

System z 2012 3Q
ISV and SI Technical Marketing Call

30 August 2012

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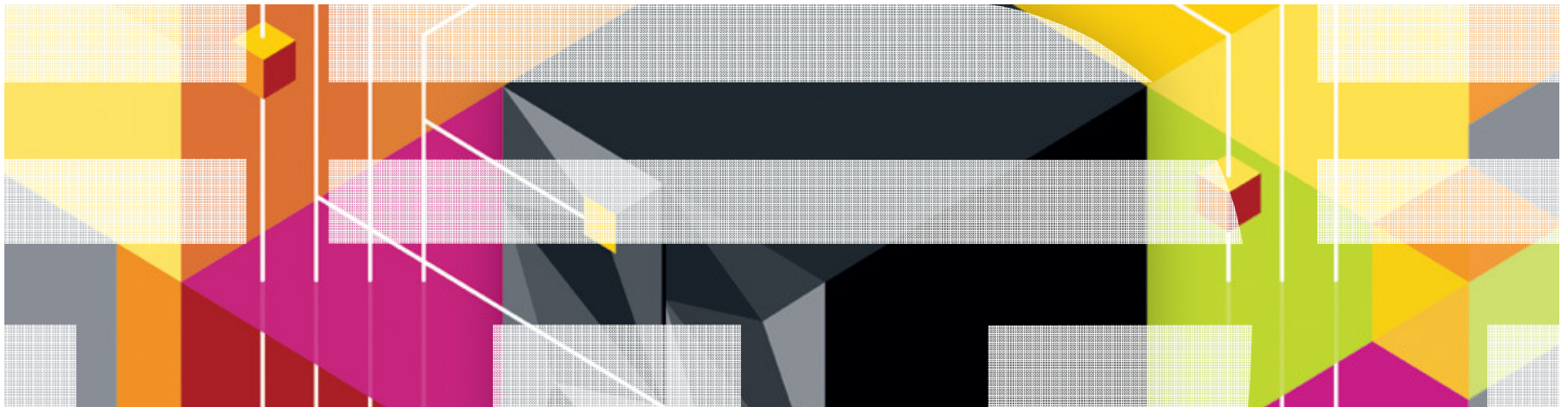
Agenda

- Hardware Innovation with the Newest Member of the IBM zEnterprise System family

Ellen Carbarnes

Hardware Innovation with the Newest Member of the IBM zEnterprise System family

Ellen Carbares



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Introducing the IBM zEnterprise EC12 System

The world's fastest, most scalable and secure enterprise system with the ability to integrate resources for ...



Operational analytics
Deliver information and insight across the enterprise

Trusted security and resiliency
Provide unmatched security and reliability for data and core-business processes

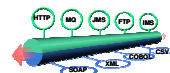
Efficiency at scale
Enable flexible delivery of services through a private enterprise cloud

Evolution of hybrid computing with IBM System z

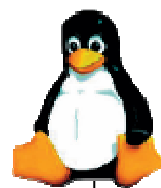
IBM zEnterprise® 196 (z196)
First ever multiplatform
computer – mainframe and
distributed with single
management



DataPower® XI50z
within the IBM
zEnterprise
BladeCenter®
Extension (zBX)



**Availability of Linux® on
IBM System x® on HX5
blades in the zBX**



**Availability of
Microsoft® Windows®
on System x blades
in zBX and APIs**



July 2010

Nov 2010

Mar 2011

Jul 2011

Sep 2011

Oct 2011

Dec 2011

Aug 2012

**Availability of zBX with IBM
POWER7® blades and
IBM Smart Analytics Optimizer**



**Announce
IBM zEnterprise 114**



**IDAA – evolution of IBM
Smart Analytics Optimizer –
coming out of the zBX and
into Netezza technology**



**IBM zEnterprise EC12
(zEC12)
Next generation of
hybrid computing**

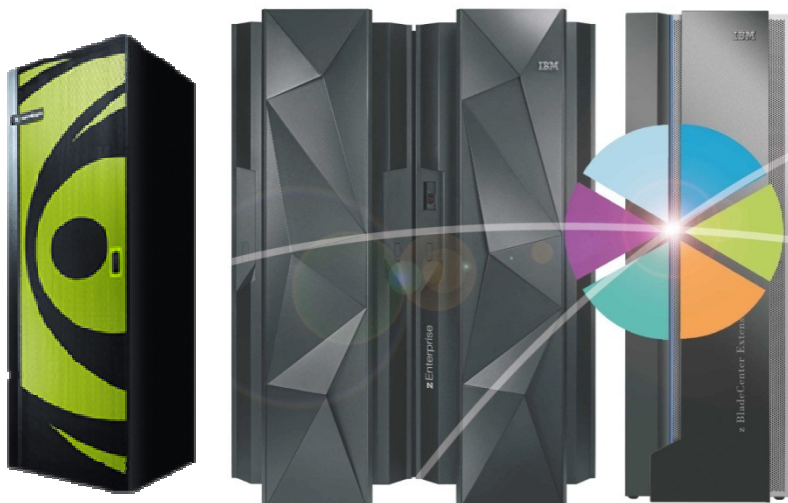


Introducing the newest members of the zEnterprise System family

The zEnterprise EC12 and zEnterprise BladeCenter Extension Model 003

IBM zEnterprise EC12 (zEC12)

- zEC12 has the industry's fastest chip with each core at 5.5 GHz
- New innovation to drive availability with IBM zAware and Flash Express
- Optimized for the corporate data serving environment
- Hardware functions boost software performance for Java™, PL/I, DB2®



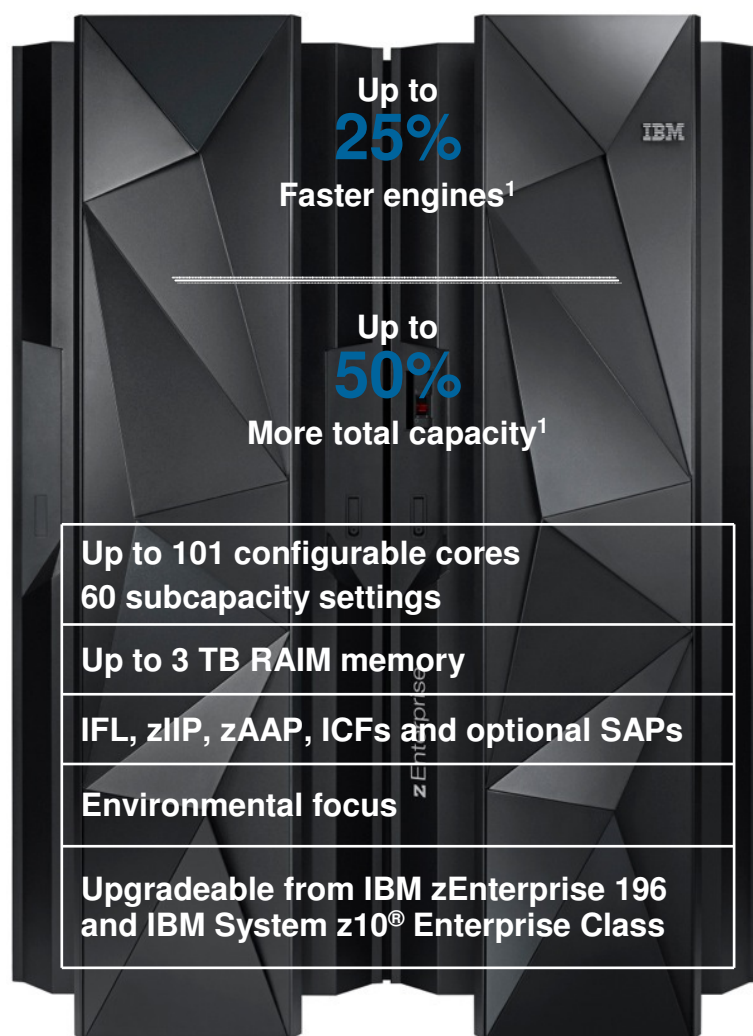
IBM zEnterprise Unified Resource Manager and zEnterprise BladeCenter Extension (zBX) Mod 003

- Supports the new zEC12 platform
- Hosts PS701 and HX5 blades
- Provides workload-awareness resource optimization
- Enhancements to System Director support zBX
- System z will continue to expand hybrid computing

Plus more flexibility and function by connecting IBM DB2 Analytics Accelerator

- IBM DB2 Analytics Accelerator (IDAA) allows deployment of business analytics on the same platform as operational applications
- Analytics and OLTP can be run as the same workload

zEnterprise EC12 is the core of next generation of System z



zEC12

Machine Type: 2827

Models: H20, H43, H66, H89, HA1

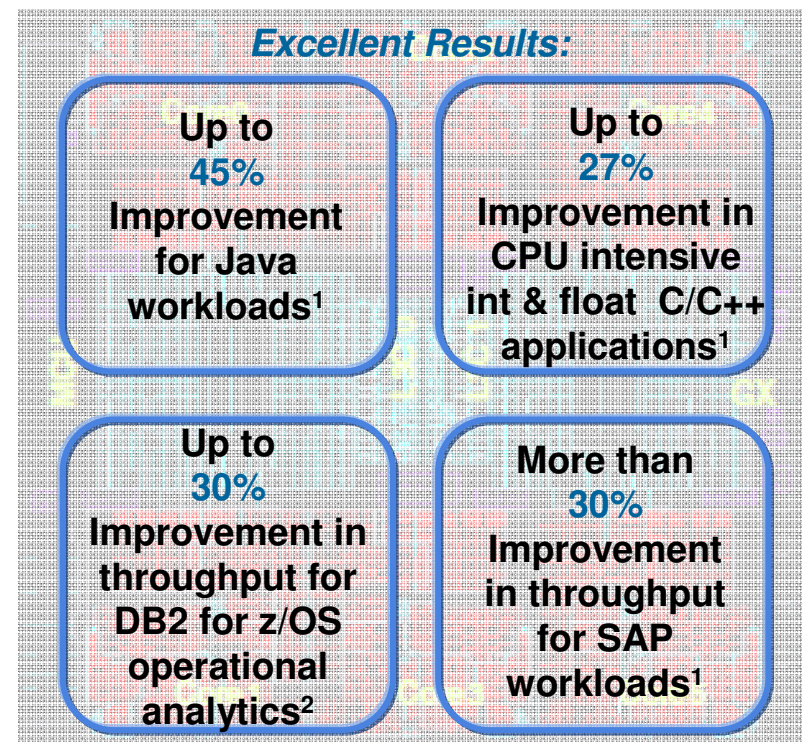
- **Advanced Technology 5.5 GHz 6-core processor chip delivers a performance boost for all workloads**
- **Innovation to drive availability to superior levels**
 - **IBM zAware** offers snap-shot of the current state of your business
 - **FLASH Express and pageable large pages** to drive availability and performance for critical workloads
- **Trusted resilience is a zEnterprise standard**

¹Based on preliminary internal measurements and projections against a z196. Official performance data will be available upon announce and can be obtained online at LSPR (Large Systems Performance Reference) website at: <https://www.ibm.com/servers/resource link/lib03060.nsf/pages/lspindex> . Actual performance results may vary by customer based on individual workload, configuration and software levels.

Processor chip optimized for software performance

Exploited by Java, PL/I, compilers, DB2, more

- **Our leadership in microprocessor design supports a boost in performance for all workloads**
 - Second generation out of order execution design
 - Multi-level branch prediction supports complex workloads
- **Larger caches to optimize data serving environments**
 - Almost 2x on chip and 2x additional on book
- **New hardware functions optimized for software performance**
 - **Transactional Execution Facility** for parallelism and scalability
 - **Runtime Instrumentation Facility** is intended to help reduce Java overhead
 - **2 GB page frames** are intended to offer performance Improvements for DB2 buffer pools and Java heaps
 - Up to **30% improvement in IMS™ throughput** due to faster CPU and cache, compilers, and more¹
 - New IBM Enterprise PL/I compiler is planned to exploit and get a performance boost from **decimal format conversions facility**



¹ Based on preliminary internal measurements and projections

² As measured by the IBM 9700 Solution Integration Center. The measured operational BI workload consists of 56 concurrent users executing a fixed set of 160,860 Cognos reports . Compared DB2 v10 workload running on IBM's z196 w/10 processors to an zEC12 w/10 processors

IBM zAware delivers smarter message monitoring capabilities



- **The complexity and rate of change of today's IT infrastructures stress the limits of IT to resolve problems quickly and accurately—while preserving SLAs**
- **IT is challenged to diagnose system anomalies and restore service quickly**
 - Systems often experience problems which are difficult or unusual to detect
 - Existing tools do little to quickly identify messages preceding system problems
 - Some incidents begin with symptoms that remain undetected for long periods of time
 - Manual log analysis is skills-intensive, and prone to errors
- **IBM zAware with Expert System Diagnostics Gets it Right, Fast**
 - IBM zAware helps improve problem determination in near real time – helps rapidly and accurately identify problems and speed time to recovery
 - Analyzes massive amounts of data to identify problematic messages, providing information to enable faster corrective action
 - Analytics on log data provides a near real time view of current system state
 - Cutting edge pattern recognition examines system behavior to help you pinpoint deviations
 - Machine learning, modeling and historical data work to describe your unique environment



IBM zAware - Identifies Unusual System Behavior

IBM zAware contains sophisticated analytics, applies IBM insight, and machine learning to understand your unique system.

Monitoring	Detection	Frequency	Reporting
<ul style="list-style-type: none"> • Supports IBM and non IBM middleware and applications • Monitors OPERLOG in a sysplex or monoplex • Assigns a message anomaly score to help identify potential issues 	<ul style="list-style-type: none"> • Detects anomalies other solutions might miss • Can find the rare or infrequent message • Can detect an unusual number of normal messages • Can detect messages issued out of context 	<ul style="list-style-type: none"> • Samples every 2 minutes • 10 minute interval • Uses 90 day rolling baseline; a utility provided to populate baseline; flexibility provided 	<ul style="list-style-type: none"> • Near real time analysis • Intuitive reporting – both high level and drill down • Color coded browser display • XML output can feed ISVs or processes <ul style="list-style-type: none"> – Tivoli® intends to provide alert and event notifications¹



IBM Flash Express – Smarter Availability for Smarter Systems

- **Flash Express is an innovative solution designed to help you compete effectively in today's market**
 - Automatically improve availability for key workloads at critical processing times
 - Drive availability and performance for workloads that cannot tolerate paging spikes or inconsistent performance
 - Slash latency for critical application processing such as diagnostics collection
- **Extends IBM's expertise in memory management introducing a new tier of memory using Flash Express**
- **Provides a secured, resilient and immediately usable solution**
- **Planned Flash Express and pageable large page exploiters:**
 - z/OS V1.13 *Language Environment*
 - *Java SDK7* and by extension
 - *WAS Liberty Profile* v8.5
 - *DB2*
 - *IMS 12*
 - And a future release of *CICS® Transaction Server*
 - *IMS 12 Common Queue Server*



IBM System z Security as the Enterprise Standard



- **Intrinsic platform security and privacy for transactions and sensitive data helps enable System z to be the secure enterprise application server and data vault**
 - Hardware cryptography built into each general purpose CP and IFL, and via the new Crypto Express4S coprocessors
 - Secure your critical information assets (or data) throughout their life cycle
- **Security capabilities that span the needs of multiple industries**
 - Strong focus on security and crypto functions required by the Banking/Finance industries
 - Support for the payment card industry with solutions that leverage the zEC12 for compliance and security (i.e. EMV for American Express)
 - New IBM Enterprise PKCS #11 Coprocessor firmware and support from z/OS helps meet the requirements of the European Union and public sector clients
- **Leveraging the strengths of operating system security and cryptographic capabilities**
 - Qualities needed by enterprises adopting cloud application architectures
 - Wide range of cryptographic primitives exploited by operating system and middleware to help secure and accelerate workloads
- **zEC12 supports the System z exclusive protected key processor based cryptography**
 - Blends the speed of processor based crypto with the security of the Crypto Express coprocessor
- **PR/SM™ designed for EAL 5+ certification**

zEC12 – Supports efficiencies in the data center

- **New non-raised floor option offers flexible possibilities for the data center**
- **Continuing to support options for better control of energy usage and improved efficiency in your data center**
 - zEC12 has a new radiator-based air cooled system design for more efficient cooling and improved concurrent maintenance
 - Water cooled options on zEC12 allow for up to 9% additional data center energy savings¹
 - Savings with optional HV DC power when implemented in a new data center could be on the order of 7-12% of server input power²
- **More capacity but little change to the footprint in the data center**
 - Identical floor cutouts for zEC12 as the z196 and z10 EC³ with no significant increase in weight
 - Depth of system with covers will increase by 64 mm / 2.52 inches
- **Over 12 years experience in designing and building earthquake resistant servers**

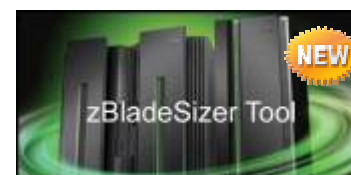
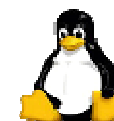
¹ Based on internal measurements with average power usage effectiveness (PUE) of 2 with well configured zEC12 configuration.

² Based on internal measurements and projections.

³ With the exception of water cooling and overhead cabling

zBX – A Uniquely Configured Extension of the zEnterprise

- **zBX Model 003 supported by zEC12**
 - Investment protection – Model 002 upgrades to Model 003
- **No need to make changes to applications and application certifications are inherited from blades**
- **Managed by Unified Resource Manager**
 - Management of resources as defined by your business goals and objectives
 - Integrated network for better security, control and faster time to value
 - Programmable interfaces (APIs) to connect with system management tools for total management capabilities - IBM Tivoli Monitoring (ITM) has been enhanced to use the APIs



zBX
Machine Type: 2458
Model: 003

PS701 blades
(112 max)

Up to
112 **HX5 (7873)**
blades (56 max)

DataPower
XI50z (28 max)

1-4 Racks based on
number of installed
blades

One zBX per zEC12

Optional Acoustic
Doors

Optional Rear Door
Heat Exchanger

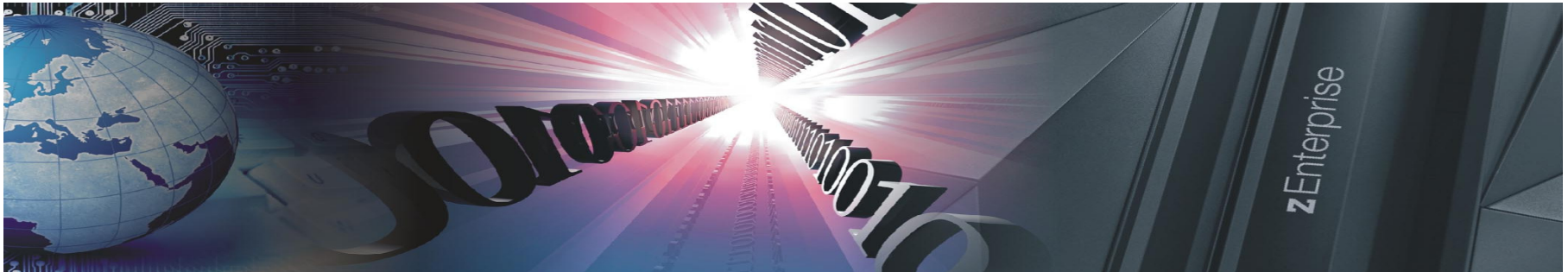
Upgradeable from zBX
Model 002

Continuing to build a multi-platform roadmap for the future *Strengthening the story*

- **IBM intends to deliver new Systems Director capability delivered through Unified Resource Manager APIs¹**
 - Ability to discover, inventory, and visualize zBX resources under the Systems Director umbrella
 - Image management provided for blades within a zBX to support provisioning of new virtual servers
 - Energy Management of the zBX to lower energy consumption and costs
 - Power capping on System x and Power blades and power savings for Power blades
- **In the future, System z will continue to expand in the hybrid computing area¹**
- **IBM intends to deliver workload-aware optimization for System x blades through function in Unified Resource Manager¹**
- **IBM intends to deliver automated multi-site recovery for zBX hardware components based upon Geographically Dispersed Parallel Sysplex™ GDPS® technologies.¹**

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

Operating System Support for zEC12



- **The following are the minimum operating systems planned to run on zEC12:**
 - z/OS
 - z/OS V1.12, V1.13
 - z/OS V1.11, V1.10 Lifecycle Extension
 - Linux on System z distributions:
 - SUSE Enterprise Server (SLES) SLES 10 and SLES 11
 - Red Hat Enterprise Linux (RHEL) 6 and RHEL 5
 - z/VM
 - VM V5.4, 6.1, 6.2 with PTFs
 - z/VM V6.1, 6.2 for zBX support
 - z/VSE
 - z/VSE V4.3, V5.1, with PTFs
 - z/VSE V5.1 with PTFs for Crypto Express4S toleration
 - z/TPF V1.1
- **Using the general purpose application server blades we have:**
 - Linux: Red Hat RHEL 5.5 and up, 6.0 and up and SUSE Linux Enterprise Server (SLES) 10 (SP4) and up and SLES 11 SP1 and up
 - Microsoft Windows Server 2008 R2 and Microsoft Windows Server 2008 (SP2) (for either Windows we recommend Datacenter Edition)
 - AIX: AIX 5.3 Technology Level 12 or higher, AIX 6.1 Technology Level 5 or higher, AIX 7.1

IBM zEnterprise EC12 in an information-centric world

Operational analytics to enable business opportunities

- Most sophisticated data warehousing and analytics solutions with the fastest query performance in the market
- Leverage your data to build competitive advantage

Trusted resilience for unmatched security and reliability

- Most secure system with 99.999% reliability
- Unified platform for rapid development of secure applications end-to-end

Efficiency at scale

- Most efficient and fastest system for mission-critical workloads
- Increased efficiency will free up IT resources to focus on new services to drive growth
- Hybrid architecture enables rapid cloud deployment



Backup

Dates for zEC12 - 2012 Rollout



- **August 28, 2012 – Announcement**
- **September 19, 2012 – GA**
 - IBM zEnterprise EC12 (zEC12)– All models H20, H43, H66, H89, and HA1
 - z10 EC upgrades to zEC12 radiator-based air-cooled
 - z10 EC upgrades to IBM zEC12 water-cooled
 - z196 air-cooled upgrades to zEC12 radiator-based air-cooled
 - z196 air-cooled upgrades to zEC12 water-cooled
 - z196 water-cooled upgrades zEC12 water-cooled
 - IBM zEnterprise BladeCenter Extension (zBX) Model 003
 - zBX Model 002 upgrades to zBX Model 003 to a new zEC12
 - z196 with zBX Model 002 upgrades to zEC12 with zBX Model 003
 - IBM zAware (feature #0011, #0101, and #0102)
 - Flash Express (#0402) - hardware orderable August 28, 2012, and deliverable starting September 19, 2012; Planned availability of z/OS exploitation of functionality is December 14, 2012
- **November 7, 2012**
 - Features and functions for the zBX Model 003
 - zBX Model 002 upgrades to a Model 003 on an zEC12
- **December 7, 2012**
 - Model conversions for zEC12
- **December 14, 2012**
 - z/OS V1.13 support for Flash Express, available via web download
- **December 31, 2012**
 - MES features for all models of zEC12

Flexible Connectivity on zEC12

Improving bandwidth, granularity and options for connections

For Clustering

- **HCA-3 InfiniBand® Coupling Links**
 - 12x InfiniBand
 - 1x InfiniBand (4 ports) **NEW** *improved scalability*
- **ISC-3 (peer mode only) ¹**
- **STP** **NEW** *– Improved broadband security*

Heterogeneous environments

- **zBX**
 - Intraensemble data network (IEDN)
 - Intranode management network (INMN)
 - NEW** – *Increased 10 Gb Ethernet connectivity within zBX*
- **To PureSystems**
 - 10 Gb Ethernet

HMC

- NEW** • *New IBM zAware partition managed from 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 zEC12

- **PCIe I/O Infrastructure**
- **I/O Drawer and I/O Cage**
- NEW** • *Flash Express*



To the Data

- **FICON® Express8S (PCIe-based)**
 - SX and 10KM LX
- **FICON Express4¹**
 - SX and 10 km LX
- NEW** • *Enhanced channel subsystem*
- **FICON Express8¹**
 - SX and 10KM LX

To the Network

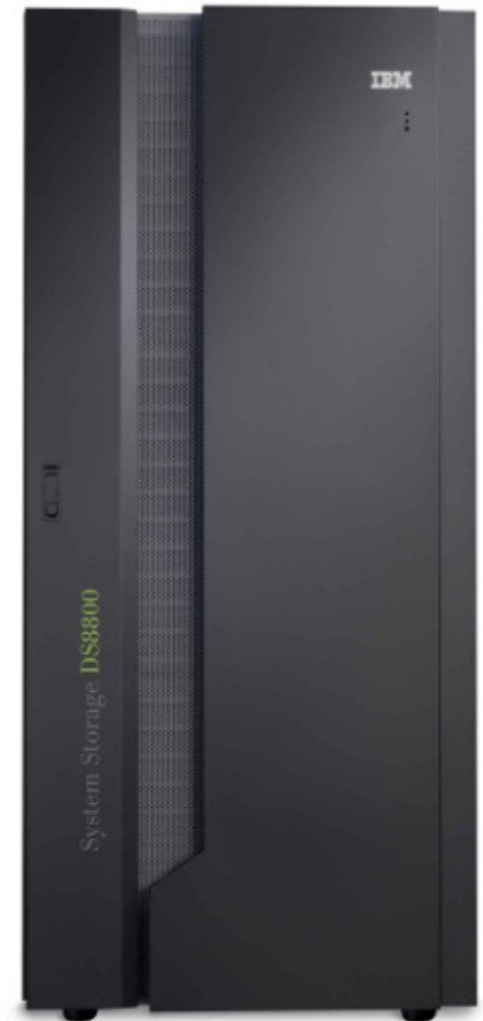
- **OSA-Express4S PCIe based)**
 - 10 Gb Ethernet LR and SR
 - 1 Gb Ethernet SX and LX
 - NEW** – *1000BASE-T Ethernet*
- **OSA-Express3¹**
 - 10 Gb Ethernet
 - 1 Gb Ethernet
 - 1000BASE-T Ethernet

¹ Carry forward only

IBM System Storage DS8800

Unique performance, availability and scalability makes DS8800 the ideal storage platform for zEnterprise

- **Self-optimizing performance and cost for hybrid computing**
 - Easy Tier can improve performance by up to 3x by moving only 3% of data to SSDs
 - Integrated QoS management aligns server and storage resources with application priorities
 - 8x faster query performance for operational analytics with special DS8000® List Prefetch Optimizer for High Performance FICON
- **Designed for near-continuous operations with over six-nines availability**
 - Fully-redundant design for near-continuous data access
 - Tight integration between DS8000 remote mirroring and GDPS HyperSwap is designed for over six-nines (99.9999%) availability
- **Optimized for zEnterprise efficiency and scalability**
 - Support for System z Discovery and Auto-Configuration simplifies configuration
 - Extended Address Volumes of up to 1 TB volumes simplifies management of large volumes
 - New support for System z load balancing algorithms can optimize throughput and response times between server and DS8000



Robust tape storage to protect your information

Helping our clients retain data securely and in compliance with regulatory requirements

Comprehensive tape storage product line for System z attachment



**TS1140
Tape Drive**

- Offers high performance (250 MBps) and high native capacity (4 TB) for storage consolidation
- Provides information security with support for encryption and key management
- Supports Write Once Read Many (WORM) cartridges to help satisfy compliance requirements



**TS3500
Tape Library**

- Scalable, automated data retention with up to 2.7 EB capacity with 3:1 compression
- Offers enhanced data availability and reliability with optional dual library accessory
- Provides data security and regulatory compliance via support for tape drive encryption and WORM cartridges



**TS7700
Virtualization
Engine**

- Virtualization solution implements a fully integrated tiered storage hierarchy of disk and tape
- Reduces batch processing time, total cost of ownership and management overhead
- Disk-only models with up to 1.3 PB native tape volume cache
- Grid configurations for information availability and business continuity

Tape is often cost effective versus disk

- Lower price per MB
- Lowest power and cooling storage option available today

Synergy with zEC12 operating systems

z/OS

- Java exploitation of **Transactional Execution** for **increased parallelism and scalability**
- Enhanced security support for **digital signatures**
- Faster problem determination with **IBM zAware for improved availability**
- Improve availability and performance with **Flash Express**
- **2 GB page** support
- Simpler Specialty Engine (**zIIP**) exploitation
- z/OS v1.13 exploitation of new hardware
- Plus **over 4,100** applications enabled on z/OS®

z/VM

- z/VM® **Compatibility support**
- Guest exploitation **support for new encryption technology**
- Improved I/O performance using **High Performance FICON (zHPF)** for guest exploitation

Linux on System z

- **Improved consolidation ratio** through new capacity performance
- Improved I/O performance using **High Performance FICON (zHPF)**
- **Application and Linux optimization** enabled by full exploitation of zArchitecture extensions
- Optimized system setup via **Linux health checker**
- **FCP end-to-end data integrity checking** for applications and storage subsystems
- Plus **over 3,000** applications on System z



z/TPF

- Support for **86 CPUs**
- **Hardware exploitation** for performance improvements

z/VSE

- **64-bit addressing** with z/VSE® V5.1
- Strong **interoperability with Linux** on System z
- New CICS functionality (**CICS Explorer**)

- **AND** with blades on the zBX there are even more options with applications on **AIX, Linux on System x or Microsoft Windows**

zEC12 Functional Comparison to z196

Processor / Memory	<ul style="list-style-type: none"> Uniprocessor Performance System Capacity Processor Design Cache Models Processing cores Granular Capacity Memory Fixed HSA 	<ul style="list-style-type: none"> Up to 25% performance improvement over z196 uniprocessor ¹ Up to 50% system capacity performance improvement over z196 80-way ¹ New 5.4-6¹ GHz processor chip versus 5.2 GHz zEC12 has 33% more L2 cache, instruction and data (total 2 MB versus total 1.5 MB on z196), 100% more L3 cache (total 48 MB versus 24 MB on z196), 100% more L4 cache (384 MB versus 196 on z196) Five models with up to 4 books (z196 had five models) Up to 101 cores to configure, up to 80 on z196 Up to 161 capacity settings versus 125 on the z196 Up to 3 TB RAIM memory (same as z196) Up to 32 GB fixed HSA versus z196 has 16 GB fixed HSA
Virtualization and Alternative Processors	<ul style="list-style-type: none"> Virtualization zEnterprise BladeCenter Extension (zBX) 	<ul style="list-style-type: none"> zEnterprise Unified Resource Manager provides virtualization management for blades installed in the zBX Mod 003. zEnterprise Unified Resource Manager has “resource workload awareness” where hybrid resources can be managed and optimized across the zEnterprise. zEnterprise System is a truly integrated hardware platform that is able to span and intelligently manage resources across mainframe and distributed technologies – including select POWER7 and IBM System x blades Supported optimizer is DataPower XI50z in the zBX Mod 003. zBX Model 003 (versus zBX Model 002 which attaches to z196)
Connectivity	<ul style="list-style-type: none"> HiperSockets™ FICON I/O subsystem Internal I/O Bandwidth Coupling Cryptography 	<ul style="list-style-type: none"> Both zEC12 and z196 support of 32 HiperSockets New OSA-Express4S 1000 BASE-T included in PCIe I/O infrastructure. FICON Express8S and OSA-Express4S adapters available on zEC12, z196, z114 zEC12 has industry standard 8 Gbps InfiniBand supports high speed connectivity and high bandwidth Coupling with HCA-3 InfiniBand Coupling Links Crypto Express4S enhanced with new FIPS 140-2 Level 4 cert and PKCS#11 support Elliptic Curve Cryptography (ECC)
RAS	<ul style="list-style-type: none"> RAS Focus Availability 	<ul style="list-style-type: none"> New IBM zAware offers high speed analytics facilitates the ability to consume large quantities of message logs for smarter monitoring zEC12 offers advanced memory enhancements (RAIM) and advanced power and thermal optimization and management that can help to control heat / improve RAS New PCIe Flash Express on zEC12 to handle paging workload spikes and improve availability – not available on z196
Environmentals	<ul style="list-style-type: none"> Energy Cooling 	<ul style="list-style-type: none"> Power Save modes for processor New improved integrated cooling system Optional Non Raised Floor and overhead cabling options for both I/O and (New!) Power Optional water cooling and DC power

¹ Based on preliminary internal measurements and projections. Official performance data will be available upon announce and can be obtained online at LSPR (Large Systems Performance Reference) website at: <https://www-304.ibm.com/servers/resourcelink/lib03060.nsf/pages/lspindex?OpenDocument>. Actual performance results may vary by customer based on individual workload, configuration and software levels.

zEC12 Overview

- **Machine Type**
 - 2827
- **5 Models**
 - H20, H43, H66, H89 and HA1
- **Processor Units (PUs)**
 - 27 (30 for HA1) PU cores per book
 - Up to 16 SAPs per system, standard
 - 2 spares designated per system
 - Dependant on the hardware model - up to 20, 43, 66, 89, 101 PU cores available for characterization
 - Central Processors (CPs), Internal Coupling Facility (ICFs), Integrated Facility for Linux (IFLs), System z Application Assist Processors (zAAPs), System z Integrated Information Processor (zIIP), optional - additional System Assist Processors (SAPs)
 - Sub-capacity available for up to 20 CPs
 - 3 sub-capacity points
- **Memory**
 - RAIM Memory design
 - System Minimum of 32 GB
 - Up to 768 GB per book
 - Up to 3 TB for System and up to 1 TB per LPAR
 - 32 GB Fixed HSA, standard
 - 32/64/96/112/128/240/256 GB increments
 - Flash Express
- **I/O**
 - 6 GBps I/O Interconnects – carry forward only
 - Up to 48 PCIe interconnects per System @ 8 GBps each
 - Up to 4 Logical Channel Subsystems (LCSSs)
 - Up to 3 Sub-channel sets per LCSS
- **STP - optional** (No ETR)



zBX Overview



- **Machine Type/Model 2458-003**
- **Racks – Up to 4 (B, C, D and E)**
 - 42U Enterprise, (36u height reduction option)
 - 4 maximum, 2 chassis/rack
 - 2-4 power line cords/rack
 - Non-acoustic doors as standard
 - Optional Acoustic Doors
 - Optional Rear Door Heat Exchanger (conditioned water required)
- **Chassis – Up to 2 per rack**
 - 9U BladeCenter
 - Redundant Power, cooling and management modules
 - Network Modules
 - I/O Modules
- **Blades (Maximum 112 single width blades in 4 racks)**
 - Customer supplied POWER7 Blades (0 to 112)
 - Customer supplied IBM System x Blades (0 to 56)
 - DataPower XI50z, M/T 2462-4BX (0 to 28 – double width)
- **Management Firmware**
 - Unified Resource Manager
- **Top of Rack (TOR) Switches - 4**
 - 1000BASE-T intranode management network (INMN)
 - 10 GbE intraensemble data network (IEDN)
 - GbE IEDN for customer network
- **Network and I/O Modules in the BladeCenter**
 - 1000BASE-T and 10 GbE modules
 - 8 Gb Fibre Channel (FC) connected to customer supplied disks

zBX offers Flexibility for Workload Deployment and Integration

- **zBX is built with integrated IBM certified components**
 - Standard parts – TOR switch, BladeCenter Chassis, Power Distribution Units, Optional Acoustic Panels
 - Optional optimizer - IBM WebSphere DataPower Integration Appliance XI50 for zEnterprise (DataPower XI50z) ordered as a feature of zBX
- **Up to 112 blades are supported on zBX**
 - System x and POWER7 blades are acquired through existing channels
 - IBM System x Blades – up to 56
 - 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 – up to 112
 - IBM BladeCenter PS701 Express - 8-core processor 3.0GHz, three configurations supported in zBX - 32 GB, 64 GB, 128 GB
 - AIX: AIX 5.3 Technology Level 12 or higher, AIX 6.1 Technology Level 5 or higher, AIX 7.1
 - Up to 28 DataPower XI50z blades (double wide)
 - Ability to mix and match blades in the same chassis and number of blades supported varies by type
- **System z support – Blades assume System z warranty and maintenance when installed in the zBX**
- **Investment protection**
 - Upgrade the Model 002 to Model 003

IBM zEnterprise
BladeCenter Extension (zBX)
Machine Type: 2458 Mod 003
(for attachment to zEC12)



Operating System Environments extend application flexibility

- **Operating Systems are customer acquired and installed**
- **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
- **Support for Linux and Windows environments on System x blades in zBX**
 - 64-bit version support only
 - Linux: Red Hat RHEL 5.5 and up, 6.0 and up & SUSE Linux Enterprise Server (SLES) 10 (SP4) and up and SLES 11 SP1 and up
 - Microsoft Windows Server 2008 R2 and Microsoft Windows Server 2008 (SP2) (for either Windows 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
- **PowerHA™ SystemMirror Standard Edition for AIX supported for the zBX with PS701 blades**



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.



IBM BladeCenter PS701



IBM BladeCenter HX5 (7873)

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, 6.1 or 7.1 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 WebSphere DataPower Integration Appliance XI50 for zEnterprise Helps Extend the Value of zEnterprise

Purpose-built hardware for simplified deployment and hardened security helps businesses quickly react to change and reduce time to market

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.
- **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.
- **Operational controls:** Monitoring rolled into System z environment from single console. Consistent change management with Unified Resource Manager.
- **Cloud:** WebSphere DataPower enhancements can provide a secure, managed connection from the enterprise applications or enterprise users to public cloud applications.

Unified Resource Manager optimizes system resources

- Bringing mainframe governance for System z resources
- Single view of virtualized resources across platforms
- Integrated network for better security, control and faster time to value
- Management of resources as defined by your business goals and objectives
- Programmable interfaces (APIs) to connect with system management tools for total management capabilities
 - IBM Tivoli Monitoring (ITM) has been enhanced to use the APIs
- New dynamic storage capabilities for System x blades

