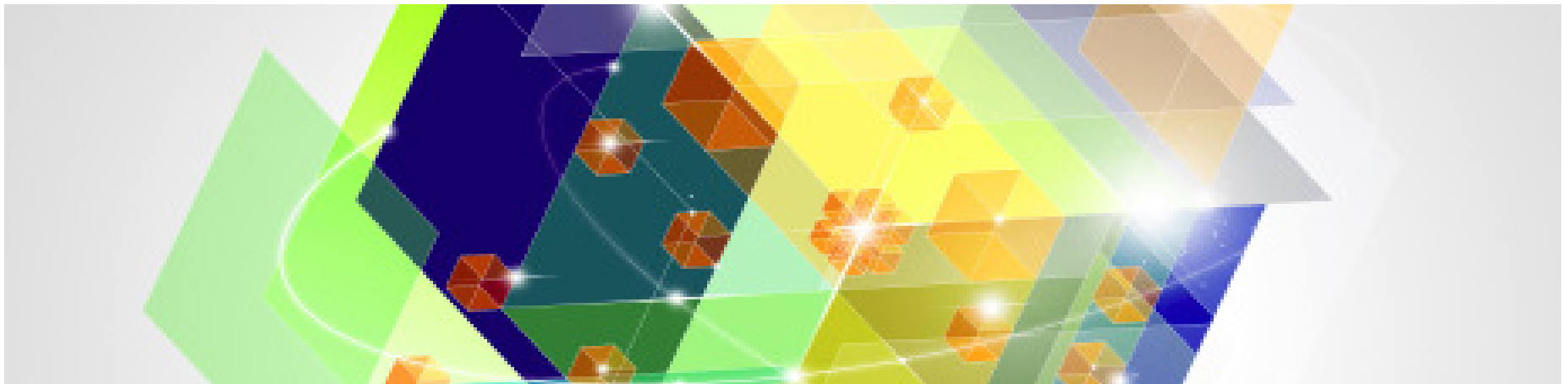


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zEnterprise.
Freedom by Design

IBM zEnterprise System: What's New - Announcement Overview



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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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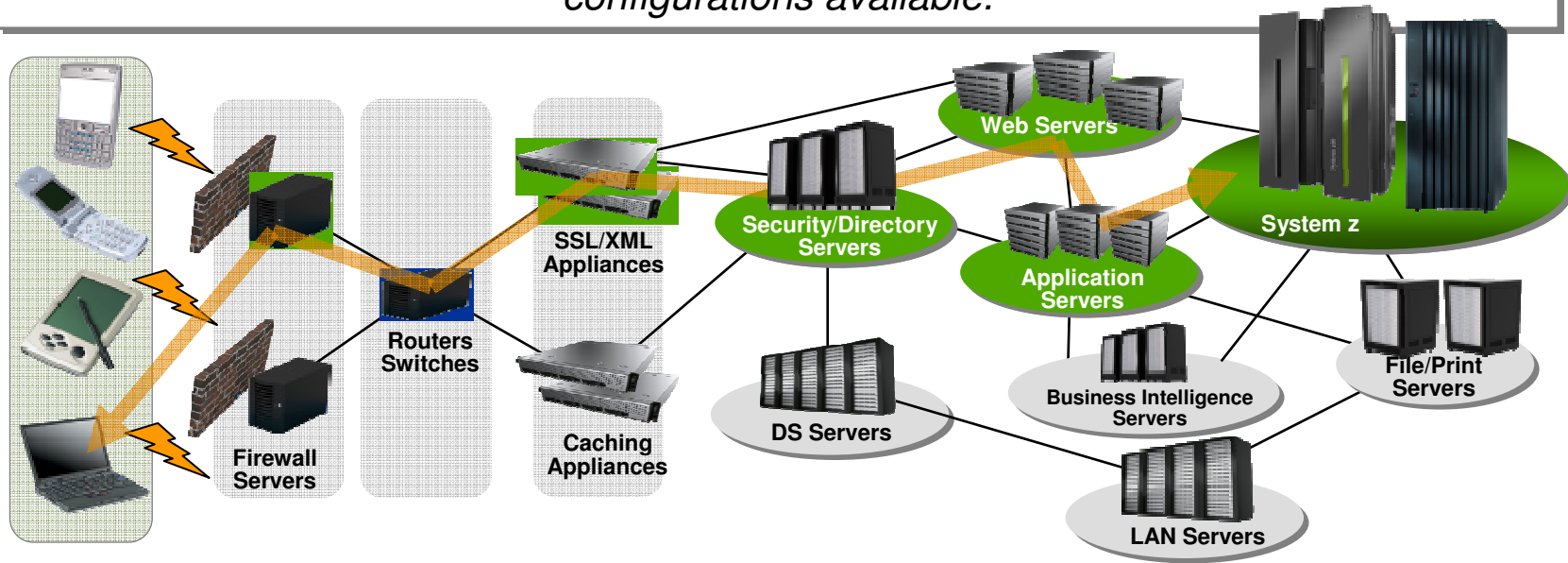
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Information technology today: Limitations

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



IBM zEnterprise 196™ (z196)

- Optimized to host large-scale database, transaction, and mission-critical applications
- The most efficient platform for large-scale Linux® consolidation
- Capable of massive scale-up
- New easy-to-use z/OS® V1.12

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

zEnterprise BladeCenter® Extension (zBX)

- Selected IBM POWER7® blades and IBM System x® blades for deploying applications in a multi-tier architecture
- High-performance optimizers and appliances to accelerate time to insight and reduce cost
- Dedicated high-performance private network

Introducing the next steps in the evolution of zEnterprise



- New innovations to improve zEnterprise at its core
- Increase flexibility to deploy and manage enterprise clouds
- New zEnterprise designed for mid-sized clients



What's New: Delivering innovation and value at all levels

Bringing hybrid computing to a broader set of businesses



Central Processing Complex

- New I/O subsystem for improved system connectivity
- Security enhancements
- Clustering improvements
- New IBM zEnterprise 114 (z114) for mid-sized businesses

zEnterprise Unified Resource Manager

- Delivering APIs to enable management of Unified Resource Manager from external tools¹

zEnterprise BladeCenter Extension (zBX)

- Introduction of select System x blades into zBX
- Support for Linux & in the future Windows¹ to broaden application support and integration.

Introducing IBM zEnterprise 114 (z114)

Bringing the zEnterprise hybrid
computing model to clients of all sizes



zEnterprise technology designed for small and mid-sized businesses

The Value Begins At the Heart with the z114 ...

zEnterprise 114 (z114)

Machine Type: 2818

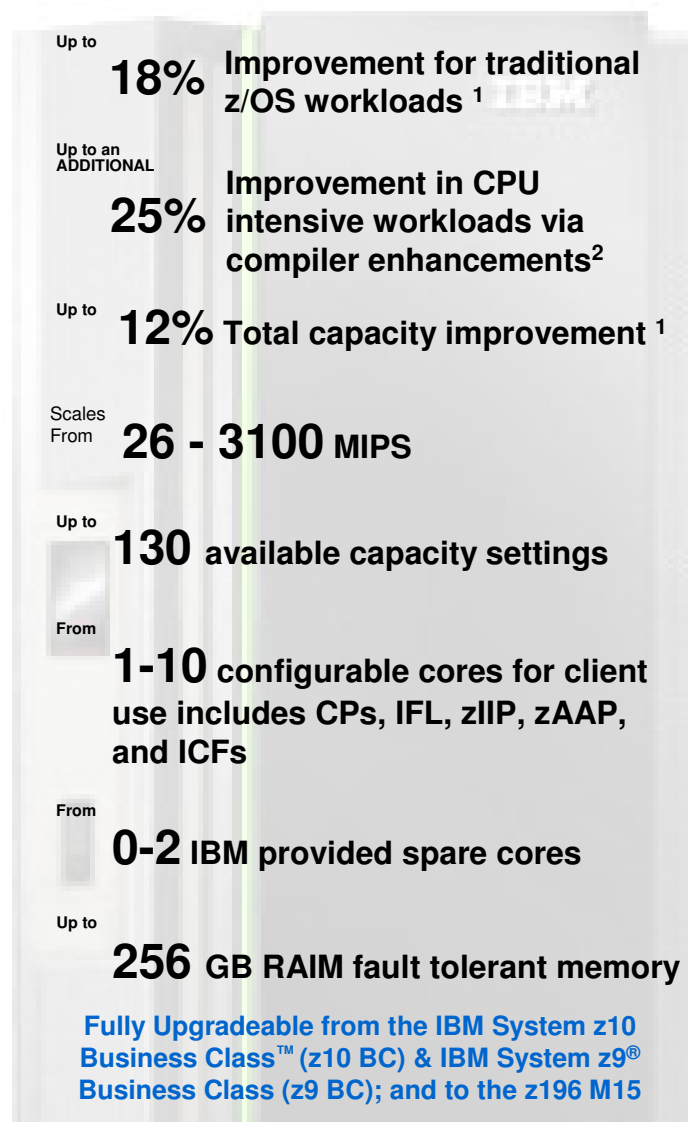
2 Models: M05 & M10

■ **New technology in a new package**

- ▶ Modular 2 drawer design for lower cost of entry
- ▶ Granularity for right-sizing your system
- ▶ Additional Scale for consolidation and growth
- ▶ Improved data center efficiency
- ▶ Same Qualities of Service as the z196
- ▶ Hybrid enabled to drive workload integration and management

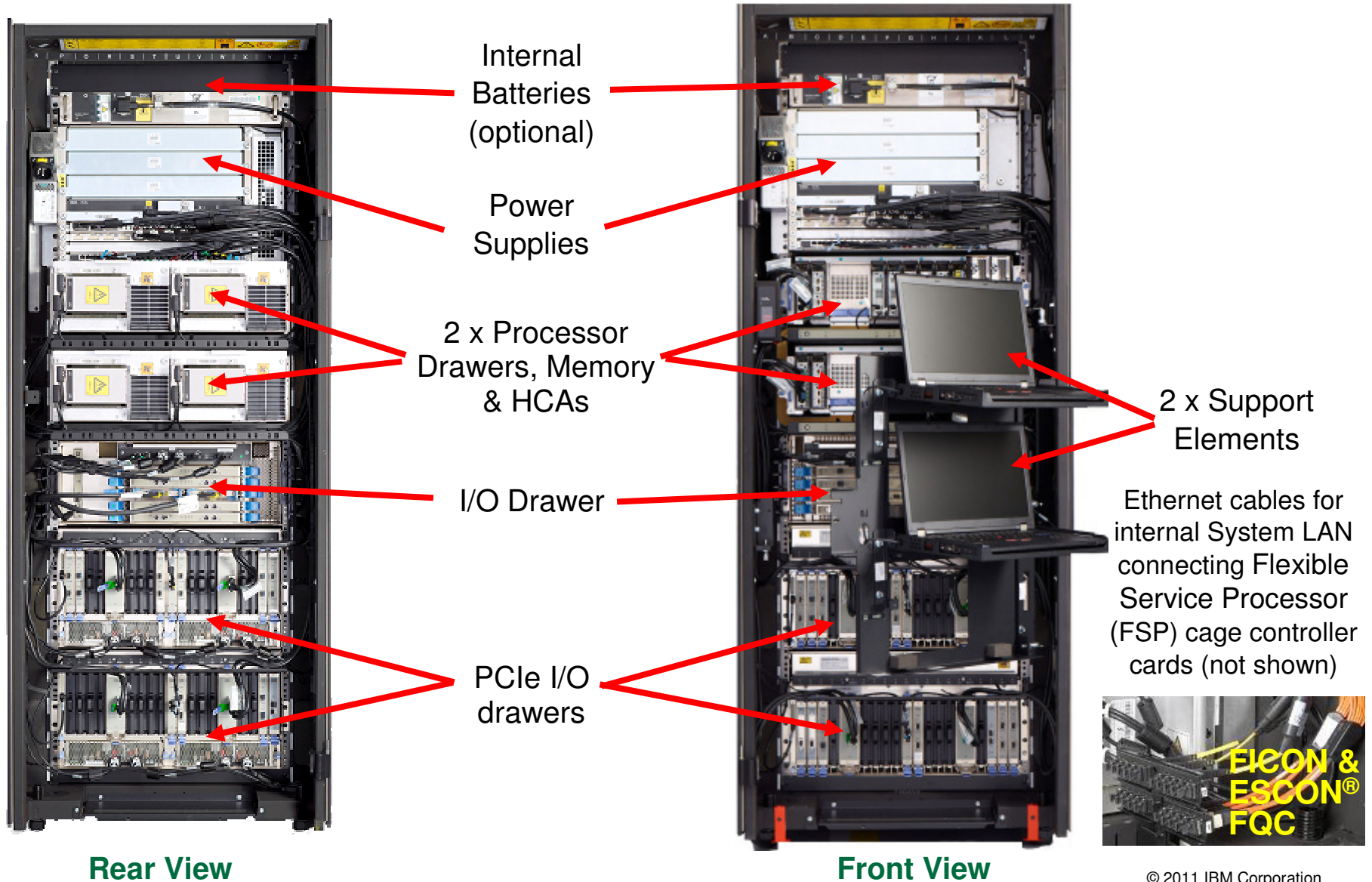
■ **Improved Platform Economics**

- ▶ New Software Curve
- ▶ Lower Hardware Maintenance
- ▶ Lower specialty engine and memory prices
- ▶ Upgradeability for investment protection



¹Relative capacity and performance compares at equal software levels as measured by IBM Large System Performance Reference (LSPR) workloads using z/OS® 1.11. Results may vary.
²The z114 will exhibit up to 25% increase for CPU intensive workload as provided by multiple C/C++ compiler level improvements when going from z/OS 1.09 to z/OS 1.12 © 2011 IBM Corporation

z114 – Under the covers



Processor / Memory Subsystem Drawers (Model M05 and M10)

One z10 BC Drawer



Two z114 Drawers (Model M10)



- **System resources split between 2 drawers (Model M10)**
- **Second CEC drawer (Model 10) for:**
 - Increased specialty engine capability
 - Increased memory capability
 - Increased I/O capability
 - More coupling links than z10 BC
 - More I/O features than z10 BC

Save with z114's lower energy consumption

The average z114 uses **less electricity than a clothes dryer** and about the same amount of power as 4 kitchen coffee makers.¹

With the z114, get **about 12% more work done per unit of energy** over the z10 BC.

The z114 M05 can help **lower energy demands by as much as 15%** compared to the z10 BC.

49 x4100 Sun servers draw **more than 5X the power** of the z114s needed to replace them to run an identical Linux workload.²

A z114 can provide **more performance per watt than a Nehalem** x86-blade solution for a mid-sized client.²

... and don't forget about the new High-Voltage DC Power Option

¹ Average z114 3KW. Energy star.gov, manufacture data and ABS Alaskan identify coffee makers as approximately 800 watts.

² IBM Eagle customer studies; results may vary.



Operating System Support for z114

- Currency is key to operating system support and exploitation of future servers
- The following are the minimum operating systems planned to run on z114

<i>Operating System</i>	<i>Supported levels</i>
z/OS	• V1.11, 1.12, 1.13 or higher • V1.10* (requires Lifecycle Extension after September 30, 2011) • V1.8 and 1.9, in Lifecycle Extension • zBX Ensemble support: z/OS V1.10* or higher
Linux	• Red Hat RHEL 5 • Novell SUSE SLES 11
z/VM	• V5.4 • zBX Ensemble support: V6.1
z/VSE	• V4.2 • zBX Ensemble support V4.3 or higher
z/TPF	• V1.1 or higher

* z/OS 1.10 support ends Sept. 30, 2011, and Lifecycle Extension is required after that date.



Leverage the latest operating systems to exploit the full value of the z114

z/OS Version 1 Release 13



- The new face of z/OS - the z/OS Management Facility adds new software deployment and disk management tasks and many enhancements that help create a more productive and integrated z/OS experience.
- Foundation for modern batch applications - updates to shorten batch window, simplify batch programming, and give you more flexibility in deploying batch applications.
- Autonomics for improved, early error detection - helps provide early warning of certain system issues before they can impact your business
- Performance for new and traditional workloads
- Support of new encryption and compliance standards and keys

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 extends the choice of integrated workloads through blades on zBX
- The z114 lowers the entry cost to get started with the Enterprise Linux Server
- Faster cores and a bigger system cache on the z196 and the z114 let you do even more with less when running Linux on z/VM
- Integrated blades on zBX will offer added dimension for workload optimization including applications on Windows

z/VSE® Version 5.1



- Introduces 64-bit virtual addressing to z/VSE
 - ▶ Reduces memory constraints
 - ▶ Allows to exploit more 'data in memory'
- Continues the z/VSE strategy of protect, integrate, and extend (in short "PIE")
 - ▶ Protect existing customer investments in applications and data on z/VSE
 - ▶ Integrate z/VSE with the rest of IT
 - ▶ Extend with Linux on System z to build modern integrated solutions
- Exploitation of selected zEnterprise functions and features as well as IBM System Storage options
- Includes a SoD on CICS Explorer capabilities for CICS TS for VSE/ESA™



Connectivity Enhancements

New features with big performance boost

HMC

- Location to run Unified Resource Manager – including monitoring CPU, energy, workload performance
- Host of the ensemble – controlling all functions of the ensemble
- Primary with Alternate needed for DR

Within z196/z114 and to zBX



- **PCIe I/O Infrastructure**
- I/O Drawer and I/O Cage¹
- Intraensemble data network (IEDN)
- Intranode management network (INMN)



For Clustering



▪ **HCA-3 InfiniBand® Coupling Links**

- 12x InfiniBand (improved performance with 12x IFB3 protocol)
- 1x InfiniBand (4 ports)

- ISC-3 (peer mode only)



- IC (define only)

- STP

- Improved time coordination for zBX components

To the Network



- **OSA-Express4S (PCIe-based)**
 - 10 Gigabit Ethernet LR and SR
 - 1 Gigabit Ethernet SX and LX
- OSA-Express3
 - 1000BASE-T Ethernet

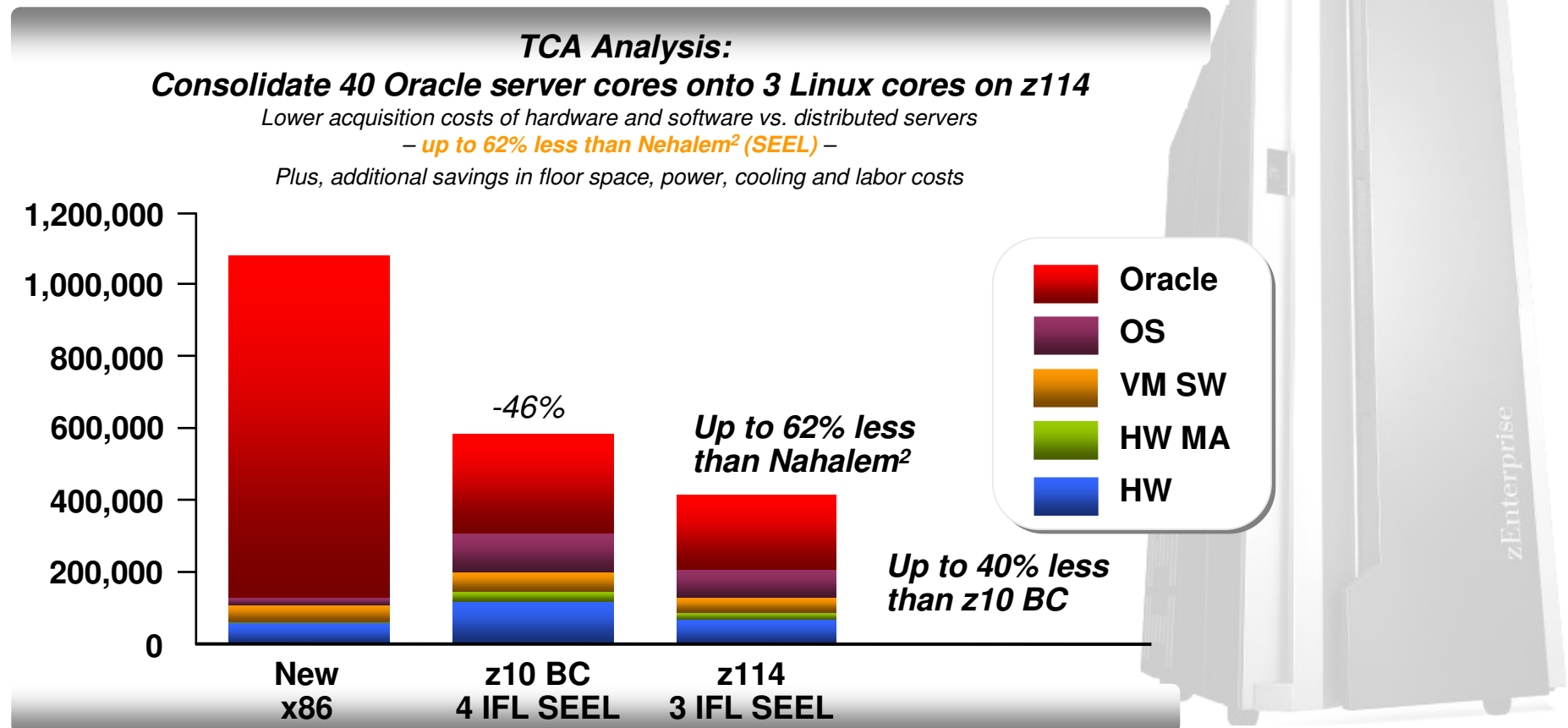


To the Data

- **FICON Express8S (PCIe-based)**
- ESCON
 - Up to 240 maximum

The economics of Linux on z114 for consolidation and cost reduction

- Consolidate an average of **30 distributed servers** or more on a single core, or **hundreds** in a single footprint.
- Deliver a virtual Linux server for approximately **\$500 per year** or as little as a **\$1.45 per day per virtual server** (TCA)¹



¹ Based on US Enterprise Linux Server pricing. Pricing may vary by country. Model configuration included 10 IFL cores running a mixed workload averaging 31 virtual machines per core with varying degrees of activity. Includes zEnterprise hardware and z/VM virtualization software. Does not include Linux OS or middleware software.

² Distributed server comparison is based on IBM cost modeling of Linux on zEnterprise vs. alternative distributed servers. Given there are multiple factors in this analysis such as utilization rates, application type, local pricing, etc., savings may vary by user.

A zEnterprise for Everyone

Freedom to choose the “right sized” mainframe to fit your needs.

If you ...

...want the flexibility to manage across heterogeneous platform – including z/OS, AIX, Linux on System x, Windows on System x¹

...are looking for an entry level mainframe with options for traditional capacity settings

... need a smaller mix of special engines (*zAAP on zIIP great option here!)

... have smaller Coupling and/or I/O attachment requirements

... need the lowest cost application development environment.

The z114 M05 may be the perfect option.



If you ...

...want the flexibility to manage across a heterogeneous platform

...want to replace your server with one that has the same number of engines – but would like more IFLs, zAAPs or zIIPs

... want to replace your standalone coupling facility or Linux only server with a machine that provides engine, memory and I/O scale out capabilities

... have future growth needs, but prefer grow in smaller increments and want to avoid disruptive outage during upgrade

The z114 M10 is just what you need.



If you ...

...want the flexibility to manage across a heterogeneous platform

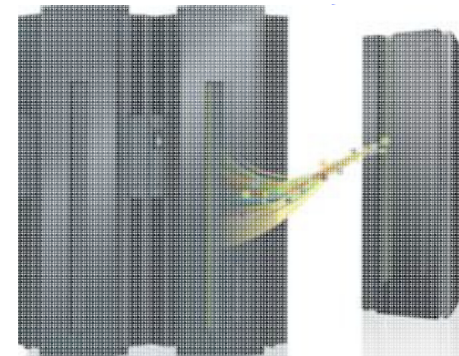
... have a large mainframe capacity requirement or desire for massive consolidation – scale to over 52,000 MIPS in one footprint

... have a large disk installment so in turn have large I/O requirements

... need new ways to address your ‘green’ requirements – like water cooling and static power save mode

... have a large CBU requirement – and like the control of having your disaster recovery site right in your own shop.

The enhanced z196 is right for you.



Introducing New Hybrid Capabilities



To integrate, support and manage an expanding portfolio of operating environments and workloads

New Blades Provide Added Flexibility for Workload Deployment and Integration



Introducing System x Blades in the zBX

- Select IBM BladeCenter HX5 7873 dual-socket 16-core blades
- Ordered and fulfilled through System x providers and installed into the zBX by the customer
- The zBX web page will host current blade ordering information:
http://www.ibm.com/common/ssi/cgi-bin/ssialias?infotype=SA&subtype=WH&appname=STGE_ZS_ZS_USEN&tmlfid=ZSL03128USEN&attachment=ZSL03128USEN.PDF
- Blades assume System z warranty and maintenance when installed in the zBX

■ Unified Resource Manager will install an integrated hypervisor on blades in the zBX

- KVM-based with IBM service and support

■ Up to 112 Blades supported on zBX

- Ability to mix and match DataPower XI50z, POWER7 and System x blades in the same chassis for better zBX utilization
- IBM Smart Analytics Optimizer can mix with others in same rack
- Number of blades supported varies by type



**... managed by the
zEnterprise Unified Resource Manager**

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

Optimizers

- IBM Smart Analytics Optimizer
- IBM WebSphere DataPower Integration Appliance XI50z for zEnterprise

Select IBM Blades

- IBM BladeCenter PS701 Express
- IBM BladeCenter HX5 7873

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

- Up to 112 PS701 Power blades
- Up to 28 HX5 System x blades
- Up to 28 DataPower XI50z blades (double-wide)
- Up to 56 IBM Smart Analytics Optimizer blades

Extending support to New operating system environments

NEW

- **Support for Linux and in the future Windows¹ environments on select System x blades**
 - 64-bit version support only
 - Linux: RHEL 5.5, SLES 11 SP1
 - Additional versions to follow¹
 - In the future we are planning to support Microsoft® Windows® Server 2008 - Datacenter Edition¹
- **Certifications inherited from System x**
- **Operating Systems are customer acquired and installed**
- **Delivering APIs to enable management of Unified Resource Manager from external tools¹**
 - Providing API access to Unified Resource Manager functions

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

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

Summary

Introducing the next capabilities in the evolution of zEnterprise

Is your business positioned to leverage the best platform for each workload?

- ★ **NEW!** IBM zEnterprise 114 (z114)
A new entry point for hybrid computing with a 25% lower entry hardware cost than z10 BC
- ★ **NEW!** SOD for delivering APIs to enable management of Unified Resource Manager from external tools¹
Increased flexibility to deploy and manage enterprise clouds
- ★ **NEW!** System x blade support for Linux integrated into zEnterprise – with Windows¹ support to follow in the future
Enables more choices for optimal deployment of workloads on best fit architecture for efficiency and innovation
- ★ **NEW!** IBM Implementation Services for System z – zEnterprise Setup and Migration
- ★ **NEW!** IBM zEnterprise 114 Financing Offer
Acquire z114 today – defer payments until 2012



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Selected System z Hardware Deep Dive Sessions



- System z Hardware Keynote:
 - [The New Era of Smarter Computing: Optimized Systems](#), Tuesday, 8:00 AM
- System z Hardware Sessions
 - [More Power and Flexibility to System z](#) – Tuesday, 9:30 AM
(A technical overview of the July 12 announcement)
 - [IBM zEnterprise 196 \(z196\) Hardware Overview and Update](#) – Tuesday, 11:00 AM
 - [IBM zEnterprise BladeCenter Extension \(zBX\) Hardware Overview and Update](#) – Tuesday, 1:30PM
 - [Introducing the IBM zEnterprise 114 \(z114\)*](#) – Tuesday 3:00 PM
 - [Introducing the new z196 and z114 PCIe I/O and Coupling Infrastructure](#) – Tuesday, 4:30 PM
 - [IBM zBX HMC Hardware and Operational Management](#) – Wednesday, 8:00 AM
 - [IBM zEnterprise Unified Resource Manager](#) – Wednesday, 9:30 AM
- More than two dozen additional sessions covering zEnterprise and zBX



***Come see the new z114 at the IBM booth
at SHARE in Orlando!***

Thank you!
ibm.com/systems/z

