



zEnterprise System Overview

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Introduction

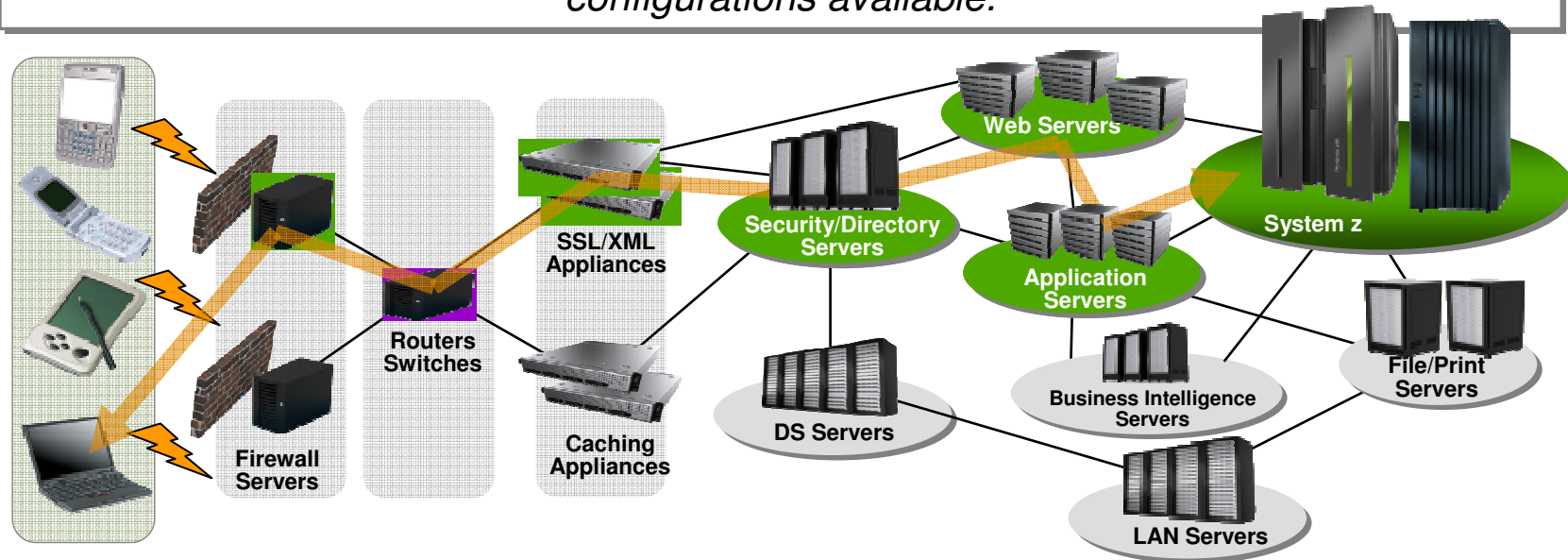
.... A New Dimension in Computing

A new system of systems that provides an infrastructure that can integrate multiple architectures within an enterprise to form a heterogeneous pool of resources for optimized workload deployment

And ... provides a single control point for management of these resources

Information technology today: Limitations

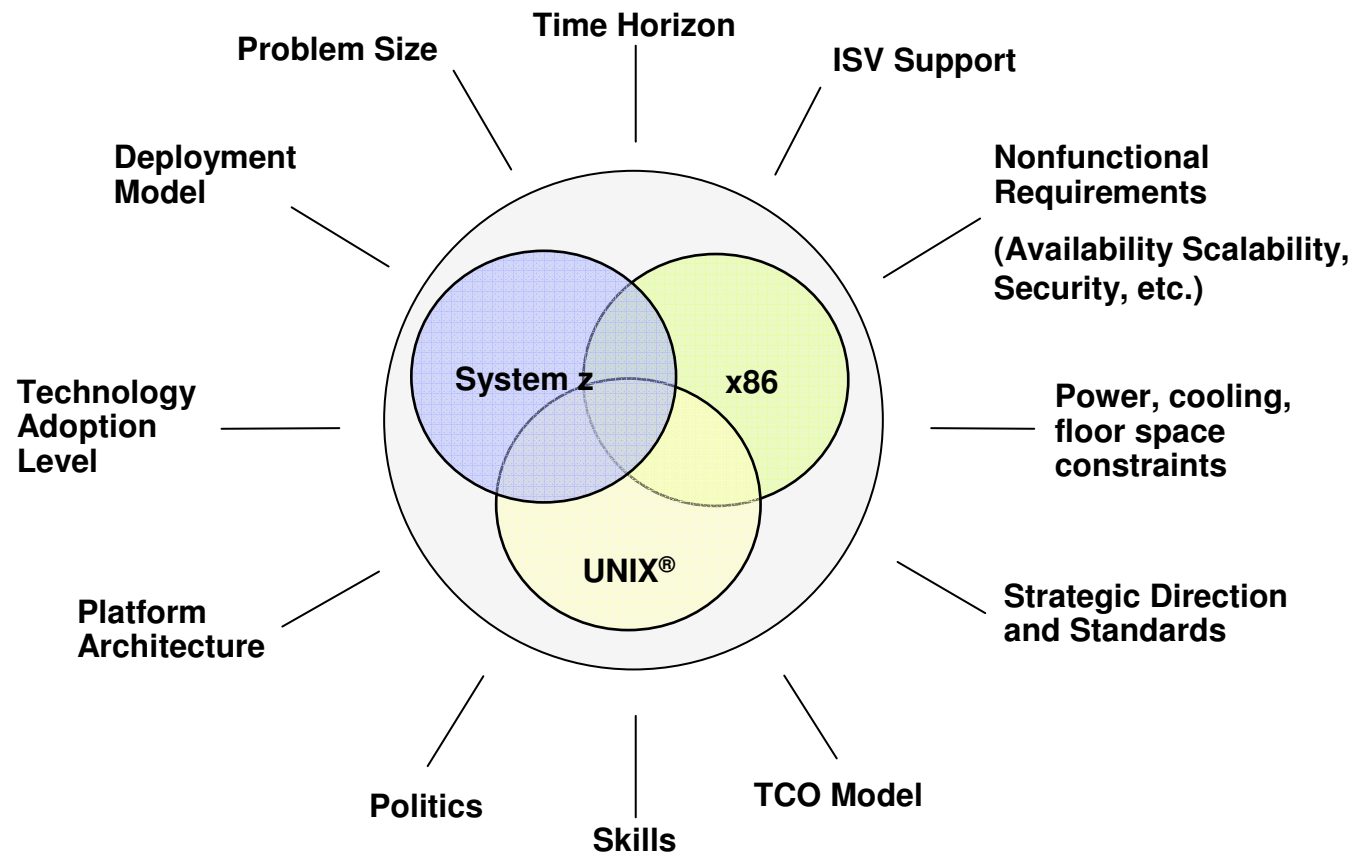
Information technology today is limited by the technology and architecture configurations available.



- 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.**

Platform Choice – Fit for Purpose, Workload and Situation

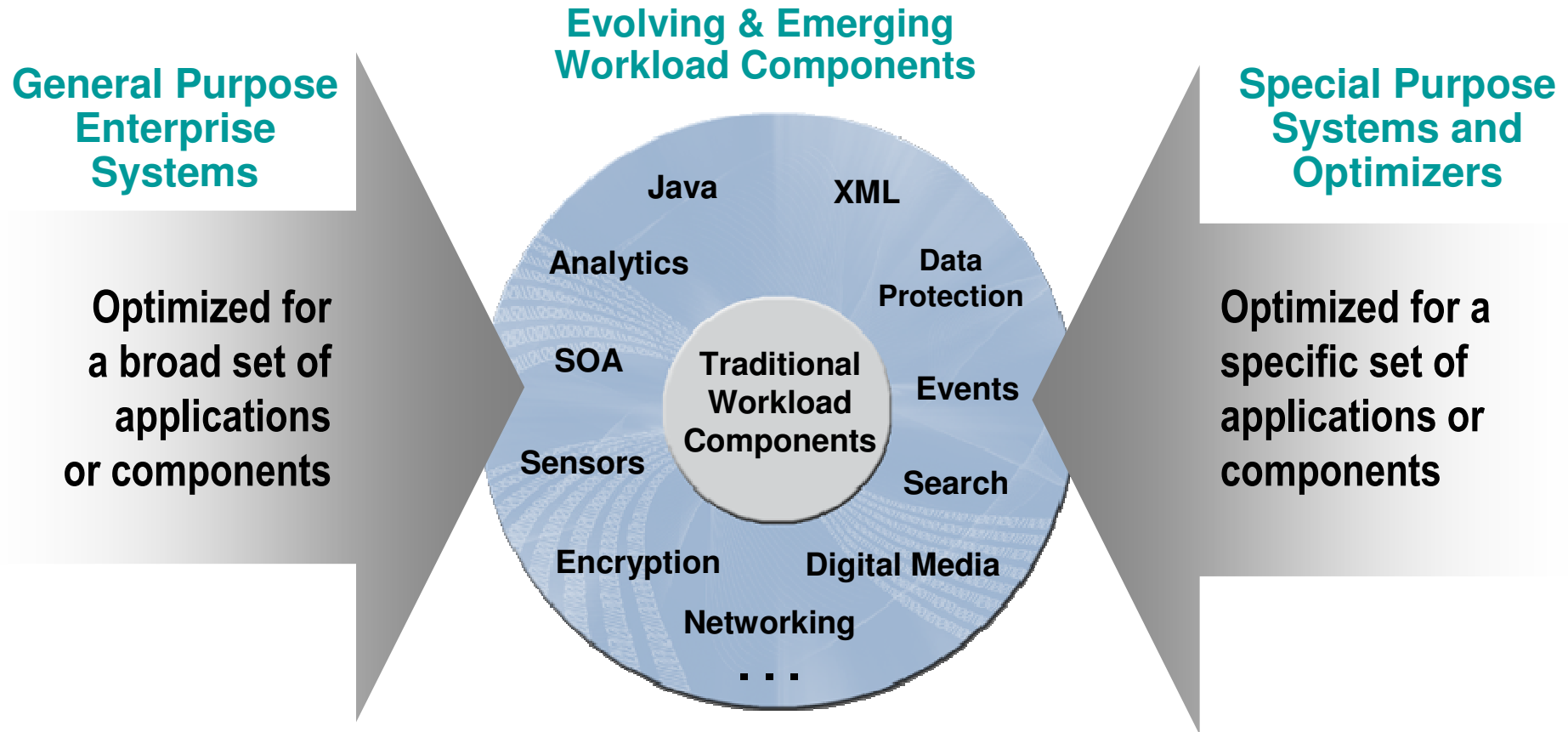
Many factors influence a platform selection, making it difficult to present a simple selection matrix



Some factors are specific to each business, others are common to all and can be generalized

Emerging Applications with Special-Purpose Capabilities

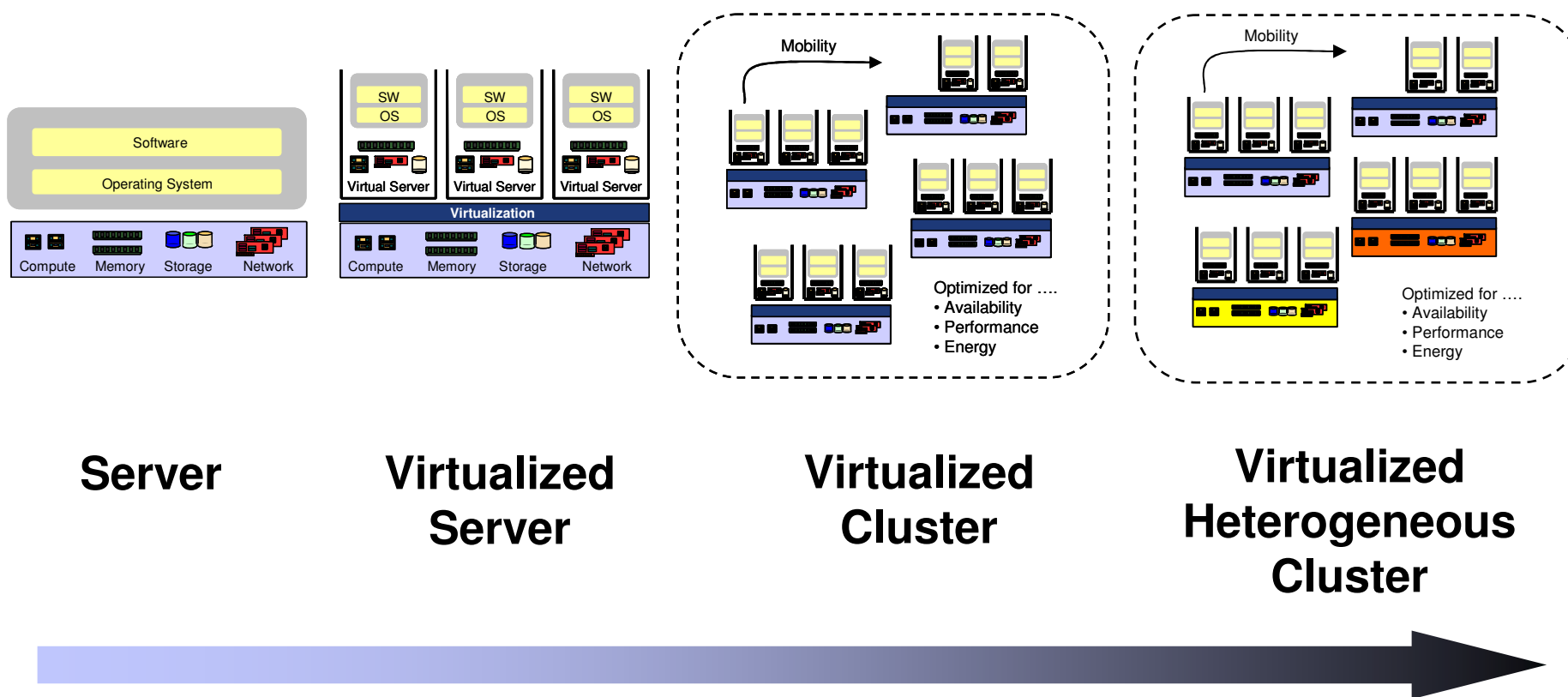
Future objectives include extended application integration and optimization



Integration will be critical

Both General and Special Purpose capabilities are needed

The Evolution of the “Platform”



Server

Virtualized Server

Virtualized Cluster

Virtualized Heterogeneous Cluster



Advanced Management of Virtualized IT Infrastructure

IBM zEnterprise System – Best in Class Systems and Software Technologies

A system of systems that unifies IT for predictable service delivery



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

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

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

- 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 AIX® and Linux /Microsoft Windows¹ 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 for client use	
IFL, zIIP, zAAP, ICFs and optional SAPs	
Up to 3 TB RAIM memory	
15 subcapacity settings	
Cryptographic enhancements	
Optional water cooling and/or HV DC Power	
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

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

¹ For average LSPR workloads running z/OS® 1.11.

... 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 Rear Acoustic Panels
- **System z support**
 - Problem reporting, hardware and firmware updates
- **Expanding operating system support for z196**
 - AIX on IBM p Blades, Microsoft Windows/Linux on IBM System x Blades¹
- **Simplified management**
 - Improved time to install and implement new applications
 - Central point of management for heterogeneous workloads
 - No change to applications



Optimizers

- IBM Smart Analytics Optimizer
- IBM WebSphere DataPower Integration Appliance XI50 for zEnterprise

Select IBM Blades

- BladeCenter PS701 Express
- IBM System x Blades¹

One to four – 42u racks – capacity for up to 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**

Design Points of zEnterprise BladeCenter Extension (zBX)

Customers had connectivity but wanted management

- **Enhance the overall experience of attaching blades and optimizers**
 - Increase availability of infrastructure – build in redundancy
 - Faster installation
 - Pre-test and assemble blade components at IBM plant
 - Auto-detect new blades inserted into a BladeCenter
 - Provide z-like maintenance - by System zSSR - 24X7, call home

- **Improve the connectivity between blades and IBM System z®**
 - Build a very high speed secure network
 - Reduce or eliminate the need for firewalls
 - No encryption/decryption
 - Ensure network availability – build in redundancy
 - Simplify – Significantly reduce the need for connection devices / black boxes (e.g, routers, switches)

- **Automate as many functions as possible across the infrastructure**
 - Consolidate “platform management” function and offer as integrated virtualization firmware for each component
 - Automatically load firmware
 - Manage across multiple heterogeneous platforms including mainframes, POWER®, select IBM System x Blades¹
 - Automatically maintain consistent firmware levels on distributed servers



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?

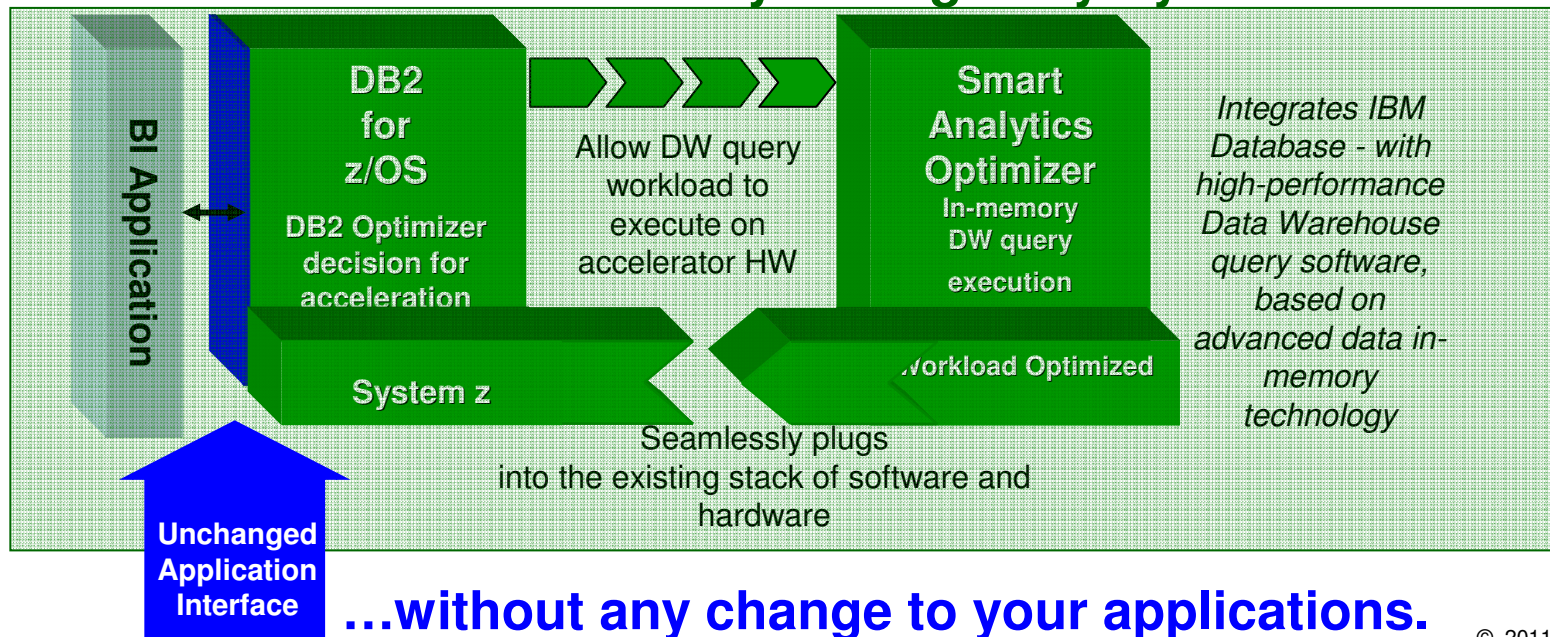
- **Performance:** Unprecedented response times to enable 'train of thought' analyses frequently blocked by poor query performance.
- **Integration:** Connects to DB2® through deep integration providing transparency to all applications.
- **Self-managed workloads:** Queries are executed in the most efficient 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

IBM Smart Analytics Optimizer

- **A special purpose, workload optimized system**
 - Accelerate typical DW queries from traditional database server to the optimizer
 - Based on IBM research prototype
 - Network attached Blades
- **No changes to the applications**
- **Designed to improve performance of typical DW queries 5-10x**
 - Vector processing - evaluation of all predicates in parallel
 - Consistent Query Response Times
 - Achieving linear scaling with the number of CPUs
 - Data Compression ratios of more than 90%
- **Significant price/performance and TCO improvement**
 - Order of magnitude performance improvement for offloaded queries
 - Significant reduction in DBA effort for tuning offloaded queries (MQTs, indexes, etc.)
 - Managing the data consistently, coherently, and securely on z/OS

Total solution remains centrally managed by System z...

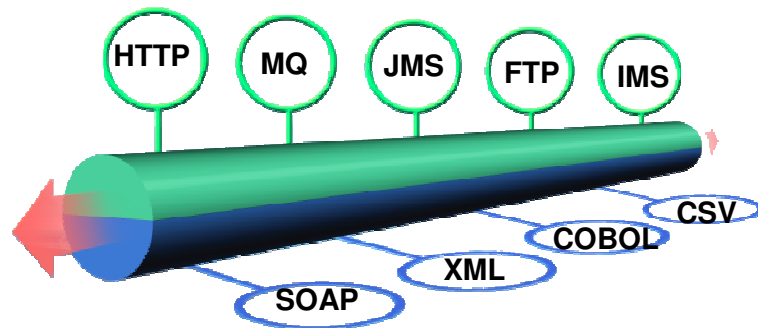


IBM WebSphere DataPower Integration Appliance XI50 for zEnterprise (DataPower XI50z) in the zBX

Purpose-built hardware for simplified deployment and hardened security

What is it?

The IBM WebSphere DataPower Integration Appliance XI50 for zEnterprise can help simplify, govern, secure and integrate XML and IT services by providing connectivity, gateway functions, data transformation, protocol bridging, and intelligent load distribution.



How is it different?

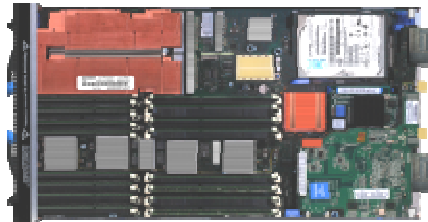
- **Security:** VLAN support provides enforced isolation of network traffic with secure private networks. And integration with RACF security.
- **Improved support:** Monitoring of hardware with “call home” for current/expected problems and support by System z Service Support Representative.
- **System 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 synchronization with System z. Consistent change management with Unified Resource Manager.

IBM POWER7 and IBM System x¹ 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, or Microsoft Windows/Linux on IBM System x blades (SOD) ¹ but have it under a single management umbrella.



How is it different?

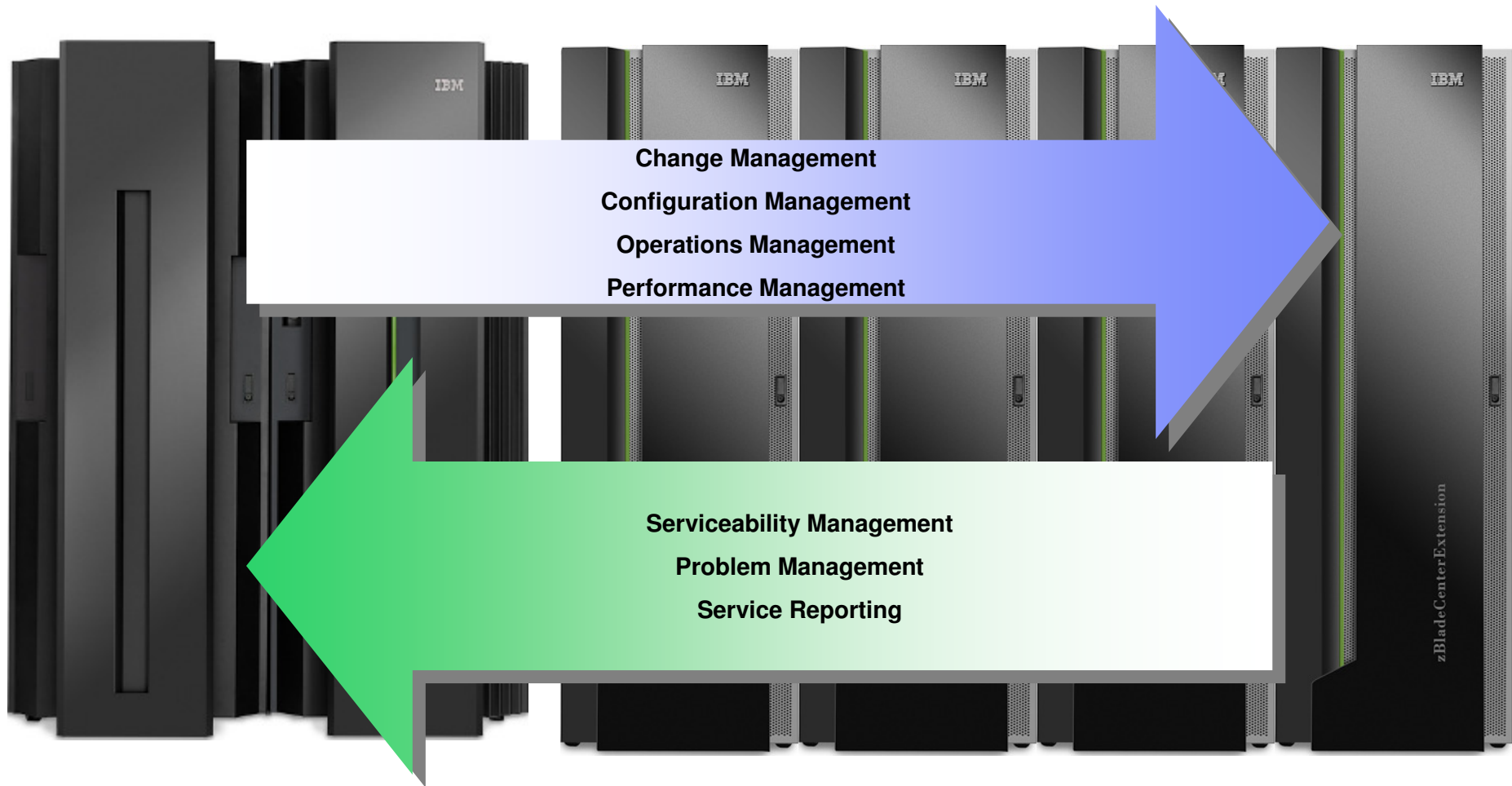
- **Complete management:** Advanced management brings operational control and cost benefits, improved security, workload management based on goals and policies.
- **Virtualized and Optimized:** Virtualization means fewer resources are required to meet peak demands with optimized interconnection.
- **Integrated:** 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.

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z196 and zBX – zEnterprise Unified Resource Management

z196

zBX



Unified Resource Manager Design Points

Integrate and manage your mainframe and distributed environment as one

- Incorporate “**hardware management / platform management**” capabilities into robust firmware to control each attached hardware component – mainframe to blade
 - Hypervisors managed as firmware
 - Network managed by firmware – improved access control
 - Single management point of control – the HMC - reduced complexity of day-to-day operations
 - Simplified installation - auto discovery and configuration of resources inserted into the zBX
- Deliver **workload awareness** to optimize the system resources in accordance with understanding the policies assigned to that particular workload.
- **System z service and support management** for the z196 AND the virtual machines and blades
 - Monitoring of heterogeneous architectures for problems, logging and analyzing of events, initiating recovery procedures, call home and notifying the user – all with time stamps to maintain data and transaction integrity
- Unified Resource Manager offers **virtual server provisioning and management for Linux guests running on z/VM** – even if you don’t have a zBX
 - Simplified skill level needed to manage a Linux on z/VM environment

Manage your mainframe and distributed with the same tools, same techniques, same practices

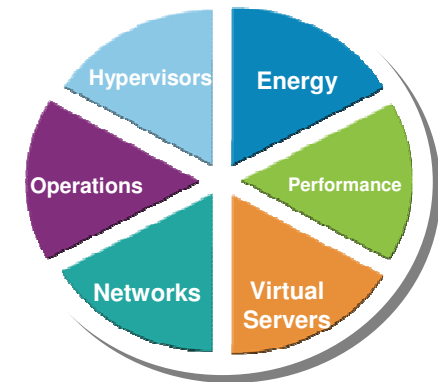
Unified Resource Manager

Unified Resource Manager

Two suites of tiered functionality

▪ **Manage**

- Monitoring 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
- Simple Administrative Wizard
 - **Virtual server provisioning**
 - Enablement of **integrated storage and network** across hypervisors

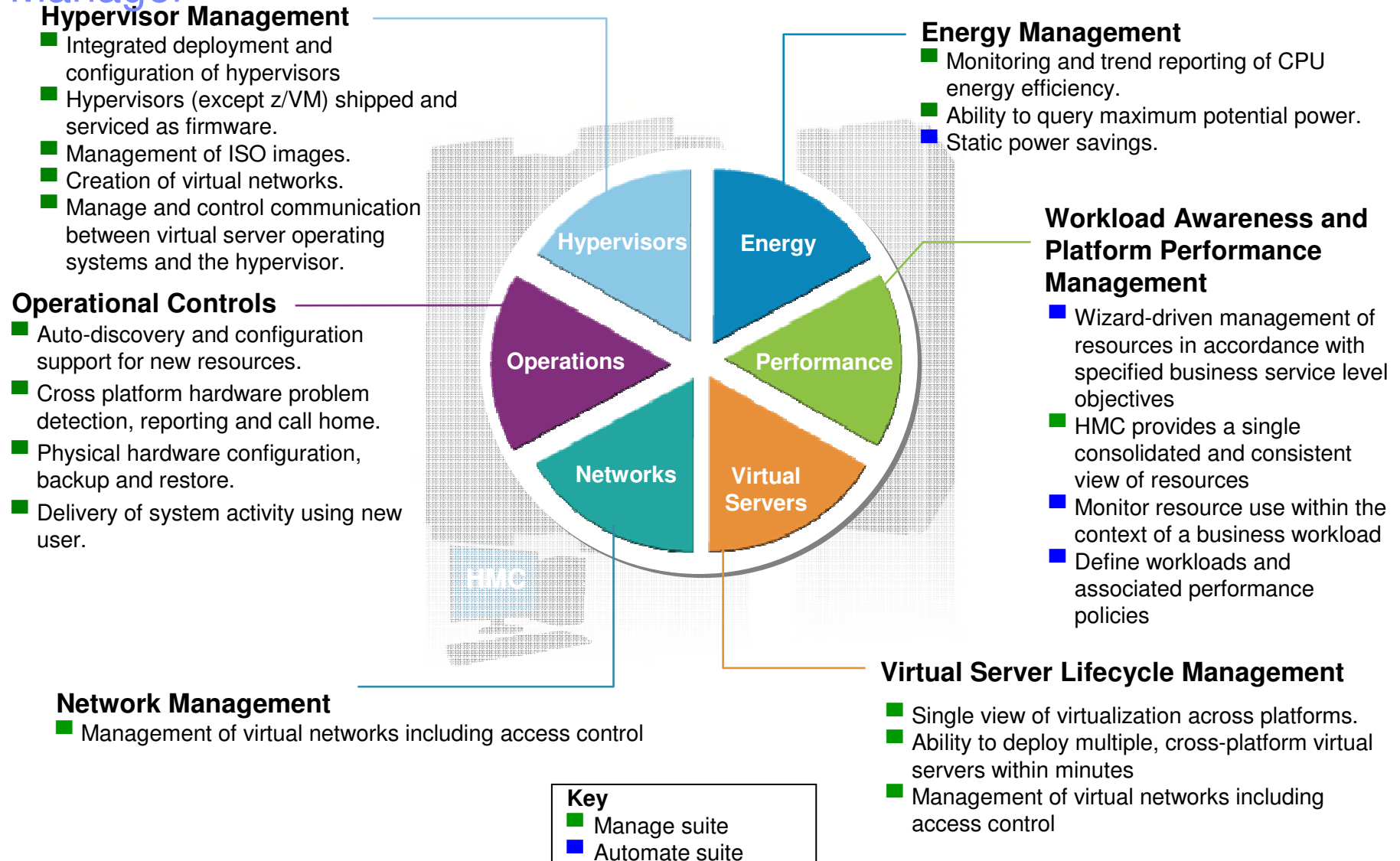


▪ **Automate**

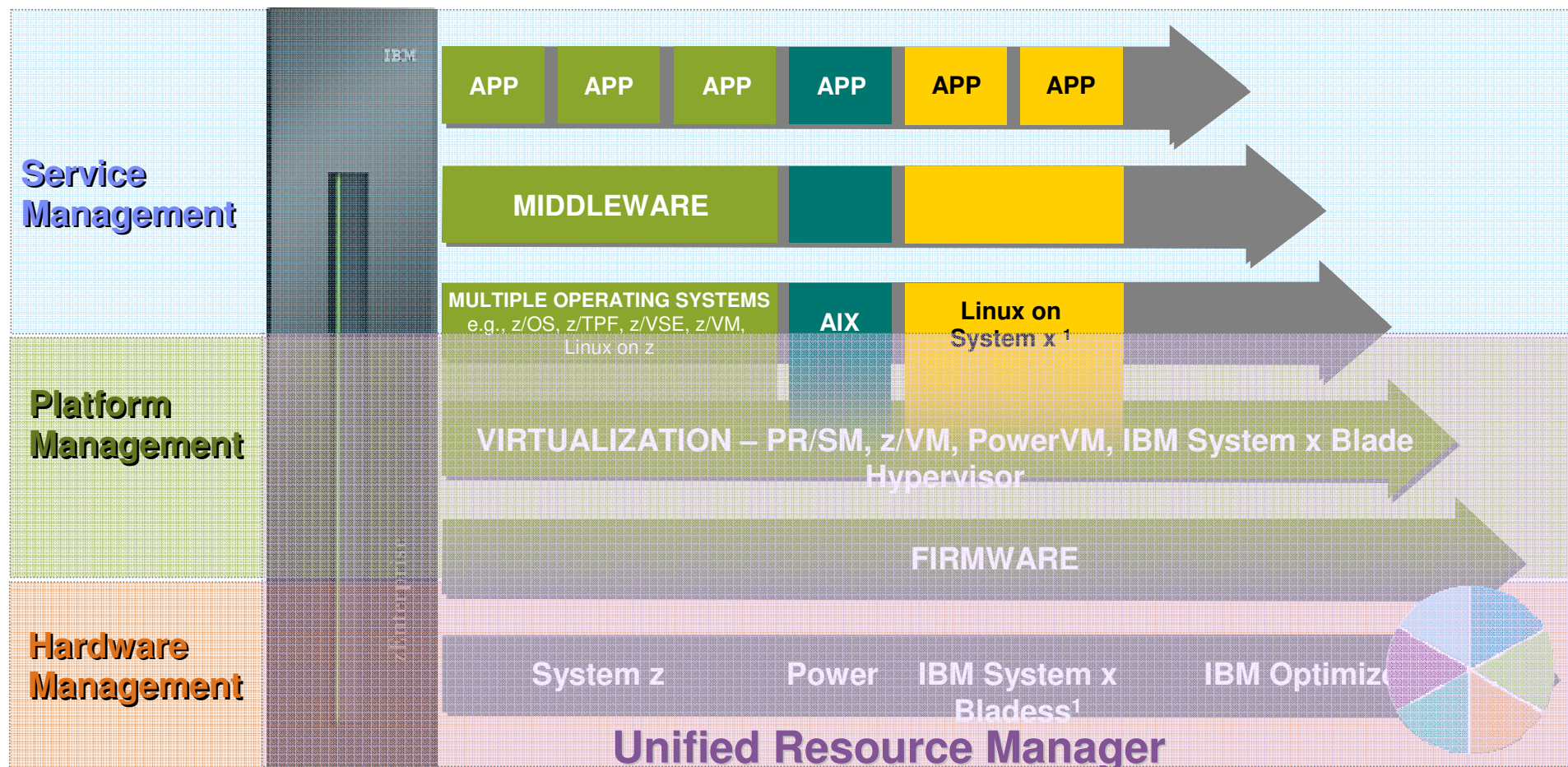
- Additional wizard function
 - Capability to **associate workload resources with a named business process**
- Ability to manage to a user-defined **performance service level policy** and enable performance monitoring, reporting and resource optimization
- Static power savings (reduce power on z196 during low utilization such as DR or backup servers) and **energy management** capabilities

Unified Resource Manager can help you to align the needs of the business with what IT can deliver ... and THAT brings real value

Six Functional Management Areas Within Unified Resource Manager



Built on this construct – zEnterprise – Innovation at every level

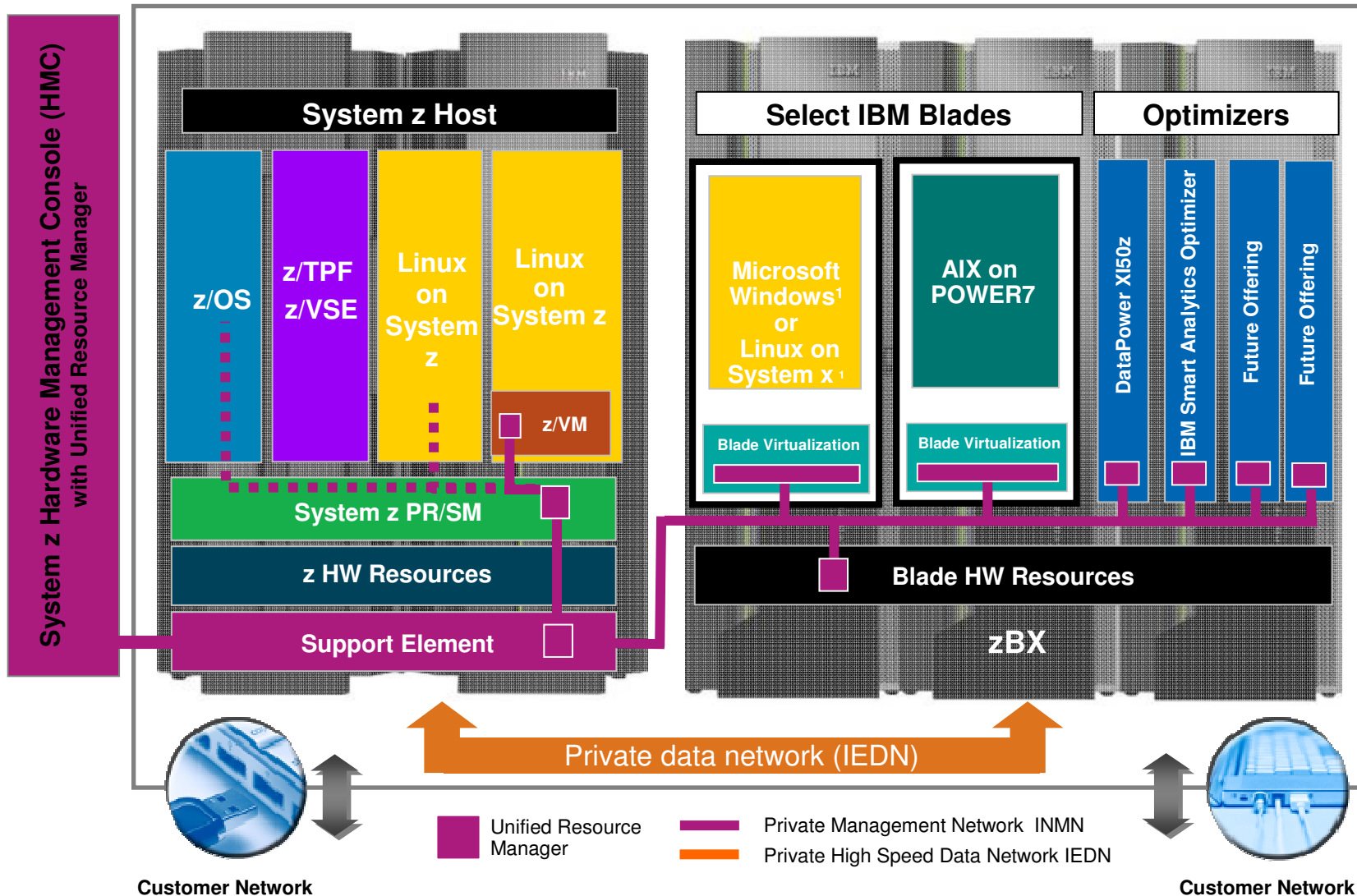


Focused, collaborative innovation

A “complete systems” approach

Putting zEnterprise System to the task

Use the smarter solution to improve your application design



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Ensemble Management Users and Roles

Role	Description
Ensemble Administrator	Responsible for creating and managing the zEnterprise 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 WWPN, 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

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

Linux on System z

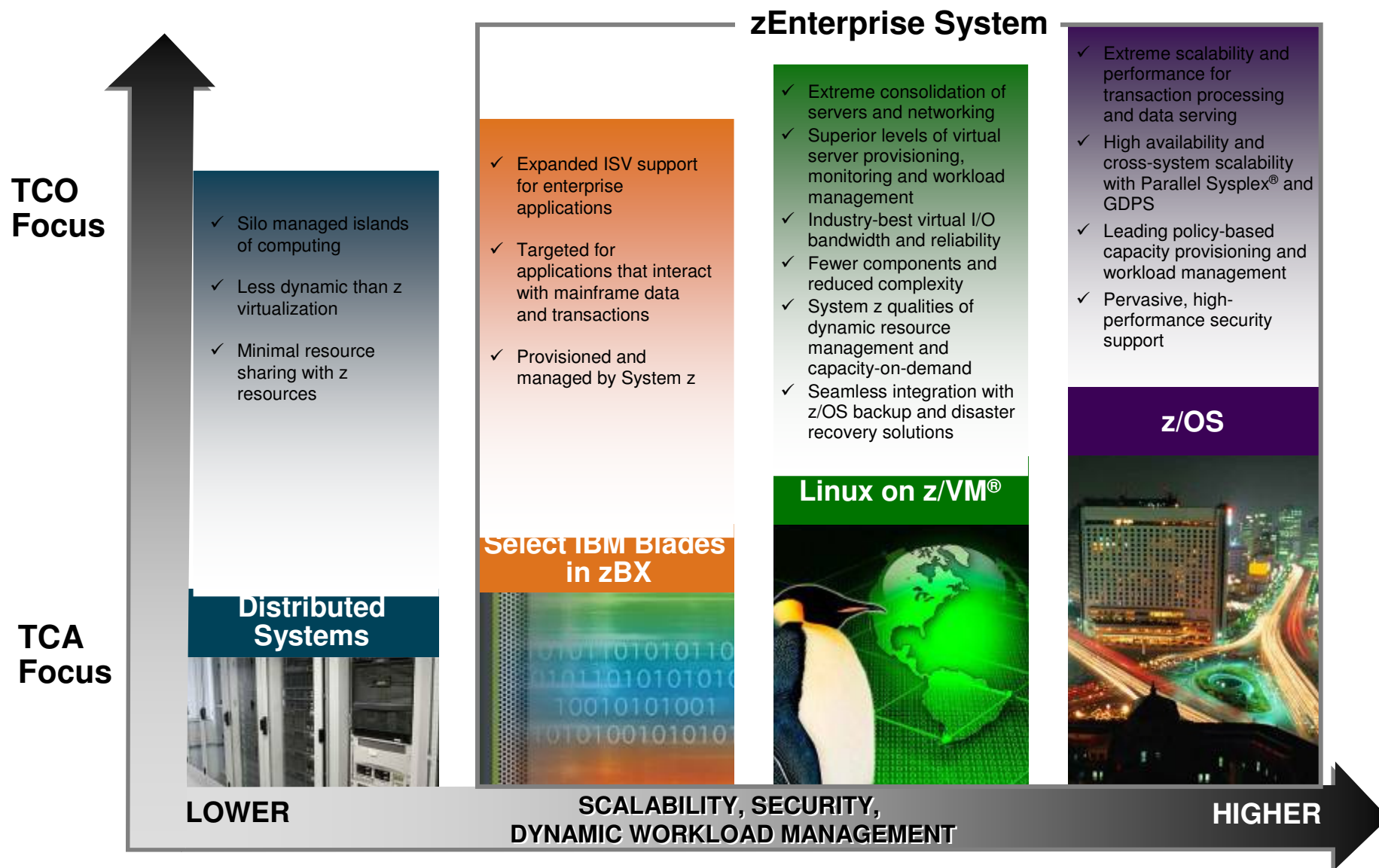


- Server and application consolidation on System z using Linux and z/VM is the industry leader in large-scale, cost-efficient virtual server hosting
- zEnterprise introduces virtual server provisioning and management for Linux guests running on z/VM
 - Use the Unified Resource Manager to create z/VM 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



Service levels to match your business needs

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



zEnterprise System:

A Multi System / Multi Architecture with a management system that offers:

- **Single point of control via Hardware Management Console**
- **Secure high-speed network for data and support**
- **Provisioning and management of physical and virtual resources**
- **Workload based monitoring, reporting and performance management**
- **Monitoring and management of energy use across the system**



Dank u

Dutch

Merci

French

С п а с и б о

Russian

Gracias

Spanish

شكراً

Arabic

감사합니다

Korean

Tack så mycket

Swedish

धन्यवाद

Hindi

תודה רבה

Hebrew

Obrigado

Brazilian
Portuguese

谢谢

Chinese

Dankon

Esperanto

Thank You

ありがとうございます

Japanese

Trugarez

Breton

Danke

German

Tak

Danish

Grazie

Italian

நன்றி

Tamil

děkuji

Czech

ขอบคุณ

Thai

go raibh maith agat

Gaelic