IBM zEnterprise and Unified Resource Manager enhancements

Table of contents

At a glance

The zEnterprise™ System (zEnterprise) with its zEnterprise BladeCenter® Extension (zBX) infrastructure offers the ability to efficiently deploy and integrate multitier application workloads that span mainframe, DataPower®, POWER7®, and System x® technologies, all under a single management umbrella.

Today, IBM is announcing further enhancements and new capabilities for the zEnterprise that can accelerate the journey to smarter computing:

- HiperSockets™ Completion Queue
- Improved network monitoring and metrics
- HiperSockets integration with the intraensemble data network (IEDN)
- z/VM® V6.2 HiperSockets Virtual Switch Bridge support
- SAP support for System x Linux™ and Microsoft™ Windows™
- Server Application State Protocol (SASP) load balancing
- Support for additional configurations:
  - Additional Fibre Channel optics for BladeCenter chassis
  - Support for BladeCenter HX5 blade with 192 and 256 GB memory
  - Up to 56 System x blades

Overview

The IBM® zEnterprise System (zEnterprise) is optimized for your business needs by offering a revolutionary system design that addresses the complexity and inefficiency in today's multi-architecture data centers. The IBM zEnterprise System takes advantage of the history and functionality of the mainframe, and extends that expertise to distributed technology, bringing computing to the next level, delivering a breakthrough infrastructure.

Today, System z® is expanding the IBM zEnterprise 196 (z196) and IBM zEnterprise 114 (z114), the IBM zEnterprise BladeCenter Extension (zBX), and the IBM zEnterprise Unified Resource Manager (Unified Resource Manager) with new functions and support for additional configurations. These are designed to enhance our zEnterprise offering for more demanding workloads with broader management capabilities.

IBM is a registered trademark of International Business Machines Corporation

Key prerequisites

Refer to the Hardware requirements and Software requirements sections of this announcement.

Planned availability date

- Available now
  - HiperSockets Completion Queue
  - Improved network monitoring and metrics
  - HiperSockets integration with the intraensemble data network (IEDN)
  - SAP support for System x Linux and Microsoft Windows
  - SASP load balancing
  - Additional Fibre Channel optics for BladeCenter chassis
  - Support for HX5 blades with 192 and 256 GB memory
- March 30, 2012
  - Support for 56 System x blades
  - Month Indicator (#0660)
  - Day Indicator (#0661)
  - Hour Indicator (#0662)
  - Minute Indicator (#0663)
- April 13, 2012
  - z/VM V6.2 guest exploitation support for High Performance FICON® for System z (zHPF)
  - z/VM V6.2 HiperSockets Virtual Switch Bridge support
  - z/VM V6.2 support for HiperSockets integration with the IEDN
  - z/VM V6.2 support for improved network monitoring and metrics
- April 24, 2012
  - RPQ for additional Fibre Channel optics for BladeCenter chassis
  - Detach zBX (#0030)
  - Attach zBX (#0031)

Availability of programs with an encryption algorithm in France is subject to French government approval.

Description

The world today is changing and becoming smarter and more technological. Every aspect of life is benefiting from the interconnection of systems and the infusion of intelligence into those systems. Nothing is changing more than information technology, and the opportunities for innovation and smarter computing models have never been greater. To take advantage of these opportunities, new systems will need to talk together, share data better, be easier to manage, and be more cost effective.

The IBM zEnterprise System (zEnterprise) is a perfect fit in this world of smarter computing, being both the next step in the evolution of System z leadership and a premier solution for centrally managed enterprise cloud environments. It is a true hybrid computing system comprised of virtualized heterogeneous resources that are integrated, managed as a single system, and optimized to your business objectives. The zEnterprise includes a central processor complex (CPC), either the IBM zEnterprise 196 (z196) or the IBM zEnterprise 114 (z114), the zEnterprise

BladeCenter Extension (zBX) with its integrated optimizers and/or select IBM blades, and the management fabric that ties it all together, the IBM zEnterprise Unified Resource Manager (IBM Unified Resource Manager).

The zEnterprise ensemble is designed to simplify managing a heterogeneous system infrastructure. It does this through use of:

- Operational controls
- Virtual server lifecycle management
- Hypervisor management
- Energy management
- Network management
- Workload awareness and performance management
- Resource awareness

A zEnterprise node consists of the zEnterprise CPC and the optionally attached zEnterprise BladeCenter Extension (zBX). An ensemble consists of one to eight zEnterprise nodes. If there is more than one node in the ensemble, then it must also include a zBX. The Unified Resource Manager provides advanced end-to-end management capabilities for the diverse systems in the ensemble.

HiperSockets Completion Queue

The HiperSockets Completion Queue function is designed to allow HiperSockets to transfer data synchronously if possible and asynchronously if necessary. This combines ultra-low latency with more tolerance for traffic peaks. HiperSockets Completion Queue is supported by Linux on System z via AF_IUCV socket communication. Refer to the Software requirements section. This fulfills the Statement of Direction for the z114 and z196 as described in Hardware Announcement ZG11-0207, dated July 12, 2011, "IBM zEnterprise 114 - Freedom by design," and in Hardware Announcement ZG11-0193, dated July 12, 2011, "IBM zEnterprise 196 enhancements deliver faster access to data."

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 is now designed to provide improved performance monitoring and collection of metrics from the hypervisors and Layer 2 networking resources associated with the intraensemble data network (IEDN) for IBM POWER7 and System x blades within the zBX. 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.

z/VM V6.2 support is targeted to be available on April 13, 2012, and fulfills the Statement of Direction for z/VM as described in Software Announcement ZP11-0499, dated October 12, 2011, "IBM z/VM V6.2 - Accelerate the journey to smarter computing with multi-system virtualization and virtual server mobility."

HiperSockets integration with the intraensemble data network (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. This fulfills the Statement of Direction for the z114 and z196 as described in Hardware Announcement ZG11-0207, dated July 12, 2011, "IBM zEnterprise 114 - Freedom by design," and in Hardware Announcement ZG11-0193, dated July 12, 2011, "IBM zEnterprise 196 enhancements deliver faster access to data."

HiperSockets Virtual Switch Bridge Support

z/VM V6.2 support is targeted to be available on April 13, 2012 and includes support for link layer bridging of a HiperSockets channel to an external network via a virtual switch (vswitch). z/VM support fulfills the Statement of Direction for z/VM as described in Software Announcement ZP11-0499, dated October 12, 2011, "IBM z/VM V6.2 - Accelerate the journey to smarter computing with multi-system virtualization and virtual server mobility."

Refer to the Software requirements section.

SAP support for System x Linux and Microsoft Windows

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 database 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

For a new build zBX, the number of 8 Gb short wavelength (SX) Fibre Channel optical transceivers (feature number 0615) in each BladeCenter H chassis has been increased from four to 12. This increases the maximum number of Fibre Channel links between a zBX and SAN directors from 32 to 96 and enables the Fibre Channel I/O from the blades in each BladeCenter H chassis to be distributed and load balanced over up to 12 SAN connections.

Each blade still can only connect to the SAN over two links since it only has two Fibre Channel ports. But the number of connections from the set of the blades in the BladeCenter H chassis and the SAN has increased.

All the available SX optics do not need to be utilized. Using at least two per BladeCenter H switch (or four from each chassis) is recommended for redundancy. Other connections may be utilized based on I/O requirements of the workloads running on the blades and the SAN configuration, as appropriate.

For machines shipped prior to December 1, 2011, MES support is available to increase the number of Fibre Channel optical transceivers (feature number 0615) from four to 12 per BladeCenter H chassis. This is planned to be available on April 24, 2012. The MES is based on a per-chassis basis and is available as an RPQ.

Additional System x configurations

In addition to the 64 GB and 128 GB memory supported on the System x Machine Type 7873 (HX5) blades since September 2011, the Unified Resource Manager now supports 192 GB and 256 GB configurations.

IBM plans on supporting 56 System x blades in the zBX on March 30, 2012.

The supported operating systems and configurations are listed in *IBM BladeCenter HX5 (7873) Planning Information for the IBM zEnterprise System,* document number ZSL03128-USEN.

http://www.ibm.com/common/ssi/cgi-bin/ssialias?infotype=SA&subtype=WH&appname=STGE_ZS_ZS_USEN&htmlfid=ZSL03128USEN&attachment=ZSL03128USEN

Accessibility by people with disabilities

A US Section 508 Voluntary Product Accessibility Template (VPAT) containing details on accessibility compliance can be requested at

http://www.ibm.com/able/product_accessibility/index.html

Product positioning

The IBM zEnterprise System takes advantage of all the history and functionality of the mainframe and extends it with distributed technology to bring it to the next level, going beyond other systems that are out there today.

At the core is our mainframe - either the zEnterprise 196 (z196) or zEnterprise 114 (z114). The infrastructure component of the zEnterprise that houses and supports select IBM blade servers and workload optimizers is the IBM zEnterprise BladeCenter Extension (zBX). The zBX is designed with integrated IBM certified components, tested and packaged together by IBM. It is prebuilt and configured for easy integration with the z196 or z114. The zBX houses high-performance specialty processors for specific workloads such as WebSphere® DataPower Integration Appliance XI50 for zEnterprise (DataPower XI50z), and select IBM BladeCenter PS701 Express® blades or IBM BladeCenter HX5 (7873) blades.

A configured zBX can run various types of operating systems including AIX, Linux, and Microsoft Windows, which means zEnterprise can help clients take advantage of data and applications that center around the mainframe. Everything is managed by the IBM zEnterprise Unified Resource Manager - a single interface providing virtualization and management for the blades and hardware control for the mainframe, bringing simplified data center management and extending functionality and performance to your environment.

Today's announcement strengthens the zEnterprise offering by improving the network communications between the zBX and the mainframe with improved latency, new monitoring and management capability, along with support from z/OS. IBM is expanding the System x configurations and operating systems supported by the zBX, which will allow the zEnterprise to be the foundation for a strong hybrid computing infrastructure, such as supporting multi-tier business applications such as SAP or core banking.

Statement of general direction

Removal of support for Ethernet half-duplex operation and 10 Mbps link data rate

The next IBM mainframe product family announced after the IBM zEnterprise 196 (z196) and the IBM zEnterprise 114 (z114) is planned to be the last System z product family to support half-duplex operation and 10 Mbps link data rate for copper Ethernet environments. The 1000BASE-T Ethernet feature will support full-duplex operation and auto-negotiation to 100 or 1000 Mbps exclusively.

IBM's statements regarding its plans, directions, and intent are subject to change or withdrawal without notice at IBM's sole discretion. Information regarding potential future products is intended to outline our general product direction and it should not be relied on in making a purchasing decision. The information mentioned regarding potential future products is not a commitment, promise, or legal obligation to deliver any material, code, or functionality. Information about potential future products may not be incorporated into any contract. The development, release, and timing of any future features or functionality described for our products remains at our sole discretion.

Reference information

For more information on the IBM zEnterprise 196, refer to Hardware Announcement ZG11-0193, dated March 06, 2012, "IBM zEnterprise 196 enhancements deliver faster access to data."

For more information on the IBM zEnterprise 114, refer to Hardware Announcement ZG11-0207, dated March 06, 2012, "IBM zEnterprise 114 - Freedom by design."

For more information on the IBM zEnterprise BladeCenter Extension (zBX) support for System x, refer to Hardware Announcement ZG11-0200, dated March 06, 2012, "IBM zEnterprise BladeCenter Extension support for select IBM BladeCenter HX5 blades."

For more information on the zBX, refer to Hardware Announcement ZG10-0263, dated March 06, 2012, "IBM zEnterprise BladeCenter Extension (zBX)."

For more information on z/VM, refer to Software Announcement ZP11-0499, dated March 06, 2012, "IBM z/VM V6.2 - Accelerate the journey to smarter computing with multi-system virtualization and virtual server mobility."

Product number

Description	Machine type	Model	Feature
IBM zEnterprise 196	2817	M15 M32 M49 M66 M80	
Detach zBX			0030
Attach zBX			0031

Description	Machine type	Model	Feature
IBM zEnterprise 114	2818	M05 M10	
Detach zBX			0030
Attach zBX			0031

Description	Machine type	Model	Feature
Site prep/install support	2819	EEC EBC GEC GBC	
Month Indicator			0660
Day Indicator			0661
Hour Indicator			0662
Minute Indicator			0663

Education support

Visit the following website for additional information

http://www.ibm.com/training/us

Contact your IBM representative for course information.

Publications

The following publications are available now in the *Library* section of Resource Link®:

Title	Order number
zEnterprise BladeCenter Extension Installation Manual for Physical Planning (IMPP) - 2458-002	GC27-2611
zEnterprise 196 System Overview	SA22-1086
zEnterprise 114 System Overview	SA22-1087
zEnterprise System PR/SM™ Planning Guide	SB10-7155

The following publications are updated and will be available at planned availability in the *Library* section of Resource Link:

Title	Order Number
zEnterprise System Introduction to Ensembles	GC27-2609
zEnterprise BladeCenter Extension Installation Manual - 2458-002	GC27-2610
zEnterprise System Ensemble Planning and Configuring Guide	SC27-2608
System z Hardware Management Console Web Services API (Version 2.11.1)	SC27-2616

Publications for zBX can be obtained at Resource Link by accessing the following website

http://www.ibm.com/servers/resourcelink

Using the instructions on the Resource Link panels, obtain a user ID and password. Resource Link has been designed for easy access and navigation.

IBM Redbooks® publications can be found at

http://www.redbooks.ibm.com

Services

Global Technology Services

IBM services include business consulting, outsourcing, hosting services, applications, and other technology management.

These services help you learn about, plan, install, manage, or optimize your IT infrastructure to be an on-demand business. They can help you integrate your high-speed networks, storage systems, application servers, wireless protocols, and an array of platforms, middleware, and communications software for IBM and many non-IBM offerings. IBM is your one-stop shop for IT support needs.

For details on available services, contact your IBM representative or visit

http://www.ibm.com/services/

For details on available IBM Business Continuity and Recovery Services, contact your IBM representative or visit

http://www.ibm.com/services/continuity

For details on education offerings related to specific products, visit

http://www.ibm.com/services/learning/index.html

Select your country, and then select the product as the category.

Technical information

Specified operating environment

Hardware requirements

You should review the PSP buckets for minimum Machine Change Levels (MCLs) and software PTF levels before installing the blades. To support new functions and features, MCLs and PTFs are required.

The IBM zEnterprise 196 (z196) and IBM zEnterprise 114 (z114) require Driver 93 at a minimum to be used with Unified Resource Manager support made available on December 16, 2011, for managing the z/VM V6.2 hypervisor from the Unified Resource Manager.

The IBM zEnterprise 196 (z196) and IBM zEnterprise 114 (z114) require Driver 93 at a minimum to be used with Unified Resource Manager support made available on December 16, 2011, to support the use of AIX 7.1 as an operating system on the POWER7 blades.

Descriptions of the MCLs and PTFs relating to the Unified Resource Manager are available now through Resource Link.

Access Resource Link at

http://www.ibm.com/servers/resourcelink

Select Fixes, Hardware, Exception Letters.
Click on zEnterprise 196 or zEnterprise 114.
Click on Driver xx Customer Exception Letter.

The most recent driver information is at the top of the list.

Peripheral hardware and device attachments

The IBM zEnterprise BladeCenter Extension supports the use of the same set of external devices as the IBM BladeCenter HX5 (7873). More information on the HX5 can be found in Hardware Announcement ZG11-0078, dated April 06, 2011, "IBM BladeCenter HX5 is a scalable blade server designed to provide new levels of utilization, performance, and reliability for compute- and memory-intensive workloads."

Software requirements

Listed are the operating systems and the minimum versions and releases required by IBM zEnterprise BladeCenter Extension related functions and features. Select the releases appropriate to your operating system environments.

Note: Refer to the z/OS, z/VM, z/VSE subsets of the xxxxDEVICE Preventive Service Planning (PSP) bucket prior to installing a 2458.

HiperSockets integration with the IEDN support on a z196 or z114 requires at a minimum:

- z/OS V1.13 with PTFs
- z/VM V6.2 with PTFs planned to be available April 13, 2012

High Performance FICON for System z (zHPF) guest exploitation support on a z196 or z114 requires at a minimum:

- z/VM V6.2 with PTFs planned to be available April 13, 2012

This fulfills the Statement of Direction for z/VM as described in Software Announcement ZP11-0499, dated October 12, 2011, "IBM z/VM V6.2 - Accelerate the journey to smarter computing with multi-system virtualization and virtual server mobility."

HiperSockets Completion Queue support on a z196 or z114 requires at a minimum:

- z/OS V1.13
- Linux on System z distributions:
  - Red Hat Enterprise Linux (RHEL) 6.2
  - Novell SUSE Linux Enterprise Server (SLES) 11 SP2

The System x support for zBX does not require any additional software support on the zEnterprise beyond what is necessary to support the zBX.

A listing of operating systems supported on the System x can be found in

http://www.ibm.com/common/ssi/cgi-bin/ssialias?infotype=SA&subtype=WH&appname=STGE_ZS_ZS_USEN&htmlfid=ZSL03128USEN&attachment=ZSL03128USEN

Further details on IBM zEnterprise Unified Resource Manager support in the z/VM environment can be found at

http://www.vm.ibm.com/service/vmrequrm.html

Planning information

Customer responsibilities

Information on customer responsibilities for site preparation can be found in the Library section of Resource Link at:

http://www.ibm.com/servers/resourcelink

Cabling responsibilities

Fiber optic cables, cable planning, labeling, and placement are all customer responsibilities for new installations and upgrades. Installation Planning Representatives (IPRs) and System Service Representatives (SSRs) will not perform the fiber optic cabling tasks without a services contract.

The following tasks are required to be performed by the customer prior to machine installation:

- All fiber optic cable planning
- All purchasing of correct fiber optic cables
- All routing of fiber optic cables to correct floor cutouts for proper installation to server
- All SAN switches and disk planning
- All fiber optic cable labeling to identify the connection point in the zBX and the connected device

Additional service charges may be incurred during the server installation if the above cabling tasks are not accomplished as required.

For further details also refer to the *Installation Manual for Physical Planning* (IMPP), available on Resource Link.

Note: IBM Site and Facilities Services can satisfy your fiber optic as well as your copper cabling requirements.

Installability

The average installation time for an IBM zEnterprise BladeCenter Extension is approximately 13 installer hours. This does not include planning hours. This assumes the Pre-Installation Configuration Service, a full System Assurance Product Review, and implementation of the cable services have been performed. See your IBM representative for details on these services.

Security, auditability, and control

The IBM zEnterprise BladeCenter Extension uses the security and auditability features and functions of host hardware, host software, and application software.

The customer is responsible for evaluation, selection, and implementation of security features, administrative procedures, and appropriate controls in application systems and communications facilities.

Global Technology Services

Contact your IBM representative for the list of selected services available in your country, either as standard or customized offerings, for the efficient installation, implementation, and/or integration of this product.

IBM Electronic Services

IBM has transformed its delivery of hardware and software support services to help you achieve higher system availability. Electronic Services is a web-enabled solution that offers an exclusive, no-additional-charge enhancement to the service and support available for IBM servers. These services are designed to provide the opportunity for greater system availability with faster problem resolution and preemptive monitoring. Electronic Services comprises two separate, but complementary, elements: Electronic Services news page and Electronic Services Agent.

The Electronic Services news page is a single Internet entry point that replaces the multiple entry points traditionally used to access IBM Internet services and support. The news page enables you to gain easier access to IBM resources for assistance in resolving technical problems.

The Electronic Service Agent™ is no-additional-charge software that resides on your server. It monitors events and transmits system inventory information to IBM on a periodic, client-defined timetable. The Electronic Service Agent automatically reports hardware problems to IBM. Early knowledge about potential problems enables IBM to deliver proactive service that may result in higher system availability and performance. In addition, information collected through the Service Agent is made available to IBM service support representatives when they help answer your questions or diagnose problems. Installation and use of IBM Electronic Service Agent for problem reporting enables IBM to provide better support and service for your IBM server.

To learn how Electronic Services can work for you, visit

http://www.ibm.com/support/electronic

Terms and conditions

Warranty period

Each zBX feature assumes the same warranty or maintenance terms as the machine in which it is installed for the remainder of the warranty or maintenance period for such machine.

IBM intends to provide improved System x blade service characteristics when those blades are installed in a zBX compared to the standard System x service terms, just as IBM intends to deliver the enhanced System z model of service and support for all IBM blade products that are installed in and supported for use in the zBX. The enhanced service and support for System x blades is intended to be available when the blades are installed in a zBX and activated via their unique System z enablement feature number. This service model includes 24x7 on-site support, including FRU replacement by the client's local Service Support Representative (SSR), during the zBX's warranty period. As such, a customer who installs supported IBM blades and acquires the requisite feature number on the zBX will receive the benefits of the zBX warranty service. This practice will not apply if the blade has been removed from the zBX when a warranty service claim is submitted.

Warranty service upgrades and post-warranty IBM maintenance contracts should not be purchased by customers when ordering an IBM blade for installation in a zBX since System z is providing the higher level of service for blades while they are installed in a zBX.

Pricing

For all local charges, contact your IBM representative.

Announcement countries

All European, Middle Eastern, and African countries except Iran, Sudan, and Syria.

Trademarks

zEnterprise, HiperSockets, PR/SM and Electronic Service Agent are trademarks of IBM Corporation in the United States, other countries, or both.

BladeCenter, DataPower, POWER7, System x, z/VM, IBM, System z, FICON, z/VSE, AIX, DB2, z/OS, WebSphere, Express, Resource Link and Redbooks are registered trademarks of IBM Corporation in the United States, other countries, or both.

Linux is a registered trademark of Linus Torvalds in the United States, other countries, or both.

Microsoft and Windows are trademarks of Microsoft Corporation in the United States, other countries, or both.

UNIX is a registered trademark of The Open Group in the United States and other countries.

Other company, product, and service names may be trademarks or service marks of others.

Terms of use

IBM products and services which are announced and available in your country can be ordered under the applicable standard agreements, terms, conditions, and prices in effect at the time. IBM reserves the right to modify or withdraw this announcement at any time without notice. This announcement is provided for your information only. Reference to other products in this announcement does not necessarily imply those products are announced, or intend to be announced, in your country. Additional terms of use are located at

http://www.ibm.com/legal/us/en/

For the most current information regarding IBM products, consult your IBM representative or reseller, or visit the IBM worldwide contacts page

http://www.ibm.com/planetwide/