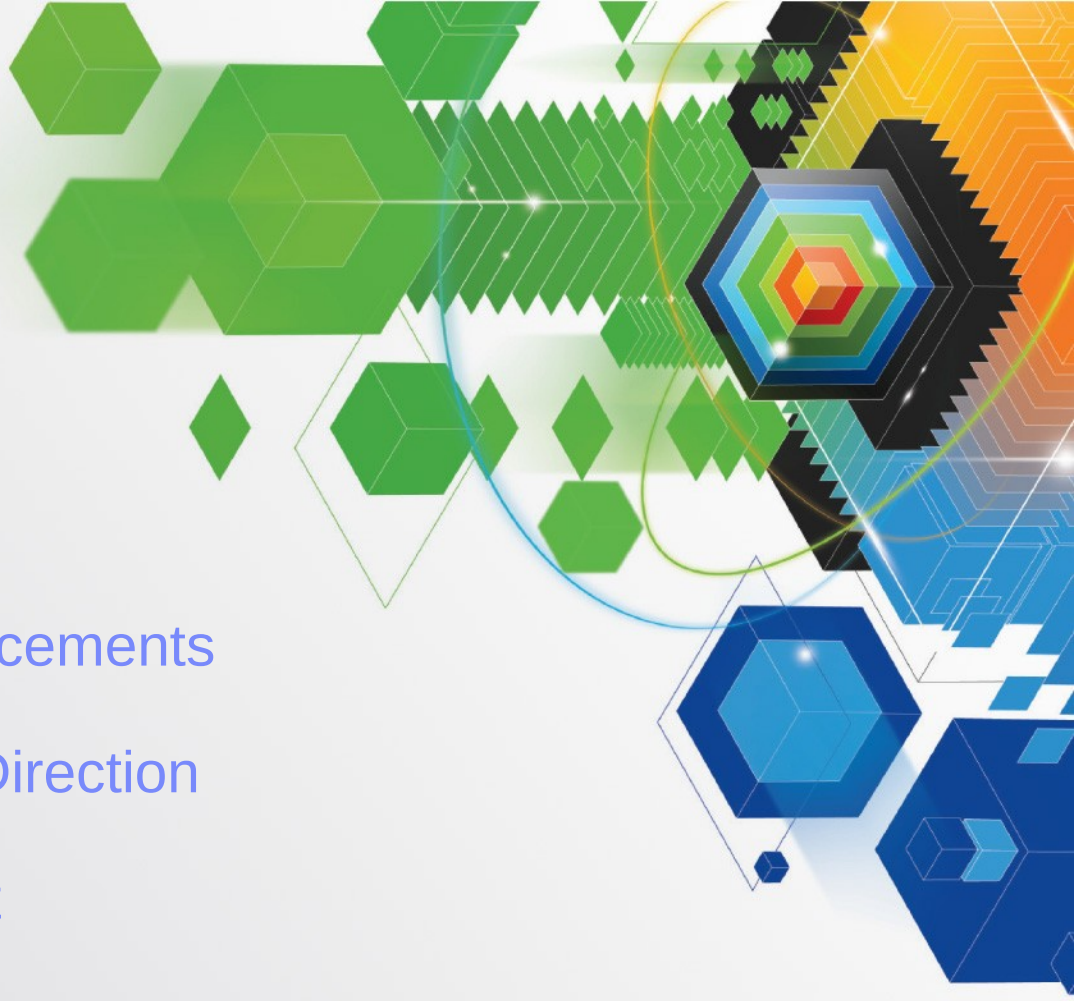
IBM's System z Forum

Sydney	February 23
Canberra	February 29
Melbourne	March 1



Recent Hardware Announcements

Hardware Statements of Direction

Operating System support

Upcoming Events

Recent Hardware Announcements

IBM zEnterprise 114 (z114) and z196 at driver level 93: Key Dates for Hardware, 2011 – September 09, 2011

- **Planned Availability Dates:**
  - **September 09, 2011 – Driver 93**
    - IBM zEnterprise 114 Models M05 and M10 new builds
    - Field installed features and conversions that are delivered solely through a modification to the machine's Licensed Internal Code (LIC):
      - LIC only upgrades for any PU type and memory
      - LIC for CBU and On/Off Capacity upgrade for installed z114s
      - z114 Capacity Setting downgrades
    - IBM System z9® Business Class (z9® BC) upgrades to z114
    - IBM System z10™ Business Class (z10 BC™) upgrades to z114
    - NEW z196's at driver level 93
      - MES for new function/features for installed z196s
    - TKE Support for LIC 7.1
  - **September 26, 2011**
    - Unified Resource Manager functions:
      - Manage suite (#0019) enhancements
      - Automate/Advanced Management Firmware Suite (#0020) enhancements
      - Manage Firmware System x Blade (#0042)
      - Advanced Management Firmware System x Blade (#0046)
    - Selected HX5 Blades for zBX
      - Linux on x Blades
  - **October 21, 2011**
    - Add a zBX as an MES to the installed z114
  - **December 31, 2011**
    - z114 Model M05 to M10 upgrades
    - z114 feature adds (memory, I/O, RPQs and zBX features)

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

IBM zEnterprise 114 and 196 (z114 and z196) – October 12, 2011
All require: Driver 93 with the most current LIC fixes available on the dates indicated

- **Planned Availability Dates**

– **November 18, 2011**
  - System z High Performance FICON enhancements
  - GDPS support for the zEnterprise System
  - New IBM Implementation Services for System z

– **December 2, 2011**
  - Support for z/VM 6.2 on zEnterprise and z10

– **December 16, 2011**
  - 1000BASE-SX and 1000BASE-LX optics for the zBX 10 GbE Top of Rack (customer network)
  - Additional zBX 8 Gbps FCS optics for POWER7 and System x blade connections to the customer SAN
  - Support for Windows on select System x Blades
  - Support for updated DataPower XI50z firmware
  - Support for AIX 7.1 on POWER7 blades
  - Unified Resource Manager Enhancements
    - Unified Resource Manager API support
    - Unified Resource Manager dynamic discovery of storage resources
    - Unified Resource Manager support for z/VM 6.2

z196

z114

zBX

IBM zEnterprise 114 and 196 (z114 and z196) – December 16, 2011
All require: Driver 93 with the most current LIC fixes available on the dates indicated

- **Planned Availability Dates**

– **December 16, 2011**

- HiperSockets Completion Queue
- Improved network monitoring and metrics for p and x Blades within the zBX
- HiperSockets integration with the IntraEnsemble Data Network (IEDN)
- SAP vhostmd support for Linux and Windows on x86 blades in the zBX
- Server Application State Protocol (SASP) load balancing
- Additional 8 GbE fibre channel optics - increased the number of SAN connections for BladeCenter chassis
- Two additional memory options for HX5 blades - 192 and 256 GB

– **March 30, 2012**

- Support for 56 System x blades

z196

z114

zBX

On November 1, 2011, IBM Smart Analytics Optimizer was withdrawn from marketing for new build and MES zBX. It has been replaced with IBM DB2 Analytics Accelerator for z/OS (IDAA), a new workload optimized, appliance add-on that attaches to the zEnterprise System.

Important z10 news

http://www-01.ibm.com/common/ssi/rep_ca/6/877/ENUSZG11-0116/ENUSZG11-0116.PDF

- *Effective June 30, 2012, IBM is withdrawing from marketing:*
- **All models of the IBM System z10 Enterprise Class (z10 EC)** and all upgrades to the z10 EC from the IBM zSeries 990 (z990), IBM System z9 EC (z9 EC), or IBM System z10 BC (z10 BC)
- **All models of the IBM System z10 Business Class (z10 BC)** and all upgrades to the z10 BC from the IBM zSeries 890 (z890) or IBM System z9 BC (z9 BC)
- **Model conversions and hardware MES features applied to an existing z10 EC or z10 BC server**
- System z10 upgrades requiring hardware additions or hardware changes are withdrawn from marketing effective June 30, 2012
- System z10 microcode-only upgrades are withdrawn from marketing effective June 30, *2013* – some examples are:
  - Capacity changes, not requiring addition of a processor book
  - Addition of specialty engines, not requiring addition of a processor book
  - Addition of memory, when sufficient pre-planned memory is already installed
  - On/Off Capacity on Demand (The Capacity on Demand offerings that are configured prior to withdrawal are usable until the offering expiration or termination date, as applicable). (*see over*)

Important z10 news... http://www-01.ibm.com/common/ssi/rep_ca/6/877/ENUSZG11-0116/ENUSZG11-0116.PDF

- On or after the effective dates for the withdrawal of these offerings, you can no longer order these products directly from IBM.
- System z10 end of support will be no less than 5 years after withdrawal from marketing

Clarification for Capacity On Demand offerings.

For any CoD offering the customer must have the enablement features installed and the contracts signed and countersigned before 30 June 2012.

There are lots of Ts and Cs in the contracts which cause them to terminate (eg if a customer sells a box to someone else) but assuming the contracts continue to be valid:

For CBU ... all CBU records have an expiry date, they will continue to be valid until that expiry date regardless of any announced WdfM. The last date that a customer can order a new CBU record is 30 June 2013 (since the record is microcode). So the absolute last date that CBU will work on a z10 is 30 June 2018 assuming the customer purchase a new 5 year record on 30 Jun 2013.

For OOCoD ... any existing records continue to be valid. The last date that the customer can order and download a new record is 30 June 2013. Any record will expire after 180 days. The option to refresh an existing record will cease after 30 June 2013 so the absolute last day on which OOCoD will work is 30 Dec 2013 (180 days after 30 June 2013)

For CIU ... the last date to order a new CIU upgrade is 30 June 2013. The customer can delay installing the upgrade if he chooses but he will be invoiced immediately regardless of actual installation date.

For CPE ... same as OOCoD.

Hardware Statements of Direction

zEnterprise – Statements of Direction (SODs)

The IBM zEnterprise 196 and the zEnterprise 114 are the last System z servers to support the Power Sequence Controller (PSC) feature.

IBM intends to not offer support for the PSC (feature #6501) on future System z servers after the z196 (2817) and z114 (2818). PSC features cannot be ordered and cannot be carried forward on upgrade to such a follow-on server.

The IBM zEnterprise 196 and the zEnterprise 114 are the last System z servers to offer ordering of ISC-3

Enterprises should begin migrating from ISC-3 features (#0217, #0218, #0219) to 12x InfiniBand (#0163 - HCA2-O or #0171 - HCA3-O fanout) or 1x InfiniBand (#0168 - HCA2-O LR or #0170 - HCA3-O LR fanout) coupling links.

The IBM zEnterprise 196 and the zEnterprise 114 are the last System z servers to support ESCON channels

IBM plans not to offer ESCON channels as an orderable feature on System z servers that follow the z196 (machine type 2817) and z114 (machine type 2818). In addition, ESCON channels cannot be carried forward on an upgrade to such follow-on servers. This plan applies to channel path identifier (CHPID) types CNC, CTC, CVC, and CBY and to features #2323 and #2324.

System z customers should continue migrating from ESCON to FICON. Alternate solutions are available for connectivity to ESCON devices

zEnterprise – Statements of Direction (SODs) – October 12, 2011

- **Global Resource Serialization (GRS) ring to support FICON channels**
  - Many customers are migrating from ESCON channels to FICON channels, and in Hardware Announcement dated July 12, 2011, IBM announced that the zEnterprise 196 (z196) and zEnterprise 114 (z114) generation of servers is intended to be the last to support ESCON channels. Although IBM recommends that you use GRS Star, and for GRS Ring environments recommends XCF communications for CTC management, IBM intends to extend z/OS Global Resource Serialization (GRS) Ring function to natively support FICON channel-to-channel (CTC) connections in the z/OS release following z/OS V1.13, and to make this support available on z/OS V1.11, V1.12, and V1.13
- **Revision of FICON Express4 support on future System z servers:**
  - In previous statements of direction IBM stated that the IBM zEnterprise 196 and IBM zEnterprise 114 would be the last servers to support FICON Express4 channels. IBM now plans to support carry forward of the FICON Express4 features (#3321 and #3322 only) into the server after the zEnterprise System.

zEnterprise – Statements of Direction (SODs) - continued

- **The IBM zEnterprise 196 and the zEnterprise 114 are the last System z servers to support OSA-Express2 features:**
  - Enterprises should begin migrating from OSA-Express2 features (#3364, #3365, #3366) to OSA-Express3/OSA Express4S features.

- **The IBM zEnterprise 196 and the zEnterprise 114 are the last System z servers to support dial-up modems for use with the Remote Support Facility (RSF), and the External Time Source (ETS) option of Server Time Protocol (STP).**
  - The currently available Network Time Protocol (NTP) server option for ETS as well as Internet time services available using broadband connections can be used to provide the same degree of accuracy as dial-up time services.
  - Enterprises should begin migrating from dial-up modems to Broadband for RSF connections.

zEnterprise – Statements of Direction (SODs) – October 12, 2011

- **Removal of modem support**
  - Beginning with the next System z server after the IBM zEnterprise 196 and 114, the new Hardware Management Console (HMC) is intended to no longer provide modem support. As a result, modems will not be allowed for use with the Remote Support Facility (RSF), or for an External Time Source (ETS) option of Server Time Protocol (STP). Only broadband connections will be allowed. The new HMC driver is planned to provide enhanced security by providing Network Time Protocol (NTP) authentication support, when a NTP server is accessed to get accurate time for the STP Coordinated Timing Network (CTN).
  - Note that the above changes will affect new orders of z196 and z114, as well as upgrades of HMC driver levels to this new version
  - Enterprises using modems for RSF or STP should plan on migrating to broadband connections. The currently available NTP server option for ETS, as well as internet time services available using broadband connections, can be used to provide the same degree of accuracy as dial-up time services
  - Reference: Integrating the Hardware Management Console's Broadband Remote Support Facility into your Enterprise, SC28-6880
  - **Note:** When implemented, the above changes are intended to apply to new HMC orders for z196 and z114, as well as upgrades of older HMCs to this new version of HMC LIC.

- **IBM intends that the zEnterprise 196 and zEnterprise 114 will be the last servers to offer ordering of the external Ethernet switch**.

zEnterprise – Statements of Direction (SODs) – October 12, 2011

- **GDPS/Global Mirror clusters managed by SA AppMan:**
  - GDPS plans to enhance its Distributed Cluster Management (DCM) support for IBM Tivoli System Automation Application Manager (SA AppMan) by extending it to the GDPS/Global Mirror (GM) offering in addition to the GDPS/PPRC offering available today. This will allow for coordinated disaster recovery across System z and distributed servers at unlimited distances. With GDPS/GM managing replication of data for both System z and for the distributed servers under SA AppMan control, this solution can also provide cross-platform data consistency across the System z and distributed servers.
- **GDPS DCM support for stand alone distributed servers:**
  - GDPS plans to enhance its DCM support for SA AppMan by extending it to stand alone distributed servers, building upon the support for clustered distributed servers available today. This capability can benefit distributed servers running on a zBX or on other distributed platforms, which are not members of a clustered network, and will allow continuous availability and disaster recovery across heterogeneous platforms. Support is planned for GDPS/PPRC and GDPS/GM.

zEnterprise – Statements of Direction (SODs) – October 12, 2011

- **HMC z/VM Tower Systems Management Support**
  - z/VM 6.2 is intended to be the last release supported by the HMC z/VM Tower systems management support originally introduced with System z9. The alternative implementation for virtual server and virtual resource management for z/VM V6 continues to be supported by the zEnterprise Unified Resource Manager on zEnterprise or later.
- **z/VM Support for zHPF Guest Exploitation**
  - IBM intends to provide support for guest virtual machines utilizing the High Performance FICON for System z (zHPF) I/O protocol. z/VM will support guest operating systems that issue single track as well as multiple track zHPF I/O.

Operating System support

z/OS Support Summary

Release	z9 EC WdfM	z9 BC WdfM	z10 EC	z10 BC	z196	z114	End of Service	Coexists with z/OS
z/OS V1.8	X	X	X	X	X	X	9/09[1]	V1.10
z/OS V1.9	X	X	X	X	X	X	9/10[1]	V1.11
z/OS V1.10	X	X	X	X	X	X	9/11[1]	V1.12
z/OS V1.11	X	X	X	X	X	X	9/12*	V1.13*
z/OS V1.12	X	X	X	X	X	X	9/13*	V1.14*
z/OS V1.13	X	X	X	X	X	X	9/14*	V1.15*

Notes:

'The IBM Lifecycle Extension for z/OS provides the ability for customers to purchase extended defect support for that release of z/OS for up to 24 months after the z/OS release's end of service date.

* Planned. All statements regarding IBM's plans, directions, and intent are subject to change or withdrawal without notice.

http://www-03.ibm.com/systems/z/os/zos/support/zos_eos_dates.html

System z z/VM & z/VSE Support Summary

		z9 EC WdfM	z9 BC WdfM	z10 EC	z10 BC	z196	z114	Ship Date	End of Market	End of Service
z/VSE	4.2	x	x	x	x	x	x	10/08	11/10	10/12
	4.3	x	x	x	x	x	x	4Q10	TBD	TBD
	5.1*	x	x	x	x	x	x	4Q11	TBD	TBD
z/VM	5.4	x	x	x	x	x	x	09/08	TBD	9/13*(1)
	6.1	No	No	x	x	x	x	10/09	TBD	4/13*
	6.2	No	No	x	x	x	x	11/12	TBD	TBD

1) End of Service date for z/VM 5.4 extended

* Planned. All statements regarding IBM's plans, directions, and intent are subject to change or withdrawal without notice. Any reliance on these Statements of General Direction is at the relying party's sole risk and will not create liability or obligation for IBM.

Note: z/VM 6.1 Implements a new Architecture Level Set (ALS) available only on IBM System z10 servers or later

Linux on System z Support

	z9 EC WdfM	z9 BC WdfM	z10 EC	z10 BC	z196	z114	Availability Date
RHEL 5	x	x	x	x	x	x	03/2007
RHEL 6	x	x	x	x	x	x	11/2010
SLES 10	x	x	x	x	x	x	08/2006
SLES 11	x	x	x	x	x	x	03/2009

	End of Production Ph 1	End of Production Ph 2	End of Production Ph 3
RHEL 5 support*	4Q 2011	4Q 2012	03/31/2014
RHEL 6 support*	4Q 2014	4Q 2015	11/30/2017
	General support	Extended support	Self support
SLES 10 support*	07/31/2013	07/31/2016	07/31/2016
SLES 11 support*	03/31/2016	03/31/2019	03/31/2019

* SLES = SUSE Linux Enterprise Server
RHEL = Red Hat Enterprise Linux
Support dates may be changed by Linux distributors

- **For latest information and details contact your Linux distributor**
- Recommendation: use RHEL 6 or SLES 11 for new projects
- For latest information about supported Linux distributions on System z refer to: http://www.ibm.com/systems/z/os/linux/resources/testedplatforms.html

Upcoming Events

What's on?

OZ999AU System z / zEnterprise Integrated Hardware Cryptography (3 day class)

March 5 – 7, Melbourne
March 12 – 14, Sydney
March 19 – 21, Canberra

http://www-304.ibm.com/jct03001c/services/learning/ites.wss/au/enpageType=course_description&courseCode=OZ999AU

Interaction Conference*

University of NSW, CBD campus
April 12 - 13

http://www.interaction.com.au/

Enterprise Computing Conference

University of Canberra
May 15 – 16

http://www.canberra.edu.au/ecc

*Where an expanded version of this presentation will be given by Simon Williams

What's on? continued...

IBM Systems Technical Symposium

August 14 to 17, Sydney

http://www-304.ibm.com/jct03001c/services/learning/ites.wss?pageType=page&c=J678972N46944N53

IBM System z ITSO World Tour

October 8 to 12, TBD

http://www.redbooks.ibm.com

IBM System z Technical Education

January to June 2012 schedule:

http://www-304.ibm.com/jct03001c/services/learning/ites.wss/au/en?
pageType=subchapter_list&chapter=5533&chapterName=IBM+System+z

Backup slides

(Reference Material related to recent hardware announcements)

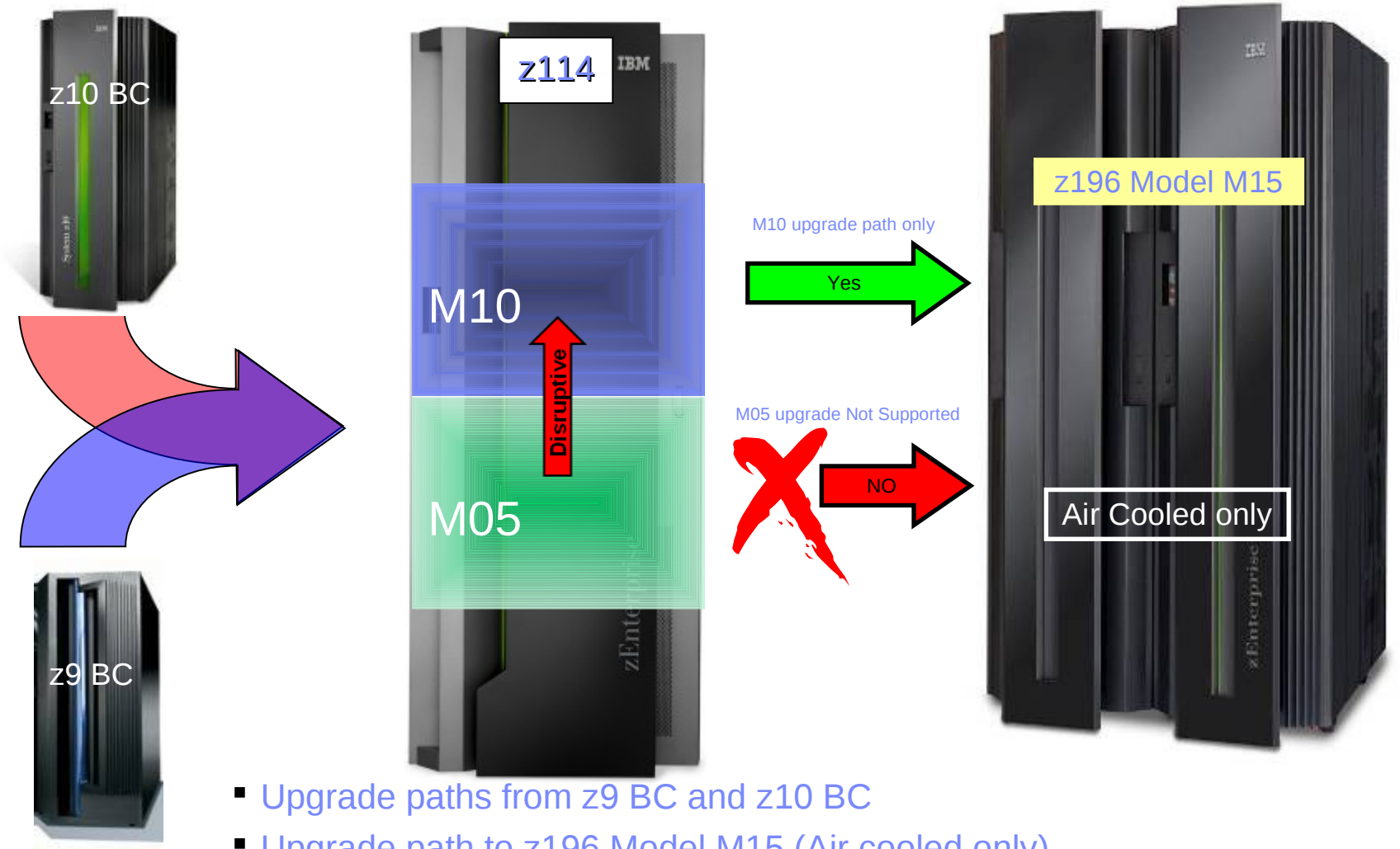
Recent Hardware Announcements

- IBM zEnterprise 114 Models M05 and M10 new builds
- IBM System z9® Business Class (z9® BC) upgrades to z114
- IBM System z10™ Business Class (z10 BC™) upgrades to z114
- NEW z196's at driver level 93
- TKE Support for LIC 7.1
- Unified Resource Manager functions:
- Manage suite (#0019) enhancements
- Automate/Advanced Management Firmware Suite (#0020) enhancements
- Manage Firmware System x Blade (#0042)
- Advanced Management Firmware System x Blade (#0046)
- Selected HX5 Blades for zBX
- Linux on x Blades
- System z High Performance FICON enhancements
- GDPS support for the zEnterprise System
- Support for z/VM 6.2 on zEnterprise and z10
- 1000BASE-SX and 1000BASE-LX optics for the zBX 10 GbE Top of Rack (customer network)
- Additional zBX 8 Gbps FCS optics for POWER7 and System x blade connections to the customer SAN
- Support for Windows on select System x Blades
- Support for updated DataPower XI50z firmware
- Support for AIX 7.1 on POWER7 blades
- Unified Resource Manager Enhancements
- Unified Resource Manager API support
- Unified Resource Manager dynamic discovery of storage resources
- Unified Resource Manager support for z/VM 6.2
- HiperSockets Completion Queue
- Improved network monitoring and metrics for p and x Blades within the zBX
- HiperSockets integration with the IntraEnsemble Data Network (IEDN)
- SAP vhostmd support for Linux and Windows on x86 blades in the zBX
- Server Application State Protocol (SASP) load balancing
- Additional 8 GbE fibre channel optics - increased the number of SAN connections for BladeCenter chassis
- Two additional memory options for HX5 blades - 192 and 256 GB
- Support for 56 System x blades

z114 Overview

- Machine Type
  - 2818
- 2 Models
  - M05 and M10
  - Single frame, air cooled
  - Non-raised floor option available
  - Overhead Cabling and DC Power Options
- Processor Units (PUs)
  - 7 PU cores per processor drawer (One for M05 and two for M10)
  - Up to 2 SAPs per system, standard
  - 2 spares designated for Model M10
  - Dependant on the H/W model - up to 5 or 10 PU cores available for characterization
    - Central Processors (CPs), Integrated Facility for Linux (IFLs), Internal Coupling Facility (ICFs), System z Application Assist Processors (zAAPs), System z Integrated Information Processor (zIIP), optional - additional System Assist Processors (SAPs)
  - 130 capacity settings
- Memory
  - Up to 256 GB for System including HSA
    - System minimum = 8 GB (Model M05), 16 GB (Model M10)
    - 8 GB HSA separately managed
    - RAIM standard
    - Maximum for customer use 248 GB (Model M10)
    - Increments of 8 or 32 GB
- I/O
  - Support for non-PCIe Channel Cards
  - Introduction of PCIe channel subsystem
    - Up to 64 PCIe Channel Cards
  - Up to 2 Logical Channel Subsystems (LCSSs)
- STP - optional (No ETR)

z114 Upgrade paths



- Upgrade paths from z9 BC and z10 BC
- Upgrade path to z196 Model M15 (Air cooled only)
- Disruptive upgrade M05 to M10 and from M10 to z196 M15

TKE 7.1 LIC features

Security

New smart card reader support

Ease of Use/Simplification

Key Data Migration Wizard update
A single Process for Loading an Entire Key

Hardware Support

New Operational AES Key type
Users can load and manage the new AES EXPORTER, IMPORTER, and CIPHER operational keys from the TKE's crypto module notebook

PIN Decimalization Table Support
CCA version 4.2 for the Crypto Express3 feature includes support for 100 decimalization tables for each domain on a host cryptographic adapter.

zEnterprise Unified Resource Manager Pricing Strategy
Priced to Value: Tiered functionality that scales

Manage, Advanced Management and Automate are ordered as features of the z196 or z114

When placing an order for a z196 or z114, the default is 'Manage' FC#0019. If you want "Advanced Management / Automate' you will need to order FC#0020. The additional feature codes for these functions for the blades/optimizers will automatically be generated for you based on the number of blades/optimizers that you order. To get ensemble management and cables make sure that you also order FC#0025 on the z196 or z114.

Manage	Delivers Unified Resource Manager's function for core operational controls, installation and configuration, and energy monitoring
Advanced Management	Delivers workload definition and performance policy monitoring and reporting. Load balancing capabilities
Automate	Delivers workload definition and performance policy monitoring and reporting. Delivers goal oriented monitoring and goal oriented management of resources and energy management. Load balancing capabilities.

	Manage – per connection	Advanced Management - per connection	Automate – per connection
z196 or z114 base hardware configuration	FC#0019 - N/C	N/A	FC#0020 - N/C
IFL	N/C	N/A	FC#0052 – Yes
POWER7 Blade (zBX FC#0612)	FC#0041 – Yes	N/A	FC#0045 – Yes
DataPower Blade (zBX FC#0611)	FC#0040 – Yes	N/A	FC#0044 – N/C
System x Blade (zBX FC#0613)	FC#0042 – Yes	FC#0046 - Yes	N/A

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 blade
    - The zBX web page will host the most current blade ordering information: http://www.ibm.com/common/ssi/cgi-bin/ssialias?infotype=SA&subtype=WH&appname=STGE_ZS_ZS_USEN&htmlfid=ZSL03128USEN&attachment=ZSL03128USEN.PDF
  - Ordered and fulfilled through System x providers and installed into the zBX by the customer
  - 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
  - Number of blades supported varies by type

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

Optimizers
- IBM WebSphere DataPower Integration Appliance XI50z for zEnterprise

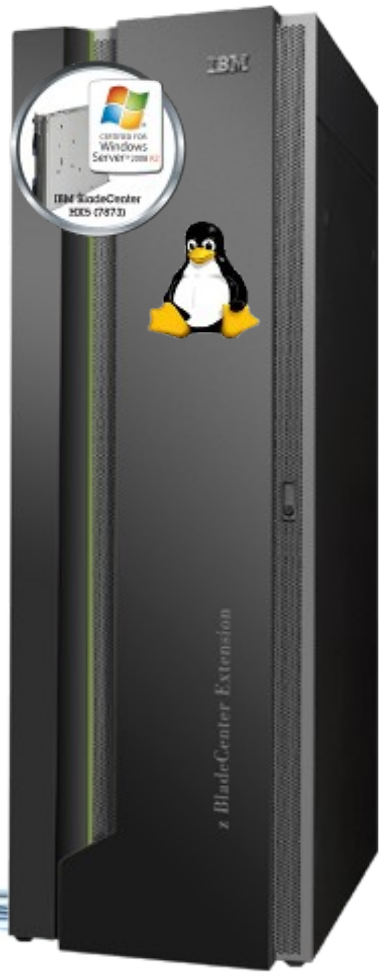
Select IBM Blades
- IBM BladeCenter PS701 Express
- IBM BladeCenter HX5 7873 blade

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)

Operating System Environments extend application flexibility

- Support for Linux and Windows environments on System x blades in zBX
  - 64-bit version support only
  - Linux: RHEL 5.5, 5.6, 6.0 & Novell SUSE SLES 10 (SP4) and SLES 11 SP1
  - Microsoft Windows Server 2008 R2 and Microsoft Windows Server 2008 (SP2) (for either we recommend Datacenter Edition)
  - The zBX web page will host the most current blade ordering information: http://www.ibm.com/common/ssi/cgi-bin/ssialias?infotype=SA&subtype=WH&appname=STGE_ZS_ZSUSEN&htmlfid=ZSL03128USEN&attachment=ZSL03128USEN.PDF
- 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
  - For the most current POWER7 blade ordering information: http://www.ibm.com/common/ssi/cgi-bin/ssialias?infotype=SA&subtype=WH&appname=STGE_ZS_ZS_USEN&htmlfid=ZSY03019USEN&attachment=ZSY03019USEN.PDF
- Certifications inherited from blades
  - SAP support for Linux and Windows on x86 blades in the zBX
- Operating Systems are customer acquired and installed



zEnterprise zHPF supports data transfers larger than 64 k bytes

- zHPF multi-track data transfers are no longer limited to 64 k bytes
  - Up to 256 tracks can be transferred a single operation
  - Eliminating the 64 k byte limit is designed to allow a FICON Express8 channel to fully exploit its available bandwidth
  - This enhancement is exclusive to z196 and z114
- Designed to help provide
  - Higher throughput for zHPF multi-track operations
  - With lower response time
- Requires:
  - FICON Express8 and 8S or FICON Express4 channel
  - CHPID TYPE=FC definition
  - Control unit support for zHPF
- z/OS operating system support

White Paper: “High Performance FICON (zHPF) for System z Analysis”
http://www.ibm.com/support/techdocs/atsmastr.nsf/WebIndex/WP101789

High Performance FICON (zHPF) for DS8000 System z Attached Analysis:
AG Storage ATS Offering
http://www.ibm.com/support/techdocs/atsmastr.nsf/WebIndex/FLASH10668

zHPF enhancements for optimal system performance

HPF enhancement for QSAM, BPAM, and BSAM access methods
- New DS8000 I/O commands optimize QSAM, BPAM, and BSAM access methods for exploiting zHPF
- Shorter elapsed times for I/O intensive batch takes pressure off the batch window
- Benefits non-extended format sequential and basic and large format sequential data sets

HPF format writes
- Faster DB2 loads, reorgs, index rebuilds, and database restores
  - DB2 load throughput with DB2 9 and 10 increases up to 52% (4K pages)
- DB2 preformatting throughput increases up to100%

HPF enhancement for DB2 list prefetch
- Achieves higher cache hit ratio in the control unit
- Faster disorganized index scans with DB2 10
  - Up to 4.9 times faster when using FICON Express8S and Rotate Extents
- For all versions of DB2, skip sequential I/O is 3x to 4x faster
- With 4K pages, FICON Express8 single stream list prefetch throughput is 111% higher
- With 4K pages, FICON Express8S single stream list prefetch throughput is 130% higher
- FICON Express8S halves the number of zHPF list prefetch I/O when using 4K pages
- Together, DB2 10 for z/OS and zHPF is up to 11 times faster, and with SSD up to 60 times faster

Significant throughput gains in many areas
- Complete conversion of DB2 I/O to zHPF maximizes resource utilization and performance
- Synchronous I/O service times are reduced by up to 30%
- Sequential pre-fetch throughput increases up to 19%
- Dynamic pre-fetch throughput increases up to 23% (40% with SSD)

zHPF Enhancements

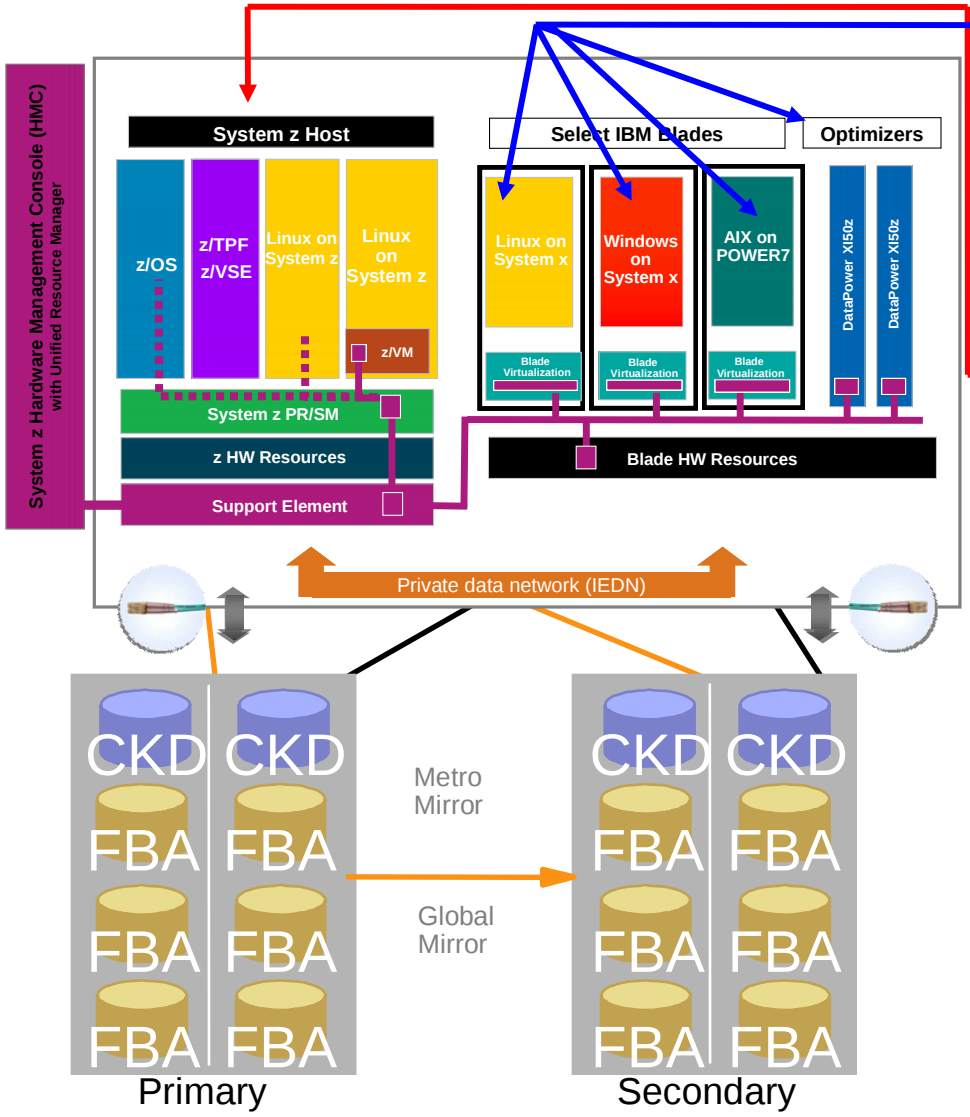
Performance improvements for QSAM, BPAM, and BSAM access methods
Operating System Requirements: z/OS R13, z/OS R12 with PTFs or z/OS R11 with PTFs
Channel requirement: Any supported FICON channel defined as TYPE=FC

Performance improvements for format writes
Applicable to all data sets originally supported by the Modified Indirect Data Address Word (MIDAW) facility and zHPF and also to QSAM, BPAM, and BSAM data sets.
Designed to improve performance the most for small blocks, which are typically used for databases
Operating System Requirement: z/OS R13, z/OS R12 with PTFs or z/OS R11 with PTFs
Channel requirement: Any supported FICON channel defined as TYPE=FC

Performance improvements for DB2 list prefetch processing
Operating System Requirements: z/OS R13 with PTFs, z/OS R12 with PTFs or z/OS R11 with PTFs
Channel requirement: FICON Express8S channel defined as TYPE=FC

IBM Server and System Storage Requirements for all enhancements
zEnterprise 196 or zEnterprise 114
IBM System Storage DS8800 (Level 7.6.2.xx.xx, bundle version 86.20.xxx.xx or later)
or IBM System Storage DS8700 (Level 7.6.2.xx.xx, bundle version 76.20.xxx.xx or later)

GDPS Capabilities for zEnterprise Business Continuity



- Management of Metro Mirror or Global Mirror configurations
  - Data consistency across z/OS and distributed systems running in zBX
  - Single point of control
- xDR Infrastructure management solution for z/OS and Linux applications on System z:)
  - Data consistency, HyperSwap, Planned/Unplanned site switches
- Management and coordination of
  - Planned and unplanned outages
  - For z196 in a Sysplex
  - For distributed servers in zBX using Distributed Cluster management (DCM) and
    - Tivoli System Automation Application Manager
    - Veritas Cluster Server

http://www-03.ibm.com/systems/z/advantages/gdps/resources.html

GDPS Extensions for zEnterprise - 1 of 2

The GDPS support for the zEnterprise System includes:
Disaster Recovery with synchronous remote copy up to 300 km
GDDPS/PPRC on z/OS together with either Tivoli System Automation Application Manager (AppMan) or Veritas Cluster Server (VCS) on the zBX can be used to support a synchronous remote copy target up to 300 km away. This is an increase from the previously announced distance for AppMan of 100 km, allowing more flexible selection of the DR site location.
Note: Near-continuous availability capability is still limited to 200 fiber km.

Application CA / DR at unlimited distance
GDPS/XRC or GDPS/GM on z/OS together with VCS running on a zBX blade can be used to support an asynchronous remote copy target at unlimited distances away.

This builds upon the existing GDPS ability to:

Manage data on distributed systems using its Open LUN Management

Provide a business continuity solution across z/OS, z/VM, and Linux on System z applications on System z (xDR)

Provide coordinated planned/unplanned site switches using the Distributed Cluster Management (DCM) function.

GDPS Extensions for zEnterprise - 2 of 2

Multiplatform Resilience for System z (xDR) extended to support z/VSE

- Using heartbeat signals, GDPS can detect that a z/VSE guest under z/VM is no longer available and can restart it in place. This enhancement is designed to improve availability for z/VSE.

Reduced HyperSwap impact and improved scalability

- GDPS can now take advantage of disk subsystem capability to notify the host system proactively that it is entering recovery processing to trigger a HyperSwap. This enhancement is designed to reduce the impact of a HyperSwap event and to reduce outage time for certain events by allowing the former primary PPRC disk to complete its recovery while host I/Os proceed on the swapped-to disk.
- GDPS can now take advantage of disk subsystem capability to notify each of the attached hosts of PPRC suspension events at the Logical Subsystem (LSS) level instead of at the individual PPRC device level. This enhancement is designed to reduce the message traffic significantly between the disk subsystems and the attaching hosts and to provide greater scalability during HyperSwap and Freeze events.
- Hardware Requirement: IBM System Storage DS8800 or DS8700

z/VM Version 6 Release 2

Announced October 12, 2011

z/VM V6.2 may be ordered on November 29, 2011

z/VM V6.1 will be withdrawn when V6.2 becomes orderable

If order is placed prior to this date, z/VM V6.1 will be shipped

Generally available December 2, 2011

End of service April 30, 2015

Major changes include:

Single System Image

Live Guest Relocation

Turnkey support for Unified Resource Manager

Single System Image feature
Clustered hypervisor with Live Guest Relocation

Provided as an optional priced feature

Connect up to four z/VM systems as members of a Single System Image (SSI) cluster

Provides a set of shared resources for member systems and their hosted virtual machines

Cluster members can be run on the same or different System z servers

Simplifies systems management of a multi-z/VM environment

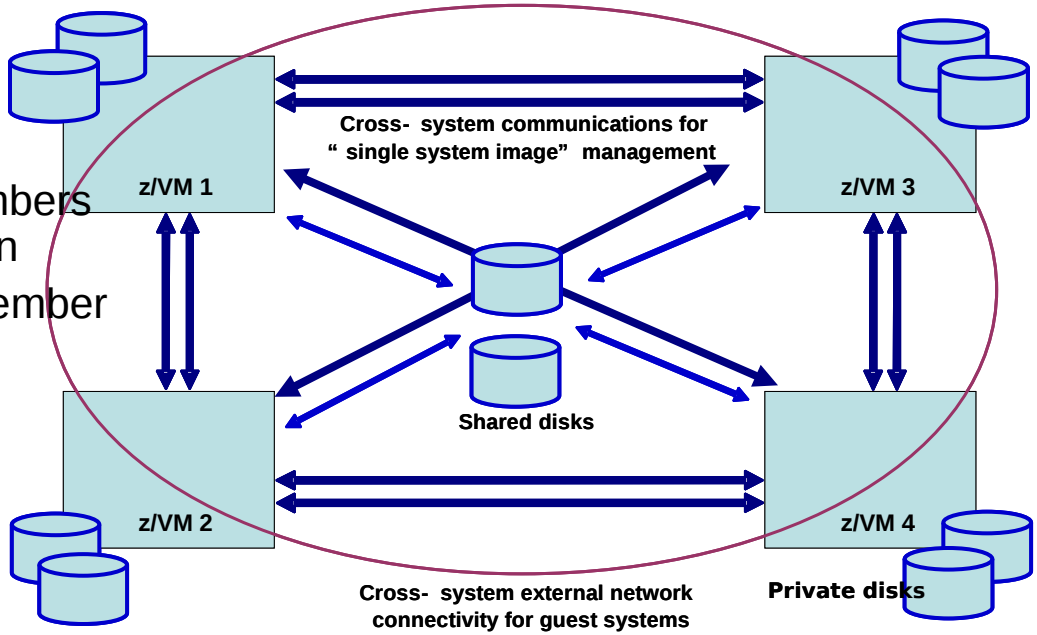
Single user directory

Cluster management from any member

- Apply maintenance to all members in the cluster from one location
- Issue commands from one member to operate on another

Built-in cross-member capabilities

Resource coordination and protection of network and disks



Single System Image feature
Clustered hypervisor with Live Guest Relocation

Dynamically move Linux guests from one member to another with Live Guest Relocation

Reduce planned outages

Enhance workload management

Non-disruptively move work to available system resources and non-disruptively move system resources to work

When combined with Capacity Upgrade on Demand, Capacity Backup on Demand, and Dynamic Memory Upgrade, you will get the best of both worlds

Bring additional resources to the workload!

Move the workload to the resources!

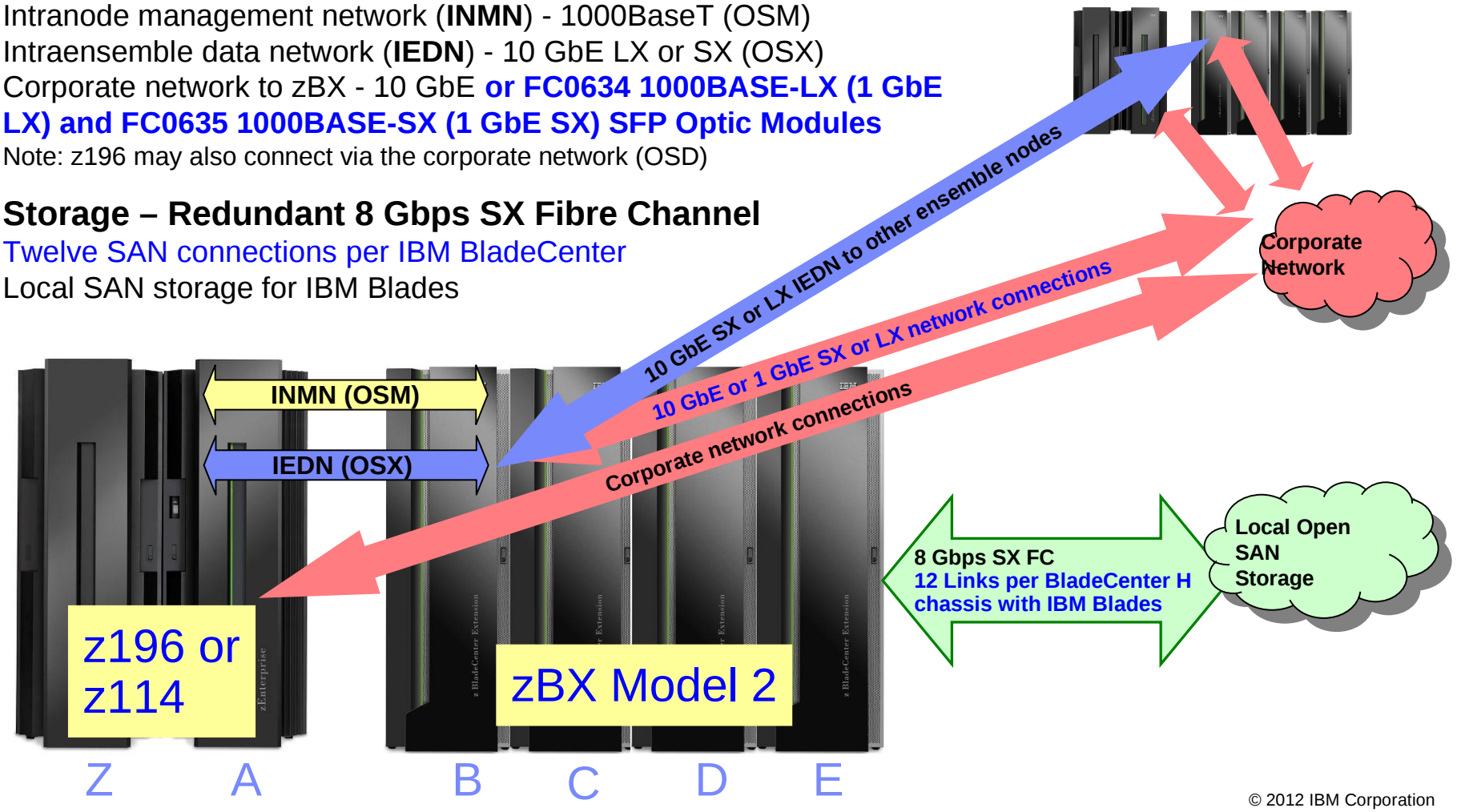
New 1 GbE SX or LX zBX to Customer Network Connections Increased SAN Connections (December 16, 2011)

Networks – Redundant zBX-002 "B" frame top of rack switches

Intranode management network (**INMN**) - 1000BaseT (OSM)
Intraensemble data network (**IEDN**) - 10 GbE LX or SX (OSX)
Corporate network to zBX - 10 GbE **or FC0634 1000BASE-LX (1 GbE LX) and FC0635 1000BASE-SX (1 GbE SX) SFP Optic Modules**
Note: z196 may also connect via the corporate network (OSD)

Storage – Redundant 8 Gbps SX Fibre Channel

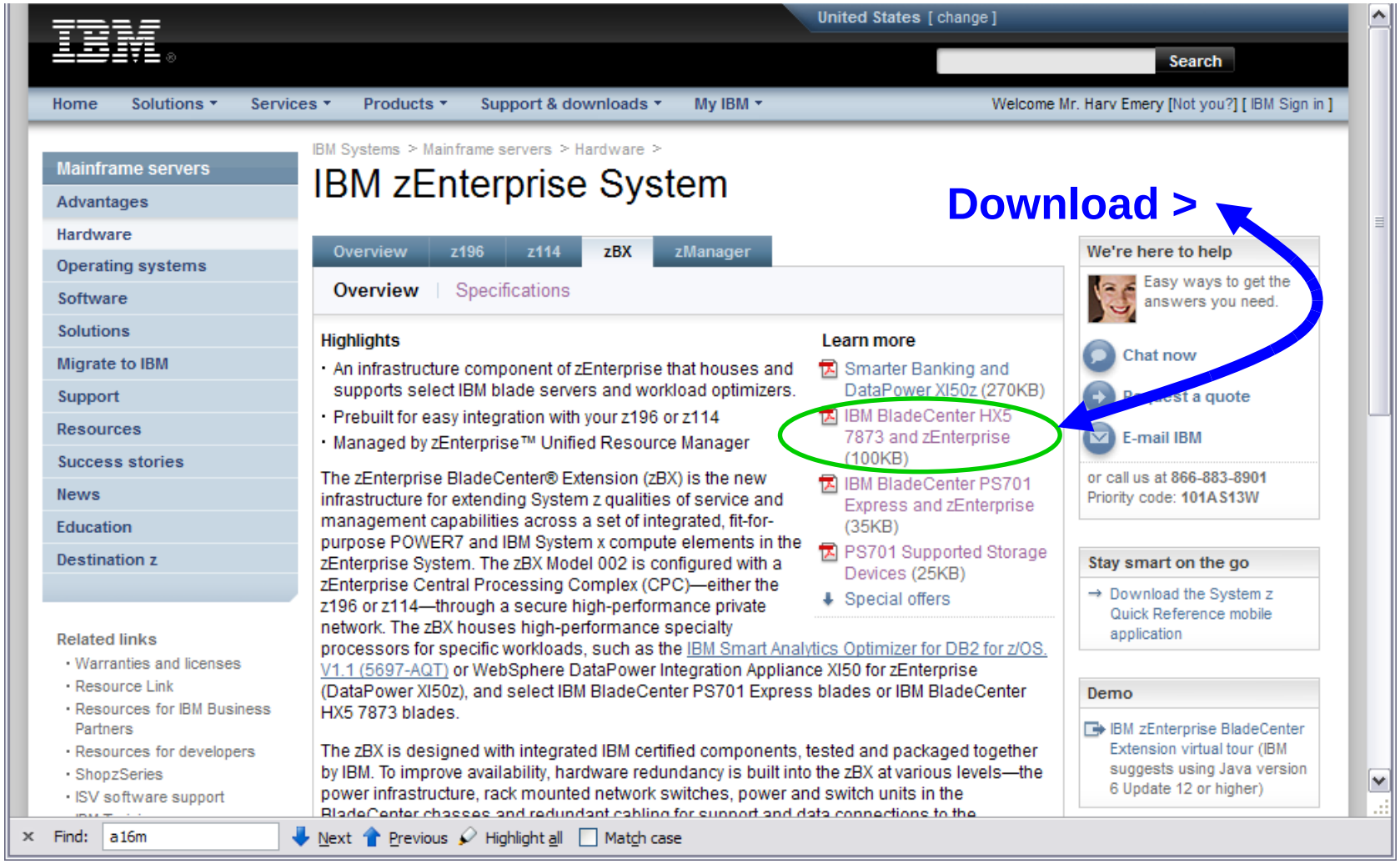
Twelve SAN connections per IBM BladeCenter
Local SAN storage for IBM Blades



Windows Support on System x Blades in zBX (December 16, 2011)

Supported System x HX5 7873 Blades and OS Releases in zBX are documented:
Here: http://www.ibm.com/systems/z/hardware/zenterprise/zbx.html

Download the “IBM BladeCenter HX5 7873” PDF to check details.



IBM WebSphere DataPower Integration Appliance XI50 for zEnterprise (DataPower XI50z) – Updated Firmware (December 16, 2011)

- **DataPower XI50z (2462-4BX)**
  - Same hardware as DataPower XI50B (4195-4BX)
    - "Double-wide" Blade: 2 BladeCenter slots
    - IBM HS22 Blade + DataPower expansion unit
  - Current firmware based on DataPower firmware v3.8.1
  - New firmware based on DataPower firmware v4.0.1
  - Same Acceleration, Security, and Integration capabilities

- **Can coexist with POWER7 and IBM System x blades in the same zBX BladeCenter**

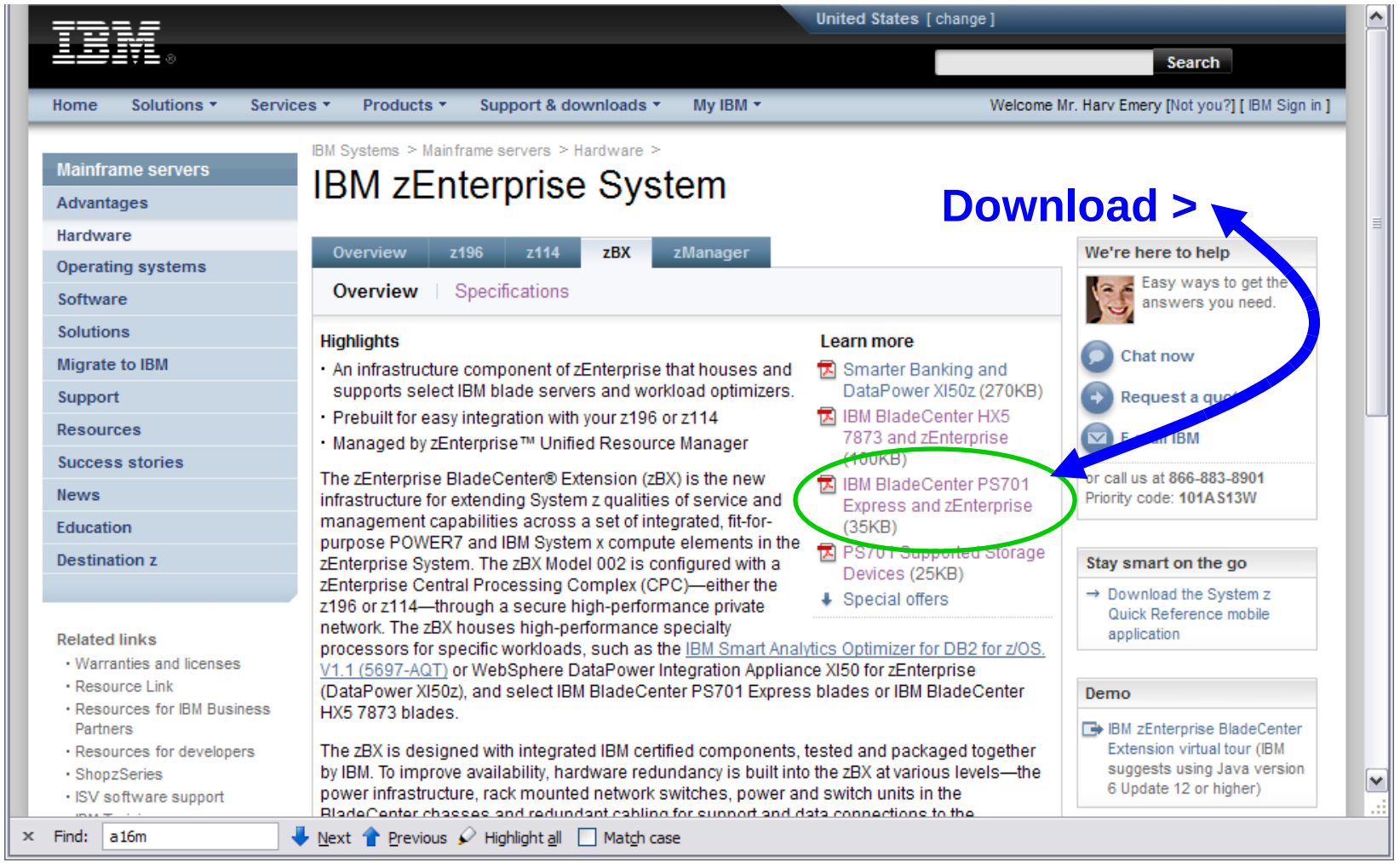
- **Leverages advanced zBX BladeCenter networking infrastructure**
  - 2 x 1 GbE interfaces to zBX 1 GbE top of rack switches (INMN)
  - 2 x 10 GbE interfaces to zBX 10 GbE top of rack switches (IEDN)

- **Ordering, configuration and installation**
  - Hardware and firmware are configured and ordered by eConfig as zBX features
  - Ships installed in a new-build zBX or field installed by IBM service as an MES

- **Tightly integrated with zEnterprise**
  - Hardware and firmware management by Unified Resource Manager
  - Inherits zEnterprise Ensemble serviceability, monitoring and reporting capabilities

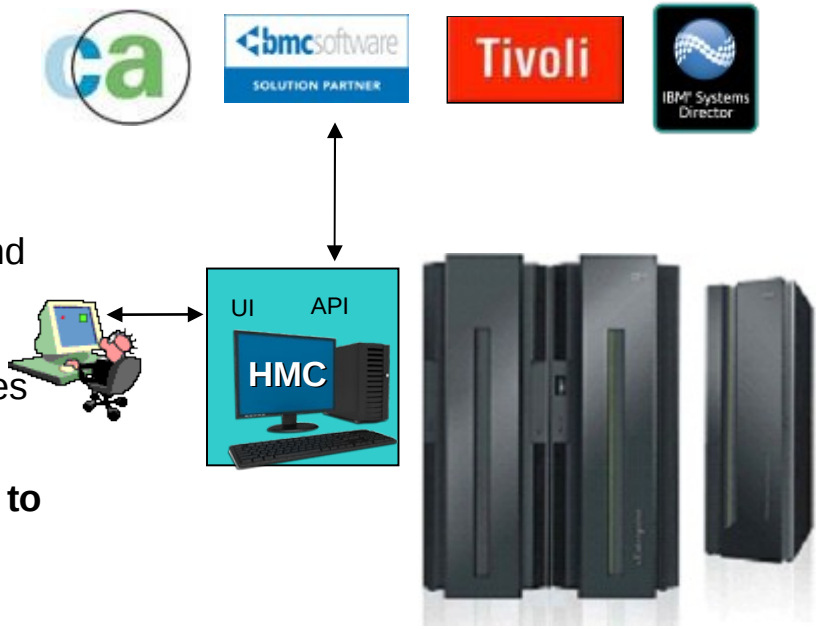
AIX 7.1 Support on POWER7 in zBX (December 16, 2011)

Supported AIX Releases for POWER7 blades in zBX are documented:
Here: http://www.ibm.com/systems/z/hardware/zenterprise/zbx.html
Download the “IBM BladeCenter PS701 Express” PDF to check details.



Unified Resource Manager APIs
Enabling external management tools

- **New API support allows programmatic access to the same underlying functions exploited by the HMC user interface (UI)**
  - Same resource types, instances and policies
  - HMC UI steps are accomplished using panels in a wizard-style task while API steps are accomplished by calling API management primitives
  - Therefore the API functions correspond to views and tasks in the UI such as:
    - Listing resource instances
    - Creating, changing, deleting resource instances
    - Operational control of resource instances
- **Access to these functions will enable tools external to the HMC to manage the Unified Resource Manager**
- **Initially the priority scenarios will be the discovery, monitoring, and provisioning use cases**



Extending zEnterprise Unified Resource Manager
Continuing to add function and management

- **Operational Controls enhanced with auto-discovery and configuration support for new resources**
  - Dynamic discovery and configuration of storage resources by Unified Resource Manager

- **Extending management functions of Unified Resource Manager with programmatic access**
  - New Unified Resource Manager APIs enable discovery, monitoring and management of ensemble resources using external tools
    - Open documented interface available for clients
      - **Access using common scripting languages like Perl and Python**
    - IBM Tivoli® will be taking advantage of the APIs:
    - CA Technologies, Dovetailed Technologies, CSL International and other ISVs are interested in taking advantage of the APIs

Co:Z Co-Processing Toolkit

Tivoli

ca technologies

CSL International

HiperSockets Completion Queue

- Allows HiperSockets to transfer data asynchronously if possible and synchronously if necessary, thus combining ultra-low latency with more tolerance for traffic peaks
- HiperSockets Completion Queue is planned to be supported in the z/VM and z/VSE environments in future deliverables.

Improved network monitoring and metrics

- The Unified Resource Manager now provides improved performance monitoring and collection of metrics from the hypervisors and Layer 2 networking resources associated with the IEDN. The information can be used for the purpose of determining the status and general health of resources and assisting with problem determination. It can also be used to aid with performance management decisions. Metrics will be displayed on the Monitor Dashboard and will be accessible through APIs.

Support for HiperSockets over IEDN

- The IEDN provides an internal network for zEnterprise servers and zBX blades to communicate. IBM is now extending the existing IEDN with a newly defined type of HiperSockets network. The combination of this HiperSockets network and the physical IEDN will appear as a single Layer 2 network. This will extend the reach of the HiperSockets network outside the CPC to the entire ensemble, appearing as a single Layer 2 network. z/VM 6.2 support is targeted to be available on April 13, 2012.

SAP support for zBX

- The zBX supports the SAP operating environment for Linux and Windows running on select System x blade servers and AIX on select IBM POWER7 blade servers. This can help clients with multi-tier applications where the data base tier is DB2 for z/OS and the application servers are on distributed platforms such as UNIX for the application tier and System x blades for the presentation tier

Server Application State Protocol (SASP) load balancing

- The Unified Resource Manager now provides performance recommendations to external load balancers which implement Server Application State Protocol (SASP) to improve load balancing decisions.

Additional fibre channel optics for BladeCenter chassis

- The zBX now supports up to 96x 8 Gb Short Wave (SW) optical transceivers used within the Fibre Channel Network switch gear, used within the zBX. This allows you to plug in additional optics to the fibre channel connections to distribute the load over more connections.

System x Blades for zBX

- **Four configurations of the HX5 blade are supported**
- **The machine type is 7873.**
- **The processor supported for all configurations is the E7-2830 at 2.13 GHz.**
- **There are eight cores per socket and we will support two sockets or 16 cores.**
- **All configurations will have two 50 GB SSD, a 10 Gb ethernet and 8Gb fiber channel adapter.**
- **The difference in configurations is in the amount of memory.**
- **The following are supported configurations: 64 GB, 128 GB, 192 GB and 256 GB.**

	One	Two	Three	Four
Processor - 2.13 Ghz (E7-2830)	2	2	2	2
Cores	16	16	16	16
50 GB SSD	2	2	2	2
10 GbE Adapter	1	1	1	1
8Gb FC Adapter	1	1	1	1
Memory (GB)	64	128	192	256

Operating Systems update

z/OS V1.13, z/VSE V5.1, and z/VM V6.2

In the second half of 2011 IBM introduced new releases of all our mainframe operating systems

z/OS V1.13 with major enhancements in support of batch processing
z/VSE V5.1 with networking, high availability and zEnterprise support
z/VM V6.2 with clustering in support of Linux on System z (see earlier slides)

z/OSMF Software Deployment (R13)

New! - simplified deployment of installed software

New task designed to make deployment of installed software simpler and safer.

Easy to follow checklist replaces manual and error prone procedures with a user friendly application

Incorporates IBM recommended best practices for software deployment.

Software Deployment can clone software

Locally, single system or within a sysplex

Remotely, across a network, and multiple sysplexes.

Software Deployment can also:

Identify, modify, delete software instances

Generate jobs to copy a software instance

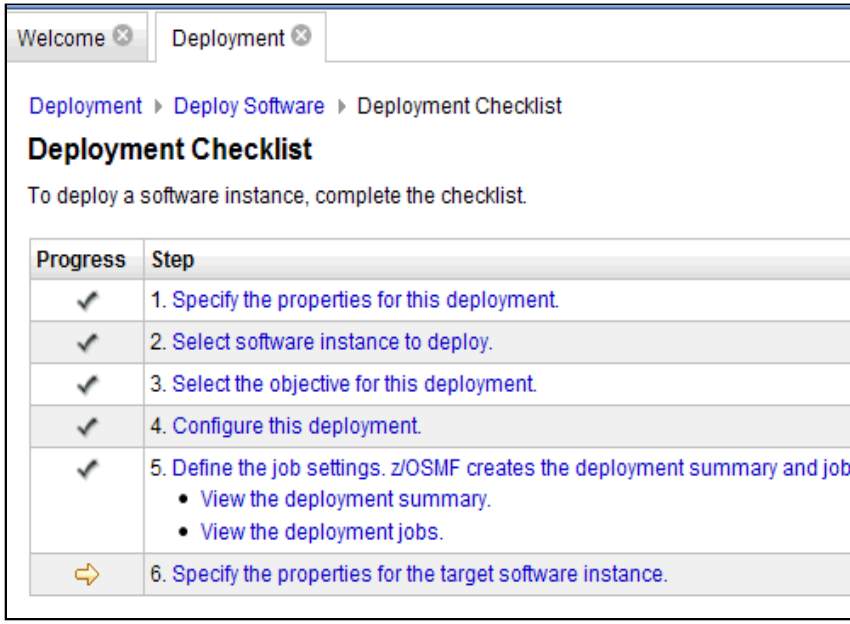
Verify cross-system and cross-product requisites, verify fixes

Copy ALL parts of the software (SMP/E CSI inventory too)

Clones all SMP/E installed software!

IBM, ISV, z/OS, stack or individual products

Service upgrades for all of the above (via complete replacement)



z/OSMF DASD Management* (R13)

New! - The first phase in simplifying storage management

Add storage to an SMS Pool storage group through a single user interface

Easier, with less SMS skill needed

Manage containers of pre-defined available volumes with the introduction of the reserve storage pool resource.

Display new pool storage group attributes

View the list of pool storage groups associated with the active configuration

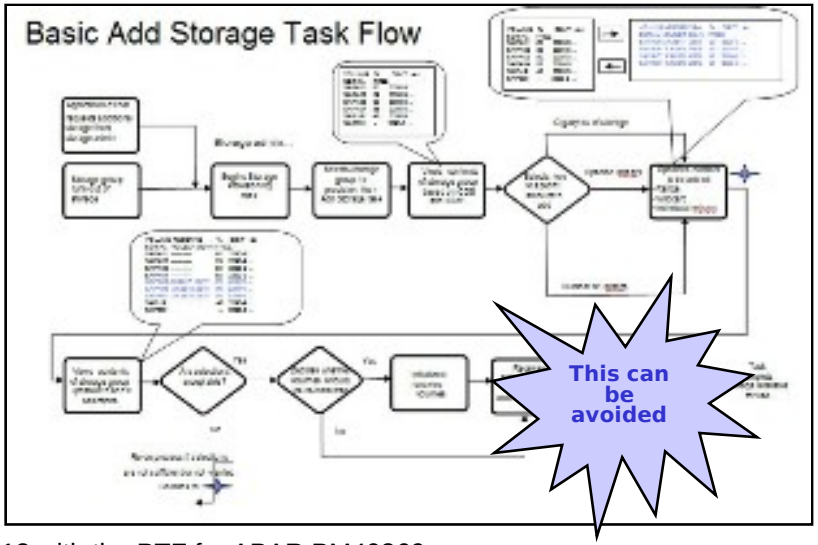
View an alert when the Storage Utilization Notification Threshold is exceeded

Display storage group level attributes

View volumes associated with a storage group

Display volume level attributes

Select the AddStorage Wizard to guide you through steps that can simplify the task of adding storage to a storage group



*Planned to be made available in first quarter 2012 with the PTF for APAR PM40869

z/OSMF Capacity Provisioning (R13)

New! – view the status of z/OS capacity provisioning domains

System z On/Off Capacity on Demand

Ideal if your business has few periodic workload peaks over the year. Potentially:

Save on hardware - No need to purchase hardware, 'you rent it' for the days you need it.

Save on IBM software charges – only pay for software charges for On/Off CoD peak capacity in the month it is incurred*

Also ideal if you own extra hardware capacity (banked capacity). Potentially:

Save on monthly software charges – budget for peak 'banked' capacity and turn off the resources when not needed to possibly gain software savings.

z/OS Capacity Provisioning Manager can automate On/Off CoD for z/OS

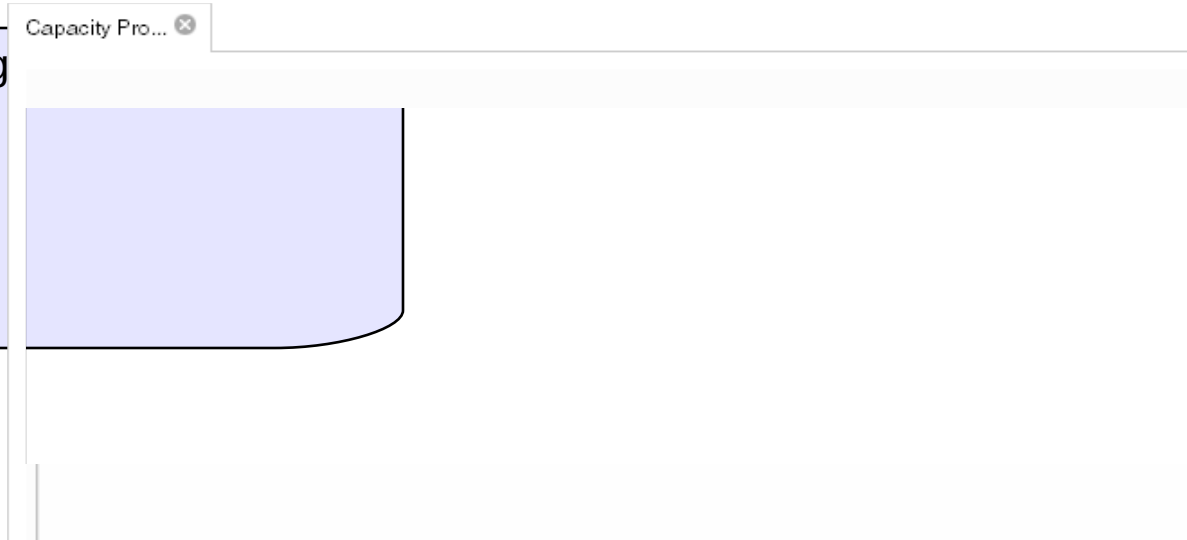
Can manage processing capacity more reliably, more easily, and faster.

What had taken minutes or hours to discover, identify, decide, and resolve, now can be specified to happen automatically in as little as two minutes.

New z/OSMF Capacity Provisioning

Initial phase simplifies the **monitoring** of z/OS CP connections, domains, configurations, and policies

Separate Windows-based tool required for z/OS CP **management** functions.



* Additional terms and conditions apply

New programmatic interface for z/OS batch

Function delivered with z/OSMF R13

A new REST API (HTTP(s)-based) interface to z/OS

Easy programmatic access to the power of z/OS batch capabilities

REST API web services can be used by: web applications (javascript/AJAX, Flex(Flash), etc) and other web service clients, such as Java, PHP, Perl, etc

The REST API web service will connect to both JES2 and JES3, as well as select secondary subsystems

- **Today:**
- **Complex programming**
  - Allocate and open internal reader
  - TSO/ISPF submit,
  - FTP “interface-level2”
  - Java™ z/OS submit interface
- **Security protocol limitations**

- **New option today**
- Any web-based, Java, PHP, Perl application, etc. supporting HTTP
- New RESTful HTTPs based API
- Highly secure, firewall friendly,
- Simplified text-like programming

Break the barriers of batch
Submit JCL, get status, retrieve output files, change jobclass, cancel job, purge job

- z/OS JES2 and z/OS JES3

z/OS R13 - The foundation for modern batch (detail)

- **Expand existing COBOL applications!**
  - The z/OS Batch Runtime environment, provides Java-to-COBOL interoperability, for transactional updates to DB2®, and for sharing database connections between Java and COBOL* (Ideal for processing for computationally intensive programs and extensions)
  - Use JZOS Batch Toolkit for z/OS for efficient use of z/OS System interfaces for Java batch (IBM Java SDKs for z/OS)
  - JAVA! Leverage specialty engines!

- **Simplified programming!**
  - A new REST API allows you to submit z/OS batch jobs and retrieve z/OS batch job information from distributed systems as well as z/OS systems; and is intended to make z/OS batch processing much more accessible to non-z/OS systems**
  - JES2 JCL enhancements provide in-stream data in catalogue procedures, more options on setting job return codes, and the ability to stop and hold a job at the end of a step (not just at the end of the job) give much more granularity and control. Examples of feedback:
  - *"This will improve usability of JCL procedures; for example, by making it possible to put utility control statement in the same member as the rest of the proc. "*
  - *"Support for z/OS JCL in-stream datasets in Procs is a great addition and will be beneficial to a lot of our clients. Job level return codes is also a very nice addition."*
  - *"Being able to stop jobs on step boundaries will be particularly useful for us."*

- **Shorter batch windows**
  - Allow overlapping processing for multi-volume data sets (FREEVOL=EOV, R13)
  - Avoid recalling migrated datasets, just to delete them (IEFBR14, R11)
  - "Pipe" data between two batch jobs to enable these jobs to perform reads and writes concurrently (BatchPipes®, 5655-D45)

- **Real time batch capability**
  - WebSphere Compute Grid delivers a resilient, highly available, secure, and scalable runtime with container-managed services for batch applications
  - Capable of supporting 24x7 batch and OLTP processing, and parallel computing

* Prerequisites:
IBM 31-bit SDK for z/OS, Java Technology Edition, Version 6.0.1 (5655-R31)
DB2 V9.1 for z/OS (5635-DB2) or later with PTFs
IBM Enterprise COBOL for z/OS V4.1 (5655-S71) or later
** REST API is with z/OSMF V1.13

Additional z/OS R13 simplification enhancements

- Health Checker Framework, updates
  - Greater ability to schedule health checks
  - Ability for checks to raise message severity as conditions change
- New health checks:
  - Two new checks for Allocation – intended to warn about potential Allocation deadlock conditions
  - Detects tape library initialization errors with suggestions on how to resolve.
- New Migration checks for:
  - zFS configuration options, new symbolic links, z/OS console mode of operation
- DFSMSrmm™, updates:
  - NEW automatic recovery for missing our out-of-sequence tape volumes. For multivolume data sets, DFSMSrmm will attempt to return the corrected list
  - New ability to specify data sets by expiration date or VRS policy management. Help simplify retention policies, avoid batch VRS policy management, and enable you to determine how long a tape data set will be retained
- DFSMSdfp™ updates:
  - New includes the explanatory text for Open, Close, and End of Volume error conditions along with the error message.
- SMF dump improvement for log streams (SMF dump to log stream introduced with z/OS R9)

z/OS Availability Enhancements

- **Availability enhancements (with R13)**
  - **Avoid JES2 re-starts** with JES2 dynamic spool migration, rapidly discontinue and drain spool volumes quickly
  - **Avoid JES3 re-starts** with JES3 dynamic spool add
  - **Improved channel recovery** - track errors and automatically remove failing paths (on a controller level) faster
  - **zFS internal restart** - automatically recover disabled aggregates in Sysplex aware mode – avoiding lengthy manual system recovery process.
  - **Automatic rerouting and recovery of z/OS system name server resolver**
  - **Concurrent service for DADSM and CVAF and DADSM dynamic exits** – avoid planned outages

z/OS Availability Enhancements

Parallel Sysplex updates for R13

- **Fully shared zFS in a sysplex!**
  - **Between 50% (1.5x) and 150% (2.5x)* I/O performance improvement** for any z/OS UNIX workload using shared zFS in a Parallel Sysplex®. Applications that use zFS, such as z/OS UNIX System Services and WebSphere Application Server for z/OS, are expected to benefit
  - Also: Less-disruptive recovery from most internal zFS problems (for both single system and sysplex-aware systems)
  - Also: A new health check for zFS configuration files

- Simplified software deployment – clone z/OS and software in a sysplex (z/OSMF R13)
- Eliminate the need for WebSphere MQ for SDSF Sysplex environments.
- Automatic monitoring, takeover, and recovery to prevent CSM-constrained conditions
- NEW Easier to use XCF signaling protocol
- Updated volume information on all systems in the sysplex when DFSMSdss™ or DFSMShsm™ Fast Replication Backup and Recovery processing complete
- More responsive to VIPA changes
- Workload balancing of IPsec IKEv2 and IPv4.

* I/O performance improvements measured for fully shared zFS ranged from very small to 900%, with the majority of workload conditions tested falling between 50% and 150%. The actual amount of improvement will depend on the environment (monoplex or Parallel Sysplex) and the type of file processing being done.

z/OS R13 Performance for many key workloads

Between 50% and 150%* I/O performance improvement for any z/OS UNIX workload using shared zFS in a Parallel Sysplex.

- Applications that use zFS, such as z/OS UNIX System Services and WebSphere Application Server for z/OS, are expected to benefit

"We are very committed to running WebSphere Application Server on z/OS, and we are very excited about the new zFS (System z File System) Direct I/O capability in z/OS V1.13. Not only do we anticipate significant performance improvements with this capability, but we also anticipate exploiting the parallel sysplex functionality more easily now. " -- Bertil Andersson, Senior Enterprise IT Architect, Svenska Handelsbanken

- Between 15% and 55%* IEBCOPY performance improvement for traditional workloads
  - Workloads copying PDS to PDS, copying PDS to sequential, or compressing a PDS are expected to benefit
- Potential for shorter batch windows *
  - New JCL FREEVOL=EOV parameter frees up a tape volume when the batch job is done with it.
- Network throughput Enterprise Extender can be improved
  - Using Inbound Workload Queuing (IWQ), available on OSA-Express3 and OSA-Express4S (July 12, 2011)
- Foundation for extreme data handling and simplified storage management
  - Potentially improved I/O performance without the need for application changes for QSAM-, BPAM-, and BSAM-based workloads by leveraging High Performance FICON™. Also, existing EAV functionality is enhanced with support for larger, 1 TB Extended Address Volumes (EAVs).** - IBM statements of direction

* Based on IBM Lab results, your results will vary.
I/O performance improvements measured for fully shared zFS ranged from very small to 900%, with the majority of workload conditions tested falling between 50% and 150%. The actual amount of improvement will depend on the environment (monoplex or Parallel Sysplex) and the type of file processing being done.
IEBCOPY improvement will depend on conditions such as: the amount of data being copied, block size, and type of IEBCOPY operation
Batch concurrency for multi volume tape datasets and will depend on the amount of data being processed

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

Thank You!

Want to know more about any of these topics?

Simon Williams
simonwil@au1.ibm.com
0411 235 382