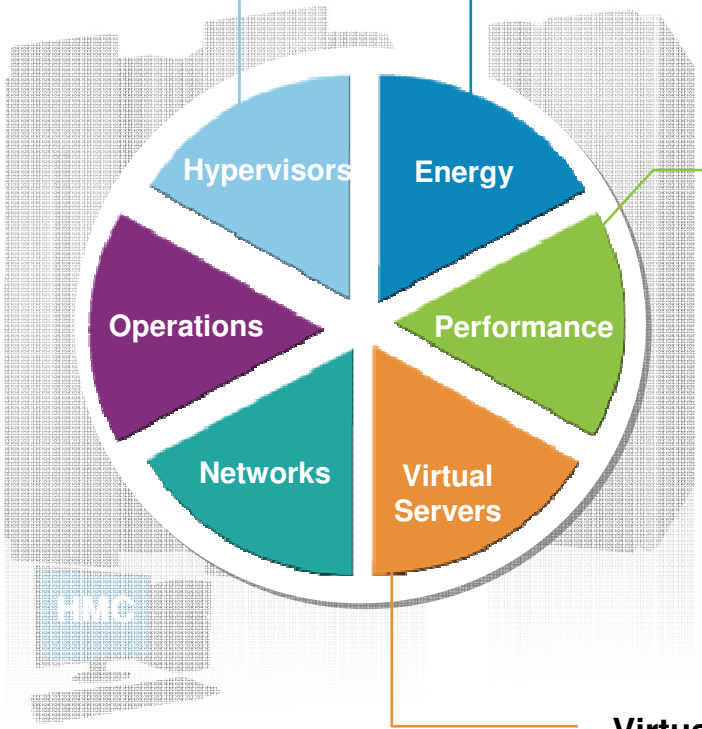
zEnterprise Unified Resource Manager
Platform Management

Hypervisor Management

- Manage and control communication between virtual server operating systems and the hypervisor.

Energy Management

- Static power savings



Workload Awareness and Platform Performance Management

- Wizard-driven management of resources in accordance with specified business service level objectives
- HMC provides a single consolidated and consistent view of resources
- 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 networks including access control

Key

- Manage suite
- Automate suite

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zEnterprise hardware management and platform management

Hypervisor Management

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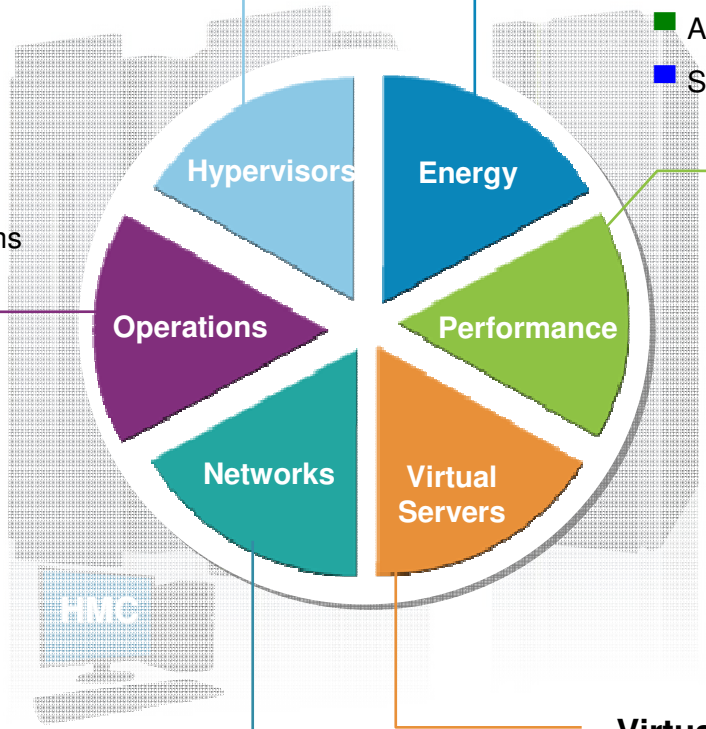

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… Value made possible by the Unified Resource Manager

Simplified installation of hypervisors

Gain significant time to market with improved speed of deployment

Simplified energy management

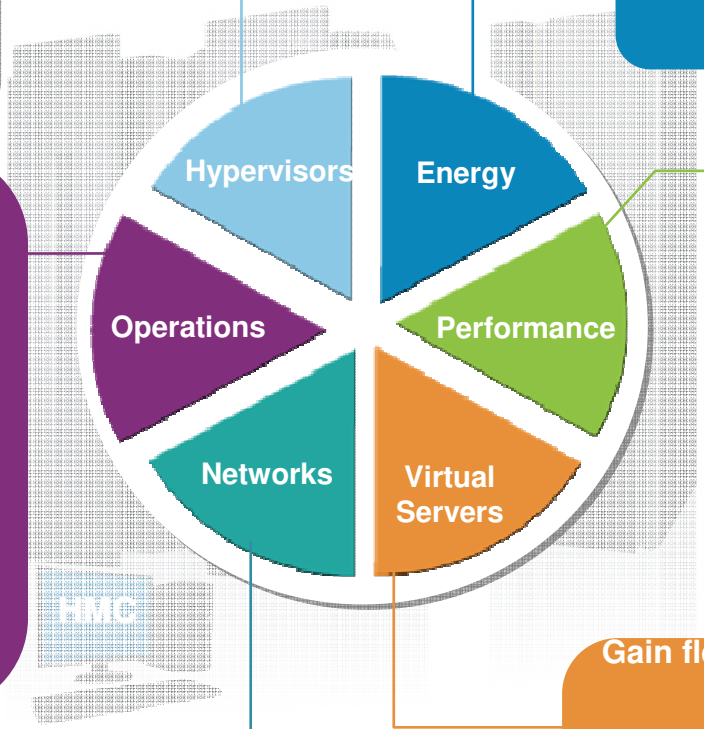
Energy cost savings

Save time, cost and simplify asset management

Decrease problem determination and resolution time for cross-platform resources

Improve and simplify cross-platform availability procedures

Enable broader and more granular view of resource consumption



Allow critical workloads to receive resources and priority based on goal-oriented policies established by business requirements

Smart business adjustments based on workload insight

Provide deep insight into how IT resources are being used

Factory installed and configured network

Improved network security with lower latency, less complexity, no encryption/decryption

Gain flexibility, consistency and uniformity of virtualization

Provide the business with faster time to market

Simplified network management for applications

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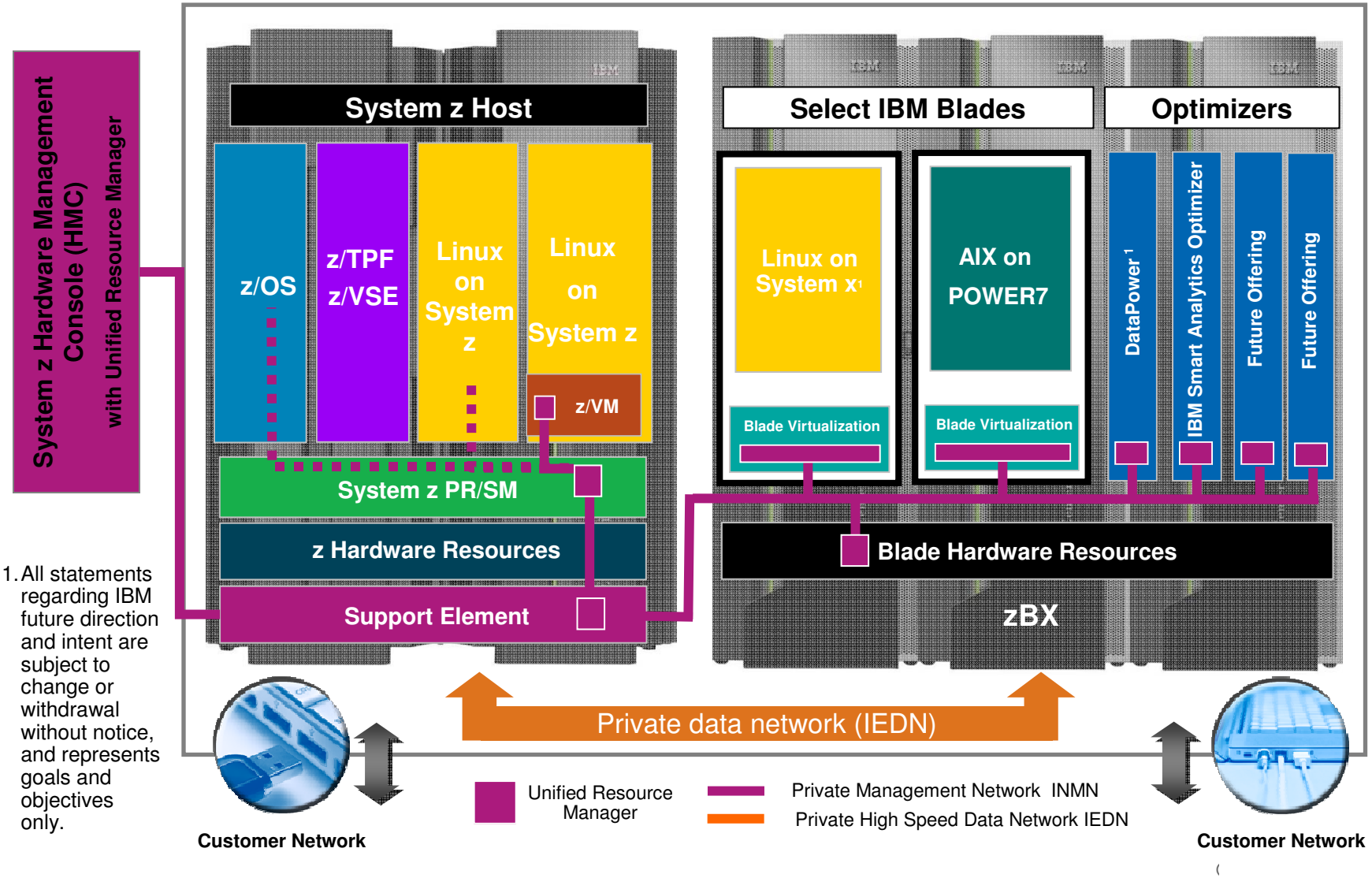
Putting zEnterprise System to the task

Use the smarter solution to improve your application design



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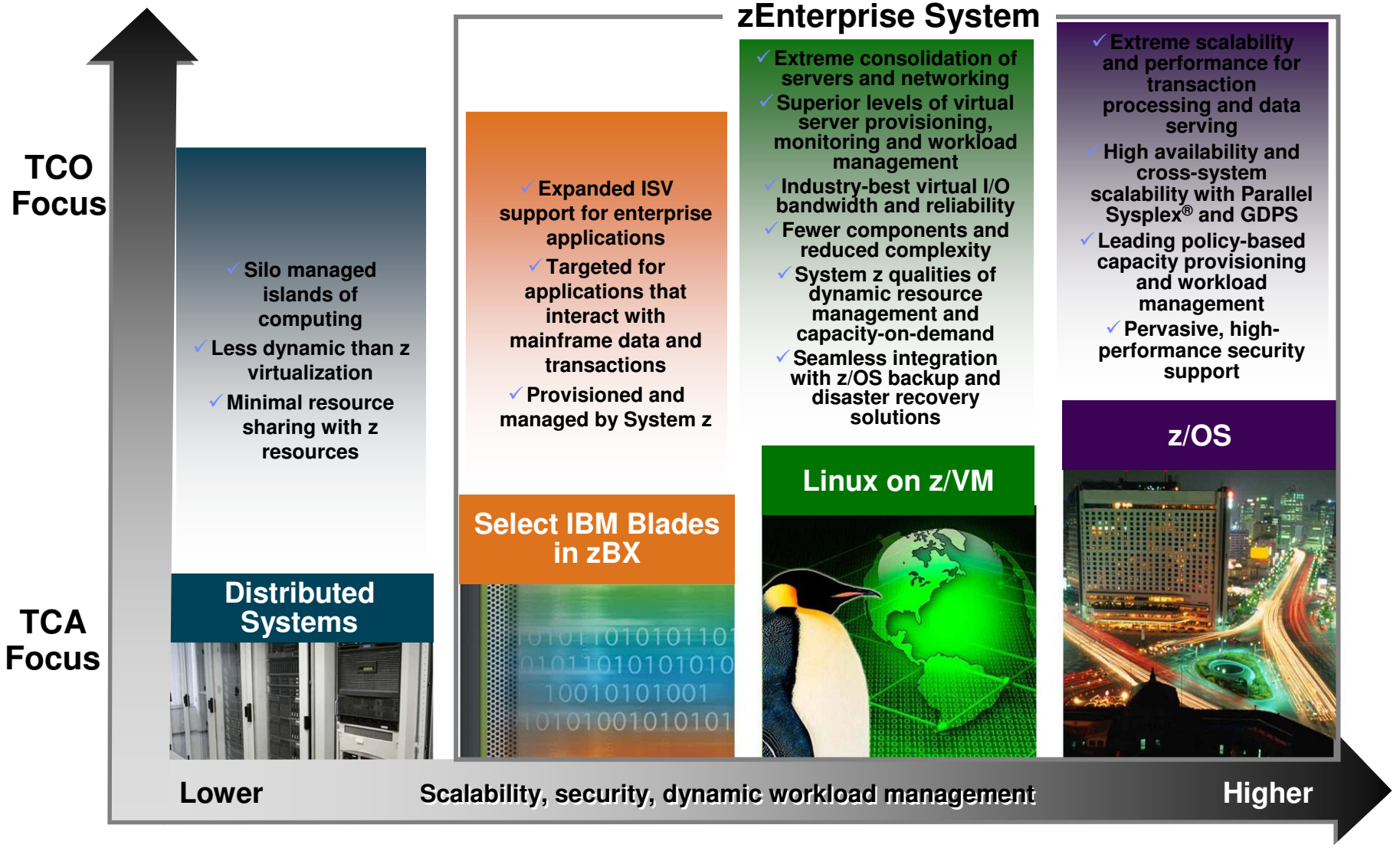
Service levels to match your business needs

Increased flexibility for your multi-architecture strategy



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 POWER7 and IBM x86[1] 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**

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Backup

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Unified Resource Manager and zBX Overview

Machine Type:

2817

Models:

M80, M66, M49, M32, M15

Machine Type:

2458

Model 002

- **Standardized Configuration:**
  - One to four 42u racks – capacity for 112 blades
  - Integrated IBM Certified components – driven by System z order
    - Standard parts - TOR Switch, BladeCenter Chassis, Power Distribution Units
    - Configured for high availability
  - Select IBM blades
    - POWER7 PS701 blades
    - IBM x86 blade[1] (SOD)
  - Optimizer
    - IBM Smart Analytics Optimizer
    - WebSphere DataPower[1] appliance (SOD)
  - Managed by zEnterprise Unified Resource Manager
  - Concurrent zBX attachment and enablement
- **Environmentals:**
  - Optional water cooling with rear door heat exchanger
  - Optional acoustic door panels
  - Energy monitoring and management
- **Software:**
  - No change to application
  - No System z software running in zBX
  - No MIPS/MSU rating
- **Simplified Management:**
  - Operational control via z196
    - Managed via secure internal network
    - Reduces proliferation of individually managed external resources
  - System z support
    - Problem reporting
    - Hardware and firmware updates
  - Improved time to install and implement new applications
  - Central point of management for heterogeneous workloads
  - Increase utilization of resources

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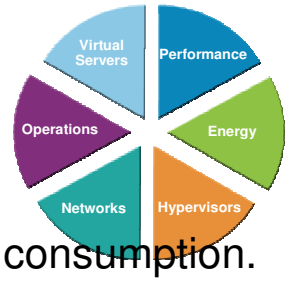
zEnterprise Unified Resource Manager
Two suites of tiered functionality



- **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.
- **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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z196, zBX and zManager
Bringing real value to workloads running on zEnterprise System

- **SAP**
  - Speed, Scalability and Memory/Cache enhancements allow large SAP systems to continue grow effectively at a competitive cost.
  - Security on System z increasingly provides the safest data serving capability in the industry from which to build a flexible SAP infrastructure
  - Key to Banking, Retail, Manufacturing
- **Multi-Tier Web Serving**
  - New instructions, combined with new compilers ensures a place for System z as a scalable and available platform for web growth and flexibility
  - Key to Banking, Insurance, Government, Healthcare
- **Business Intelligence / Data Warehousing**
  - Increased Speed, Memory architecture and processor capacity open up avenues to extend the value of DB2 in the analytics arena
  - Key Cross Industry

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