




A z/OS System Programmer's Guide to Migrating to a New IBM System z10 EC Server



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z/OS Software Positioning for a New z10 EC Server



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Agenda

- IBM System z10 EC Overview
- z10 EC Support by z/OS Releases
- Migration Considerations
 - General
 - Migration Considerations for Selected Functions
 - Exploitation Considerations for Selected Functions
 - Multisystem/Sysplex Considerations
- Migration Paths
 - General Recommendations and Considerations
 - Recommended Paths for Supported z/OS Releases
- Summary
- Backup
 - Cryptographic Support




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A z/OS System Programmer's Guide to Migrating to a New IBM System z10 EC Server

The IBM System z10 Enterprise Class (z10 EC) server is a marriage of evolution and revolution, building on the inherent strengths of the System z platform, delivering new technologies and virtualization that are designed to offer improvements in price / performance for key workloads as well as enabling a new range of hybrid solutions. The z10 EC further extends System z's leadership in key capabilities with the delivery of expanded scalability for growth and large-scale consolidation, availability to help reduce risk and improve flexibility to respond to changing business requirements, and improved security. The z10 EC is at the core of the enhanced System z platform that is designed to deliver technologies that businesses need today along with a foundation to drive future business growth.

The good news is all supported z/OS releases can run on a z10 EC server. Similarly, all supported z/OS and z/OS.e releases can participate in a sysplex that has a CF or operating system image on a z10 EC server. The even better news is that most customers are well positioned to use the new server.

Come hear about how to upgrade to a IBM System z10 EC server! This informative topic will describe the software required to run on a new server (including cryptographic software), compatibility code required on other systems that share resources with systems running on the new server, and migration actions associated with the new software. This topic will be of interest to systems programmers and their managers who will upgrade to a z10 EC server.

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IBM System z10 Enterprise Class Overview

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z/OS Software Positioning for a New z10 EC Server 

System z10 EC New Functions and Features

| | | |
|---|--|---|
| Five New Hardware Models |  <p style="color: white; font-weight: bold; font-size: small;">SOD: PSIFB for z9 EC & BC for non-dedicated CF Models*</p> | 6.0 GBps InfiniBand HCA to I/O Interconnect |
| Faster Processor Unit (PU) | | FICON Enhancements |
| Up to 64 Customer PUs | | SCSI IPL included in Base LIC |
| 36 CP Subcapacity Settings | | OSA-Express3 10 GbE (2Q08)* |
| Star Book Interconnect | | HiperSockets enhancements |
| Up to 1,520 GB Memory | | InfiniBand Coupling Links (2Q08)* |
| Fixed HAS as standard | | STP using InfiniBand (2Q08)* |
| Large Page (1MB) | | Standard ETR Attachment |
| HiperDispatch | | FICON LX Fiber Quick Connect |
| Enhanced CPACF with SHA 512, AES 192 and 256-bit keys | | Power Monitoring Support |
| Hardware Decimal Floating Point | | Scheduled Outage Reduction |
| New Capacity on Demand architecture and enhancements | | Improved RAS |
| Capacity Provisioning | | |

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IBM System z10 Enterprise Class Overview


The IBM System z10 Enterprise Class (z10 EC) is a world class enterprise server designed to meet your business needs. The System z10 EC is built on the inherent strengths of the IBM System z platform and is designed to deliver new technologies and virtualization that provide improvements in price/performance for key new workloads. The System z10 EC extends System z leadership in key capabilities with the delivery of expanded scalability for growth and large scale consolidation, improved security and availability to reduce risk, and just-in-time capacity deployment, helping to respond to changing business requirements. The System z10 EC delivers:

A System Programmer's Guide to Migrating to a New IBM System z10 EC Server

- Improved total system capacity in a 64-way server, offering increased levels of performance and scalability to help enable new business growth
- Quad-core 4.4 GHz processor chips that can help improve the execution of CPU intensive workloads
- Up to 1.5 terabytes of available real memory per server for growing application needs (with up to 1 TB real memory per LPAR).
- Increased scalability with 36 available subcapacity settings
- Just-in-time deployment of capacity resources which can improve flexibility when making temporary or permanent changes. Activation can be further simplified and automated using z/OS Capacity Provisioning.
- New temporary capacity offering Capacity for Planned Event (CPE), a variation of Capacity Back Up (CBU). CPE can be used when capacity is unallocated, but available, and is needed for a short term event.
- A new 16 GB fixed Hardware System Area (HSA) which is managed separately from customer memory. This fixed HSA is designed to improve availability by avoiding outages.
- Memory and books that are interconnected with a point-to-point symmetric multi processor (SMP) network running with an InfiniBand host bus bandwidth at 6 GBps designed to deliver improved performance.
- The new InfiniBand Coupling Links (planned to be available second quarter 2008) provide an additional option for your Parallel Sysplex cluster on System z10 and System z9.
- The new OSA-Express3 10 GbE LR (planned to be available second quarter 2008) with double the port density, increased throughput, and reduced latency.
- HiperSockets Improvements with Multiple Write Facility (planned to be available second quarter 2008) for increased performance and Layer 2 support to host IP and non-IP workloads.
- Encryption accelerator provided on quad-core chip, which is designed to provide high speed cryptography for protecting data in storage. CP Assist for Cryptographic Function (CPACF) offers more protection and security options with Advanced Encryption Standard (AES) 192 and 256 and stronger hash algorithm with Secure Hash Algorithm (SHA-512 and SHA-384)
- HiperDispatch for improved efficiencies between hardware and z/OS operating system
- Hardware Decimal Floating Point on each core on the Processor Unit (PU), which can aid in decimal floating point calculations and is designed to deliver performance improvements and precision in execution
- Large page support (1 megabyte pages)
- Up to 336 FICON Express4 channels
- Fiber Quick Connect (FQC), a fiber harness integrated in the System z10 EC frame for a 'quick' connect to ESCON and FICON LX channels.
- Support for IBM Systems Director Active Energy Manager (AEM) for Linux on System z for a single view of actual energy usage across multiple heterogeneous IBM platforms within the infrastructure. AEM V3.1 is a key component of IBM's Cool Blue portfolio within Project Big Green. (This satisfies the direction announced in Software Announcement 207-289, dated November 13, 2007, for IBM Systems Director Active Energy Manager for POWER, V3.1, which stated: Future System z servers plan to support the monitoring functions of IBM Systems Director Active Energy Manager)


Planned Availability dates:

- Features and functions for the System z10 EC: February 26, 2008
- System z10 EC Models E12, E26, E40, E56 and E64: February 26, 2008
- z990 upgrades to System z10 EC: February 26, 2008
- z9 EC upgrades to System z10 EC: February 26, 2008
- MES features for Models E12, E26, E40, E56 and E64: May 26, 2008
- Model conversions for System z10 EC: May 26, 2008
- InfiniBand coupling links (#0163): May 30, 2008
- System z9 EC InfiniBand coupling links (#0167): May 30, 2008
- System z9 BC InfiniBand coupling links (#0167): May 30, 2008
- OSA-Express3 10 GbE LR (#3362, #3363, #3370): May 30, 2008
- Software support for HiperSockets with Multiple Write Facility: Second quarter, 2008

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IBM System z10 EC Support by z/OS Release

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z/OS Software Positioning for a New z10 EC Server 

IBM System z10 EC Support by z/OS Release

- IBM System z10 EC capabilities differ depending on z/OS release
 - **Support provided for z/OS 1.7 and higher**
- Software requirements differ depending on z/OS release and functions exploited
 - **Support provided via a combination of web deliverables and PTFs**
 - **Required PTFs will be documented in hardware PSP Bucket**
 - z10 EC: Upgrade = 2097DEVICE, Subset = 2097/ZOS
 - **Broken out by:**
 - > z/OS release
 - > **Required and Exploitation**

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z10 EC Support by z/OS Release

The software support for the z10 EC servers, similar to the IBM System z9 EC and z9 BC servers, differs by z/OS release level, is provided by a combination of FMIDs and PTFs. The specific PTFs that need to be installed will depend on the z/OS release. In addition, exploitation of certain functions, specifically some cryptographic functions, and the IBM System z9 Integrated Information Processor and IBM System z10 Integrated Information Processor (zIIP) support, requires the installation of FMIDs. These FMIDs are downloadable Web Deliverables. These Web deliverables are unpriced and can be downloaded at: <http://www.ibm.com/eserver/zseries/zos/downloads>.

z/OS Software Positioning for a New z10 EC Server

z/OS Support Summary

| | z800 | z900 | z890 | z990 | z9 EC | z9 BC | z10 EC | End of Service | Coexists with z/OS | Ship Date |
|-----------|------|------|------|------|-------|-------|--------|----------------|--------------------|-----------|
| z/OS 1.7 | X | X | X | X | X | X | X | 9/08 | 1.9 | 9/05 |
| z/OS 1.8 | X | X | X | X | X | X | X | 9/09* | 1.10* | 9/06 |
| z/OS 1.9 | X | X | X | X | X | X | X | 9/10* | 1.11* | 9/07 |
| z/OS 1.10 | X | X | X | X | X | X | X | 9/11* | 1.12* | 9/08* |

Note: For HiperDispatch, z/OS 1.7 requires the zIIP Web Deliverable to be installed (but not a zIIP processor)

z/OS.e - z800, z890 and z9 BC only. Release 1.8 will be the last release of z/OS.e. Only service-supported releases can coexist in the same sysplex

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z/OS Support Summary

All supported z/OS releases can run on a z10 EC server. Similarly, all supported z/OS and z/OS.e releases can participate in a sysplex that has a CF or operating system image on a z10 EC server. Not all System z10 functions are available in every z/OS release. Other than the minimum support, there is no requirement to install either software or hardware first to exploit a specific function.

z/OS Software Positioning for a New z10 EC Server

z/OS Supported Software Environments for the IBM System z10 EC

- z/OS V1.10
- z/OS V1.9
- z/OS V1.8
- ➔ z/OS V1.7

z/OS 1.6 is not supported on z10 EC

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z/OS Software Positioning for a New z10 EC Server

z/OS 1.7 Software Support for IBM System z10 EC

- Provides same functionality as that on the System z9 EC
 - Multiple Subchannel Sets support
 - FICON Express4 (CHPID type FC)
 - OSA-Express2 Gigabit Ethernet, 1000BASE-T Ethernet, and 10 Gigabit Ethernet
 - IBM System z9 Integrated Information Processor (zIIP) Support
 - With zIIP Web Deliverable installed
 - Server Time Protocol (STP)
 - CFCC Level 15
- Plus
 - OSA-Express3 10 Gigabit Ethernet (2nd quarter, 2008)
 - 65535 MP Factors
 - Crypto Toleration (CP Assist for Cryptographic Functions and Configurable Crypto Express2, Key management for remote loading of ATM and Point of Sale (POS) keys,...)
 - HiperDispatch
 - Requires zIIP Web Deliverable to be installed (but not a zIIP processor)
 - Parallel Sysplex InfiniBand (PSIFB) Coupling Links (2nd quarter, 2008)
 - Decimal Floating Point
 - High Level Assembler support only
 - Crypto Exploitation (Crypto Advanced Encryption Standard (AES) for 256-bit keys SHA-384 and 512 bit for message digest support, RSA keys up to 4096 bits in Length,...)
 - Usage Report Program (IFAURP) Support

z/OS.e 1.7 is not supported on z10 EC

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z/OS V1.7 Software Support for IBM System z10 EC Servers

OSA-Express3 10 GbE LR: The OSA-Express3 features (Gigabit Ethernet SX and LX, 10 Gigabit Ethernet LR) provide connectivity to clients and servers using 1 Gbps or 10 Gbps local area networks. They are System z10 EC integrated hardware features installed in an I/O cage, making them integral components of the server I/O subsystem. This new generation is designed to deliver reduced latency, improved throughput, and double the port density.

OSA-Express3 10 Gigabit Ethernet (GbE) has been designed to increase throughput for standard frames (1492 byte) and jumbo frames (8992 byte) to help satisfy the bandwidth requirements of your applications. This increase in performance (compared to OSA-Express2 10 GbE) has been achieved through an enhancement to the architecture that supports direct host memory access by using a data router, eliminating store and forward" delays. The OSA-Express3 10 GbE has been designed with two PCI adapters, each with one port. Doubling the port density on a single feature helps to reduce the number of I/O slots required for high-speed connectivity to the Local Area Network (LAN). Each port continues to be defined as CHPID type OSD, supporting the Queued Direct Input/Output (QDIO) architecture for high-speed TCP/IP communication.

The OSA-Express3 10 GbE feature continues to be Long Reach (LR) supporting the 9 micron single mode fiber optic cabling environment. The connector is **new**; it is now the small form factor, LC Duplex connector. Previously the SC Duplex connector was supported. The LC Duplex connector is common with FICON, ISC-3, and OSA-Express2 Gigabit Ethernet LX and SX.

OSA-Express3 10 GbE LR is exclusive to z10 EC and supports CHPID type OSD. It is supported by z/OS, z/VM, z/VSE, z/TPF, and Linux on System z.

Preview - OSA-Express3 support for OSA-Express for NCP: OSA-Express for NCP, Channel path identifier (CHPID) type OSN, will be made available for use with the OSA-Express3 GbE features. This CHPID type is used for LPAR-to-LPAR connectivity from operating systems that support Channel Data Link Control (CDLC) to IBM Communication Controller for Linux (CCL); supports Network Control Program (NCP) functions. OSA-Express for NCP is currently supported on the OSA-Express2 GbE features in the z/OS, z/VM, z/VSE, TPF, z/TPF, and Linux on System z environments

65535 MP Factors: The z/OS System Resources Manager (SRM) uses the MP factors to calculate the machine capacity. The MP factor table keeps scaling information for multi processor systems. A system with two processors is not quite twice as fast as a single processor system. The processing speed decreases with the amount of processors. Each entry in the MP table stands for an n-way system. Originally, a percent value with the range from 0 to 100 was used. The first value was 100 (hard coded) because a 1 way system has always 100% of single processor speed. All other values are provided by the hardware in the MP factor table. As the number of processors has grown, the granularity of 100 was not good enough anymore and the range was changed from 0-100 to 0-255 in z/OS V1.6. With the new z10 EC, 1/255 CP has become an insufficiently granular increment to effectively manage n-way systems. Thus, 65,535 (64K) MP Factors are now supported to improve the accuracy of the MP Factors selected by SRM to manage n-way systems.

Cryptographic Toleration Support

CP Assist for Cryptographic Function (CPACF): CPACF supports clear-key encryption. All CPACF functions can be invoked by problem state instructions defined by an extension of System z architecture. The function is activated using a no-charge enablement feature (#3863) and offers the following on every CPACF that is shared between two Processor Units (PUs) and designated as CPs and/or Integrated Facility for Linux (IFL):

- Data Encryption Standard (DES)
- Triple Data Encryption Standard (TDES)
- Advanced Encryption Standard (AES) for 128-bit keys
- Secure Hash Algorithm, SHA-1, SHA-224 and SHA-256
- Pseudo Random Number Generation (PRNG)

Configurable Crypto Express2: The Crypto Express2 feature has two PCI-X adapters. Each of the PCI-X adapters can be defined as either a **Coprocessor** or an **Accelerator**.

Crypto Express2 Coprocessor - for secure-key encrypted transactions (default) is:

- Designed to support security-rich cryptographic functions, use of secure encrypted key values, and User Defined Extensions (UDX)
- Designed for Federal Information Processing Standard (FIPS) 140-2 Level 4 certification

Crypto Express2 Accelerator - for Secure Sockets Layer (SSL) acceleration:

- Is designed to support clear-key RSA operations
- Offloads compute-intensive RSA public-key and private-key cryptographic operations employed in the SSL protocol

Crypto Express2 features can be carried forward on an upgrade to the new System z10 EC, so users may continue to take advantage of the SSL performance and the configuration capability.

The configurable Crypto Express2 feature is supported by z/OS, z/VM, z/VSE, and Linux on System z. z/VSE offers support for clear-key SSL transactions only. Current versions of z/OS, z/VM, and Linux on System z offer support for both clear-key and secure-key operations.

Key management for remote loading of ATM and Point of Sale (POS) keys. The elimination of manual key entry is designed to reduce downtime due to key entry errors, service calls, and key management costs.

Improved key exchange with non-CCA cryptographic systems. New features added to IBM Common Cryptographic Architecture (CCA) are designed to enhance the ability to exchange keys between CCA systems, and systems that do not use control vectors by allowing the CCA system owner to define permitted types of key import and export while preventing uncontrolled key exchange that can open the system to an increased threat of attack.

These are supported by z/OS and by z/VM for guest exploitation.

Support for ISO 16609 CBC Mode T-DES Message Authentication (MAC) requirements: ISO 16609 CBC Mode T-DES MAC is accessible through ICSF function calls made in the PCI-X Cryptographic Adapter segment 3 Common Cryptographic Architecture (CCA) code.

This is supported by z/OS and by z/VM for guest exploitation.

HiperDispatch: A z10 EC exclusive, HiperDispatch represents a cooperative effort between the z/OS operating system and the z10 EC hardware and is intended to provide improved efficiencies in both the hardware and the software in the following ways:

- Work may be dispatched across fewer logical processors therefore reducing the multi-processor (MP) effects and lowering the interference among multiple partitions
- Specific z/OS tasks may be dispatched to a small subset of logical processors which Processor Resource/Systems Manager (PR/SM) will tie to the same physical processors, thus improving the hardware cache re-use and locality of reference characteristics such as reducing the rate of cross-book communication.

Refer to white paper WP101229 on the Techdocs web site (www.ibm.com/support/techdocs) to understand the benefits of HiperDispatch.

InfiniBand Coupling Links for Parallel Sysplex: InfiniBand coupling links provide an additional option for your Parallel Sysplex cluster on System z10 and System z9. When used in the data center, InfiniBand coupling links are designed to complement but may not replace Integrated Cluster Bus-4 (ICB-4) and InterSystem Channel-3 (ISC-3) links. If ISC-3 links are used within the data center, InfiniBand coupling links may be an alternative.

Coupling facilities can now be separated by up to 150 meters (492 feet).

InfiniBand coupling links use fiber optic cabling containing 12 pairs (12x) of fiber compared to one pair (1x) of fiber used with ISC-3 fiber optic cabling. InfiniBand coupling links support double data rate (DDR) when a z10 EC is communicating with another z10 EC. InfiniBand coupling links support single data rate (SDR) when a z10 EC is communicating with a z9 EC dedicated CF or z9 BC Model S07 dedicated CF. When the InfiniBand coupling link is z10 EC-to-z10 EC, the link auto-negotiates to 6 GBps. A z10 EC system auto-negotiates to 3 GBps when connected to a z9 EC or z9 BC dedicated coupling facility.

Note: The InfiniBand link data rate of 6 GBps or 3 GBps does not represent the performance of the link. The actual performance is dependent upon many factors including latency through the adapters, cable lengths, and the type of workload. With InfiniBand coupling links, while the link data rate may be higher than that of ICB, the service times of coupling operations are greater, and the actual throughput may be less than with ICB links.

Refer to the *Coupling Facility Configuration Options* whitepaper for a more specific explanation of when to continue using the current ICB technology versus migrating to InfiniBand coupling links. The whitepaper is available at: <http://www.ibm.com/systems/z/advantages/pso/whitepaper.html>

A new infrastructure was created to support an InfiniBand coupling link environment. Host channel adapter optical (HCA-O) fanouts are being introduced for z10 EC and for z9 EC and z9 BC dedicated coupling facilities. The HCA-O fanouts, with two ports per fanout, reside on the front of each processor book. The fiber optic cables are plugged directly into the front of the HCA-O fanouts.

- HCA2-O fanout for z10 EC
- HCA1-O fanout for z9 EC and z9 BC Model S07 dedicated coupling facilities

There is a new physical definition to associate with a channel path identifier with an adapter identification. Unlike channels installed in an I/O cage, which are identified by a physical channel path identifier (PCHID) number related to their physical location, HCA-O fanouts and ports are identified by an adapter identification (AID) value which is determined by its physical location. The AID must be used to assign a CHPID to the fanout in the hardware configuration definition. The CHPID assignment is done by associating the CHPID to an AID and port. The AID assigned to a fanout can be found in the PCHID report provided for each new server or for upgrades on z10 EC, z9 EC, and z9 BC.

There is also a new CHPID type CIB (coupling using InfiniBand). CHPID type CIB is common for z10 EC, z9 EC, and z9 BC.

On z10 EC, z9 EC, and z9 BC the design allows up to 16 CHPIDs to be defined across the two ports on each HCA-O fanout. This can reduce the number of coupling links; physical coupling links to be shared by multiple sysplexes. For example, this capability allows for one CHPID to be directed to one coupling facility and a second CHPID to be directed to a separate coupling facility on the same target server,

using the same port. An increased number of CHPIDs per physical link can help to facilitate consolidation of ISC-3 links onto InfiniBand coupling links.

InfiniBand coupling links can also be used to exchange timekeeping messages for Server Time Protocol (STP).

You can choose the coupling links that best suit your business needs, IC, ICB, IFB, or ISC-3.

Hardware Decimal Floating Point (Focused performance boost)

Recognizing that speed and precision in numerical computing are essential, with the introduction of z10 EC each core on the PU has its own hardware decimal floating point unit, which is designed to improve performance of decimal floating point over that provided by System z9.

Decimal calculations are often used in financial applications and those done using other floating point facilities have typically been performed by software through the use of libraries. With a hardware decimal floating point unit, some of these calculations may be done directly and accelerated.

Software support for hardware decimal floating point on a z10 EC server is provided in several programming languages. On z/OS V1.7 support is provided in Assembler Language in Release 5 of High Level Assembler. On z/OS V1.8 and higher support is provided in Language Environment to support additional programming languages including XL C/C++ (if you use the z/OS V1.9 XL C/C++ compiler on z/OS V1.8, following the instructions that are available at

<http://www.ibm.com/software/awdtools/czos/>. Decimal Floating Point data and instructions are also supported in Enterprise PL/I V3.7 and resulting programs can be debugged by Debug Tool V8.1. Java applications, which make use of the BigDecimal Class Library, will automatically begin using the Hardware Decimal Floating Point instructions when running on a z10 EC server. Support for Decimal Floating Point data types is also provided in SQL as provided in DB2 Version 9.

Hardware Decimal Floating Point Support is by z/OS and z/VM.

Cryptographic Exploitation Support

Enhancements to CP Assist for Cryptographic Function (CPACF): CPACF has been enhanced to include support of the following on CPs and IFLs:

- Advanced Encryption Standard (AES) for 192-bit keys and 256-bit keys
- SHA-384 and SHA-512 bit for message digest (SHA-1, SHA-256, and SHA-512 are shipped enabled and do not require the enablement feature)

Support for CPACF is also available using the Integrated Cryptographic Service Facility (ICSF). ICSF is a component of z/OS, and is designed to transparently use the available cryptographic functions, whether CPACF or Crypto Express2, to balance the workload and help address the bandwidth requirements of your applications.

The enhancements to CPACF are exclusive to the System z10 EC and supported by z/OS, z/VM, z/VSE, and Linux on System z.

Support for RSA keys up to 4096 bits: The RSA services in the CCA API are extended to support RSA keys with modulus lengths up to 4096 bits. The services affected include key generation, RSA-based key management, digital signatures, and other functions related to these.

Refer to the ICSF Application Programmers Guide, SA22-7522, for additional details

Dynamically add crypto to a logical partition. Today, users can preplan the addition of Crypto Express2 features to a logical partition (LP) by using the Crypto page in the image profile to define the Cryptographic Candidate List, Cryptographic Online List, and Usage and Control Domain Indexes in advance of crypto hardware installation.

With the change to dynamically add crypto to a logical partition, changes to image profiles, to support Crypto Express2 features, are available without outage to the logical partition. Users can also dynamically delete or move Crypto Express2 features. Pre-planning is no longer required.

This enhancement is supported by z/OS, z/VM for guest exploitation, and Linux on System z.

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| z/OS 1.7 Software Support for IBM System z10 EC | | | | | | | | | | | | | | | | | | | | |
| Release | z10 EC PSP Bucket – 2097DEVICE 2097/ZOS | | | | | | | | | | | | | | | | | | | |
| | Included in Base z/OS Support | | | | | | | | | | Explicit z/OS Support | | | | | | | | | |
| | z10 EC GA1 Support | OSA-Express 3 10 GbE* | 65535 MP Factors | New zArchitecture Instructions | Crypto Toleration | HiperDispatch | Large Memory > 128GB (1 TB) | C/C++ ARCH(8) and TUNE(8) | Greater than 64 CPUs (64) | RMF FICON Enhancements | PS/IB Coupling Links* | Decimal Floating Point** | Crypto Exploitation | Large Page Support | Capacity Provisioning | HiperSockets Multiple Write Facility* | OSA-Express3 Double Port Density* | Usage Report Program | Layer 3 VMAC Support | Service Aids Support for Large Dumps |
| z/OS 1.7 | P | B | P | P | W P | N | N | N | N | N | P | P | W | N | N | N | N | P | N | N |
| z/OS 1.7 w/ZIIP | P | B | P | P | W P | W P | N | N | N | N | P | P | W | N | N | N | N | P | N | N |

Note: The IBM System z9 Integrated Information Processor (IBM zIIP) Web Deliverable is required for HiperDispatch Support
 ▶ A zIIP Processor is NOT required

Legend
 B – FMID in Base product (assumes service identified in z9 EC PSP Bucket is installed)
 W – FMIDs shipped in a Web Deliverable
 P – PTFs required
 N – Not Supported

* Became available May 30 2008 ** High Level Assembler Support only

z/OS V1.7 Software Support for IBM System z10 EC Servers

The following support is required to run this z/OS V1.7 on a z10 EC processor. It is documented in the z10 EC PSP bucket: upgrade 2097DEVICE, subset 2097/ZOS. If you are skipping generations of hardware, then you will need to review the PSP buckets for the servers skipped (Upgrade: 2094DEVICE, subset 2094/ZOS if you are not already on a z9 EC or z9 BC server, and Upgrade 2084DEVICE, subset 2084/ZOS if you are not already on a z990 or z890)

To use HiperDispatch, you must download and install the *IBM zIIP Support for z/OS and z/OS.e V1R6/R7* Web deliverable (which is FMID JBB772S for z/OS V1R7), as well as the PTFs listed in the z10 EC PSP bucket. Note: While the web deliverable and PTFs are required for HiperDispatch, a zIIP engine does NOT have to be defined for that LPAR.

If you require Crypto Express2 compatibility support when a Crypto Express2 PCI-X adapter is configured as a coprocessor on the z10 EC, you must have minimally the PTFs listed in the PSP bucket installed.

If you require CP Assist for Cryptographic Function (CPACF) (which are AES, PRNG, SHA-256), or if you require Crypto Express2 exploitation when a Crypto Express2 PCI-X adapter is configured as an accelerator or a coprocessor on the z10 EC, you must minimally have installed the Cryptographic Support for z/OS V1R6/R7 and z/OS.e V1R6/R7 Web download (no longer available), the Enhancements to Cryptographic Support for z/OS and z/OS V1R6/R7 Web deliverable (no longer available), or the Cryptographic Support for z/OS V1R7-V1R9 and z/OS.e V1R7-V1R8 Web deliverable. You should also install the PTFs identified in the program directory that comes with the Web deliverable and the PTFs that are recommended in the appropriate ICSF PSP bucket.

If you require support for support for Remote Key Loading for ATMs and point of sale devices, and implementation of ISO 16609 CBC Mode TDES MAC you must install the Enhancements to Cryptographic Support for z/OS V1R6/7 and z/OS.e V1R6/7 Web Deliverable (no longer available), or

A System Programmer's Guide to Migrating to a New IBM System z10 EC Server

with the Cryptographic Support for z/OS V1R7-V1R9 and z/OS.e V1R7-V1R8 Web deliverable. You should also install the PTFs identified in the program directory that comes with the Web deliverable and the PTFs that are recommended in the appropriate ICSF PSP bucket.

If you require enhancements to CP Assist for Cryptographic Function (CPACF) which includes Crypto Advanced Encryption Standard (AES) for 256-bit keys SHA-384 and 512 bit for message digest support, ISO Format 3 PIN blocks, support for RSA keys up to 4096 bits, Random Number Generator Long, or enhanced TKE Auditing, then you must install the Cryptographic Support for z/OS V1R7-V1R9 and z/OS.e V1R7-V1R8 Web Deliverable. You should also install the PTFs identified in the program directory that comes with the Web deliverable and the PTFs that are recommended in the appropriate ICSF PSP bucket.


The following APARs/PTFs are required to run z/OS V1.7, using these functions, on a z10 EC server.

| Function | FMID | APAR | PTF | Component | |
|---|----------------|------------|---|-------------------------------------|-----------------------|
| Base z10 EC Support Includes <ul style="list-style-type: none"> • Compatibility • OSA-Express3 10GbE • 65535 MP Factors • New zArchitecture Instructions • Crypto Toleration • HiperDispatch | HIO1104 | OA22001 | UA90380 | IOCP | |
| | HCS7720 | OA16525 | UA90391 | HCD | |
| | JCS772J | OA24437 | UA40703 | | |
| | | OA16525 | UA90393 | | |
| | | OA24437 | UA40706 | | |
| | HCM1710 | IO05753 | UO90001 | HCM | |
| | EER3500 | IO08254 | UO00715 | EREP | |
| | HMQ4150 | PK58463 | UK33787 | HLASM | |
| | HRM7720 | OA12774 | UA39254 | RMF | |
| | | OA24074 | UA40030 | | |
| | | OA24589 | UA40546 | | |
| | | OA24602 | UA40477 | | |
| | JRM772J | OA24074 | UA40052 | | |
| | | HBB7720 | OA20135 | UA38880 | BCP (WLM/SRM) |
| | | | OA22675 | UA39409 | BCP (HDW Performance) |
| OA23719 | UA39450 | | BCP (Reconfig) | | |
| JBB772S | N/A | N/A | zIIP Web Deliverable | | |
| | OA20135 | UA38945 | BCP (WLM/SRM) | | |
| | OA20418 | UA39343 | BCP (WLM/SRM) | | |
| | OA20633 | UA39387 | BCP (Supervisor) | | |
| | OA22675 | UA39412 | BCP (HDW Performance) | | |
| | OA23333 | UA39387 | BCP (Supervisor) | | |
| | OA24031 | UA39921 | BCP (WLM/SRM) | | |
| OA24322 | UA40000 | BCP | | | |
| HCR7720 | OA11946 | UA20686 | ICSF | | |
| HKM5410 | OA23223 | UA39284 | OMEGAMON XE for z/OS V4R1M0 | | |
| N/A, distributed platform deliverable, Interim Fix | OA23223 | N/A | OMEGAMON XE for z/OS V4R1M0 4.1.0-TIV-KM5-IF0005 | | |
| HOGI400 | OA23232 | UA40565 | OSA/SF | | |
| Crypto Exploitation | HCR7750 | N/A | N/A | ICSF Web Deliverable | |
| Crypto (ICSF) Web Deliverable (HCR7750) Toleration | HCR7740 | OA21807 | UA37971 | ICSF (z/OS V1.9) | |
| | HCR7731 | | UA37970 | ICSF (z/OS V1.8 or Web Deliverable) | |
| | HCR7730 | | UA37969 | ICSF Web Deliverable | |
| | HCR7720 | | UA37968 | ICSF (z/OS V1.7) | |


A System Programmer's Guide to Migrating to a New IBM System z10 EC Server

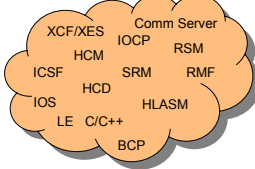
| Function | FMID | APAR | PTF | Component |
|-------------------------------|---------|---------|---------|--------------|
| PSIFB Coupling Links | HBB7720 | OA17177 | UA41131 | BCP (IOS) |
| | | OA17936 | UA41145 | BCP (XES) |
| | JBB772J | OA17177 | UA41136 | BCP (IOS) |
| Decimal Floating Point | HMQ4150 | PK18170 | UK14321 | HLASM |
| Usage Report Program (IFAURP) | HBB7720 | OA24178 | UA40790 | BCP (IFAURP) |

Note: The OMEGAMON PTFs are only needed if you have those IBM OMEGAMON products installed. Similarly, you only need to install the PTFs for JBB772S, if you have the *IBM zIIP Support for z/OS and z/OS.e V1R6/R7* Web deliverable installed. However, as mentioned earlier, that web deliverable is required to use HiperDispatch on z/OS V1.7.

z/OS Software Positioning for a New z10 EC Server 


z/OS Supported Software Environments for the IBM System z10 EC

- z/OS V1.10
- z/OS V1.9
-  z/OS V1.8
- z/OS V1.7




z/OS 1.6 is not supported on z10 EC

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z/OS Software Positioning for a New z10 EC Server 

z/OS 1.8 Software Support for IBM System z10 EC

- All functions listed for z/OS 1.7
- Plus
 - Large Memory > 128GB (1 TB)
 - VMAC Support for OSA Express2 and OSA Express3 when configured as CHPID type OSD (QDIO)
 - Service Aids Support of Large Dumps
 - Additional support for Decimal Floating Point
 - High Level Assembler, LE, DBX, and CDA RTLE
 - XL C/C++
 - You need to use the z/OS V1.9 XL C/C++ compiler on z/OS V1.8
 - Instructions are available at <http://www.ibm.com/software/awdtools/czos/>
 - Once you do that, you will also be able
 - > To use ARCH(7) or ARCH(8) to exploit decimal floating point
 - > To use ARCH(8)/TUNE(8) on z/OS V1.8 to generate code to use instructions only available on a z10 EC service and optimize the code for a z10 EC server.



z/OS.e 1.8 is not supported on z10 EC

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z/OS V1.8 Software Support for IBM System z10 EC Servers

Large Memory

z/OS supports up to 4 TB of real memory on a single z/OS image (as of z/OS 1.8). Since this limit is higher than the current hardware supports, the actual limit will be dependent on the server that you run on. You can have up to 1 TB of real memory on a single z/OS image for the z10 EC server, up to 512

A System Programmer's Guide to Migrating to a New IBM System z10 EC Server

GB of real memory on a single z/OS image on IBM System z9 servers, and up to 256 GB on z990 servers.

Additional Support for Decimal Floating Point

Support provided in Language Environment, the Runtime Library Extensions, z/OS UNIX dbx, and XL C/C++ to enable C/C++ programs to use ARCH(7) or ARCH(8) to exploit hardware decimal floating point on z/OS V1.8. However, **to use the new decimal floating point instructions you will need to use the z/OS V1.9 XL C/C++ compiler on z/OS V1.8.** Instructions are available at <http://www.ibm.com/software/awdtools/czos/>. Once you do that, you will also be able to use ARCH(7) or ARCH(8) to exploit decimal floating point, as well as use ARCH(8)/TUNE(8) on z/OS V1.8 to generate code to use instructions only available on a z10 EC service and optimize the code for a z10 EC server.

Please note: **z/OS V1.8 XL C/C++ does not support Decimal Floating Point Math, although it does support a smaller subset of ARCH(7).**

| z/OS Software Positioning for a New z10 EC Server | | | | | | | | | | | | | | | | | | | | |
|---|---|----------------------|------------------|--------------------------------|-------------------|---------------|-----------------------------|---------------------------|--------------------------|------------------------|-----------------------|--------------------------|---------------------|--------------------|-----------------------|---------------------------------------|----------------------------------|----------------------|----------------------|--------------------------------------|
| z/OS 1.8 Software Support for IBM System z10 EC | | | | | | | | | | | | | | | | | | | | |
| Release | z10 EC PSP Bucket – 2097DEVICE 2097/ZOS | | | | | | | | | | | | | | | | | | | |
| | Included in Base z/OS Support | | | | | | | Explicit z/OS Support | | | | | | | | | | | | |
| | z10 EC GA1 Support | OSA-Express3 10 GbE* | 65535 MF Factors | New zArchitecture Instructions | Crypto Toleration | HiperDispatch | Large Memory > 128GB (1 TB) | C/C++ ARCH(8) and TUNE(8) | Greater than 54 Cps (64) | RMF/FICON Enhancements | PSIFB Coupling Links* | Decimal Floating Point** | Crypto Exploitation | Large Page Support | Capacity Provisioning | HiperSockets Multiple Write Facility* | OSA-Express3 Double Port Density | Usage Report Program | Layer 3 VMAC Support | Service Aids Support for Large Dumps |
| z/OS 1.8 | P | B | P | P | B | P | B | W | N | N | P | W | W | N | N | N | N | P | P | P |

Legend
 B – FMID in Base product (assumes service identified in z9 EC PSP Bucket is installed)
 W – FMIDs shipped in a Web Deliverable
 P – PTFs required
 N – Not Supported

* Became available May 30, 2008 ** High Level Assembler Support, LE, DBX, and CDA RTLE

z/OS V1.8 Software Support for IBM System z10 EC Servers

The following support is required to run z/OS V1.8 on a z10 EC processor. It is documented in the z10 EC PSP bucket: upgrade 2097DEVICE, subset 2097/ZOS. If you are skipping generations of hardware, then you will need to review the PSP buckets for the servers skipped (Upgrade: 2094DEVICE, subset 2094/ZOS if you are not already on a z9 EC or z9 BC server, and Upgrade 2084DEVICE, subset 2084/ZOS if you are not already on a z990 or z890)

If you require Crypto Advanced Encryption Standard (AES) for 256-bit keys SHA-384 and 512 bit for message digest support, ISO Format 3 PIN blocks, support for RSA keys up to 4096 bits, Random Number Generator Long, or enhanced TKE Auditing, then you must install the Cryptographic Support for z/OS V1R7-V1R9 and z/OS.e V1R7-V1R8 Web Deliverable, as well as the PTFs identified in the

A System Programmer's Guide to Migrating to a New IBM System z10 EC Server

program directory that comes with the Web deliverable and the PTFs that are recommended in the appropriate ICSF PSP bucket.


The following APARs/PTFs are required to run z/OS V1.8, using these functions, on a z10 EC server.

| Function | FMID | APAR | PTF | Component |
|---|--|------------|--|-------------------------------------|
| Base z10 EC Support Includes <ul style="list-style-type: none"> • Compatibility • OSA-Express3 10GbE Base z10 EC Support (continued) <ul style="list-style-type: none"> • 65535 MP Factors • New zArchitecture Instructions • Crypto Toleration • HiperDispatch • Large Memory >128 GB (1TB) | HIO1104 | OA22001 | UA90380 | IOCP |
| | HCS7720 | OA16525 | UA90391 | HCD |
| | JCS772J | OA24437 | UA40703 | |
| | | OA16525 | UA90393 | |
| | | OA24437 | UA40706 | |
| | HCM1810 | IO05753 | UO90002 | HCM |
| | EER3500 | IO08254 | UO00715 | EREP |
| | HMQ4150 | PK58463 | UK33787 | HLASM |
| | HRM7730 | OA12774 | UA39277 | RMF |
| | | OA24074 | UA40031 | |
| | | OA24602 | UA40478 | |
| | JRM773J | OA24074 | UA40053 | |
| | HVT6180 | OA23066 | UA37871 | Communications Server SNA |
| | HBB7730 | OA20135 | UA38881 | BCP (WLM/SRM) |
| | | OA20418 | UA39308 | BCP (WLM/SRM) |
| | OA20633 | UA39385 | BCP (Supervisor) | |
| | OA22675 | UA39410 | BCP (HDW Performance) | |
| | OA23333 | UA39385 | BCP (Supervisor) | |
| | OA23719 | UA39451 | BCP (Reconfig) | |
| | OA24031 | UA39920 | BCP (WLM/SRM) | |
| | OA24322 | UA39998 | BCP | |
| JBB773J | OA20418 | UA39344 | BCP (WLM/SRM) | |
| | OA20633 | UA39388 | BCP (Supervisor) | |
| HKM5410 | OA23223 | UA39284 | OMEGAMON XE for z/OS V4R1M0 | |
| N/A, distributed platform deliverable, Interim Fix | OA23223 | N/A | OMEGAMON XE for z/OS V4R1M0 4.1.0-TIV-KM5-IF0005 | |
| HOGI400 | OA23232 | UA40565 | OSA/SF | |
| C/C++ ARCH(8) and TUNE(8) | You will need to use the z/OS V1.9 XL C/C++ compiler on z/OS V1.8. Instructions are available at http://www.ibm.com/software/awdtools/czos/ . | | | |
| PSIFB Coupling Links | HBB7730 | OA17177 | UA41132 | BCP (IOS) |
| | | OA17936 | UA41146 | BCP (XES) |
| | JBB773J | OA17177 | UA41137 | BCP (IOS) |
| Crypto Exploitation | HCR7750 | N/A | N/A | ICSF Web Deliverable |
| Crypto (ICSF) Web Deliverable (HCR7750) Toleration | HCR7740 | OA21807 | UA37971 | ICSF (z/OS V1.9) |
| | HCR7731 | | UA37970 | ICSF (z/OS V1.8 or Web Deliverable) |
| | HCR7730 | | UA37969 | ICSF Web Deliverable |
| | HCR7720 | | UA37968 | ICSF (z/OS V1.7) |
| Users of System SSL that want to exploit SHA-2 based certificates and algorithms | HCPT380 | OA22451 | UA40108 | System SSL |
| | JCPT38J | OA25022 | UA41070 | |
| | | OA22451 | UA40109 | |


A System Programmer's Guide to Migrating to a New IBM System z10 EC Server

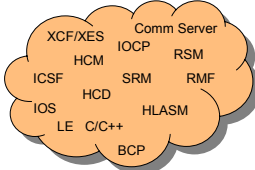
| Function | FMID | APAR | PTF | Component |
|--|--------------------|--------------------|-----------------------------|-----------------------------|
| VMAC Support for OSA Express2 and OSA Express3 when configured as CHPID type OSD | HIP6180 JIP6189 | PK36947 | UK22970 UK22971 | Communication Server IP |
| Service Aids Support of Large Dumps | HBB7730 | OA23132 OA23137 | UA39832 UA39867 | BCP (IPCS) BCP (SA Dump) |
| Usage Report Program (IFAURP) | HBB7730 | OA24178 | UA40791 | BCP (IFAURP) |
| Decimal Floating Point | HMQ4150 | PK18170 | UK14321 | HLASM |
| | HLE7730 | PK40618 | UK33112 | LE |
| | | PK52477 | UK33079 | |
| | | PK54438 | UK33145 | |
| | | PK58449 | UK31809 | |
| | | PK64198 | UK35419 | |
| HOT7730 | OA20648 | UA39163 | z/OS UNIX (DBX) | |
| HTV7730 | PK57944 | UK32129 | Run-Time Library Extensions | |
| | PK58199 | UK32255 | | |
| You will need to use the z/OS V1.9 XL C/C++ compiler on z/OS V1.8. Instructions are available at http://www.ibm.com/software/awdtools/czos/ . | | | | |

Note: The OMEGAMON PTFs are only needed if you have those IBM OMEGAMON products installed.

z/OS Software Positioning for a New z10 EC Server 


z/OS Supported Software Environments for the IBM System z10 EC

- z/OS V1.10
-  z/OS V1.9
- z/OS V1.8
- z/OS V1.7




z/OS 1.6 is not supported on z10 EC

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z/OS Software Positioning for a New z10 EC Server 

z/OS 1.9 Software Support for IBM System z10 EC

- All functions listed for z/OS 1.7 and 1.8
- Plus
 - Additional support for Decimal Floating Point**
 - XL C/C++ Compiler Support
 - z/OS XL C/C++ Exploitation of z10 EC Machine Instructions**
 - 64-way support in a single LPAR**
 - Large Page Support**
 - Capacity Provisioning**
 - RMF FICON Enhancements**
 - RMF Monitor I/O Queuing Activity report was changed to include two new columns for the estimated Average Number of Open Exchanges and the Data Transfer Concurrency within the LCU summary row.
 - HiperSockets Multiple Write Facility (Planned for 2Q 2008)**
 - OSA-Express3 Double Port Density**
 - Ability to use of all four ports on an OSA-Express3 Gigabit Ethernet feature



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z/OS V1.9 Software Support for IBM System z10 EC Servers

64-way Support in a Single LPAR

Up to 64 processors per logical partition and up to 60 LPARs per server are available on a System z10 EC server. With up to 64 processors per server and as many as 32 z/OS logical partitions able to be

A System Programmer's Guide to Migrating to a New IBM System z10 EC Server

configured in a Parallel Sysplex cluster, up to 2,048 engines' worth of processing capacity are available to application workloads.

Large page support for 1 MegaByte pages

A change to the z/Architecture on z10 EC is designed to allow memory to be extended to support large (1 MegaByte (MB)) pages. Large pages are used, in addition to the existing 4 KB page size. The use of large pages is expected to reduce memory management overhead for exploiting applications.

Large page support is primarily of benefit for long running applications that are memory-access-intensive. Large page is not recommended for general use. Short lived processes with small working sets are normally not good candidates for large pages.

Large page support is exclusive to z10 EC and to z/OS.

HiperSockets Multiple Write Facility (Planned availability second quarter 2008)

The IBM System z10 EC provides an enhancement for HiperSockets (Internal Queued Direct I/O) which is designed to improve the efficiency of the processing for internal Logical Partition (LP) to Logical Partition (LP) communications associated with large messages. The new HiperSockets Multiple Write Facility allows messages which span multiple output buffers to be transferred with a single write operation from the source LP. This enhancement will improve the HiperSockets throughput while also lowering the CPU cost related to the processing of transferring large messages from the source to the target LP. This function is also planned to be made available on z/OS V1.9 with a PTF in the second quarter of 2008.

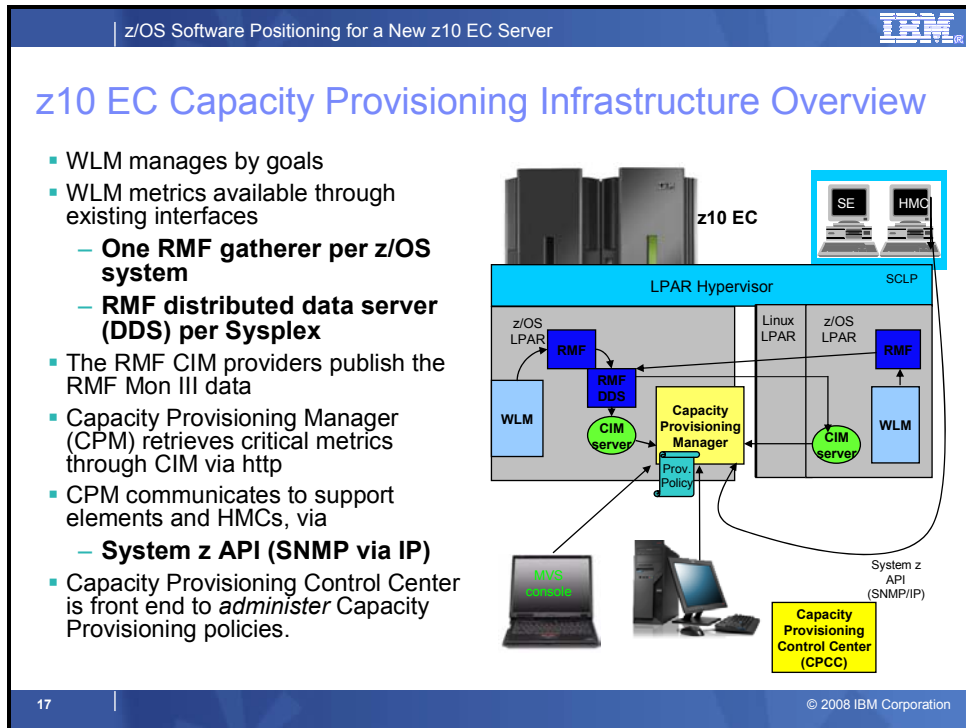
HiperSockets Multiple Write Facility is planned to be supported in the z/OS environment.

OSA-Express3 Double Port Density (Planned availability second quarter 2008)

Activating all four ports on an OSA-Express3 feature provides more physical connectivity to service the network and reduces the number of required resources (CPU cycles, I/O slots, I/O cages, fewer CHPIDs to define and manage). With double the port density, reduced latency, and improved throughput, OSA-Express3 GbE is designed to satisfy the demands of bandwidth-hungry applications. For the z/OS operating system to recognize all four ports on an OSA-Express3 Gigabit Ethernet feature, a PTF on z/OS V1.9 is required. If software updates are not applied, only two of the four ports will be "visible" to the operating system.

The benefits related to double port density include:

- Relieve constraints on the number of required I/O slots for OSA
- Help reduce the number of required I/O cages
- Satisfies the requirements for more than 48 I/O LAN ports
- Fewer CHPIDs to define and manage resulting in CPU savings



z10 EC Capacity Provisioning Infrastructure Overview

- WLM manages by goals
- WLM metrics available through existing interfaces
 - One RMF gatherer per z/OS system
 - RMF distributed data server (DDS) per Sysplex
- The RMF CIM providers publish the RMF Mon III data
- Capacity Provisioning Manager (CPM) retrieves critical metrics through CIM via http
- CPM communicates to support elements and HMCs, via
 - System z API (SNMP via IP)
- Capacity Provisioning Control Center is front end to administer Capacity Provisioning policies.

Capacity Provisioning

An installed On/Off CoD record is a necessary prerequisite for automated control of temporary capacity through z/OS Capacity Provisioning. z/OS Capacity Provisioning allows you to set up rules defining the circumstances under which additional capacity should be provisioned in order to fulfill a specific business need. The rules are based on criteria, such as: the maximum additional capacity that may be activated for one or more workloads, time and workload conditions. The workload condition can identify a specific application via WLM service classes. Capacity changes can be suggested or implemented automatically, when authorized by policy. This support provides a fast response to capacity changes and ensures sufficient processing power will be available with the least possible delay even if workloads fluctuate. See z/OS MVS Capacity Provisioning User's Guide (SC33-8299) for more information.

| z/OS Software Positioning for a New z10 EC Server | | z10 EC PSP Bucket – 2097DEVICE 2097/ZOS | | | | | | | | | | | | | | | | | | | |
|---|----------|---|----------------------|------------------|--------------------------------|-------------------|---------------|-----------------------------|---------------------------|--------------------------|------------------------|-----------------------|--------------------------|---------------------|--------------------|-----------------------|---------------------------------------|-----------------------------------|----------------------|----------------------|--------------------------------------|
| | | Included in Base z/OS Support | | | | | | | Explicit z/OS Support | | | | | | | | | | | | |
| | | z10 EC GA1 Support | OSA-Express3 10 GbE* | 65535 MP Factors | New zArchitecture Instructions | Crypto Toleration | HiperDispatch | Large Memory > 128GB (1 TB) | C/C++ ARCH(8) and TUNE(8) | Greater than 54 Cps (64) | RMF/FICON Enhancements | PS/IB Coupling Links* | Decimal Floating Point** | Crypto Exploitation | Large Page Support | Capacity Provisioning | HiperSockets Multiple Write Facility* | OSA-Express3 Double Port Density* | Usage Report Program | Layer 3 VMAC Support | Service Aids Support for Large Dumps |
| Release | z/OS 1.9 | P | B | B | P | B | B | B | B | B | B | B | B | W | B | B | P | P | P | B | P |

Legend
 B – FMID in Base product (assumes service identified in z9 EC PSP Bucket is installed)
 W – FMIDs shipped in a Web Deliverable
 P – PTFs required
 N – Not Supported

* Planned availability second and third quarter 2008
 ** Includes XL C/C++ Support (as well as HLASM, LE, DBX, and CDA RTLE)

z/OS V1.9 Software Support for IBM System z10 EC Servers

The following support is required to run z/OS V1.9 on a z10 EC processor. It is documented in the z10 EC PSP bucket: upgrade 2097DEVICE, subset 2097/ZOS. If you are skipping generations of hardware, then you will need to review the PSP buckets for the servers skipped (Upgrade: 2094DEVICE, subset 2094/ZOS if you are not already on a z9 EC or z9 BC server, and Upgrade 2084DEVICE, subset 2084/ZOS if you are not already on a z990 or z890)

If you require Crypto Advanced Encryption Standard (AES) for 256-bit keys SHA-384 and 512 bit for message digest support, ISO Format 3 PIN blocks, support for RSA keys up to 4096 bits, Random Number Generator Long, or enhanced TKE Auditing, then you must install the Cryptographic Support for z/OS V1R7-V1R9 and z/OS.e V1R7-V1R8 Web Deliverable, as well as the PTFs identified in the program directory that comes with the Web deliverable and the PTFs that are recommended in the appropriate ICSF PSP bucket.

The following APARs/PTFs are required to run z/OS V1.9, using these functions, on a z10 EC server.

| Function | FMID | APAR | PTF | Component |
|--|---------|---------|---------|-----------------------|
| Base z10 EC Support Includes <ul style="list-style-type: none"> • Compatibility • OSA-Express3 10GbE • 65535 MP Factors • New zArchitecture Instructions • Crypto Toleration • HiperDispatch • Large Memory >128 GB (1TB) • Greater than 54 CPs (64) | HBB7740 | OA20418 | UA39342 | BCP (WLM/SRM) |
| | | OA20633 | UA39386 | BCP (Supervisor) |
| | | OA22675 | UA39411 | BCP (HDW Performance) |
| | | OA23333 | UA39386 | BCP (Supervisor) |
| | | OA23719 | UA39452 | BCP (Reconfig) |
| | | OA23947 | UA39503 | BCP (IOS) |
| | | OA24322 | UA39999 | BCP |
| | JBB774J | OA20418 | UA39377 | BCP (WLM/SRM) |
| | | OA20633 | UA39389 | BCP (Supervisor) |
| | HIO1104 | OA22001 | UA90380 | IOCP |
| HCS7740 | OA20468 | UA90392 | HCD | |
| | | UA40719 | | |
| | | UA90393 | | |
| JCS774J | OA24437 | UA40720 | | |


A System Programmer's Guide to Migrating to a New IBM System z10 EC Server

| Function | FMID | APAR | PTF | Component | |
|--|--|-----------|---|---|-----------|
| Base z10 EC Support (continued) | HCM1910 | IO05753 | UO90003 | HCM | |
| | EER3500 | IO08254 | UO00715 | EREP | |
| | HMQ4150 | PK58463 | UK33787 | HLASM | |
| | • RMF FICON Enhancements | HRM7740 | OA12774 | UA39278 | RMF |
| | | | OA24074 | UA40032 | |
| | | | OA24602 | UA40501 | |
| | | JRM774J | OA12774 | UA39279 | |
| | | OA24074 | UA40054 | | |
| | HVT6190 | OA23066 | UA37872 | Communications Server SNA | |
| | HOGI400 | OA23232 | UA40565 | OSA/SF | |
| HKM5410 | OA23223 | UA39284 | OMEGAMON XE for z/OS V4R1M0 | | |
| N/A, distributed platform deliverable, Interim Fix | OA23223 | NA | OMEGAMON XE for z/OS V4R1M0 4.1.0-TIV-KM5-IF0005 | | |
| C/C++ ARCH(8) and TUNE(8) | HLB7740 | PK57536 | UK31348 | XL C/C++ Compiler | |
| | | | UK31545 | | |
| | | | UK31546 | | |
| | | | UK31547 | | |
| | | | UK33755 | | |
| PSIFB Coupling Links | HBB7740 | OA17177 | UA41133 | BCP (IOS) | |
| | | OA17936 | UA41147 | BCP (XES) | |
| | | JBB774J | OA17177 | UA41138 | BCP (IOS) |
| Crypto Exploitation | HCR7750 | NA | NA | ICSF Web Deliverable | |
| Crypto (ICSF) Web Deliverable (HCR7750) Toleration | HCR7740 | OA21807 | UA37971 | ICSF (z/OS V1.9) | |
| | HCR7731 | | UA37970 | ICSF (z/OS V1.8 or Web Del.) | |
| | HCR7730 | | UA37969 | ICSF Web Deliverable | |
| | HCR7720 | | UA37968 | ICSF (z/OS V1.7) | |
| Users of System SSL that want to exploit SHA-2 based certificates and algorithms | HCPT390 | OA22451 | UA40110 | System SSL | |
| | JCPT39J | | UA40112 | | |
| Decimal Floating Point | HMQ4150 | PK18170 | UK14321 | HLASM | |
| | HLE7740 | PK40618 | UK33113 | LE | |
| | | PK54438 | UK33146 | | |
| | | PK58450 | UK31548 | | |
| | HTV7740 | PK58202 | UK32256 | Run-Time Library Extensions | |
| Large Page Support | HBB7740 | OA20902 | UA39362 | BCP (RSM) | |
| | | OA24060 | UA39897 | | |
| | HKM5310 | OA20522 | UA34340 | OMEGAMON XE for z/OS V3R1M0 | |
| | N/A, distributed platform deliverable, Interim Fix | OA20522 | NA | OMEGAMON XE for z/OS V3R1M0 3.1.0-TIV-KM5-ITM-IF0005 | |
| Capacity Provisioning | HPV7740 | OA20824 | UA39307 | BCP (Capacity Provisioning) | |
| | HPG2900 | OA22914 | UA39413 | CIM | |
| | | JPG290A | | | UA39414 |
| | HJVA500 | PK49493 | UK27953 | IBM 31-bit SDK, Java2 Technology Edition V5 | |


A System Programmer's Guide to Migrating to a New IBM System z10 EC Server

| Function | FMID | APAR | PTF | Component |
|--|---------|---------|---------|----------------|
| HiperSockets Multiple Write Facility | HVT6190 | OA24882 | TBD | CommServer SNA |
| | HIP6190 | PK64880 | TBD | CommServer IP |
| OSA-Express3 Double Port Density (planned availability 3Q08) | HIP6190 | TBD | TBD | CommServer IP |
| Service Aids Support of Large Dumps | HBB7740 | OA23132 | UA39832 | BCP (IPCS) |
| | | OA23862 | UA39823 | BCP (SA Dump) |
| Usage Report Program (IFAURP) | HBB7740 | OA24178 | UA40791 | BCP (IFAURP) |

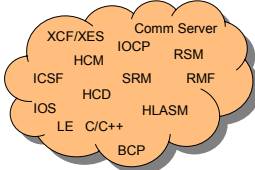
Note: The OMEGAMON PTFs are only needed if you have those IBM products installed.

z/OS Software Positioning for a New z10 EC Server 

z/OS Supported Software Environments for the IBM System z10 EC


 **z/OS V1.10**

- z/OS V1.9
- z/OS V1.8
- z/OS V1.7




z/OS 1.6 is not supported on z10 EC

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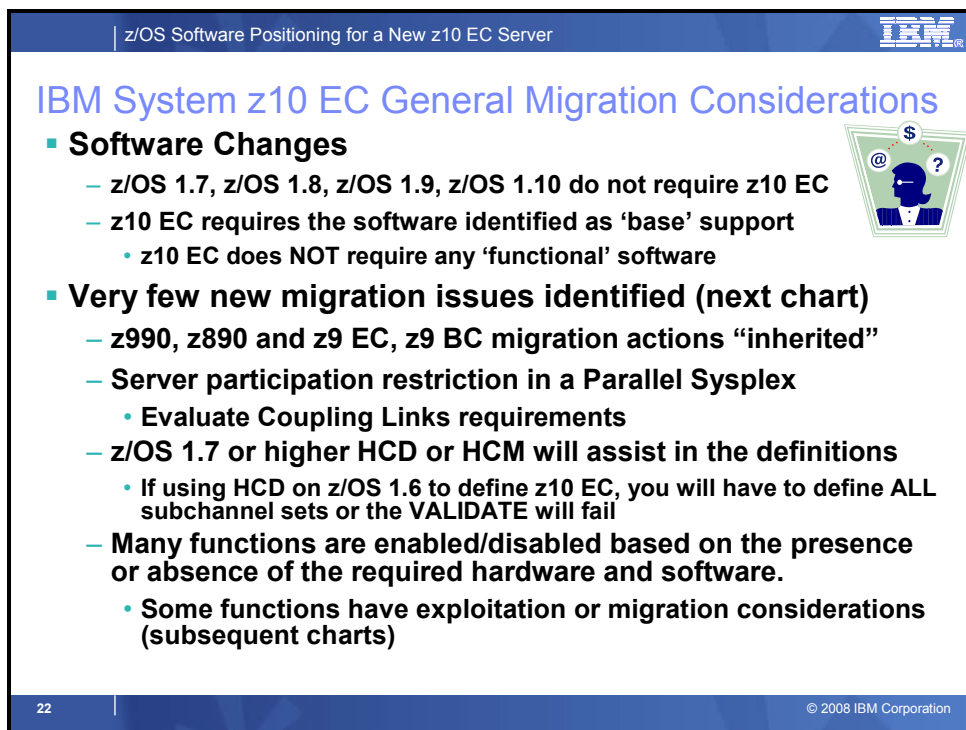
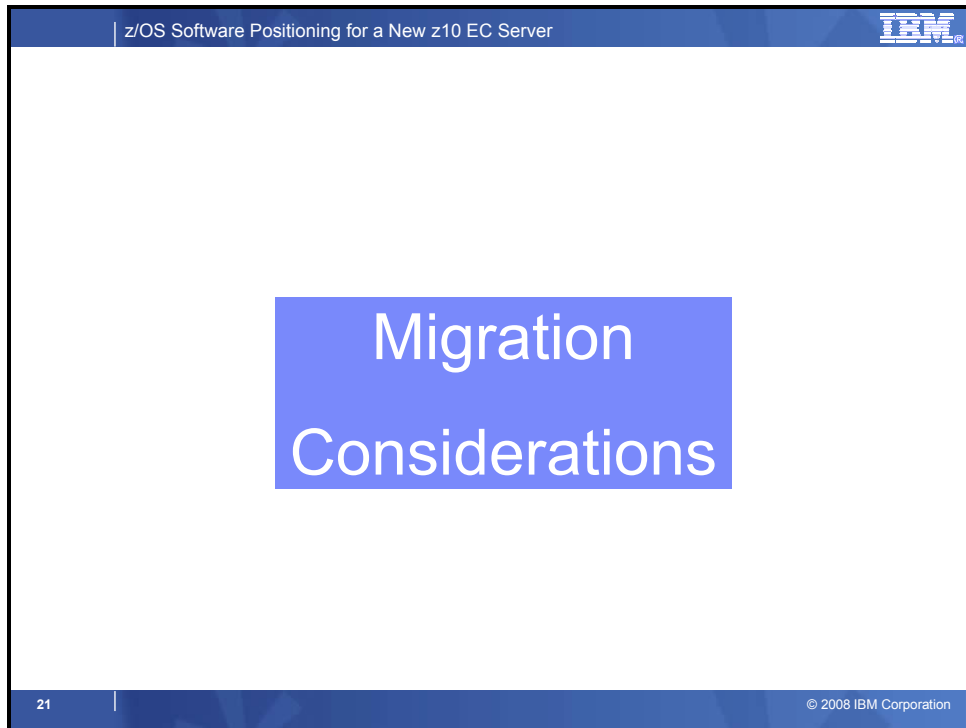
z/OS Software Positioning for a New z10 EC Server 

z/OS 1.10 Software Support for IBM System z10 EC

- All functions listed for z/OS 1.9
- Software support to be added to z10 PSP Bucket (2097DEVICE) Subset 2097/ZOS by z/OS V1.10 GA



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General Recommendations and Considerations

As you plan your migration to a System z10 EC server, consider the following.

z10 EC z/OS Software Support

Not all System z10 functions are available in every z/OS release. Some functions have exploitation or migration considerations. Many functions are enabled or disabled, based on the presence or absence of

A System Programmer's Guide to Migrating to a New IBM System z10 EC Server

the required hardware and software. Other than the minimum support, there is no requirement to install either software or hardware first to exploit a specific function.

Support is delivered by service (and FMIDs for ICSF and HiperDispatch on z/OS V1.7).

The delta (from a z9 EC or z9 BC) support for a System z10 EC server, excluding cryptographic support (and HiperDispatch support for z/OS V1.7), is delivered by service (PTFs). Some cryptographic support for the System z10 EC (and earlier) servers is provided via a web deliverable (FMID). Depending on the cryptographic support provided, and the z/OS release that you are running, you may need to download and install a different ICSF Web deliverable.

Install the necessary z/OS service, as indicated in PSP buckets.

The PSP Bucket for the z10 EC server is: Upgrade 2097DEVICE, Subset: 2097/ZOS. If you are skipping generations of hardware, then you will need to review the PSP buckets for the servers skipped (Upgrade: 2094DEVICE, subset 2094/ZOS if you are not already on a z9 EC or z9 BC server, and Upgrade 2084DEVICE, subset 2084/ZOS if you are not already on a z990 or z890). If you install one or more web deliverables, then you also need to review the software PSP bucket identified in the program directory that comes with each of those web deliverables.


If you reviewed the PSP buckets some time ago, there might have been additions since then, so ensure that any newly identified z/OS service has been installed. To assist you in determining whether you have the recommended service installed on your system, which is identified in these PSP buckets, you can use ServiceLink's PSP Service Extraction tool or the Enhanced PSP Tool (http://techsupport.services.ibm.com/390/psp_main.html). Please note that coming in z/OS V1.10 or SMP/E V3.5 are enhancements to integrate the verification and installation of service for new hardware in well known SMP/E functions (see the topic on SMP/E 3.5: Simplifying PSP Buckets and Other Goodies for more information).

Relatively few migration actions are new when coming from a z9 EC or BC

Migration to a System z10 EC server has, as its basis, a migration to a z9 EC or BC. This means that if you are migrating to a System z10 EC server from a z9 EC or BC (and have performed the migration actions associated with the z9 EC or BC), you have fewer migration actions than if you were migrating from a server prior to the z9 EC or BC and have not yet performed the migration actions associated with the z9 EC and BC. There are, in fact, very few new migration actions to perform on z/OS for a System z10 EC server if you have already migrated to a z9 EC or BC. It is important to note that you can migrate directly to a System z10 EC server without installing the intermediate (prior to z9 EC and BC) servers, but you still need to ensure that any migration considerations are satisfied for the servers that you "skipped".

z/OS 1.7 or Higher HCD or HCM will Assist in the Subchannel Set Definitions

If you use a z/OS V1.6 system to define the z10 EC server, you have to define all subchannel sets or the VALIDATE will fail. On z/OS V1.7 and higher, HCD will assist in the definitions.

z/OS Software Positioning for a New z10 EC Server 

IBM System z10 EC Specific Migration Considerations

- **New z10 EC zArchitecture Machine Instructions**
- **HiperDispatch**
 - WLM goal adjustment may be required
 - You must review and update as necessary
 - You may need to turn off/on HiperDispatch while adjusting WLM goals
- **Fixed HSA managed separately from customer memory**
- **Changes in Hardware Memory Granularity**
 - RSU in IEASYSxx can be specified as a number, percentage of all storage, or in MB (GB or TB)
 - On z9 and prior servers the number was number of 64 MB chunks
 - On z10 the number represents 256 MB chunks
 - Recommend specifying that you use the MB, GB or TB format
- **Update SCRT Level**
 - If you want to process z10 EC SMF data

23

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Plan for the Fixed HSA Enhancement on z10 EC

A new 16 GB fixed Hardware System Area (HSA) which is managed separately from customer memory. This fixed HSA is designed to improve availability by avoiding outages. It also minimizes the preplanning requirements.

Plan for the Changes in Hardware Memory Granularity on a z10 EC Server


The minimum hardware memory granularity for LPAR assignment to central storage elements (initial and reserved) and for z/OS memory reconfiguration changes on z10 EC server. On z9, z990 and z890 it was 64 MB, and on z10 EC it is 256 MB. Addressability is also increased to 8 TB. See *PR/SM Planning* for more information.

Any customer set up to do central memory reconfiguration with z/OS may have to change their RSU setting in IEASYSxx (in PARMLIB). You can specify RSU as number, a percentage of all storage, or in MB (or GB or TB). The z/OS MVS Initialization and Tuning Reference manual states that while number values from 1-9999 are supported, it is recommended that you use either the megabyte or gigabyte or terabyte format. If you currently specify RSU as a number, for example RSU=10, on a z9 that would result in 640 MB assuming a partition with largest element of 32 GB or less of central; however on z10 EC with the same size central, it would result in 2,560 MB. If you specify RSU in MB or GB, you will probably have less of an impact, but you need to understand that the values will be rounded to a multiple of 256 MB instead of 64 MB or 128 MB.

Upgrade your SCRT level, if you want to process z10 EC SMF data.

SCRT V14.2.9 (Version 14 Release 2 Modification Level 9) provides support for the z10 EC server. If you collect SMF data on a System z10 EC server which will be processed by SCRT, you must minimally use SCRT V14.2.9 to generate your SCRT reports. If you do not need to process SMF data from a z10 EC server, you are not required to download or use SCRT V14.2.9 - you may continue to use SCRT V14.1.0 or V14.2.0 until the next version upgrade of SCRT.

SCRT V14.2.9 (or a higher level) is available from the SCRT website at:
<http://ibm.com/zseries/swprice/scrt/>.

z/OS Software Positioning for a New z10 EC Server 

New z10 EC zArchitecture Machine Instructions

- **The new mnemonics may collide with (be identical to) the names of Assembler macro instructions you use**
 - **If you write programs in Assembler Language, you should compare the list of new instructions to the names of Assembler macro instructions you use and/or provide**
 - **If a conflict is identified, take one of these actions:**
 - **Change the name of your macro instruction.**
 - **Specify a separate assembler opt code table**
 - via PARM= , ASMAOPT, or ‘PROCESS OPTABLE....’ in source
 - **Use a coding technique that permits both use of a new instruction and a macro with the same name in an assembly**

Note: A few obsolete instructions were removed on System z10

- **Hexadecimal Operation Codes: E503, E504, E505, E506, E507**
- **Use on System z10 will result in Operation Exception – 0C1 ABEND in software**

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New zArchitecture Instructions

In support of the z10 EC server, the High Level Assembler introduced new mnemonics for the new machine instructions. The new mnemonics may collide with (be identical to) the names of Assembler macro instructions you use. In the event of such collisions, the Assembler's default opcode table (UNI) will treat specification of these names as instructions, probably causing Assembler error messages and possibly causing generation of incorrect object code.

If you write programs in Assembler Language, you should compare the list below to the names of Assembler macro instructions you use, to identify any such conflicts or collisions which would occur. Identical names will cause Assembler errors or the generation of incorrect object code when you assemble your programs following installation of the enabling PTF.

| <u>Mnemonic</u> | <u>Format</u> | <u>OpCode</u> | <u>Instruction Name</u> |
|-----------------|---------------|---------------|--|
| ASI | SIY | EB6A | ADD IMMEDIATE (32←8) |
| AGSI | SIY | EB7A | ADD IMMEDIATE (64←8) |
| ALSI | SIY | EB6E | ADD LOGICAL WITH SIGNED IMMEDIATE (32←8) |
| ALGSI | SIY | EB7E | ADD LOGICAL WITH SIGNED IMMEDIATE (64←8) |
| CRB | RRS | ECF6 | COMPARE AND BRANCH (32) |
| CGRB | RRS | ECE4 | COMPARE AND BRANCH (64) |
| CRJ | RIE | EC76 | COMPARE AND BRANCH RELATIVE (32) |
| CGRJ | RIE | EC64 | COMPARE AND BRANCH RELATIVE (64) |
| CRT | RRF | B972 | COMPARE AND TRAP (32) |
| CGRT | RRF | B960 | COMPARE AND TRAP (64) |
| CGH | RXY | E334 | COMPARE HALFWORD (64←16) |
| CHHSI | SIL | E554 | COMPARE HALFWORD IMMEDIATE (16←16) |
| CHSI | SIL | E55C | COMPARE HALFWORD IMMEDIATE (32←16) |
| CGHSI | SIL | E558 | COMPARE HALFWORD IMMEDIATE (64←16) |
| CHRL | RIL | C65 | COMPARE HALFWORD RELATIVE LONG (32←8) |
| CGHRL | RIL | C64 | COMPARE HALFWORD RELATIVE LONG (64←16) |
| CIB | RIS | ECFE | COMPARE IMMEDIATE AND BRANCH (32←8) |
| CGIB | RIS | ECFC | COMPARE IMMEDIATE AND BRANCH (64←8) |

A System Programmer's Guide to Migrating to a New IBM System z10 EC Server

| | | | |
|--------|-----|------|--|
| CIJ | RIE | EC7E | COMPARE IMMEDIATE AND BRANCH RELATIVE (32←8) |
| CGIJ | RIE | EC7C | COMPARE IMMEDIATE AND BRANCH RELATIVE (64←8) |
| CIT | RIE | EC72 | COMPARE IMMEDIATE AND TRAP (32←16) |
| CGIT | RIE | EC70 | COMPARE IMMEDIATE AND TRAP (64←16) |
| CLRB | RRS | ECF7 | COMPARE LOGICAL AND BRANCH (32) |
| CLGRB | RRS | ECE5 | COMPARE LOGICAL AND BRANCH (64) |
| CLRJ | RIE | EC77 | COMPARE LOGICAL AND BRANCH RELATIVE (32) |
| CLGRJ | RIE | EC65 | COMPARE LOGICAL AND BRANCH RELATIVE (64) |
| CLRT | RRF | B973 | COMPARE LOGICAL AND TRAP (32) |
| CLGRT | RRF | B961 | COMPARE LOGICAL AND TRAP (64) |
| CLHHSI | SIL | E555 | COMPARE LOGICAL IMMEDIATE (16←16) |
| CLFHSI | SIL | E55D | COMPARE LOGICAL IMMEDIATE (32←16) |
| CLGHSI | SIL | E559 | COMPARE LOGICAL IMMEDIATE (64←16) |
| CLIB | RIS | ECFF | COMPARE LOGICAL IMMEDIATE AND BRANCH (32←8) |
| CLGIB | RIS | ECFD | COMPARE LOGICAL IMMEDIATE AND BRANCH (64←8) |
| CLIJ | RIE | EC7F | COMPARE LOGICAL IMMEDIATE AND BRANCH RELATIVE (32←8) |
| CLGIJ | RIE | EC7D | COMPARE LOGICAL IMMEDIATE AND BRANCH RELATIVE (64←8) |
| CLFIT | RIE | EC73 | COMPARE LOGICAL IMMEDIATE AND TRAP (32←16) |
| CLGIT | RIE | EC71 | COMPARE LOGICAL IMMEDIATE AND TRAP (64←16) |
| CLRL | RIL | C6F | COMPARE LOGICAL RELATIVE LONG (32) |
| CLHRL | RIL | C67 | COMPARE LOGICAL RELATIVE LONG (32←16) |
| CLGRL | RIL | C6A | COMPARE LOGICAL RELATIVE LONG (64) |
| CLGHRL | RIL | C66 | COMPARE LOGICAL RELATIVE LONG (64←16) |
| CLGFRL | RIL | C6E | COMPARE LOGICAL RELATIVE LONG (64←32) |
| CRL | RIL | C6D | COMPARE RELATIVE LONG (32) |
| CGRL | RIL | C68 | COMPARE RELATIVE LONG (64) |
| CGFRL | RIL | C6C | COMPARE RELATIVE LONG (64←32) |
| ECAG | RSY | EB4C | EXTRACT CACHE ATTRIBUTE |
| EXRL | RIL | C60 | EXECUTE RELATIVE LONG |
| LAEY | RXY | E375 | LOAD ADDRESS EXTENDED |
| LTGF | RXY | E332 | LOAD AND TEST (64←32) |
| LHRL | RIL | C45 | LOAD HALFWORD RELATIVE LONG (32←16) |
| LGHRL | RIL | C44 | LOAD HALFWORD RELATIVE LONG (64←16) |
| LLHRL | RIL | C42 | LOAD LOGICAL HALFWORD RELATIVE LONG (32←16) |
| LLGHRL | RIL | C46 | LOAD LOGICAL HALFWORD RELATIVE LONG (64←16) |
| LLGFRL | RIL | C4E | LOAD LOGICAL RELATIVE LONG (64←32) |
| LRL | RIL | C4D | LOAD RELATIVE LONG (32) |
| LGRL | RIL | C48 | LOAD RELATIVE LONG (64) |
| LGFRL | RIL | C4C | LOAD RELATIVE LONG (64←32) |
| MVCOS | SSF | C80 | MOVE WITH OPTIONAL SPECIFICATIONS |
| MVHHI | SIL | E544 | MOVE (16←16) |
| MVHI | SIL | E54C | MOVE (32←16) |
| MVGHI | SIL | E548 | MOVE (64←16) |
| MFY | RXY | E35C | MULTIPLY |
| MHY | RXY | E37C | MULTIPLY HALFWORD |
| MSFI | RIL | C21 | MULTIPLY SINGLE IMMEDIATE |
| MSGFI | RIL | C20 | MULTIPLY SINGLE IMMEDIATE |
| PFD | RXY | E336 | PREFETCH DATA |
| PFDRL | RIL | C62 | PREFETCH DATA RELATIVE LONG |
| PFMF | RRE | B9AF | PERFORM FRAME MANAGEMENT FUNCTION |
| PTF | RRE | B9A2 | PERFORM TOPOLOGY FUNCTION |
| RNSBG | RIE | EC54 | ROTATE THEN AND SELECTED BITS |
| RXSBG | RIE | EC57 | ROTATE THEN EXCLUSIVE OR SELECTED BITS |
| RISBG | RIE | EC55 | ROTATE THEN INSERT SELECTED BITS |
| ROSBG | RIE | EC56 | ROTATE THEN OR SELECTED BITS |
| STHRL | RIL | C47 | STORE HALFWORD RELATIVE LONG |

A System Programmer's Guide to Migrating to a New IBM System z10 EC Server

| | | | |
|-------|-----|-----|--------------------------|
| STRL | RIL | C4F | STORE RELATIVE LONG (32) |
| STGRL | RIL | C4B | STORE RELATIVE LONG (64) |

If a conflict is identified, take one of these actions:

- (1) Change the name of your macro instruction.
- (2) Specify PARM='...OPTABLE(YOP)...' (or some other earlier opcode table).
- (3) Specify a separate ASMAOPT file containing assembler options such as in the previous method (this method requires no changes to source code or JCL).
- (4) Add as the first statement of your source program: *PROCESS OPTABLE(YOP)
- (5) Specify the PROFILE option either in JCL or the ASMAOPT file, and the specified or default member of the SYSLIB data set is copied into the front of the source program.
- (6) If you must use both a new instruction and a macro with the same name in an assembly, you can use the following technique (where XXX is a sample mnemonic):

```
* Assume the default OPTABLE(UNI) is in effect
   XXX  a,b          new instruction
   PUSH  ACONTROL   save current optable definition
   ACONTROL OPTABLE(YOP)  switch optable dynamically
   XXX  r,s,t       macro invocation
   POP   ACONTROL   restore previous definition
   XXX  c,d          new instruction
```

System z10: Obsolete Instructions Removed

Five obsolete instructions that were present on System z9 were removed on System z10. These instructions have Hexadecimal Operation Codes: E503, E504, E505, E506, E507. Continued use of these instructions on a System z10 will result in Operation Exception - 0C1 ABEND in software.


The removed instructions were originally introduced as part of the "IBM System/370: Assists for MVS" to provide various assist and lock manipulation functions. These five were carried forward to System z9. The former "MVS Assist" instruction Op Code E502 was recycled years ago for the z/Architecture 64-bit Store Real Address (STRAG) instruction. Other "MVS Assist" instructions have been gone from hardware for many years.

The removed instructions have not been used in any IBM software product for many years.

The removed instructions have never been part of z/Architecture as documented in Reference: z/Architecture Principles of Operations, SA22-7832

z/OS Software Positioning for a New z10 EC Server

ICSF Migration Considerations (Introduced by the ICSF Web Deliverable, NOT z10 EC Support)



- **Increased PKDS Size**
 - The size of the PKDS is increased to allow 4096-bit RSA keys to be stored.
 - Customers using the PKDS for asymmetric keys must copy their PKDS to a larger VSAM dataset before using the new version of ICSF. The ICSF options file must be updated with the name of the new dataset. ICSF can then be started.
 - A toleration PTF must be installed on any system sharing the PKDS with a system running HCR7750 ICSF.
 - The PTF will allow the PKDS to be larger and prevent any service from accessing 4096-bit keys stored in a HCR7750 PKDS.
- **Stop using RSA private keys on a PCICC or PCIXCC/CEX2C cryptographic card**
 - Storing new private RSA keys intended for key management usage in a cryptographic coprocessor is no longer supported.
 - Existing applications will continue to be able to use the retained keys and to delete them from the cryptographic coprocessor cards.
 - Storing private RSA keys intended for signature usage in a cryptographic coprocessor continues to be supported when the modulus length is 2048 bits or less.

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ICSF: Increase the size of your PKDS

With the Cryptographic Support for z/OS V1R7-V1R9 and z/OS.e V1R7-V1R8 Web deliverable (ICSF FMID HCR7750), the LRECL of the PKA key data set (PKDS) has increased. You must allocate a new PKDS with a larger LRECL so that internal I/O routines can handle 4096-bit tokens. Failure to migrate the PKDS before starting ICSF results in ICSF not initializing (error messages CFC0286, CSFM406A, and CSFM407A).

Before initializing ICSF, do the following:

1. If the PKDS is shared with earlier systems, install the PTF for APAR OA21807 on those systems to allow continued sharing of the PKDS. ICSF will be able to interact with both sizes of the PKDS.
2. Make a backup copy of the PKDS you are currently using.
3. Create a larger PKDS. Use the JCL in SYS1.SAMPLIB(CSFPKDS). If the PKDS will be shared, place the VSAM data set where it can be shared.
4. Copy the old PKDS to the larger PKDS using the JCL in SYS1.SAMPLIB(CSFPKDCP). Protect the VSAM data sets from viewing by non-authorized personnel.
5. Initialize the larger PKDS and update the ICSF started procedures on all systems to reference the new PKDS.
6. Stop and restart ICSF on each system.

For more information about the PKDS, see *z/OS Cryptographic Services ICSF System Programmer's Guide*.

ICSF: Stop using RSA private keys on a PCICC or PCIXCC/CEX2C cryptographic card


A PCICC or PCIXCC/CEX2C card might possess the only copy of a retained RSA private key. If you have applications or middleware that use the retained key functionality of these cards, loss of keys could occur if the hardware fails. The hardware failure could be caused by something as simple as an

A System Programmer's Guide to Migrating to a New IBM System z10 EC Server

exhausted or malfunctioning card battery. Lost retained keys have the further implication of lost data for retained key management keys, and an inability to verify signatures for retained signature keys.

Starting with the Cryptographic Support for z/OS V1R7-V1R9 and z/OS.e V1R7-V1R8 Web deliverable (ICSF FMID HCR7750), you no longer have the ability to store new private RSA keys intended for key management usage in a cryptographic coprocessor. Existing applications will continue to be able to use the retained keys and to delete them from the cryptographic coprocessor cards. However, if you have any RSA private keys on a PCICC or PCIXCC/CEX2C cryptographic card, it is recommended that you migrate them to an alternate key strategy.

Note: The storing of private RSA keys intended for signature usage in a cryptographic coprocessor continues to be supported when the modulus length is 2048 bits or less.

z/OS Software Positioning for a New z10 EC Server 

z/OS Exploitation of Selected Functions

- **InfiniBand Coupling Links**
 - PSIFB Links can coexist with other supported CF Link types in the Sysplex and on the same server
- **HiperDispatch**
 - There is a new HIPERDISPATCH=YES/NO parameter in the IEAOPTxx member of SYS1.PARMLIB and with the SET OPT=xx command to control whether HiperDispatch is enabled or disabled for this system
 - Can be changed dynamically
 - HiperDispatch is disabled by default
 - HiperDispatch is supported on z/OS 1.7 with zIIP support, z/OS 1.8 and z/OS 1.9 releases
 - A Health Check will be provided to verify that HiperDispatch is enabled on a z10 system
- **Large Page Support**
 - The Large Page support function will not be enabled without the software. Page frames will be allocated at the current 4K size without the large page support
 - There is a new LFAREA=xx%|xxxxxxM|xxxxxxG parameter in the IEASYSxx member of SYS1.PARMLIB
 - Default is zero
 - It can NOT be changed dynamically

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Exploitation and Migration Considerations for z10 EC functions

InfiniBand Coupling Links

Each system can use, or not use, Infiniband coupling links independently of what other systems are doing, and do so in conjunction with other link types. Infiniband Coupling connectivity can only be performed with other systems that also support Infiniband Coupling (other z10 EC servers, z9 EC standalone CF servers and z9 BC standalone CF servers).

HiperDispatch

There is a new HIPERDISPATCH=YES|NO parameter in IEAOPTxx member of PARMLIB, and on the SET OPT=xx command to control whether HiperDispatch is enabled or disabled for the system. It can be changed dynamically. The default is that HiperDispatch is disabled on z/OS V1.7 through V1.9. A Health Check will be provided to verify that HiperDispatch is enabled on a z10 EC system. The Health Check is shipped active, but only will detect an exception when z/OS is running on a z10 EC system and HIPERDISPATCH is set to NO.


WLM goal adjustment may be required when using this function. Review and update your WLM policies as necessary. You may need to turn off and on VCM while adjusting your WLM goals.

Refer to white paper WP101229 on the Techdocs web site (www.ibm.com/support/techdocs) to understand the benefits of HiperDispatch. It is recommended to enable HiperDispatch after all the required PTFs, and if applicable the IBM zIIP Support for z/OS and z/OS.e V1R6/R7 web deliverable, are installed.

Large Page (1MB) Support

Large page support is exclusive to z10 EC and to z/OS V1.9 (and higher). In order to use large pages, you will need to be running z/OS V1.9 (or higher), with the appropriate PTFs, in a 'native' z10 EC LPAR. The support is not enabled if you are running without the software support, or running on prior generations of servers, or when running as a z/OS guest under z/VM).

Furthermore, to exploit Large Page frames there is a new LFAREA=xx%|xxxxxxM|xxxxxxG parameter in the IEASYSxx member of PARMLIB that needs to be specified. This parameter cannot be changed dynamically.

z/OS Software Positioning for a New z10 EC Server 

z/OS Exploitation ...

- **Capacity Provisioning Manager**
 - TCP/IP connectivity from hosting system to HMC or Service Element
 - RMF (or equivalent product, including CIM RMF provider capability) must be active
 - RMF Distributed Data Server must be active
 - CIM Server must be active
 - Security and CIM customization
 - Security product must support creation of passtickets (R_GenSec) and evaluation using SAF interfaces
 - IBM 31-bit SDK, Java2 Technology Edition V5 (5655-N98) must be accessible
 - Capacity Provisioning Manager customization
 - GUI to be downloaded from host and installed on Windows XP workstation.
 - Used to define policy. Not required for regular operation.
 - Chapter 3 of *z/OS MVS Capacity Provisioning User's Guide (SC33-8299)*

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Capacity Provisioning

The prerequisites must be satisfied before you can successfully start the Provisioning Manager. These prerequisites include the runtime system and the systems that are observed by the Provisioning Manager. The runtime system may also be one of the observed systems. On the runtime system you should:

- Define datasets used for the runtime data
- Set the configuration parameters to your chosen values
- Create a started task procedure
- Provide APF authorization
- Define the security
- Define a restart policy


On the observed systems you must define the security to allow the Provisioning Manager user to connect to the system and to query the information for its management purposes.

You are recommended either to classify the Provisioning Manager and the supporting subsystems into SYSSTC, or to give these an aggressive single period velocity goal at an importance level that is higher than the work that will be defined in your provisioning policy.

In particular the following subsystems and address spaces are required:


- On the runtime system:
 - The Provisioning Manager (CPOSERV)
 - The TCP/IP infrastructure
 - The CIM server, if the Control Center is used to control the Provisioning Manager.
- On the observed systems:
 - The RMF address spaces
 - The RMF Distributed Data Server (GPMSERVE)
 - The TCP/IP infrastructure
 - The CIM server

See Chapter 3 of "*z/OS MVS Capacity Provisioning User's Guide*" (SC33-8299) for more information on this enhancement.

z/OS Software Positioning for a New z10 EC Server 

z/OS XL C/C++ Exploitation of z10 EC Machine Instructions

- C/C++ ARCH(8) and TUNE(8) options:
 - The ARCHITECTURE C/C++ compiler option selects the minimum level of machine architecture on which your program will run.
 - Note certain features provided by the compiler require a minimum architecture level. ARCH(8) exploits instructions available on z10 EC server.
 - The TUNE compiler option allows you to optimize your application for a specific machine architecture within the constraints imposed by the ARCHITECTURE option.
 - The TUNE level must not be lower than the setting in the ARCHITECTURE option.
 - For more information on the ARCHITECTURE and TUNE compiler options refer to the z/OS XL C/C++ User's Guide.
 - You must be on z/OS V1.9 with APAR PK57536
 - APAR PK60051 is provided to describe how to download and 'install' the z/OS V1.9 XL C/C++ compiler on a z/OS V1.8 system
- Exploitation Restriction:
 - Code compiled with the C/C++ ARCH(8) option can only run on System z10 EC servers, otherwise an operation exception will result
 - This is a consideration for programs running on different level servers during development, test, production, and during fallback or DR


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z/OS XL C/C++ Exploitation of z10 EC Machine Instructions

The ARCHITECTURE C/C++ compiler option selects the minimum level of machine architecture on which your program will run. Certain features provided by the compiler require a minimum architecture level. ARCH(8) exploits instructions available on System z10 EC servers. For more information, refer to the ARCHITECTURE compiler option in *z/OS XL C/C++ User's Guide*. The TUNE compiler option allows you to optimize your application for specific machine architecture within the constraints imposed by the ARCHITECTURE option. The TUNE level must not be lower than the setting in the ARCHITECTURE option. For more information, refer to the TUNE compiler option in *z/OS XL C/C++ User's Guide*. You must have at least z/OS V1.9 to use this function.


Once programs exploit the ARCH(8) or TUNE(8) option, those programs can only run on System z10 EC servers, or an operation exception will occur. This is a consideration for programs that will run on different server levels (System z9 and zSeries) during development, test, and production, as well as during fallback or disaster recovery.

Note: ARCH(7) is the minimal level required to exploit the Decimal Floating Point support. The resultant program objects can execute on z9 EC and z9 BC servers, as well as on the new z10 EC servers. Also note that on z9 servers, the ability to use the hardware decimal floating point facilities is dependent on the MCL level of the server.

z/OS Software Positioning for a New z10 EC Server 

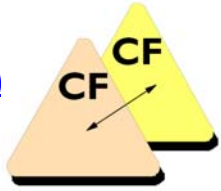
Sysplex Considerations

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z/OS Software Positioning for a New z10 EC Server 

System z CFCC Level 15

- OS requirements for System z9 and z10 Servers with CFLEVEL 15
 - **z/OS V1.6 (and higher) APAR OA17055**
 - **z/VM 5.2 or higher for guest virtual coupling**
- Structure and CF Storage Sizing with CFCC level 15
 - **May increase storage requirements when moving from:**
 - CF Level 14 (or below) to CF Level 15
 - No increase from CF Level 15 on z9 EC or z9 BC to CF Level 15 on z10 EC
 - **Use CFSIZER tool to determine:**
www.ibm.com/servers/eserver/zseries/cfsizer



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Larger Coupling Facility Structure Sizes Might be Necessary


When you change coupling facility control code (CFCC) levels, your coupling facility structure sizes might change. System z10 EC servers initially ship with CFCC Level 15. If, as part of your migration to a System z10 EC server, you change CFCC levels (either by placing a coupling facility on the System z10 EC server or by moving the coupling facility to a z9 EC or BC at a higher CFCC level), you might have

A System Programmer's Guide to Migrating to a New IBM System z10 EC Server

larger structure sizes than you did previously. If your CFCC levels are identical, structure sizes are not expected to change when you migrate from a previous server to a System z10 EC server.

Run CFSIZER.

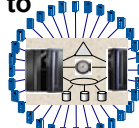
If you are moving your coupling facilities and the coupling facility structures will be on higher CFCC levels than they were previously, run the Coupling Facility Structure Sizer (CFSIZER) tool to find out if you have to increase coupling facility structure sizes. Prepare to make the necessary changes as indicated by the tool. You can find the CFSIZER tool at <http://www.ibm.com/eserver/zseries/cfsizer/>.

z/OS Software Positioning for a New z10 EC Server 

Server Participation in a Parallel Sysplex

Fulfillment of z9 SOD

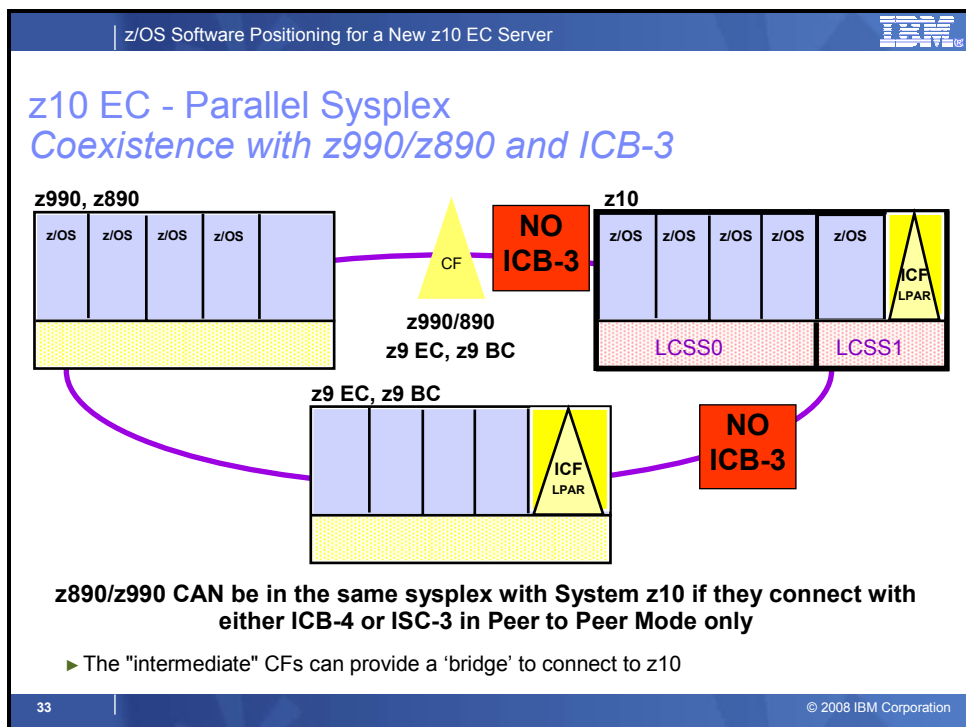
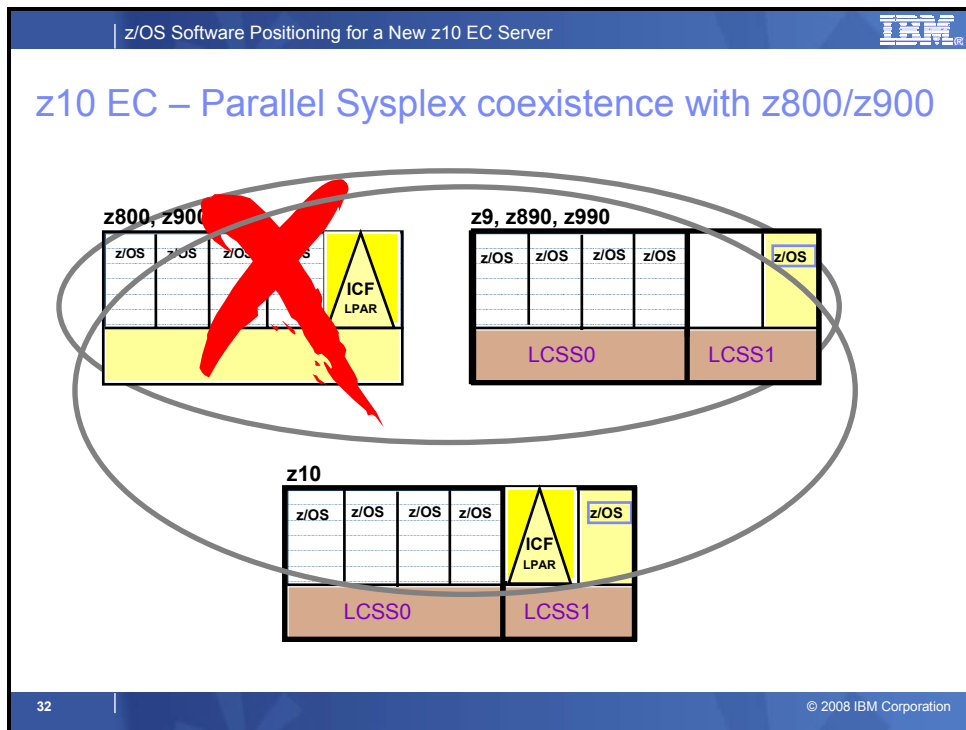
- **z10 does not support active participation in the same Parallel Sysplex with IBM eServer zSeries 900 (z900), IBM eServer zSeries 800 (z800), and older System/390 Parallel Enterprise Server systems**
 - Configurations with z/OS on z900/z800 servers moving to a z10 can't add a z10 to their sysplex
 - z990/z890 or z9 EC/z9 BC which are being upgraded to z10 and also have a z900/z800 in the sysplex will either have to upgrade the z900/z800 servers first, or remove them from their sysplex
 - Sysplex configurations using a z900/z800 for their Coupling Facility will have to move their CFs to z990/z890 or higher PRIOR to introducing an z10 EC for either a z/OS image or CF




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System z10 EC server in a sysplex:

The IBM System z9 EC and BC servers are the last servers to support active participation in the same Parallel Sysplex with z900, z800, and older servers. If you are running z/OS on a z900 or z800, you cannot add a z10 EC server to that sysplex. That is, you will not be able to perform rolling IPLs to introduce a z10 EC, if you have any z900 or z800 images (either as z/OS images or coupling facilities) in the sysplex. Any z900 or z800 servers in the sysplex have to be upgraded to a z990, z890, or higher, to have z10 EC supported in the sysplex. If you have any z/OS images or coupling facilities on a z900 or z800, and you intend to introduce z10 EC into that sysplex, you must migrate those images to z990 or z890 (or higher) prior to introducing the z10 EC.



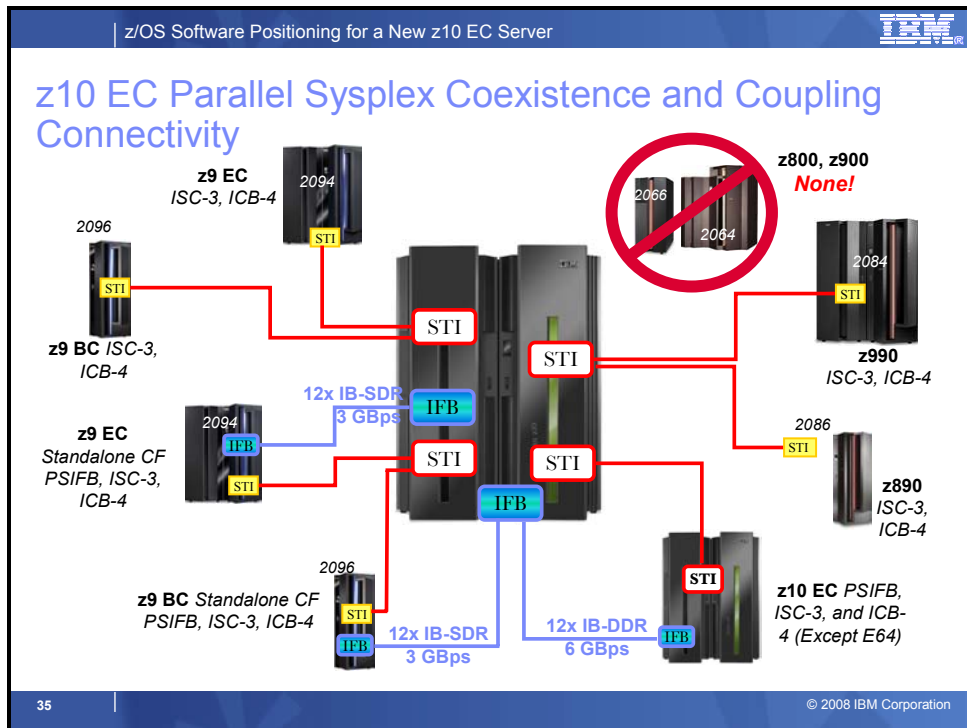
z/OS Software Positioning for a New z10 EC Server 

Coupling Links


- The ICB connector on the z10 EC is different than previous machines, requiring new links/connectors to be installed on downlevel machines in order to connect them to z10 via ICB. This is a HW-only migration action
 - Only supported on:**
 - System z10 GA1 (and higher)
 - z9 EC GA3 (and higher) and z9 BC GA2 (and higher)

Note: **ICB-4 cables can/will be ordered with the z10 for each ICB-4 link ordered**

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Please note: The IBM System z10 EC model E64 servers cannot use ICB-4 coupling links. On this model, all required coupling link connectivity must be provided using PSIFB and/or ISC-3 coupling links only.

z/OS Software Positioning for a New z10 EC Server 


Migration Paths

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z/OS Software Positioning for a New z10 EC Server 

General Recommendations and Considerations

- z10 EC based on existing System z technology
 - z/Architecture (z900/z800)
 - Multiple Logical Channel Subsystems (z990/z890)
 - OSA-Express2, FICON Express4, Crypto Express2 (z9 EC/z9 BC)
- z10 capabilities differ depending on z/OS release
 - Support provided on z/OS 1.7 (and higher)
 - z/OS.e is NOT supported on z10 EC
 - z/OS.e 1.7 and 1.8 only supported on z9 BC, z800 or z890
- Don't migrate software releases and hardware at the same time
- Keep members of the sysplex at the same software level other than during brief migration periods
- Review z10 EC restrictions and migration considerations prior to creating upgrade plan



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z10 Capabilities Differ Depending on z/OS Release

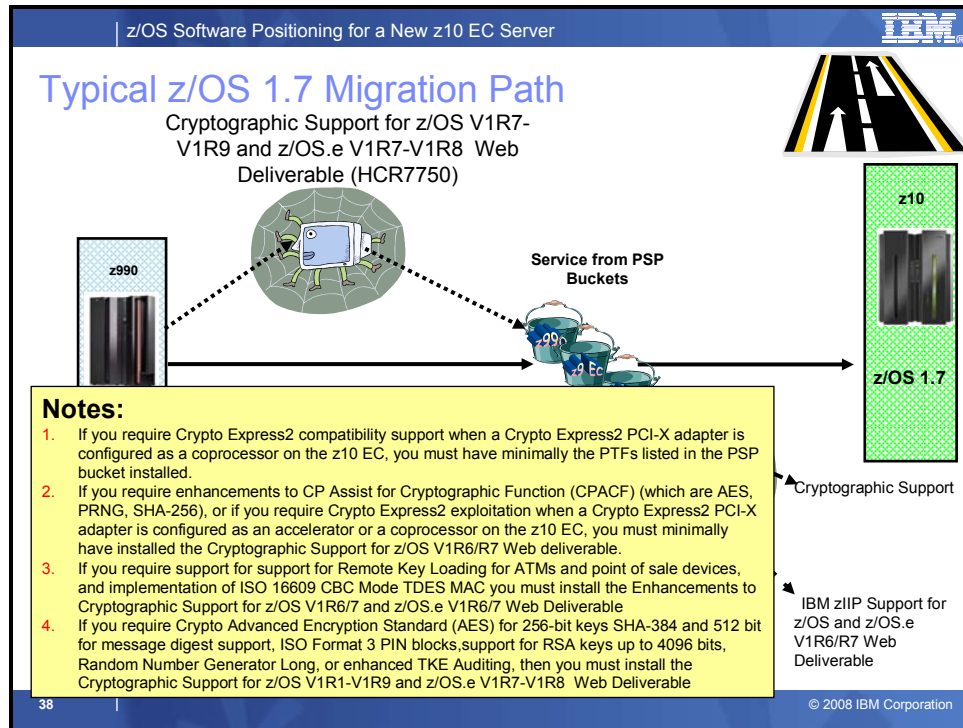
Not all System z10 functions are available in every z/OS release. Some functions have exploitation or migration considerations. Many functions are enabled or disabled, based on the presence or absence of the required hardware and software. If you wish to position to exploit any new functions for z10 EC, the software and hardware may be installed in either order. (That is, there is no requirement to install either software or hardware first to exploit a specific function.)

Use the same software level throughout a sysplex.

Having members of a sysplex at the same software level (other than during brief migration periods) is good software management policy.

Migrate hardware and software at different times.

To minimize the amount of change (and therefore risk) that you experience at one time, do not migrate your software release level at the same time that you migrate your hardware.



If your current server is a z800, z900, z990, z890, z9 EC, or z9 BC and you are running z/OS V1.7

Your operating system level is acceptable for a migration to z10 EC server, you do not need to perform a z/Architecture migration, since V1.7 must run in z/Architecture mode on z800, z900, z890, z990, z9 EC, or z9 BC servers. Your migration steps for this scenario are:

1. Ensure that you have installed the required service from the following PSP Buckets:
 - The z10 EC PSP bucket: upgrade 2097DEVICE, subset 2097/ZOS
 - The z9 EC PSP bucket: upgrade 2094DEVICE, subset 2094/ZOS (if not already on a z9 EC or z9 BC server)
 - The z990 PSP bucket: upgrade 2084DEVICE, subset 2084/ZOS (if not already on a z990 or z890)
 - The software PSP bucket identified in the program directory that comes with your deliverable.
2. To use HiperDispatch, you must download and install the *IBM zIIP Support for z/OS and z/OS.e V1R6/R7* Web deliverable (which is FMID JBB772S for z/OS V1R7), as well as the PTFs listed in the z10 EC PSP bucket. Note: While the web deliverable and PTFs are required for HiperDispatch, a zIIP engine does NOT have to be defined for that LPAR.
3. If you require Crypto Express2 compatibility support when a Crypto Express2 PCI-X adapter is configured as a coprocessor on the z10 EC, you must have minimally the PTFs listed in the PSP bucket installed.
4. If you require CP Assist for Cryptographic Function (CPACF) (which are AES, PRNG, SHA-256), or if you require Crypto Express2 exploitation when a Crypto Express2 PCI-X adapter is configured as an accelerator or a coprocessor on the z10 EC, you must minimally have installed the Cryptographic Support for z/OS V1R6/R7 and z/OS.e V1R6/R7 Web download (no longer available), the Enhancements to Cryptographic Support for z/OS and z/OS V1R6/R7 Web deliverable (no longer available), or the Cryptographic Support for z/OS V1R7-V1R9 and z/OS.e

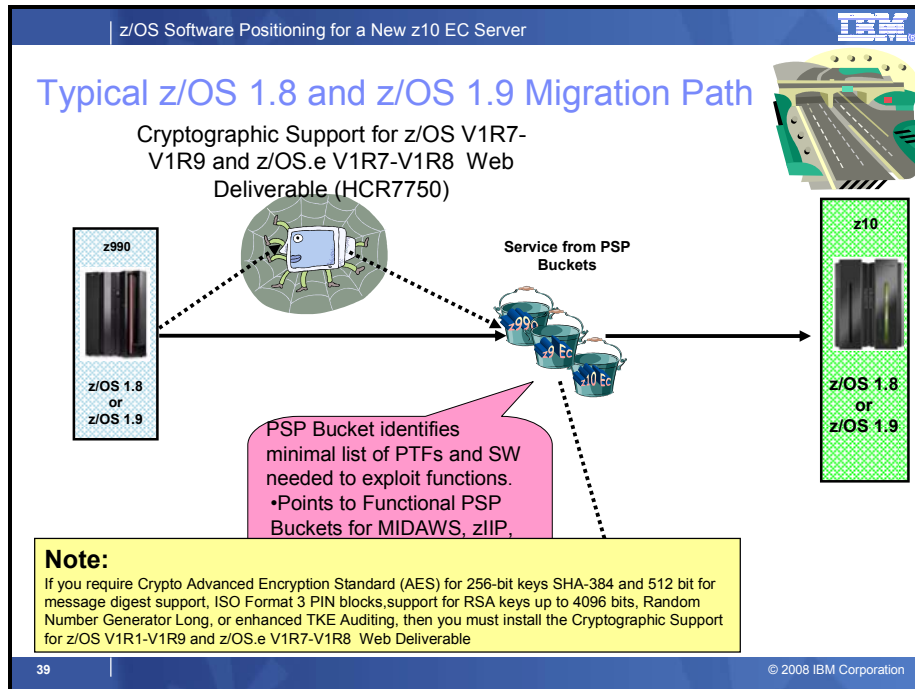
A System Programmer's Guide to Migrating to a New IBM System z10 EC Server

V1R7-V1R8 Web deliverable. You should also install the PTFs identified in the program directory that comes with the Web deliverable and the PTFs that are recommended in the appropriate ICSF PSP bucket.

5. If you require support for Remote Key Loading for ATMs and point of sale devices, and implementation of ISO 16609 CBC Mode TDES MAC you must install the Enhancements to Cryptographic Support for z/OS V1R6/7 and z/OS.e V1R6/7 Web Deliverable (no longer available), or with the Cryptographic Support for z/OS V1R7-V1R9 and z/OS.e V1R7-V1R8 Web deliverable. You should also install the PTFs identified in the program directory that comes with the Web deliverable and the PTFs that are recommended in the appropriate ICSF PSP bucket.
6. If you require enhancements to CP Assist for Cryptographic Function (CPACF) which includes Crypto Advanced Encryption Standard (AES) for 256-bit keys SHA-384 and 512 bit for message digest support, ISO Format 3 PIN blocks, support for RSA keys up to 4096 bits, Random Number Generator Long, or enhanced TKE Auditing, then you must install the Cryptographic Support for z/OS V1R7-V1R9 and z/OS.e V1R7-V1R8 Web Deliverable. You should also install the PTFs identified in the program directory that comes with the Web deliverable and the PTFs that are recommended in the appropriate ICSF PSP bucket.
7. Upgrade your hardware to a z10 EC server. If you are migrating from a z900 or z800 server, see "Migrate to a z990 or z890 server" in *z/OS Migration* for z990 and z890 migration considerations that you must also satisfy. Similarly, If you are migrating from a z990 or z890 server, see "Migrate to a z9 EC or z9 BC server" in *z/OS Migration* for z9 EC and z9 BC migration considerations that you must also satisfy.

Reminders:

1. z/OS.e is NOT supported on the z10 EC (it is only supported on z9 BC, z800 and z890 servers).
2. If you are running z/OS on a z900 or z800, you cannot add a z10 EC server to that sysplex. That is, you will not be able to perform rolling IPLs to introduce a z10 EC, if you have any z900 or z800 images (either as z/OS images or coupling facilities) in the sysplex. Any z900 or z800 servers in the sysplex have to be upgraded to a z990, z890, or higher, to have z10 EC supported in the sysplex. If you have any z/OS images or coupling facilities on a z900 or z800, and you intend to introduce z10 EC into that sysplex, you must migrate those images to z990 or z890 (or higher) prior to introducing the z10 EC.




If you are running z/OS V1.8 or z/OS V1.9 on any Current Server

Your operating system level is acceptable for a migration to z10 EC server, you do not need to perform a z/Architecture migration, since V1.8 and V1.9 must run in z/Architecture mode on z800, z900, z890, z990, z9 EC, or z9 BC servers. Your migration steps for this scenario are:

1. Ensure that you have installed the required service from the following PSP Buckets:
 - The z10 EC PSP bucket: upgrade 2097DEVICE, subset 2097/ZOS
 - The z9 EC PSP bucket: upgrade 2094DEVICE, subset 2094/ZOS (if not already on a z9 EC or z9 BC server)
 - The z990 PSP bucket: upgrade 2084DEVICE, subset 2084/ZOS (if not already on a z990/z890)
 - The software PSP bucket identified in the program directory that comes with your deliverable.
2. If you require Crypto Advanced Encryption Standard (AES) for 256-bit keys SHA-384 and 512 bit for message digest support, ISO Format 3 PIN blocks, support for RSA keys up to 4096 bits, Random Number Generator Long, or enhanced TKE Auditing, then you must install the Cryptographic Support for z/OS V1R7-V1R9 and z/OS.e V1R7-V1R8 Web Deliverable, as well as the PTFs identified in the program directory that comes with the Web deliverable and the PTFs that are recommended in the appropriate ICSF PSP bucket.
3. Upgrade your hardware to a z10 EC server. If you are migrating from a z900 or z800 server, see "Migrate to a z990 or z890 server" in *z/OS Migration* for z990 and z890 migration considerations that you must also satisfy. Similarly, If you are migrating from a z990 or z890 server, see "Migrate to a z9 EC or z9 BC server" in *z/OS Migration* for z9 EC and z9 BC migration considerations that you must also satisfy.


Reminders:

1. z/OS.e is NOT supported on the z10 EC (it is only supported on z9 BC, z800 and z890 servers) and z/OS.e is no longer available as of z/OS V1.9 (see the *z/OS Migration* book for alternatives).
2. If you are running z/OS on a z900 or z800, you cannot add a z10 EC server to that sysplex. That is, you will not be able to perform rolling IPLs to introduce a z10 EC, if you have any z900 or z800 images (either as z/OS images or coupling facilities) in the sysplex. Any z900 or z800 servers in the sysplex have to be upgraded to a z990, z890, or higher, to have z10 EC supported in the sysplex. If you have any z/OS images or coupling facilities on a z900 or z800, and you intend to introduce z10 EC into that sysplex, you must migrate those images to z990 or z890 (or higher) prior to introducing the z10 EC.

z/OS Software Positioning for a New z10 EC Server 


Summary

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z/OS Software Positioning for a New z10 EC Server 

z/OS Support Summary

- z/OS V1.7
 - Parallel Sysplex InfiniBand (PSIFB) Coupling Links (Planned availability May 30, 2008)
 - OSA-Express3 10 Gigabit Ethernet (Planned availability May 30, 2008)
 - 65535 MP Factors
 - Crypto Toleration
 - CP Assist for Cryptographic Functions and Configurable Crypto Express2, Key management for remote loading of ATM and Point of Sale (POS) keys,...
 - Crypto Exploitation
 - Crypto Advanced Encryption Standard (AES) for 256-bit keys SHA-384 and 512 bit for message digest support, RSA keys up to 4096 bits in Length, Dynamically Add Crypto to Logical Partition...
 - HiperDispatch
 - Requires zIIP Web Deliverable to be installed (but not a zIIP processor)
 - Decimal Floating Point (High Level Assembler support only)
- z/OS V1.8
 - Large Memory > 128GB (1.5TB)
 - Additional support for Decimal Floating Point (HLASM, LE, DBX, and CDA RTLE)
 - XL C/C++ support if you download and install the z/OS V1.9 XL C/C++ Compiler
- z/OS V1.9 and z/OS V1.10
 - Additional support for Decimal Floating Point (XL C/C++ Compiler)
 - z/OS XL C/C++ Exploitation of z10 EC Machine Instructions
 - Greater than 54 CPs for a single LPAR
 - Large Page Support
 - Capacity Provisioning
 - RMF FICON Enhancements
 - HiperSockets Multiple Write Facility (Planned for 2Q 2008)
 - OSA-Express3 Double Port Density (Planned for 3Q 2008)




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| z/OS Software Positioning for a New z10 EC Server | | | | | | | | | | | | | | | | | | |
|---|--|----------------------|------------------|--------------------------------|-----------------|---------------|-----------------------------|---------------------------|--------------------------|------------------------|-----------------------|--------------------------|--------------------------------------|---|---|----|---|---|
| System z10 EC Exploitation: z/OS Support Summary | | | | | | | | | | | | | | | | | | |
| Release | z10 EC PSP Bucket – 2097DEVICE 2097ZOS | | | | | | | | | | | | | | | | | |
| | Included in Base z/OS Support | | | | | | Explicit z/OS Support | | | | | | | | | | | |
| | z10 EC GA1 Support | OSA-Express3 10 GbE* | 65535 MP Factors | New zArchitecture Instructions | Crypto Tolerant | HiperDispatch | Large Memory > 128GB (1 TB) | C/C++ ARCH(8) and TUNE(8) | Greater than 54 Cps (64) | RMF FICON Enhancements | PSIFB Coupling Links* | Decimal Floating Point** | Service Aids Support for Large Dumps | | | | | |
| z/OS 1.7 | P | B | P | P | W | N | N | N | N | P | P | W | N | N | N | N | N | N |
| z/OS 1.7 w/ZIIP | P | B | P | P | W | W | N | N | N | P | P | W | N | N | N | N | P | N |
| z/OS 1.8 | P | B | P | P | B | P | B | W | N | N | P | W | W | N | N | N | N | P |
| z/OS 1.9 | P | B | B | P | B | B | B | B | B | B | B | W | B | B | P | P* | P | B |


Legend
 B – FMID in Base product (assumes service identified in z9 EC PSP Bucket is installed)
 W – FMIDs shipped in a Web Deliverable
 P – PTFs required
 N – Not Supported ** Level of decimal floating-point exploitation will vary by z/OS release and PTF level

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- z/OS Software Positioning for a New z10 EC Server
- ### Summary: z/OS, Parallel Sysplex Migration Actions
- Actions you can take before you order System z10 EC
 - Install the necessary z/OS service and web deliverables
 - Review ‘inherited’ coexistence requirements
 - Review the sysplex configuration in which the z10 EC will participate
 - Run CFSIZER (if you are upgrading your coupling facilities)
 - Review mnemonics for new z10 EC Machine Instructions
 - Review RSU Setting in IEASYSxx (if you use memory reconfiguration)
 - If necessary, update SCRT Level
 - Actions you can take after you order System z10 EC
 - Use HCD and the CHPID Mapping tool to define the processor
 - Activate HiperDispatch and if necessary adjust WLM goals
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z/OS Software Positioning for a New z10 EC Server 

Questions for




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z/OS Software Positioning for a New z10 EC Server 


Backup

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z/OS Software Positioning for a New z10 EC Server 


**z/OS Support for
z9 EC and z9 BC
Servers**

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z/OS Software Positioning for a New z10 EC Server 


Summary: Support for z9 by Release

- **z/OS or z/OS.e V1.7**
 - Separate LPAR management of Processor Units (PUs)
 - OSA-Express2 Gigabit Ethernet SX and LX for CHPID OSD and OSN
 - OSA-Express2 10 Gigabit Ethernet LR for CHPID OSD (Includes Checksum offload)
 - OSA-Express2 1000BASE-T Ethernet for CHPID types OSC, OSD, OSE, and OSN
 - Up to 32 way Single z/OS Image
 - Up to 60 Logical Partitions (15 LPARs per LCSS)
 - Channel Data Link Control (CDLC) Protocol Support
 - Request Node Identification Data (RNID) for FICON
 - 63.75K Subchannel Support
 - **OSA/SF for IP and MAC addressing for OSA Express2 CHPID Type OSD**
 - **FICON Error Recovery**
 - MIDAW (Modified Indirect Addressing Words) Support
 - CP Assist for Cryptographic Functions (CPACF)
 - Enhancements to CPACF (AES, PRNG, SHA-256)
 - Crypto Express2 as a coprocessor or accelerator
 - **Remote Key Loading for ATMs & ISO 16609 CBC TDES MAC**
 - **IBM System z9 Integrated Information Processor (IBM zIIP) Support**
 - *Decimal Floating-Point*
 - FICON Express4 CHPID FC
 - FICON Express4 supporting 1, 2, or 4 Gbps with 2-port or 4-port card
 - System-initiated CHPID Reconfiguration
 - *CFCC level 15 (*)*
 - *Multi-path IPL*
 - Multiple subchannel sets support
 - Wild branch diagnosis improvement
 - FICON link incident reporting
 - HiperSockets support of IPv6
 - VLAN management enhancements
 - XLC C/C++ Enable ARCH(7)/TUNE(7) compiler options
 - **Server Time Protocol (STP)**




z/OS.e ONLY supported on z9 BC

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z/OS Software Positioning for a New z10 EC Server 

z/OS V1.7
zIIP Migration
Consideration


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z/OS Software Positioning for a New z10 EC Server 

zIIP Related 'Release' Changes


- FMID JBB772S provides the support in z/OS 1.7 for zIIP. It changes the following fields from their values at the levels provided by FMID HBB7720 (the base FMID for z/OS 1.7):
 - **CVTPRODN** from **SP7.0.7** to **SP7.1.7**
 - **ECVTPMOD** from **00** to **01**
 - **ECVTPSEQ** from **x'01010700'** to **x'01010701'**
 - support for zIIP also introduces the **CVTZIIP** bit in **CVTOSLV4** (**CVTZIIP EQU X'02'** zIIP routine is present)
- After zIIP support is installed the value returned from the REXX `MVSVAR("SYSOPSYS")` function will be:
 - **""z/OS 01.07.01 JBB772S" on z/OS 1.7**

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z/OS Software Positioning for a New z10 EC Server 



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z/OS Software Positioning for a New z10 EC Server 

z/OS and z/OS.e Crypto Support

| Operating System | Level Shipped in Base Product | Level Required for Secure or Clear Key Support | Level Required for Enhanced Secure Key Support | Level Required for 64-bit addressing caller support | Level Required for AES, PRNG, and SHA-256 and CEX2n exploitation | Level required for Remote Key Loading for ATMs and POSs | Level Required for 4096-RSA keys, ISO-3 PIN Support | Level Required for CPACF support for SHA-384 and SHA-512 Support |
|------------------------|-------------------------------|--|--|---|--|---|---|--|
| z/OS 1.7 or z/OS.e 1.7 | HCR7720 | Integrated in z/OS base level | Integrated in z/OS base level | Integrated in z/OS base level | HCR7730 | HCR7731 | HCR7750 | HCR7750 |
| z/OS 1.8 or z/OS.e 1.8 | HCR7731 | Integrated in z/OS base level | Integrated in z/OS base level | Integrated in z/OS base level | Integrated in z/OS base level | Integrated in z/OS base level | HCR7750 | HCR7750 |
| z/OS 1.9 | HCR7740 | Integrated in z/OS base level | Integrated in z/OS base level | Integrated in z/OS base level | Integrated in z/OS base level | Integrated in z/OS base level | HCR7750 | HCR7750 |

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| z/OS Software Positioning for a New z10 EC Server | | | | | | | | | | |
|---|-------|---|---|-------------------------------------|--|--------------------|--|--|-------------------------------|---|
| zSeries and System z Crypto Support | | | | | | | | | | |
| Server | Level | Level Req'd for Secure or Clear Key Support | Level Req'd for Enhanced Secure Key Support | Level Req'd for Crypto Acceleration | Level Req'd for AES, and SHA-256 Support | CEX2n Availability | Level Req'd for Remote Key Loading for ATMs and POSs | Level Req'd for ISO-3 PIN Support, Retain Keys | Level Req'd for 4096-RSA keys | Level Req'd for CPACF support for SHA-384 and SHA-512 Support |
| z800, z900 | All | CCF | PCICC | PCICA | n/a | n/a | n/a | n/a | n/a | n/a |
| z890, z990 | GA1 | CPACF | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a |
| | GA2 | CPACF | PCIXCC | PCICA | n/a | n/a | n/a | n/a | n/a | n/a |
| | GA3 | CPACF | CEX2C | PCICA | n/a | CEX2C | n/a | n/a | n/a | n/a |
| z9 EC, z9 BC | GA1 | CPACF | CEX2C | CEX2A | CPACF | CEX2C CEX2A | CEX2C | CEX2C | CEX2C | n/a |
| | GA2 | CPACF | CEX2C | CEX2A | CPACF | CEX2C CEX2A | CEX2C | CEX2C | CEX2C | n/a |
| | GA3 | CPACF | CEX2C | CEX2A | CPACF | CEX2C CEX2A | CEX2C | CEX2C | CEX2C | n/a |
| z10 EC | GA1 | CPACF | CEX2C | CEX2A | CPACF | CEX2C CEX2A | CEX2C | CEX2C | CEX2C | CPACF |

54

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| z/OS Software Positioning for a New z10 EC Server | | | | |
|---|--|---------|--------------|---|
| z10 EC: z/OS Crypto Support | | | | |
| z/OS Release | Crypto Web Download | F MID | APAR | Comments |
| z/OS 1.7 | [09/2005] Cryptographic Support for z/OS V1R6/R7 and z/OS.e V1R6/R7 (web download no longer available) | HCR7730 | All Included | *Enhancements to CPACF (AES, PRNG, and SHA-256) and Crypto Express2 exploitation |
| | [09/2005] Enhancements to Cryptographic Support for z/OS and z/OS.e V1R6/R7 (web download no longer available) | HCR7731 | All Included | *CPACF and Crypto Express2 exploitation *Enhancements include Remote Key Loading for ATMs and POSs |
| | [11/2007] Cryptographic Support for z/OS V1R7-V1R9 and z/OS.e V1R7-V1R8 web deliverable | HCR7750 | All Included | *4096-bit RSA keys, ISO-3 PIN Support, CPACF support for SHA-394 and SHA-512, Reduced support of retained private key in ICSF |
| z/OS 1.8 | N/A – In z/OS base product | HCR7731 | All Included | *CPACF and Crypto Express2 exploitation *Enhancements include Remote Key Loading for ATMs and POSs |
| | [11/2007] Cryptographic Support for z/OS V1R7-V1R9 and z/OS.e V1R7-V1R8 web deliverable | HCR7750 | All Included | *4096-bit RSA keys, ISO-3 PIN Support, CPACF support for SHA-394 and SHA-512, Reduced support of retained private key in ICSF |
| z/OS V1.9 | N/A – In z/OS base product | HCR7740 | All Included | *PKCS11 Support |
| | [11/2007] Cryptographic Support for z/OS V1R7-V1R9 and z/OS.e V1R7-V1R8 web deliverable | HCR7750 | All Included | *4096-bit RSA keys, ISO-3 PIN Support, CPACF support for SHA-394 and SHA-512, Reduced support of retained private key in ICSF |

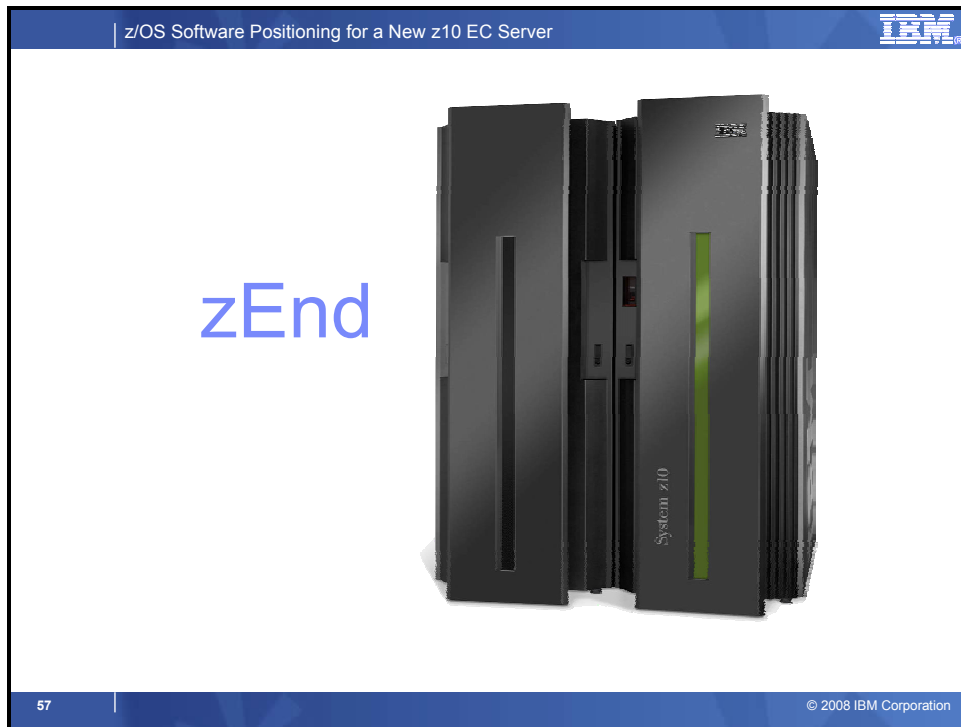
55

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| z/OS Software Positioning for a New z10 EC Server | | IBM | | |
|--|---------|--|---------|-----------------|
| ICSF Rosetta Stone | | | | |
| External Name | F MID | Applicable z/OS Releases | Avail | EoM |
| z/OS or z/OS.e V1.3 or V1.4 | HCR7706 | z/OS 1.3 and 1.4 | 3/2002 | 9/2004* |
| z990 Cryptographic CP Assist Support for z/OS V1.3 ¹ | HCR7708 | z/OS 1.3 | 6/2003 | 10/2003 |
| z/OS V1.4 z990 Compatibility Support or z.OS.e z990 Coexistence features | HCR7708 | z/OS 1.4 | 6/2003 | 10/2003 |
| z/OS V1.4 z990 Exploitation Support or z/OS.e Coexistence Update feature | HCR7708 | z/OS 1.4 | 10/2003 | 12/2006 |
| z990 Cryptographic Support ² | HCR770A | OS/390 2.10, z/OS 1.2, z/OS 1.3, z/OS 1.4, any z/OS 1.4 features, and z/OS 1.5 | 9/2003 | 5/2004 |
| z/OS or z/OS.e V1.5 | HCR7708 | z/OS 1.5 | 3/2004 | 9/2004 |
| z/OS or z/OS.e V1.6 | HCR770A | z/OS 1.6 | 9/2004 | 10/2005* |
| z990 and z890 Enhancements to Cryptographic Support ³ | HCR770B | OS/390 2.10, z/OS 1.2, z/OS 1.3, z/OS 1.4 and z/OS 1.5 | 5/2004 | 12/2006 |
| ICSF 64-bit Virtual Support for Z/OS V1.6 and z/OS.e V1.6 ⁴ | HCR7720 | z/OS 1.6 | 12/2004 | 9/2005 |
| z/OS or z/OS.e V1.7 | HCR7720 | z/OS 1.7 | 9/2005 | 10/2006 |
| Cryptographic Support for z/OS V1R6/R7 and z/OS.e V1R6/R7 ⁵ | HCR7730 | z/OS 1.6 and z/OS 1.7 | 9/2005 | 5/2006 |
| Enhancements to Cryptographic Support for z/OS and z/OS.e V1R6/R7 ⁶ | HCR7731 | z/OS 1.6 and z/OS 1.7 | 5/2006 | 11/2007 |
| z/OS or z/OS.e V1.8 | HCR7731 | z/OS 1.8 | 9/2006 | 10/2007 |
| z/OS V1.9 | HCR7740 | z/OS 1.9 | 9/2007 | Planned 10/2008 |
| Cryptographic Support for z/OS V1R7-V1R9 and z/OS.e V1R7-V1R8 web deliverable ⁷ | HCR7750 | z/OS 1.7, z/OS 1.8 and z/OS 1.9 | 9/2007 | TBD |
| z/OS V1.10 | HCR7750 | z/OS 1.10 | 9/2008 | TBD |

56

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57

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