

A Technical Tour of the newest z Innovations

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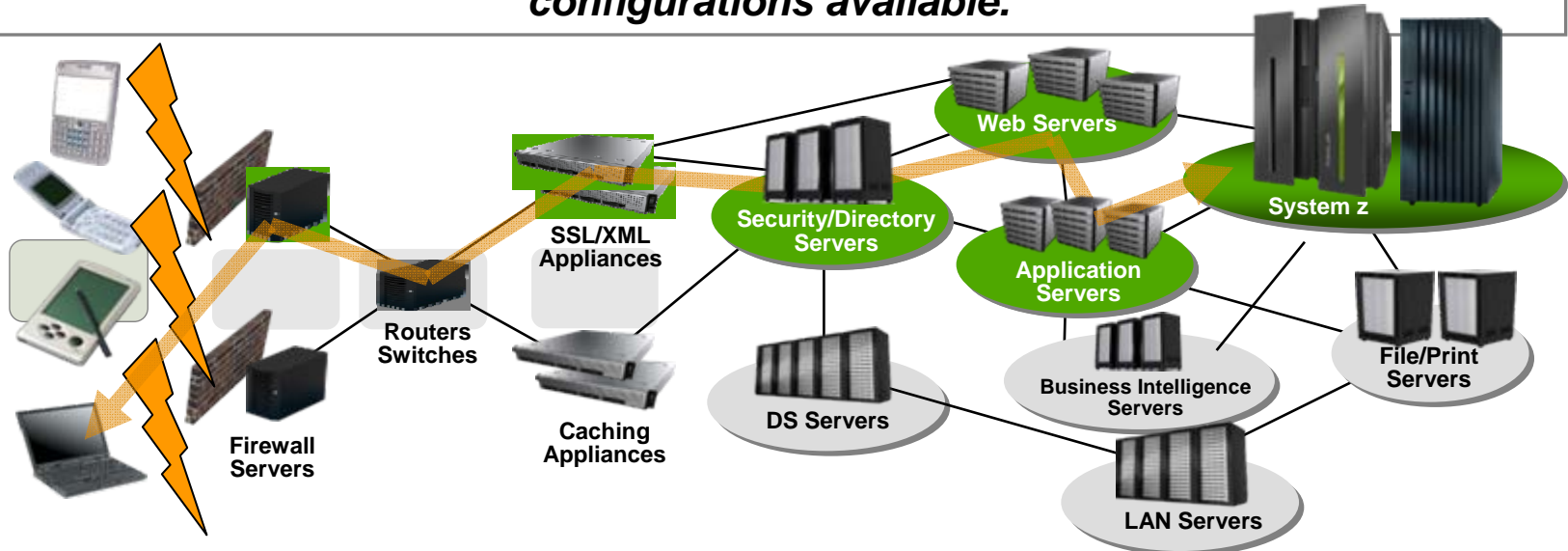
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Information Technology Today: *Limitations*

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 better approach: The ability to manage the IT infrastructure and Business Application as an integrated whole.**

IBM zEnterprise System – Best in Class Systems and Software Technologies

A system of systems that unifies IT for predictable service delivery



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

- 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: **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® Blades¹ for tens of thousands of AIX® and Linux applications
- High performance optimizers and appliances to accelerate time to insight and reduce cost
- Dedicated high performance private network



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The Value Begins At the Heart of z196 ...

- Up to **40%** Improvement for traditional z/OS workloads ¹
- Up to an **ADDITIONAL 30%** Improvement in CPU intensive workloads via compiler enhancements
- Up to **60%** Total capacity improvement ¹

1 to 80 configurable cores for client use

IFL, zIIP, zAAP, ICFs and optional SAPs

Up to 3 TB RAIM memory

45 subcapacity settings

Upgradeable from IBM System z10™ Enterprise Class (z10 EC™) and IBM System z9® Enterprise Class (z9® EC)

zEnterprise 196 (z196)

Machine Type: 2817

Models: M15, M32, M49, M66, M80

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

¹ For average LSPR workloads running z/OS 1.11.

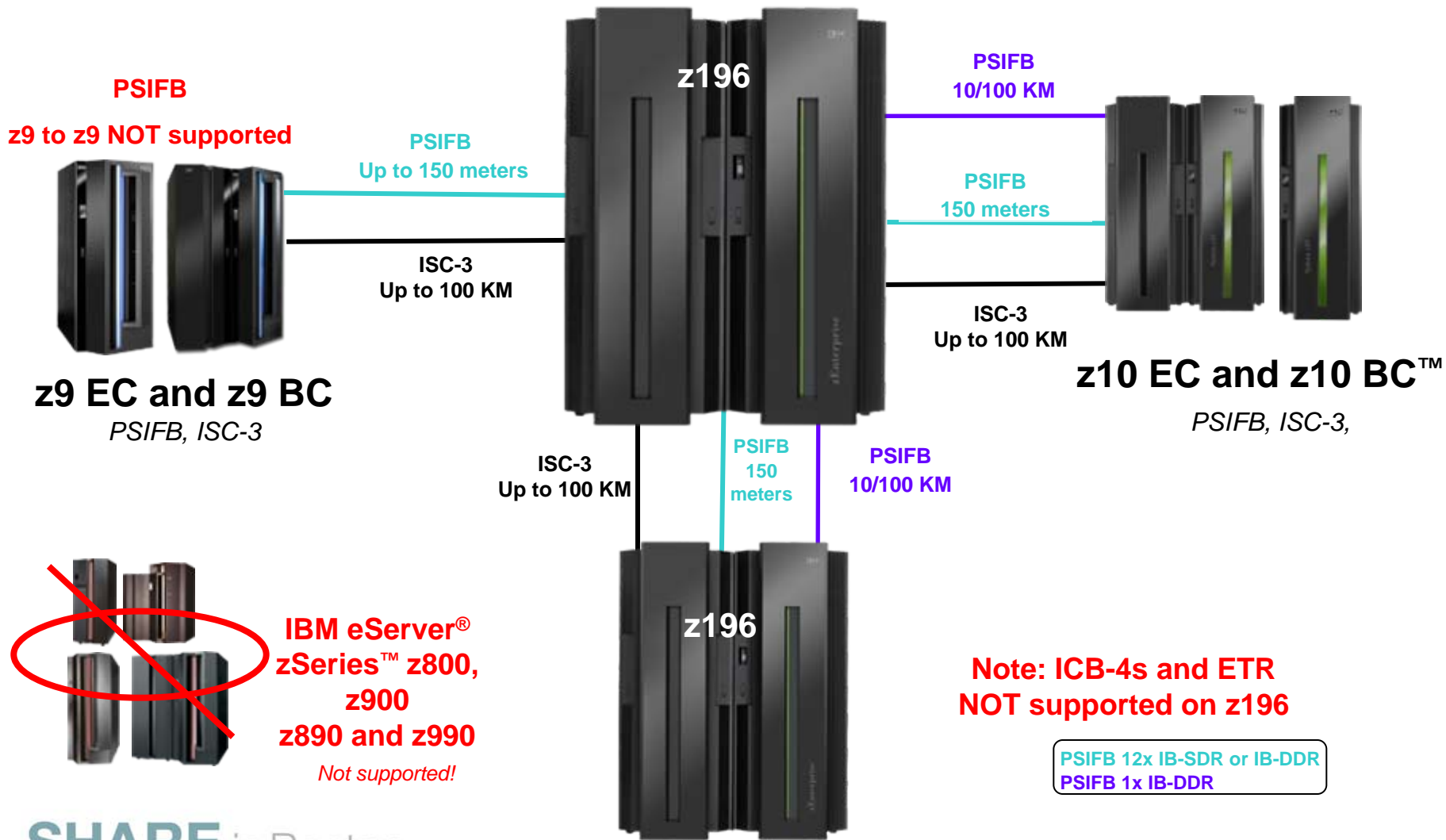
Storage Connectivity Has Gotten Easier and Performance Better

Designed, developed and tested together is key to unlocking value

- Simplified configuration of FICON® disk and tape with z/OS discovery and auto-configuration (zDAC)
- zHPF enhancements allows for increased exploitation transparently to applications and middleware
- Introduction of hot pluggable I/O drawer
- Extending for storage growth with new three subchannel sets per LCSS



z196 Parallel Sysplex coexistence of Servers/CFs and coupling connectivity



z196 – Helping to Control Energy Consumption in the Data Center

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

¹ With the exception of water cooling and overhead cabling



Synergy with z196 Operating Systems

z/OS



- New automatic discovery and configuration for fabric-attached FICON® disk and tape devices can save you hours on storage configuration time
- New definitions for new management network and data network
- New “off the wire” network traffic separation improves performance for your critical interactive and streaming workloads, as well as sysplex distributor traffic
- Support for the next generation of public key technologies with ECC support that is ideal for constrained environments such as mobile devices.
- Participation with new z196 management capabilities by allowing monitoring of z/OS workloads - a new agent can send high level z/OS WLM data to the Unified Resource Manager

z/VM and Linux on System z



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



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

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

- **Integrated IBM Certified Components driven by System z order**
 - Standard parts – TOR switch, BladeCenter Chassis, Power Distribution Units, Optional Acoustic Panels
- **System z support**
 - Problem reporting, hardware and firmware updates
- **Expanding operating system support for zEnterprise**
 - AIX, Linux on System x¹
- **Simplified management**
 - Improved time to install and implement new applications
 - Central point of management for heterogeneous workloads
 - No change to applications
- **Secure network connection between zBX and z196 for data and support.**



Optimizers

- IBM Smart Analytics Optimizer
- WebSphere® DataPower® appliance¹

Select IBM Blades

- BladeCenter PS701 Express
- System x¹

One to four – 42u racks – capacity for 112 blades

No System z software running in zBX – Passport Advantage software licensed to blades

No MIPS/MSU rating

Configured for high availability

Optional rear door heat exchanger



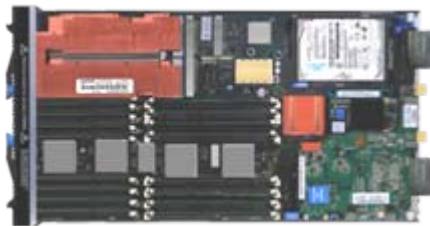
... managed by the
zEnterprise Unified Resource Manager

IBM POWER7 and System x¹ Blades

General purpose processors under one management umbrella

What is it?

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



How is it different?

- **Complete management:** Advanced management brings operational control and cost benefits, improved security, workload management based on goals and policies.
- **Virtualized and Optimized:** Virtualization means fewer resources are required to meet peak demands with optimized interconnection.
- **Integrated:** Integration with System z brings heterogeneous resources together that can be managed as one.
- **Transparency:** Applications certified to run on AIX 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.

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

Management Stack

Building an architectural construct of hardware, software, services



Service Management

IBM

- 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

- Workload based Resource Allocation and Provisioning for zEnterprise
- Physical and Virtual Resource Management (Server, Storage, Network)
- Goal Oriented Resource Management of zEnterprise (Availability, Performance, Energy, Security)
- Ensemble Network and Storage Management

Extending with **Unified Resource Manager**

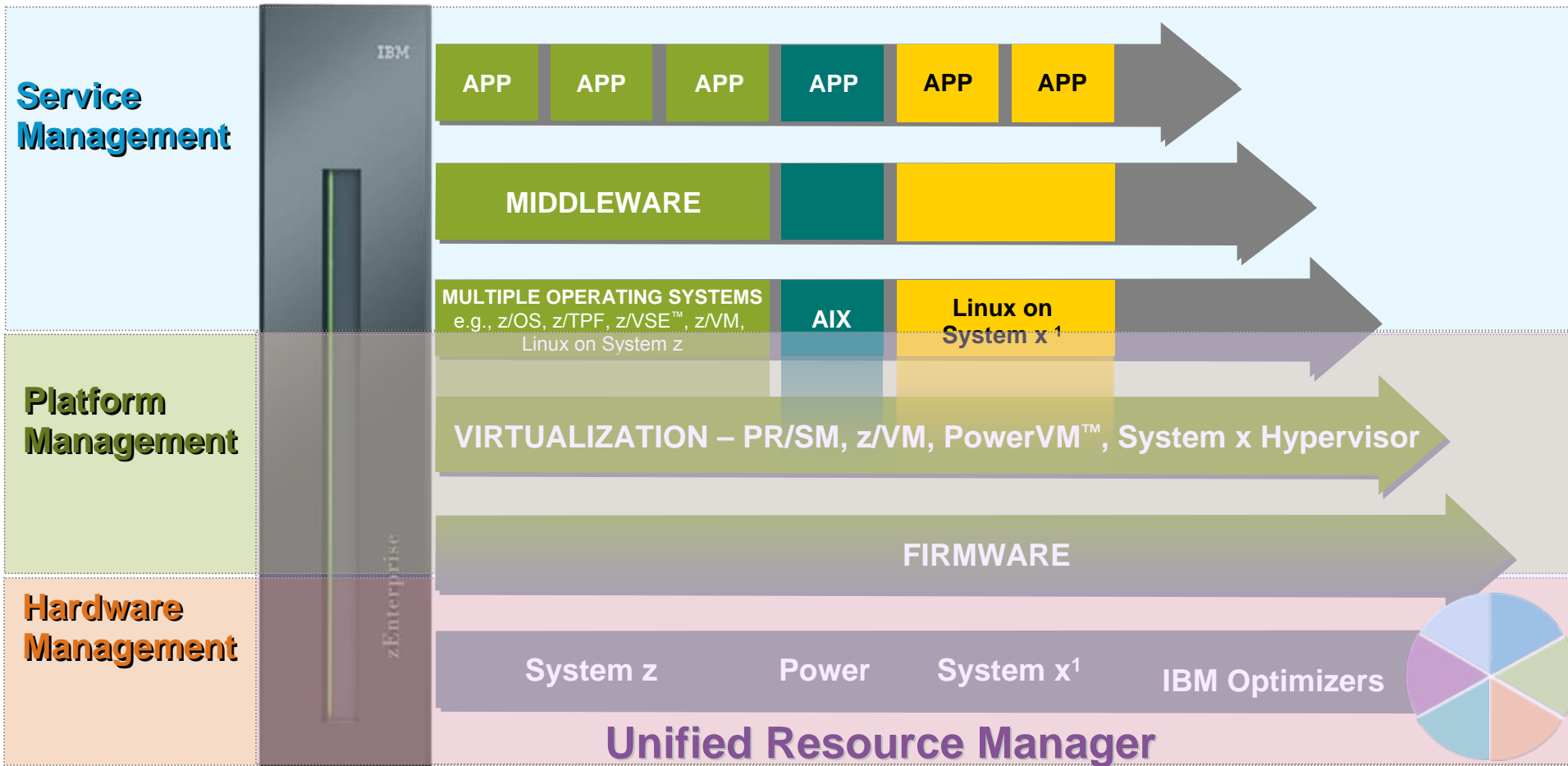
- Hypervisor management and creation of virtual networks
- Operational controls, service and support for hardware / firmware
- Network management of private and secure data and support networks
- Energy monitoring and management
- Workload awareness and platform performance management
- Virtualization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

Hardware Management

zEnterprise

- Configuration management for hardware / firmware
- Operational controls for the hardware / firmware
- Service and Support for the hardware / firmware
- Lifecycle management for the platform's virtual resources

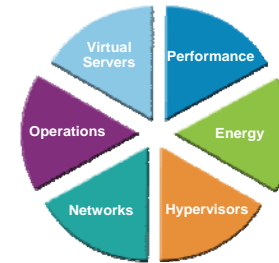
Built On This Construct – zEnterprise – Innovation At Every Level



Focused, collaborative innovation
A “complete systems” approach

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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Unified Resource Manager

zEnterprise Unified Resource Manager

Hardware Management

Hypervisor Management

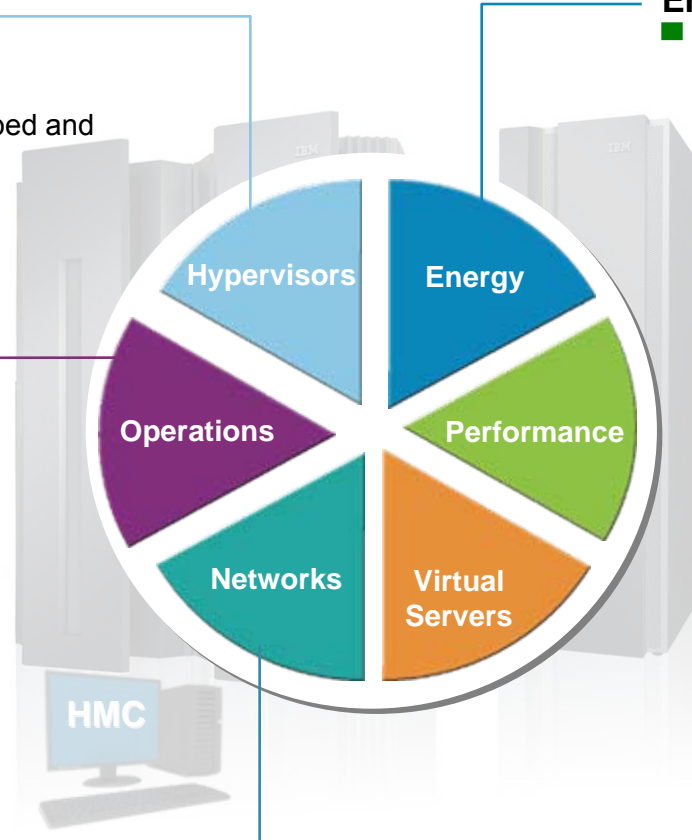
- Integrated deployment and configuration of hypervisors
- Hypervisors (except z/VM) shipped and serviced as firmware.
- Management of ISO images.
- Creation of virtual networks.

Energy Management

- Monitoring and trend reporting of CPU energy efficiency.

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 interface.



Network Management

- Management of virtual networks including access control

Key	
■	Manage suite
■	Automate suite

zEnterprise Unified Resource Manager

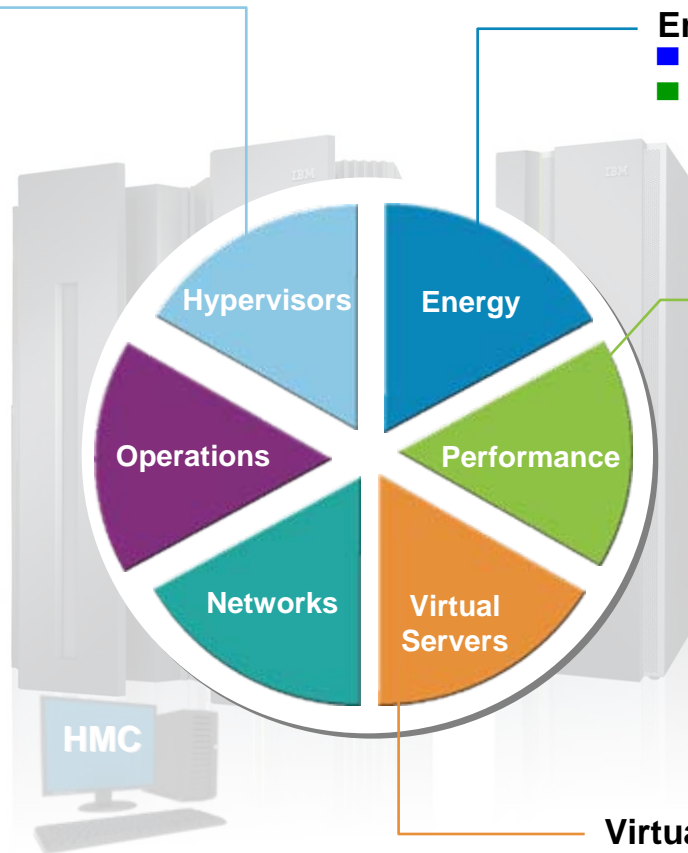
Platform Management

Hypervisor Management

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

Energy Management

- Static power savings
- Ability to query maximum potential power.



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

... Value Made Possible By the Unified Resource Manager

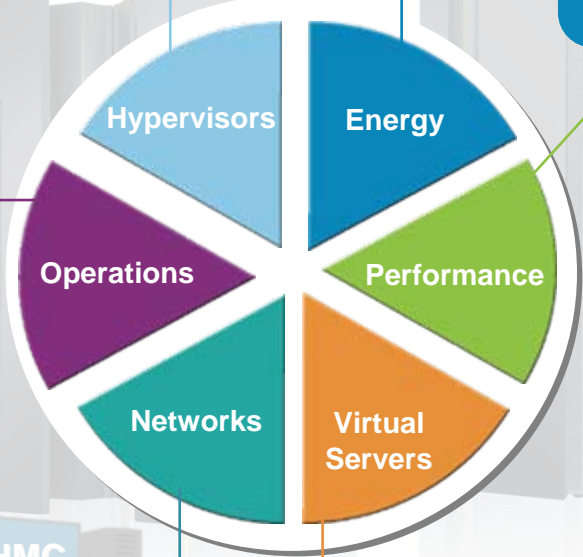


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Technology • Connections • Results

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

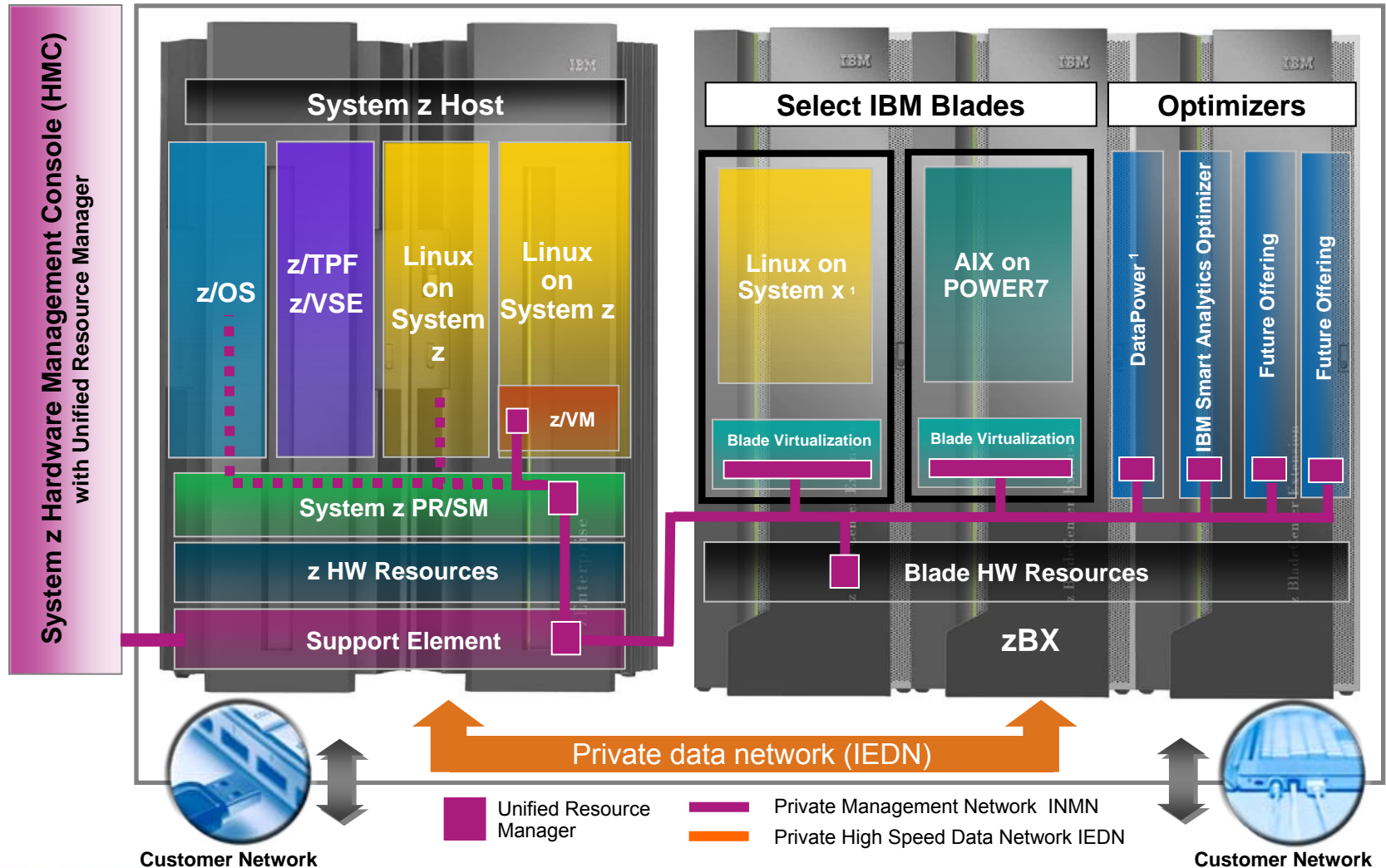
Gain flexibility, consistency and uniformity of virtualization
Provide the business with faster time to market
Simplified network management for applications

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ge suite
Automate suite

Putting zEnterprise System to the task

Use the smarter solution to improve your application design

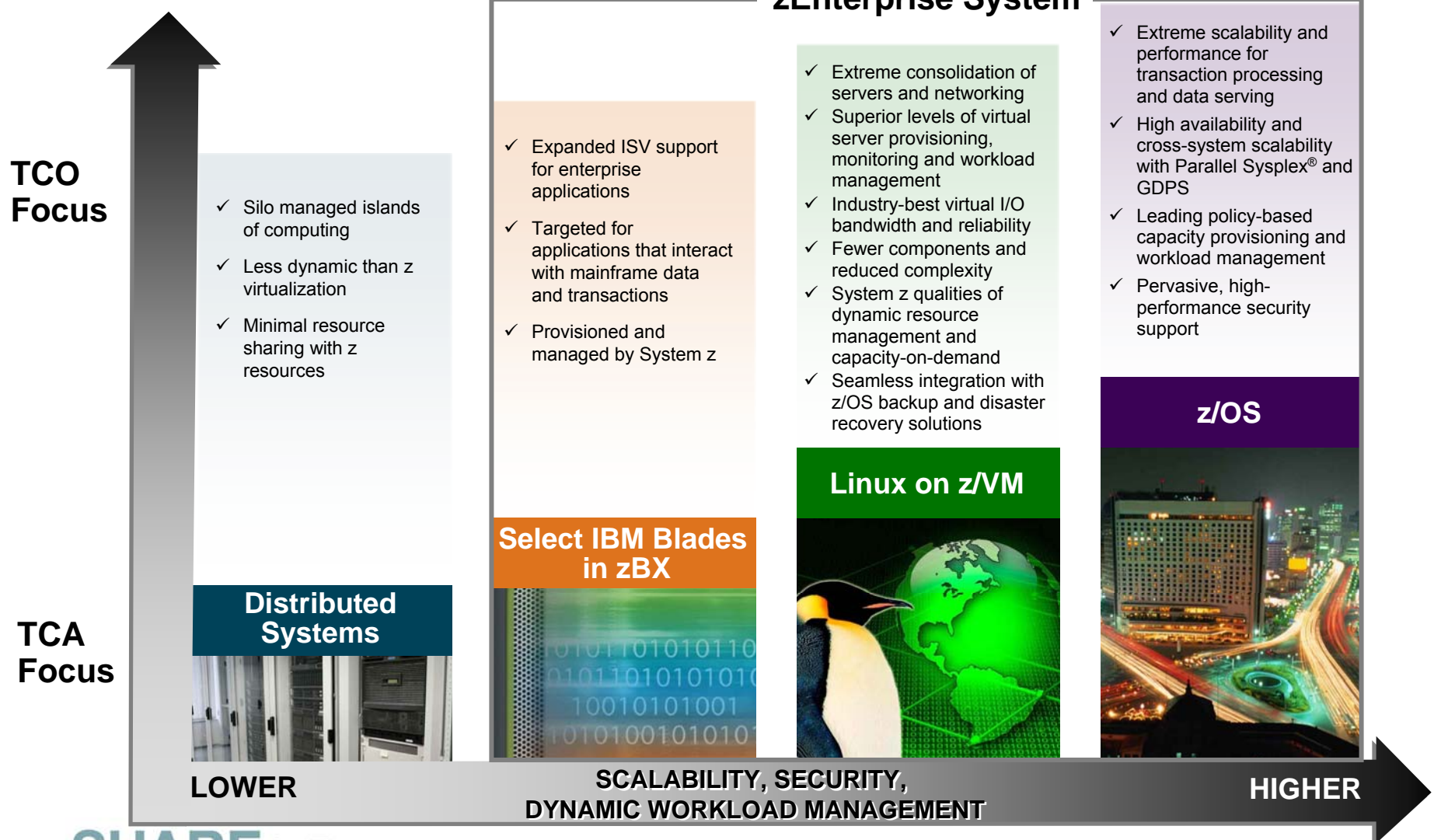


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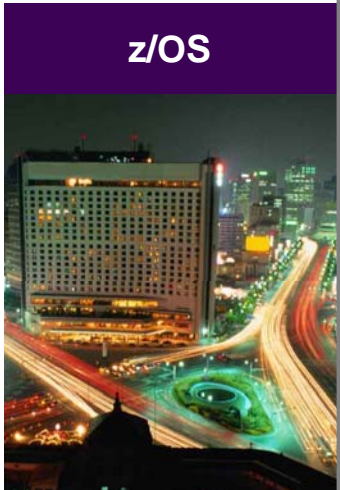
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Service Levels to Match Your Business Needs

Increased flexibility for your multi-architecture strategy when data is on z/OS



- ✓ Extreme scalability and performance for transaction processing and data serving
- ✓ High availability and cross-system scalability with Parallel Sysplex® and GDPS
- ✓ Leading policy-based capacity provisioning and workload management
- ✓ Pervasive, high-performance security support

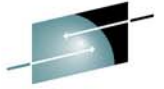


IBM zEnterprise System:

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 System x1 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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Thank you



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Backup

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Operating System Support for zEnterprise System

- **Currency is key to operating system support and exploitation of future servers**
- **The following are the minimum operating systems planned to run on z196:**
 - z/OS
 - z196: z/OS V1.9¹ for toleration only; exploitation starts with z/OS V1.10 with full exploitation with z/OS V1.12
 - Ensemble support: z/OS V1.10
 - Linux on System z distributions:
 - Novell SUSE SLES 10 and SLES 11
 - Red Hat RHEL 5
 - z/VM
 - z196: z/VM V5.4 or higher
 - Ensemble support: z/VM V6.1
 - z/VSE V4.1 or higher
 - z/TPF V1.1 or higher
- **Using the general purpose blades:**
 - AIX 5.3, 6.1
 - Linux on System x² (SOD)

