Smarter Systems for a Smarter Planet

MVS Core Technologies Project Opening

WSC Hot Topics

Session 12722 – February 4, 2013

Riaz Ahmad
IBM Washington Systems Center

Agenda

- Operating Systems Status
- Washington Systems Center Flashes
- Announcements
- Parallel Sysplex™

z/OS Key Dates

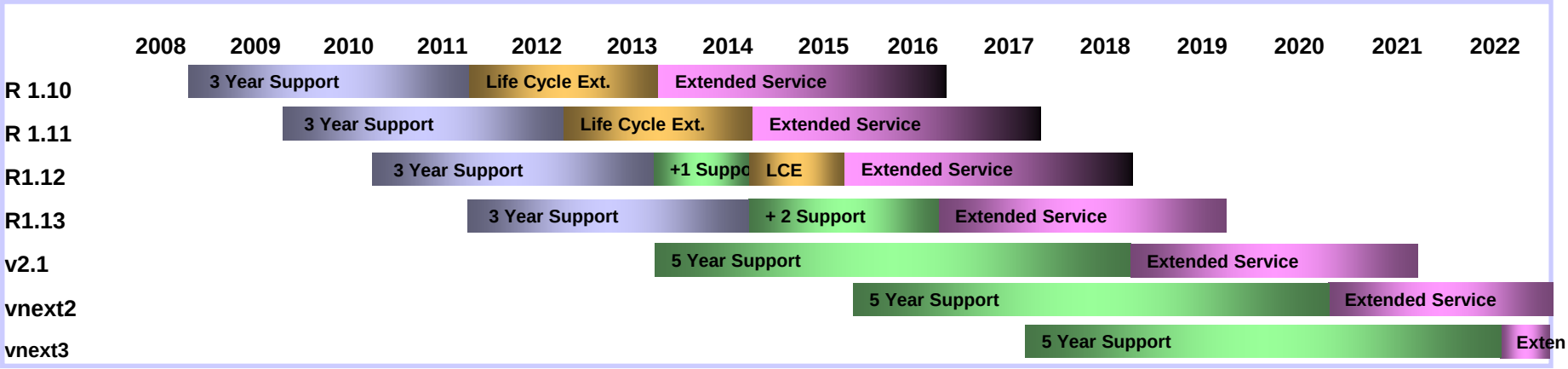
- **z/OS Version 2 Release 1**
  - **February 5, 2013:** Preview Announcement
  - **September 2013:** Planned General Availability via ServerPac, CBPDO
- **z/OS Version 1 Release 13**
  - **End of support: September 30, 2016**

- **z/OS is now on a 2-year release cycle starting with z/OS V2R1**
- **z/OS V2R1 is planned for September 2013**
- **FAQs**
  - **http://public.dhe.ibm.com/common/ssi/ecm/en/zsq03055usen/ZSQ03055USEN.PDF**
  - **z/OS home page: Under *Get more from z/OS***
    - **http://www-03.ibm.com/systems/z/os/zos/index.html**

z/OS Release Directions Summary

- Shift z/OS to a 2 year release cycle

- z/OS Version 2.1 planned to GA in September 2013
  - Will continue to deliver key hardware support & updates in between releases
  - Maintain N-2 release migration
  - 5 Year Service Support
    - Optional fee based service extension to accommodate migration
  - z/OSMF planned to be on the same release and service cycle
  - Minimum supported HW levels (z9 server or later, and 3990-3 disk controller or later)
  - R12 Support extended to 4 years, R13 Support extended to 5 years; bridges v2 migrations



See Statement Of Direction Announcement Letter 212-086 dated April 11, 2012

z/OS Support Summary

Release	z900/z 800 WdfM	z990/ z890 WdfM	z9 EC z9 BC WdfM	z10 EC z10 BC	z196 CPC	z196 w/zBX	z114 CPC	z114 w/zBX	zEC12	End of Service	Lifecycle Extension for z/OS
z/OS V1.9[2]	X	X	X	X	X		X			9/10[1]	9/12[1]*
z/OS V1.10	X	X	X	X	X	X	X	X	X	9/11[1]	9/13[1]
z/OS V1.11	X	X	X	X	X	X	X	X	X	9/12[1]	9/14[1]
z/OS V1.12	X	X	X	X	X	X	X	X	X	9/14*	[3]*
z/OS V1.13	X	X	X	X	X	X	X	X	X	9/16*	[3]*
z/OS V2.1*			X	X	X	X	X	X	X	9/18*	[3]*

Out of Lifecycle Extension for z/OS support

Defect support provided with Lifecycle Extension for z/OS

Generally supported

Notes:

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

2 **See IBM GTS services for additional fee-based extended service**

3 **Optional extended service is planned to be offered**

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

WdfM – Server has been withdrawn from Marketing

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

IBM Lifecycle Extension for z/OS V1R11 (5657-A01)

- The IBM Lifecycle Extension for z/OS V1.11 provides fee-based corrective service (a fix, bypass, or restriction to a problem) for up to two years beyond the September 30th 2012 end of service date for z/OS V1.11

- This Lifecycle Extension for z/OS V1.11 enables z/OS V1.11 users to continue to receive corrective service for z/OS V1.11 for the 2 year period of October 1, 2012 through **September 30, 2014**.

- The Lifecycle Extension for z/OS V1.11 was made available October 1, 2012.
- **More details: Announcement Letter 212-025 Dated April 11, 2012**

IBM Lifecycle Extension for z/OS V1R10 (5665-A01)

- The IBM Lifecycle Extension for z/OS V1.10 provides fee-based corrective service (a fix, bypass, or restriction to a problem) for up to two years beyond the September 30th 2011 end of service date for z/OS V1.10

- This Lifecycle Extension for z/OS V1.10 enables z/OS V1.10 users to continue to receive corrective service for z/OS V1.10 for the 2 year period of October 1, 2011 through **September 30, 2013**.

- The Lifecycle Extension for z/OS V1.10 was made available October 1, 2011.

- **More details: Announcement Letter 211-002 Dated February 15, 2011**

Secure z/OS Software Delivery

- IBM plans to remove support for unsecured FTP connections used for z/OS software and service delivery October 1, 2013
  - System z Software (products and services) downloads will require the use of
    - FTPS (FTP using Secure Sockets Layer)
    - Download Director with encryption
  - Able to download any orders created to October 1, 2013 using any currently supported method until they expire or until November 1, 2013
  - If you plan to use FTPS, IBM recommends that you visit the Connectivity Test website to verify your system setup well in advance
  - No change is required for Download Director with encryption
  - Connectivity Test:

    https://www.software.ibm.com/webapp/iwm/web/preLogin.do?lang=en_US&sour ce=cbct

System z Security Portal

As a best practice, IBM strongly recommends that customers obtain access to the System z Security Portal and subscribe to the Security Portal's automatic notification process to get access to the latest service information on security and system integrity APARs for z/OS and z/VM.

Note: IBM treats vulnerability information in connection with System z as IBM Confidential and by accessing the Security Portal you agree to treat such information as confidential in accordance with the terms set forth at:

http://www.**ibm.com**/systems/z/advantages/security/integrity_sub.html

Questions can be directed to: syszsec@us.ibm.com

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IBM z/OS Management Facility (z/OSMF) V1.13
Service Updates Available

- **Flash10794**
- Several new enhancements to IBM z/OSMF 1.13 are available through several APARs which are designed to improve usability and to extend the management capabilities of z/OSMF in new direction.
- These enhancements deliver a number of incremental capabilities since the release of z/OSMF 1.13 announced (July 12, 2012)
  - Software management extends the Software Deployment task even further to provide additional actions on SMP/E installed software
  - Application linking between the WLM and Resource monitoring plug-in
  - Capacity Provisioning to allow you to create, edit and activate domain configurations and capacity provisioning policies
  - Support for newer browsers

http://www-03.ibm.com/systems/z/os/zos/zosr13H_update/

ibm.com/support/techdocs

Cryptographic Support for z/OS V1R12 – V1R13 (HCR77A0)

- **Flash10787**
- The newest version of ICSF, FMID HCR77A0, was announced on August 28, 2012 and was available for download on September 19, 2012
- This new version of ICSF provides support for the latest hardware (IBM zEnterprise EC12).
- In addition, there are enhancements to the IBM Common Cryptographic Architecture (CCA) which can be exploited with this version of ICSF.
- There are some enhancements that are not specifically tied to the hardware, but improve performance and usability

ibm.com/support/techdocs

Parallel Sysplex Coupling Facility Dumps

- **Flash102174**
- There are situations when a serialized dump of a CF is required to diagnose an issue.
  - The ability to disruptively collect serialized CF dump has always existed
    - A disruptive dump of a CF requires the CF to stop, dump and then restart. All the structures in the CF at the time of the disruptive dump were lost when the CF restarted
  - With the z196, IBM enhanced First Failure Data Capture (FFDC) with the introduction of the capability to take a non-disruptive serialized dump of CF.
- For ND CF Dump, the CF does not stop, is not restarted, and structures are not lost.
- This Flash discusses ND serialized dumps, system programmer action and how to initiate the dump

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Best Practices Upgrading a Coupling Facility Version 2

- **WP101905**
- This paper documents the best practices for installing a new CF, doing a POR of CEC with a coupling facility image on it and reactivating a coupling facility image.
- IBM recommends that the best practices be followed to prevent unplanned down time, other adverse impacts to applications and minimize the maintenance upgrade window.
- Version 2 of the Best Practices:
  - Upgrading a CF procedure simplify the removal of the last CF link which is also the last timing link, or ensure STP timing will not be disrupted.
  - Version 2 procedures have been updated to use the CF SHUTDOWN command instead of the DEACTIVATE command
    - SUHTDOWN is safer as it will not complete if there are still structures in the CF
  - SHUTDOWN was specifically added to avoid a sysplex outage as a result of the incorrect CF being DEACTIVATEd

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z/OS Best Practices: Large Stand-Alone Dump Handling - V3

- **TD103286**
- This paper defines comprehensive "**current best practices**" when taking and handling large stand-alone dumps in the z/OS environment.
- The document focuses on optimizing stand-alone dump data capture and optimizing problem analysis time. This information is critical for large z/OS environments reporting problems to IBM.
- The ability to handle large stand-alone dumps appropriately will speed IBM problem resolutions.

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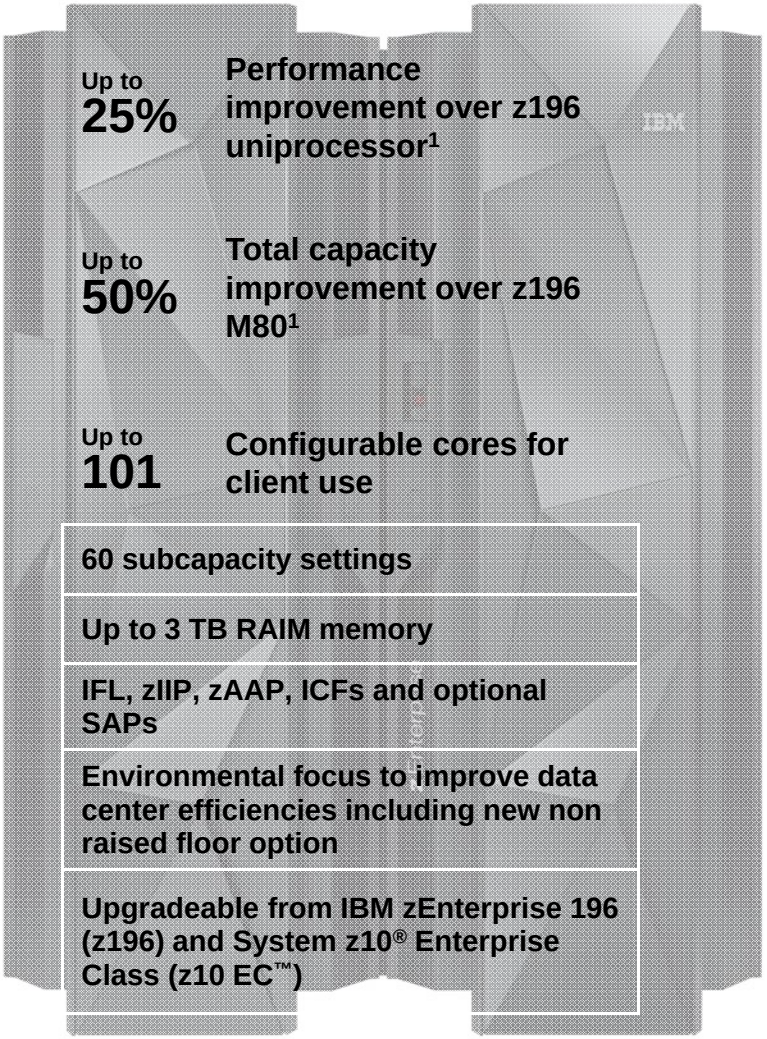
zEnterprise EC12 is the core of next generation System z



zEC12

Machine Type: 2827

Models: H20, H43, H66, H89, HA1

- Advanced Technology 5.5 GHz processor chip for performance boost for all workloads
  - Over ***78,000 MIPS*** for large scale consolidation
  - ***Larger cache*** for data serving
- Processor chip optimized for software performance
  - Advanced performance functions exploited by ***Java, PL/I, compilers, DB2*** and more
- Innovation to drive availability to superior levels
  - ***IBM zAware*** with out-of-band analytics provide point in time snap-shot of the current state of your business and can help you improve availability
  - ***FLASH Express and pageable large pages*** to drive availability and performance for critical workloads
- Security and reliability are in our DNA
  - High speed ***cryptography integrated as part of the chip***
  - Enhanced support for applications requiring data encryption, cryptographic keys and digital signing with new ***Crypto Express4S***
  - PR/SM designed for ***EAL5+ certification***

zEnterprise EC12 Functions and Features

Five hardware models
Six core 32nm PU chip
Up to 101 processors configurable as CPs, zAAPs, zIIPs, IFLs, ICFs , or optional SAPs (64-way on z/OS 1.10 , 100-way z/OS 1.11 and higher)
Increased scalability with 60 subcapacity settings
Up to 3 TB RAIM Memory
Improved processor large cache design and size to optimize data serving environments
Second generation out of order execution
Double the size of HSA – 32 GB
2GB Large Page Support
Flash Express (SCM)*
One MB Pageable Large pages**
Dynamic Reconfiguration support for Flash Express**
Optional PLPA, COMMON page data sets**
Crypto Express 4S cryptographic enhancements

*** - Planned availability for z/OS exploitation is December 14, 2012. All statements regarding IBM's plans, directions, and intent are subject to change or withdrawal without notice.**
**** - Planned availability for z/OS exploitation is 1Q2013. All statements regarding IBM's plans, directions, and intent are subject to change or withdrawal without notice.**

z/OS Support in Blue color

zEnterprise EC12 Functions and Features …

IBM zAware for improved problem determination
FICON Express 8S
OSA Express 4S (GbE LX and SX, 10GbE LR and SR), 1000BASE-T
High Performance FICON for System z
CPU Measurement Facility
Optional water cooling and DC Power
Optional overhead Power and I/O cabling
Double the size of HSA – 32 GB
CFCC Level 18 enhancements
JAVA Exploitation of the Transactional Execution Facility
Exploitation of new hardware instructions **XL C/C++ ARCH(10) TUNE(10)**
zBX (zEnterprise BladeCenter Extension) Model 003
New and improved instructions
Unified Resource Manager support for Ensemble with zEC12, z196, z114 and zBX Model 002/003

z/OS Support in Blue color

zEnterprise BladeCenter Extension (zBX) Functions and Features

One hardware model
zBX is controlled by one specific zEC12
Up to 4 Racks (B, C, D and E)
2 BladeCenters Chassis per rack
Non-acoustics doors standard
Optional Rear Door Heat Exchanger
Optional Rear acoustic door
Redundant Power, Cooling and Management Modules
10 GbE and 1 GbE Network Modules
8 Gb FC modules
IEDN 10 GbE link aggregation between the BladeCenter and TORs

zBX Model 003

Advance Management Module
1000BASE-T and 10 GbE TORs
Up to 112 Blades
POWER7 Blades
IBM System x Blades
IBM WebSphere DataPower Integration Appliance XI50 for zEnterprise
Additional connectivity for SANs
HMCs for Unified Resource Manager
Upgraded Hypervisor levels
Unified Resource Manager support for zEC12 and zBX Model 003
Unified Resource Manager support for ensembles with zEC12, z196, z114, and zBX Models 002 and 003

Introducing Flash Express

- Flash Express is intended to improve System z availability
  - Slash latency delays from paging
  - Make your start of day processing fast
  - Reduce delays from SVC Dump processing
- zEC12 offers optional Flash Express memory cards
  - Supported in PCIe I/O drawer with other PCIe I/O cards
  - Installed in pairs for availability
  - No HCD/IOCP definitions required
- Assign Flash Memory to partitions like main memory
  - Assignment is by memory amount, not by feature
  - Each partition's Flash Memory is isolated like main memory
  - Dynamically increase the partition maximum amount of Flash
  - Dynamically configure Flash Memory into and out of the partition

What Is Flash Express?

- Also referred to as Storage Class Memory (SCM)
- Flash Express is internal storage implemented via NAND Flash SSDs (Solid State Drives) mounted in PCIe Flash Express feature cards
  - Data security provided on the feature cards
  - A pair provides 1.4 TB of storage
  - A maximum of 4 pairs are supported in a server
- Flash is accessed using the new System z architected EADM (Extended Asynchronous Data Mover) Facility
  - An extension of the ADM architecture used in the past with expanded storage
- The main application of internal Flash in zEC12 is paging store for z/OS
  - Where it provides advantages in resiliency and speed
  - With Pageable large pages being introduced in tandem for exceptional performance

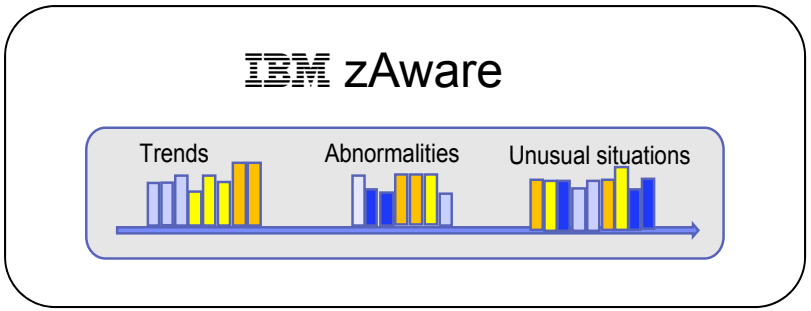
Flash Express Exploitation on zEC12

- Flash Express is exploited by z/OS
  - z/OS V1.13 Flash Web Deliverable – GA December 14, 2012
    - Pagable Large Pages (1 MB)
  - z/OS V1.13 enabling PTFs for RSM enhancements – 1Q2013
    - Flash Dynamic Reconfiguration
    - Optional PLPA and COMMON Page data sets
  - DB2 for z/OS and JAVA SDK7 SR3 will support Pageable Large Pages (SoD*)
  - IBM is working with it's Linux Distribution partners to include support in future Linux on System z distribution releases
  - IMS* CQS will use Pageable Large Pages when IMS runs on zEC12 – Availability targeted for end of 2013

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

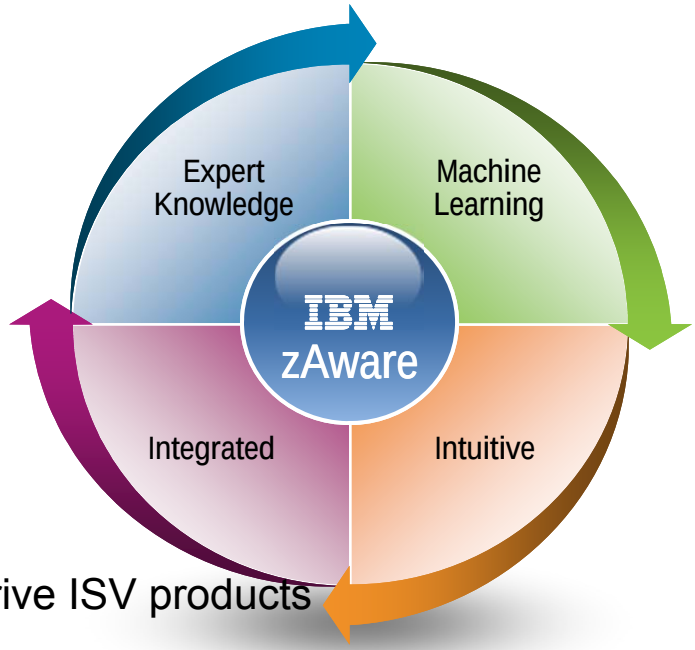
IBM zAware delivers smarter message monitoring capabilities

- **Out-of-band** high speed analytics application delivered as an integrated firmware stack
- Analyzes system messages to provide a **near real-time view of your system**
- Uses **self learning** to recognize message patterns of your environment
- User-friendly web interface
- **Easy drill down** techniques help identify problematic messages and unusual patterns to help speed up diagnostic time



IBM zAware – *IBM System z Advanced Workload Analysis Reporter*

- Monitors z/OS OPERLOG messages including all z/OS console message, ISV and application generated messages
- Can monitor across a sysplex
- Samples every 2 minutes.
- Reports on 10 minute time slices.
- Uses a 90 day baseline created from SYSLOG
- Detects anomalies monitoring systems miss
- Reports on unique messages, and a “score”
- Color-coded, browser-based (IE 8, Firefox)
- XML Output consumable through published API, can drive ISV products
  - Tivoli Integrated Service Management intends to work with IBM zAware to provide alert and event notifications*



IBM zAware Operating Requirements

- zEC12 to host IBM zAware Server
  - IBM zAware requires it's own LPAR and runs it's own self-contained firmware stack.
  - IBM zAware processor resources can be IFL or General Purpose CP
  - Memory and DASD resources are dependent on the number of monitored clients, amount of message traffic, length of time data retained
    - Memory - Min 6 GB + 256 MB. 6 GB for the first 6 z/OS Clients + 256 MB required for additional z/OS Clients above 6.
    - DASD ~ 500 GB (ECKD)
  - Network: HiperSockets or OSA ports – for both gathering of instrumentation data, and outbound alerting/communications

- IBM zAware Monitored Clients
  - IBM zAware monitored clients can be on any System z Server running z/OS 1.13 + PTFs
- 90 days historical syslog or OPERLOG data to initially prime IBM zAware

z/OS V2R1 Preview Highlights

Improving Usability and Skills

New z/OSMF Workflow & Software Management, CPM improvements; HCD/HCM HMC-wide Activate; Health Checking, zDAC improvements, Generic Tracker, Delete member name masking, D PPT,…

Integrating new Applications and Supporting Industry and Open Standards

More Batch Modernization; ASCII support in more z/OS UNIX System Services shell commands and utilities; IXCNOTE; More mutexes and shared condition variables in z/OS UNIX; Generalized Alignment Support in the Binder, Font element, TSO/E REXX™, Nested PIPI, Heap check zones, IEBCOPY enhancements …

Scalability & Performance

100-way SMP, 2 GB page, pageable 1 MB pages, transactional memory support on zEC12; RLS for Catalogs, zFS V5, Serial CF structure rebuild, EXCP support for zHPF, 8-character Job classes, PDSE V2, CFLEVEL 18, Parallel recall for batch …

Enhancing Security

LPAP access to crypto, ICSF & RRSF enhancements, SAF job class control, Certificate enhancements, z/OS UNIX timeouts; System SSL support for TLS 1.2 and NSA Suite B, …

Improving Availability

JES3 dynamic spool volume removal, Dynamic System Symbol updates, Flash Express support, RRS improvements, FORCE TCB, DCCF support for WTOR Auto-Reply, HMC 3270 console support, …

Self Managing Capabilities

DFSMShsm™ Storage Tiers, Better JES3 support for SMS-managed tape, SMS Management Class support for tape, zBX SMF performance records, DCM support for cascaded switches, z/OS UNIX Automount improvements, …

Extending the Network

Enhanced Fastpath sockets, SACK support, new FTP security exits, TCP Profile syntax check, Intrusion Detection improvements, DVIPA affinity, …

z/OS V2.1 Support of 100-way SMP

- z/OS 2.1 is planned to support 100-way symmetric multiprocessing (SMP) support in a single LPAR on IBM zEC12 servers
  - z/OS 1.12 and z/OS 1.13 with PTFs running on IBM zEnterprise EC12 servers also support up to 100 processors configured in a single LPAR
  - z/OS supports combinations of general purpose CPs, zIIPs, and zAAPs

zAAP Workloads on zIIP Processors

- IBM continues to support running zAAP workloads on zIIP processors.
- z/OS V2.1 is being designed to remove the restriction that prevents zAAP-eligible workloads from running on zIIP processors when a zAAP is installed on the server
- Intended to only to help facilitate migration and testing of zAAP workloads on zIIP processors
- The support will also be available with PTF for APAR OA38829 for z/OS 1.12 and z/OS 1.13

GRS

- IBM recommends the use of GRS STAR in a Parallel Sysplex
- For GRS Ring, IBM recommends using XCF communications rather than GRS-managed CTCs.
- zEC12 and later servers will only support FICON channels
- In z/OS 2.1 GRS plans to support FICON CTCs for GRS Ring
- **Service:**
  - z/OS 1.12 and z/OS 1.13 will require PTFs for OA38230
  - z/OS 1.10, z/OS 1.11 with Life Cycle Extension + OA38230
- You may consider migrating your existing ESCON CTCs to FICON before installing an IBM zEC12 to help simplify migration

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Sysplex Scalability and Monitoring Enhancements

- Support for up to 101 Integrated Coupling Facility (ICF) processors
  - The limit on previous System z servers was 16 ICFs
    - The maximum number of logical processors in a Coupling Facility LPAR remains at 16

- Support for up to 64 1x InfiniBand Coupling Links
  - The limit on previous System z servers was 48
  - Provides additional link connectivity for STP and for Parallel Sysplex configurations with members of more than one Sysplex on the same zEC12
  - Facilitates migration from ISC-3 to 1x InfiniBand Links

Parallel Sysplex Server Coexistence

zEC12

z9 EC or earlier - CF & OS
(Sysplex and STP)

Not Supported

Support for N-2 Only !

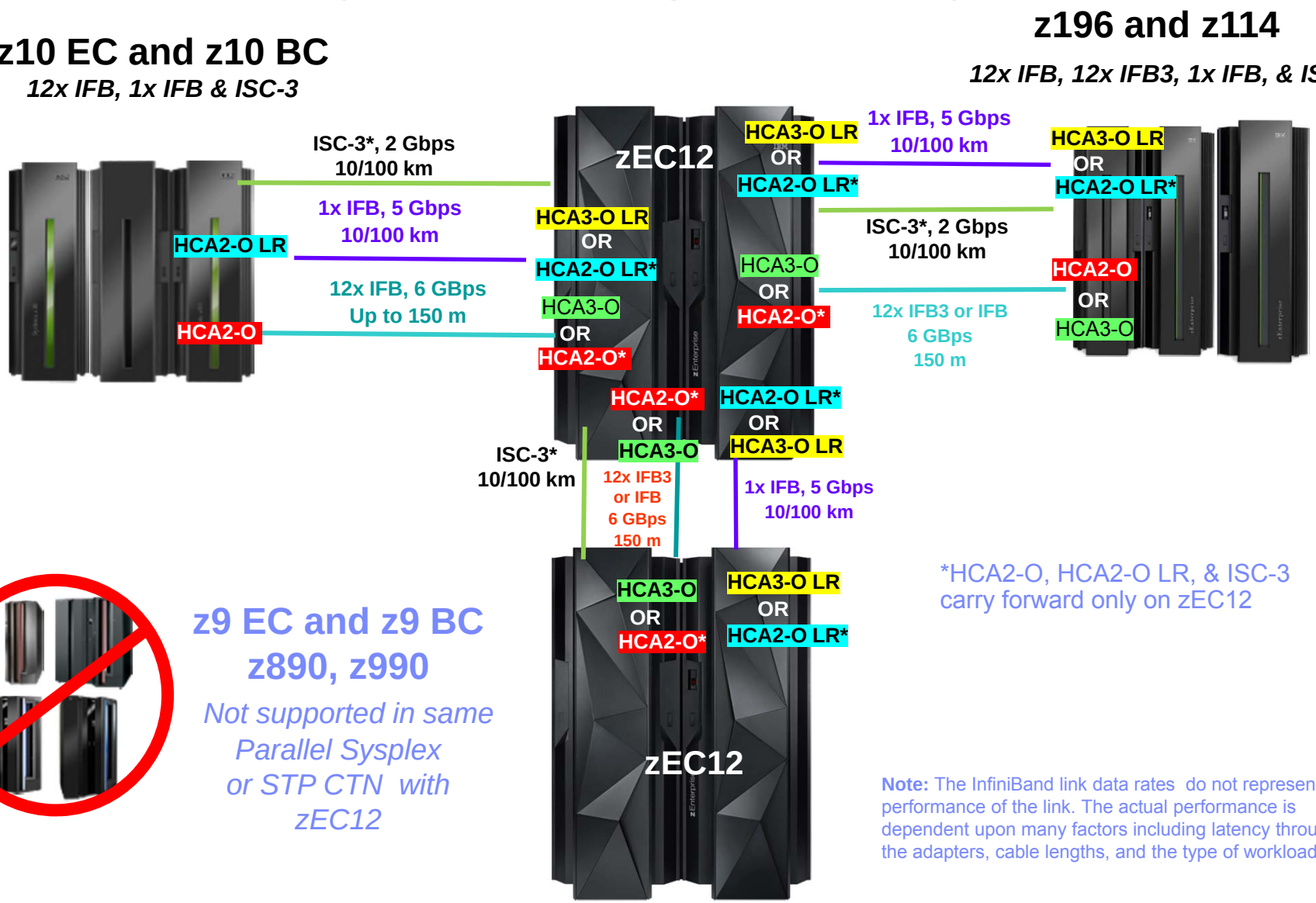
Not Supported

z9 BC or earlier - CF and OS
(Sysplex and STP)

IMPORTANT

zEC12 can be in same STP CTN as z196, z114 and z10 servers but NOT in a STP CTN with z9 servers

zEC12 Parallel Sysplex Coupling Connectivity



z9 EC and z9 BC
z890, z990

Not supported in same Parallel Sysplex or STP CTN with zEC12

*HCA2-O, HCA2-O LR, & ISC-3 carry forward only on zEC12

Note: The InfiniBand link data rates do 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.

Parallel Sysplex CFCC level 18

- **Performance Improvements**
  - Elapsed time improvements when dynamically altering the size of a cache structure
  - DB2 conditional write to a group buffer pool (GBP) cache which allows selected entries be written around the cache to disk to reduce overhead
  - Throughput enhancements for parallel cache Castout processing
  - Storage class and Castout class contention avoidance by breaking up individual storage class and Castout class queues to reduce storage class and Castout class latch contention
- **Coupling link characteristics reporting to z/OS**
  - Identifies underlying InfiniBand hardware characteristics for CIB CHPIDs to help with Sysplex monitoring and tuning
  - Enables RMF Monitor III to report additional information
    - InfiniBand Link type and protocol: 12x IFB, 12x IFB3 and 1x IFB
    - CHPID mapping to physical links – HCA IDs and port numbers
    - Link fiber optic distance
    - Fully functional or degraded status
- **Resiliency Improvements**
  - Enhanced capabilities to non-disruptively capture and collect extended diagnostic structure data from Coupling Facility structures that have encountered an error.
  - Verification of local cache controls for a Coupling Facility cache structure connector
- **Structure and CF Storage Sizing with CFCC level 18**
  - May increase storage requirements when moving from CF Level 17 (or below) to CF Level 18
  - Use of the CF Sizer Tool is recommended: http://www.**ibm.com**/systems/z/cfsizer/

RMF Channel Path Details

- Provides enhanced reporting of channel path characteristics for Parallel Sysplex Coupling Facility CIB or CFP links

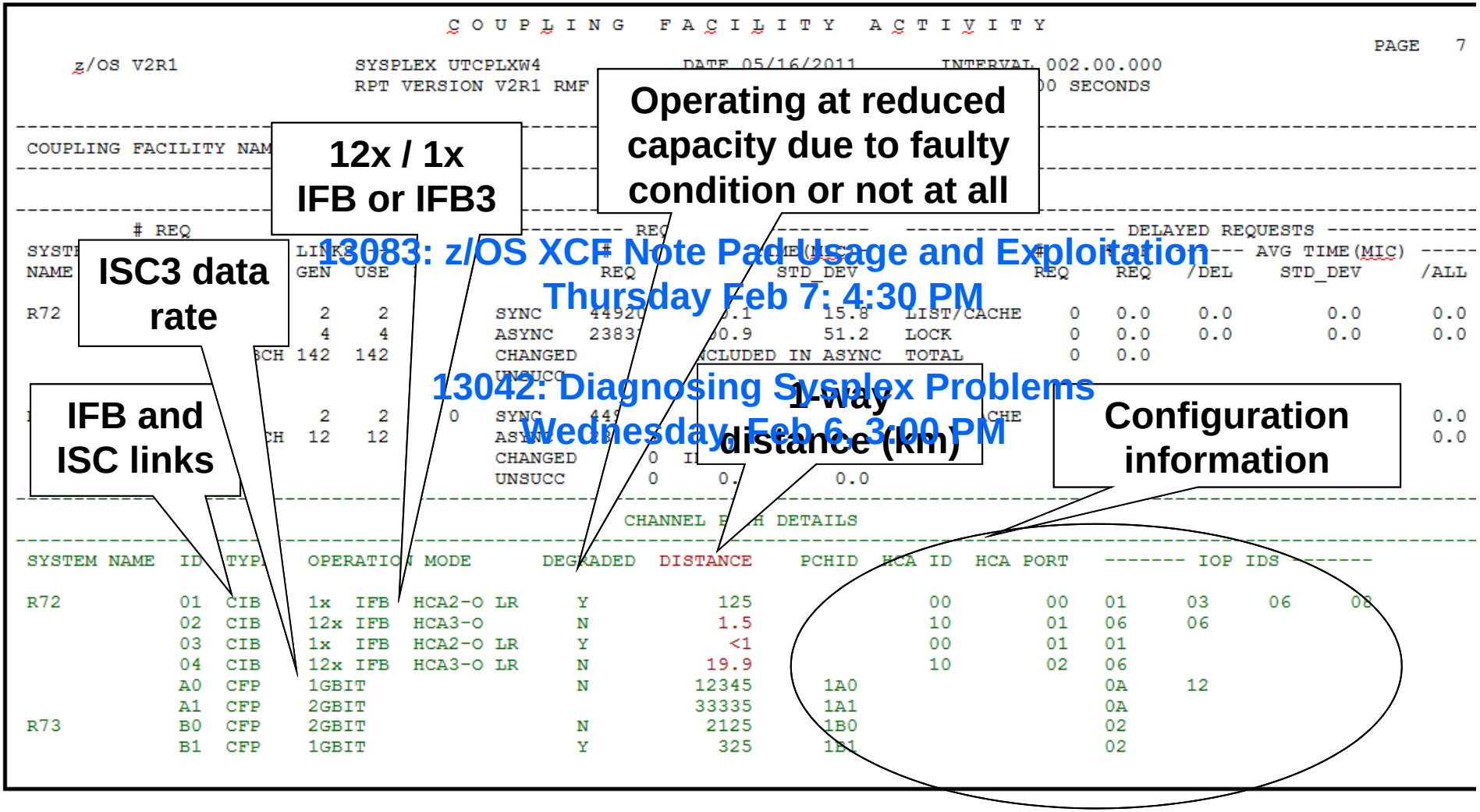
- Helps understand link performance, response times and coupling overheads
  - Channel path ID
  - Channel path operation mode
  - Channel path degraded status
  - Channel path distance
  - Accessible I/O processors

  Channel path type acronym
  Physical channel path ID
  Host channel adapter ID
  Host channel adapter port number

- New Channel Path Details section
  - RMF Coupling Facility Postprocessor Report
  - RMF Monitor III CFSYS Report
  - XML report

- **z/OS V2.1 Rollback to V1.12 via APAR OA38312 and OA37550**
- **z/OS RMF V2.1. Rollback to V1.12 via APAR OA37826**

Channel Path Details



IBM System z Social Media Channels

- **Top Facebook pages related to System z:**
  - IBM System z
  - IBM Academic Initiative System z
  - IBM Master the Mainframe Contest
  - IBM Destination z
  - Millennial Mainframer
  - IBM Smarter Computing

- **Top LinkedIn groups related to System z:**
  - System z Advocates
  - SAP on System z
  - IBM Mainframe- Unofficial Group
  - IBM System z Events
  - Mainframe Experts Network
  - System z Linux
  - Enterprise Systems
  - Mainframe Security Gurus

- **Twitter profiles related to System z:**
  - IBM System z
  - IBM System z Events
  - IBM DB2 on System z
  - Millennial Mainframer
  - Destination z
  - IBM Smarter Computing

- **YouTube accounts related to System z:**
  - IBM System z
  - Destination z
  - IBM Smarter Computing

- **Top System z blogs to check out:**
  - Mainframe Insights
  - Smarter Computing
  - Millennial Mainframer
  - Mainframe & Hybrid Computing
  - The Mainframe Blog
  - Mainframe Watch Belgium
  - Mainframe Update
  - Enterprise Systems Media Blog
  - Dancing Dinosaur
  - DB2 for z/OS
  - IBM Destination z
  - DB2utor

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