



IBM System z

Technical University 2011

What's New in z/OS 1.13

Session zES28

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z/OS Key Dates

▪ z/OS Version 1 Release 12

- **July 22, 2010:** Announcement
- **September 24, 2010:** GA via ServerPac, CBPDO and SystemPac
- **October 11, 2011:** Recommended last date for submitting z/OS 1.12 via fee based customized offerings
- **October 25, 2011:** Last date for processing orders for z/OS 1.12 via ServerPac and CBPDO

▪ z/OS Version 1 Release 13

- **February 15, 2011:** Preview Announcement
- **July 12, 2011:** Announcement
- **September 30, 2011:** General availability via ServerPac, CBPDO and SystemPac

z/OS and Server Support



	z800/ z900	z890/ z990	z9 EC/BC	z10 EC/ BC	z196	z114	DS8000 DS6000®	TS1130	End of service	Lifecycle Extension for z/OS	Coexists with	Ship date
R7	X	X	X	X (1,2)	X(1)	NO	X(1)	X	9/2008	9/2010	R9	9/2005
R8	X	X	X	X	X	X(4)	X	X	9/2009	9/2011	R10	9/2006
R9	X	X	X	X	X	X(4)	X	X	9/2010	9/2012	R11	9/2007
R10	X	X	X	X	X(3)	X(3,4)	X	X	9/2011	9/2013	R12	9/2008
R11	X	X	X	X	X	X	X	X	9/2012*		R13	9/2009
R12	X	X	X	X	X	X	X	X	9/2013*		R14*	9/2010
R13	X	X	X	X	X	X	X	X	9/2014*		R15*	9/2011*
R14*	X	X	X	X	X	X	X	X	9/2015*		R16*	9/2012*

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

(1) IBM Lifecycle Extension for z/OS V1.7 (5637-A01) was required for the z10 BC, z196, and disk storage

(2) IBM Lifecycle Extension for z/OS V1.7 (5637-A01) required for support for some z10 EC features

(3) z/OS V1.10 and later required for zBX and Ensemble management exploitation

(4) IBM Lifecycle Extension for z/OS V1.8 (5638-A01) and for z/OS V1.9 (5646-A01) required for z114.
Lifecycle Extension for z/OS V1.10 (5656-A01) required starting October 2011.

(5) See IBM GTS services for additional fee-based extended service options

Out of service (5)

**Lifecycle Extension
withdrawal 2 years later**

General support

IBM Lifecycle Extension for z/OS V1R10 (5656-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 announced February 15, 2011 and is available since October 1, 2011.
- **For details: Announcement Letter 211-002 Dated February 15, 2011**

z/OS on DVD

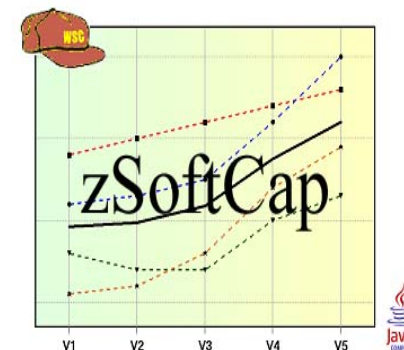
- **z/OS and related software (such as ServerPac®, CBPDO, SystemPac®, ProductPac®) are available on DVD media.**
 - ▶ z/OS (such as ServerPac or CBPDO) is no longer available on 3480, 3480 Compressed (3480C), and 3490E tape media.
- **Your choice for z/OS delivery media is now:**
 - ▶ **Over the Internet.**
 - ▶ Internet delivery is the most popular delivery option, see:

http://www-03.ibm.com/systems/z/os/zos/serverpac_internet_delivery.html
 - ▶ **IBM 3590 and 3592 Enterprise Tape**
 - ▶ Our highest-density media means there are much fewer tapes to manage!
 - ▶ **DVD**
 - ▶ Requires a workstation with a DVD drive that can read discs in DVD-5 (single-sided, single layer) format and a network connection to your z/OS
- **z/OS Customized Offering Driver (COD) is also available on DVD, but requires the DVD drive in and installation from the HMC.**



zSoftCap - New !

- What is zSoftCap ?
 - zSoftCap is a work station based tool that evaluates the effect on z/Architecture and System z processor capacity when migrating to newer levels of software, including z/OS, CICS and IMS.
- z/OS 1.13 Planning will refer to zSoftCap
 - Old SoftCap will remain available for some time by request
- What's removed from zSoftCap ?
 - Goal Mode and 31bit to 64bit Migration
- What has been added to zSoftCap ?
 - Changes to IMS workload Algorithms
 - Results will not exactly match when compared with results from SoftCap
 - Both SoftCap and the new zSoftCap can co-exist
 - z/VSE support
 - Migration from any release beginning with VSE/ESA 2.3 up to and including z/VSE 4.3
 - CICS/TS 4.2 (zSoftCap 4.1a)
 - z114 support (zSoftCap 4.1a)
- zSoftCap 4.2 is the latest release
 - Customer version is also available



z/OS Management Facility

The new face of z/OS



No-charge product

Streamlined processes and built-in guidance address a broad scope of activities and helps create a more integrated z/OS experience.

▪ **Configuration**

- Configuration Assistant for z/OS Communication Server (R11) – Simplified configuration and setup of TCP/IP policy-based networking functions

▪ **Performance**

- Capacity Provisioning (R13) - simplified monitoring of CP status for domains
- Resource Monitoring and System Status (R12) – single view of sysplex and Linux® performance status and dynamic real time resource metrics.
- Workload Management – creation, editing, and activation of WLM policies (R12)

▪ **Problem Determination**

- Incident Log (R11) – Simplified capture, packaging, sending of SVC dump diagnostic data

▪ **Software**

- Deployment (R13) - Clone z/OS images, deploy software more easily and consistently

▪ **Storage**

- DASD Management (R13) - Define new SMS storage volumes quickly and easily*

▪ **z/OS Classic Interface**

- ISPF Task integrates existing ISPF into z/OSMF to launch to ISPF functions directly (R13)

▪ **Base**

- A new web-based (REST) interface enables you to submit batch jobs and access batch data from non-z/OS systems (R13)
- Leverage IBM System z® Specialty engines
- IBM Assistance available to help with pre-planning, early discovery, and readiness review for new z/OSMF environment

* The DASD Management task is planned to be made available in 1Q 2012 with the PTF for APAR PM40869

z/OSMF Software Deployment (R13)

New! - simplified deployment of installed software

- New task designed to make deployment of installed software simpler and safer
 - Easy to follow checklist replaces manual and error prone procedures with a user friendly application
 - Incorporates IBM recommended best practices for software deployment.
- Software Deployment can clone software
 - Locally, single system or within a sysplex
 - Remotely, across a network, and multiple Sysplexes.
- Software Deployment can also:
 - Identify, modify, delete software instances
 - Generate jobs to copy a software instance
 - Verify cross-system and cross-product requisites, verify fixes
 - Copy ALL parts of the software (SMP/E CSI inventory too)
- Clones all SMP/E installed software!
 - IBM, ISV, z/OS, stack or individual products
 - Service upgrades for all of the above (via complete replacement)

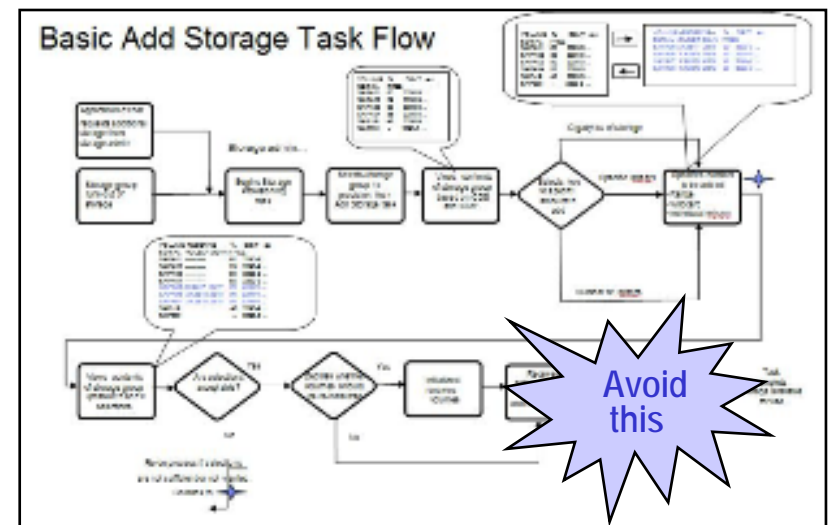
The screenshot shows a web-based interface for the z/OSMF Software Deployment Checklist. At the top, there are two tabs: 'Welcome' and 'Deployment'. Below the tabs, the breadcrumb navigation reads 'Deployment > Deploy Software > Deployment Checklist'. The main heading is 'Deployment Checklist', followed by the instruction 'To deploy a software instance, complete the checklist.' Below this is a table with two columns: 'Progress' and 'Step'. The table lists six steps, with the first five marked as complete (checkmarks) and the sixth as the current step (arrow). Step 5 includes two sub-links: 'View the deployment summary.' and 'View the deployment jobs.'

Progress	Step
✓	1. Specify the properties for this deployment.
✓	2. Select software instance to deploy.
✓	3. Select the objective for this deployment.
✓	4. Configure this deployment.
✓	5. Define the job settings. z/OSMF creates the deployment summary and job <ul style="list-style-type: none">• View the deployment summary.• View the deployment jobs.
➔	6. Specify the properties for the target software instance.

z/OSMF DASD Management* (R13)

New! - The first phase in simplifying storage management

- Add storage to an SMS Pool storage group through a single user interface
 - Easier, with less SMS skill needed
- Manage containers of pre-defined available volumes with the introduction of the reserve storage pool resource.
- Display new pool storage group attributes
 - View the list of pool storage groups associated with the active configuration
 - View an alert when the Storage Utilization Notification Threshold is exceeded
 - Display storage group level attributes
 - View volumes associated with a storage group
 - Display volume level attributes
- Select the AddStorage Wizard to guide you through steps that can simplify the task of adding storage to a storage group



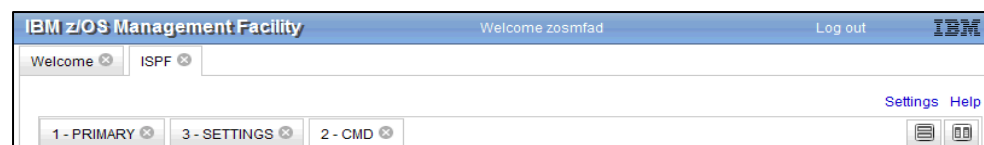
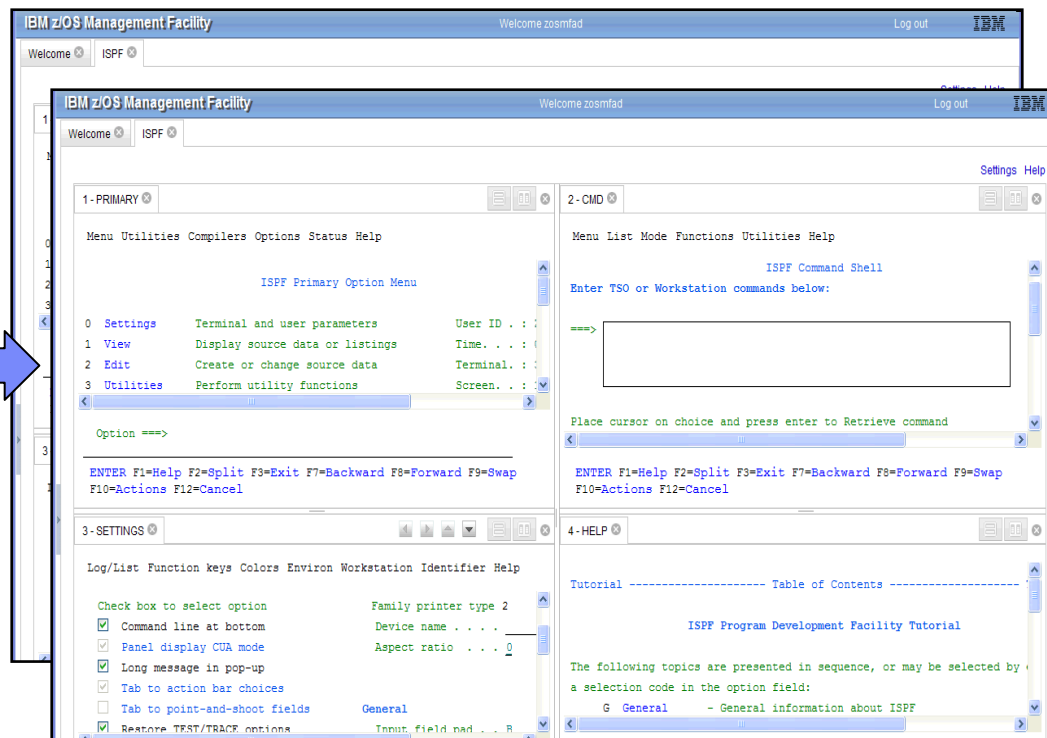
z/OSMF and ISPF (R13)

New! - Work with existing interfaces

- Enables system programmer to perform tasks from one interface.
 - Also makes ISPF applications URL Web-accessible for linking and launching from other applications

- Up to 4 panes
 - Panes can be sized. Each pane can have multiple ISPF sessions, tabs can be moved between panes
 - Shows ISPF Menu bar, Command line, Function keys
 - Open and cascade multiple windows

- Also available in tabbed format



z/OSMF Capacity Provisioning (R13)

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

▪ System z On/Off Capacity on Demand

Ideal if your systems have few periodic workload peaks over the year. Potentially:

- Save on hardware - No need to purchase hardware, 'you rent it' for the days you need it.
- Save on IBM software charges – only pay for software charges for On/Off CoD peak capacity in the month it is incurred*

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

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

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

- Can manage processing capacity more reliably, more easily, and faster.
- What had taken minutes or hours to discover, identify, decide, and resolve, now can be specified to happen automatically in as little as two minutes.

▪ New z/OSMF Capacity Provisioning task (R13)

- Initial phase simplifies the **monitoring** of z/OS CP connections, domains, configurations, and policies
- Separate Windows-based tool required for z/OS CP **management** functions.

Provisioning Manager

The Provisioning Manager is the component of Capacity Provisioning that controls the domain based on the active policies. Connections describe how to connect to a Provisioning Manager. The connections table shows connection definitions.

<input checked="" type="checkbox"/> <input type="checkbox"/> Actions ▼			
Host Address Filter	Protocol Filter	Port Filter	
<input type="checkbox"/> Same system as z/OSMF			
<input type="checkbox"/> cpmprod.ibm.com	HTTPS	5989	
<input type="checkbox"/> cpmtest.ibm.com	HTTP	5988	

* Additional terms and conditions may apply

Application Linking (R13)

Example, link Incident Log to SDSF in context

- A more seamless experience when working with z/OS
- Make your own linkages between z/OSMF apps and even to any web-based apps
- Define an 'event' (such as "View Job Status")
- Then define the 'event handler' action and parameters (such as 'go to ISPF' with context of the job)

The screenshot shows the IBM z/OS Management Facility interface. On the left, the 'Incident Log' is displayed with a table of incidents. A blue arrow points from the 'View Job Status' action in the 'Incident Log' to the 'SDSF' (System Display and Search Facility) window on the right. The 'SDSF' window shows the command 'SDSF OUTPUT DISPLAY PGM=FTP JOB000058 DSID 2 LINE 0 COLS 02- 81' and the resulting output, which includes job details and a list of jobs.

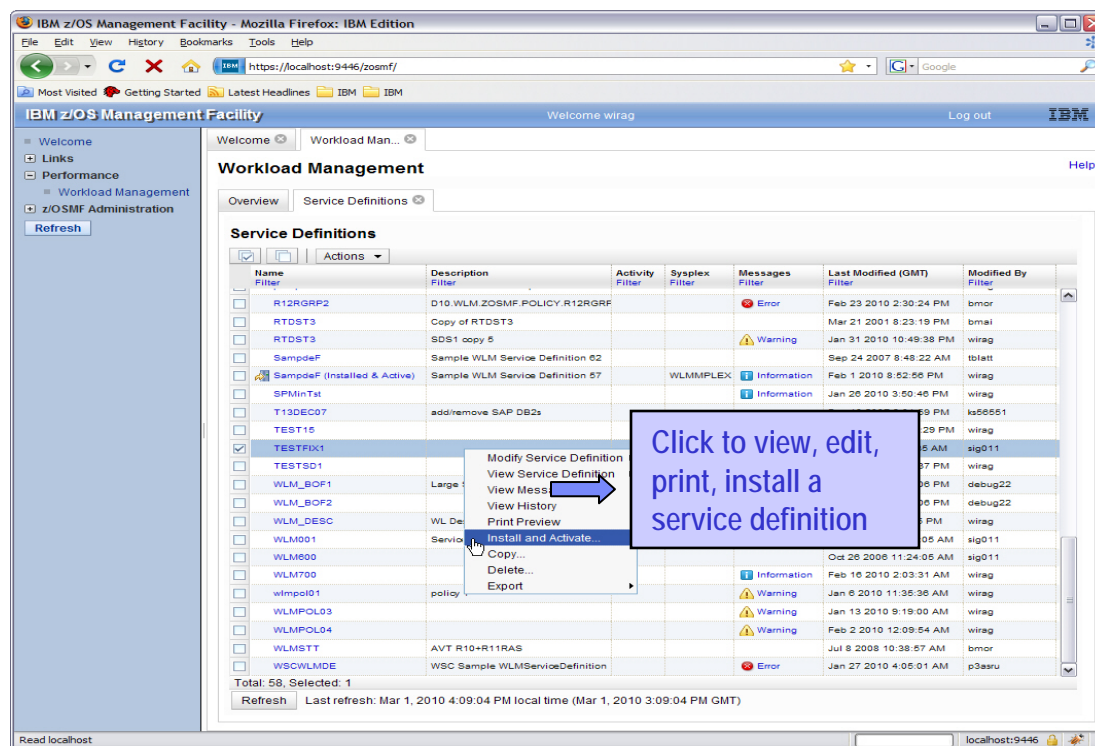
**Action from the Incident Log:
Launch to view job status - SDSF**

z/OSMF Workload Management (R12)

Consolidated inventory of service definitions

- **WLM Service Definition Editor**
- **Store all service definitions in one repository**

- Available starting with z/OS and z/OSMF R12
- Direct access to the WLM Couple Data Set to install/extract service definitions. No need to FTP WLM policy files
- Activation of service policies and monitoring of the WLM status in the sysplex
- **For z/OSMF R13**
 - More granular authorization
 - Persistent settings



Note, screen capture from z/OSMF R12

Resource Monitoring (R12)

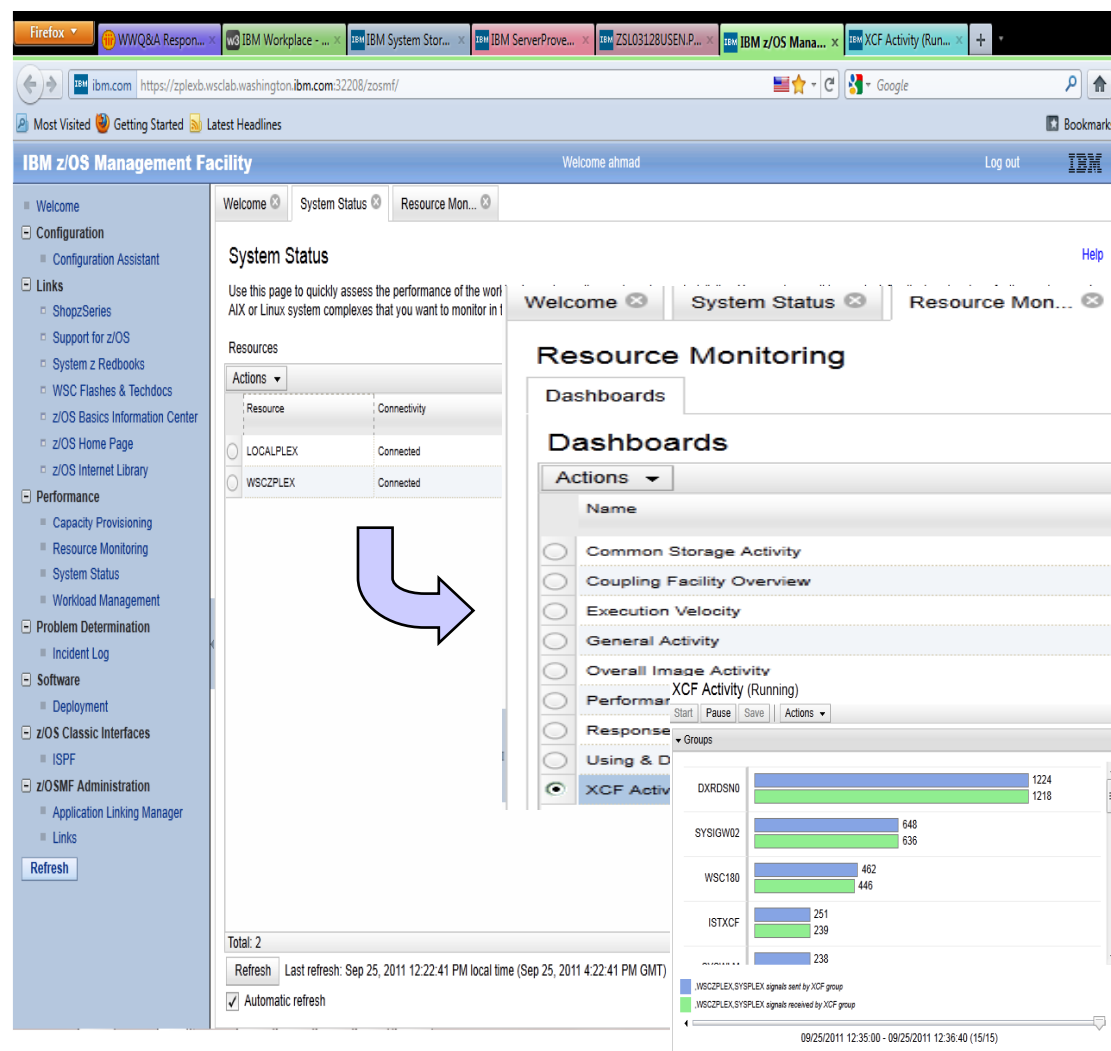
A snapshot of the performance of workloads running on your systems

■ Sysplex status:

- Instant snapshot of workload performance
- RED, YELLOW GREEN status gives instant indication of WLM goals
- Monitor z/OS AND Linux
- Drill down to see RMF™ metrics
- Renamed **System Status** (R13)

■ Monitoring Desktops

- GUI for RMF
- Monitor most Resource Measurement Facility (RMF) Monitor III metrics, create and save custom views, and display real-time performance data as bar charts.
- Renamed **Dashboards** (R13)



Integrated z/OS and Linux resource monitoring

A monitoring solution for multi-tier workloads

- Monitor the resources for z/OS and Linux workloads

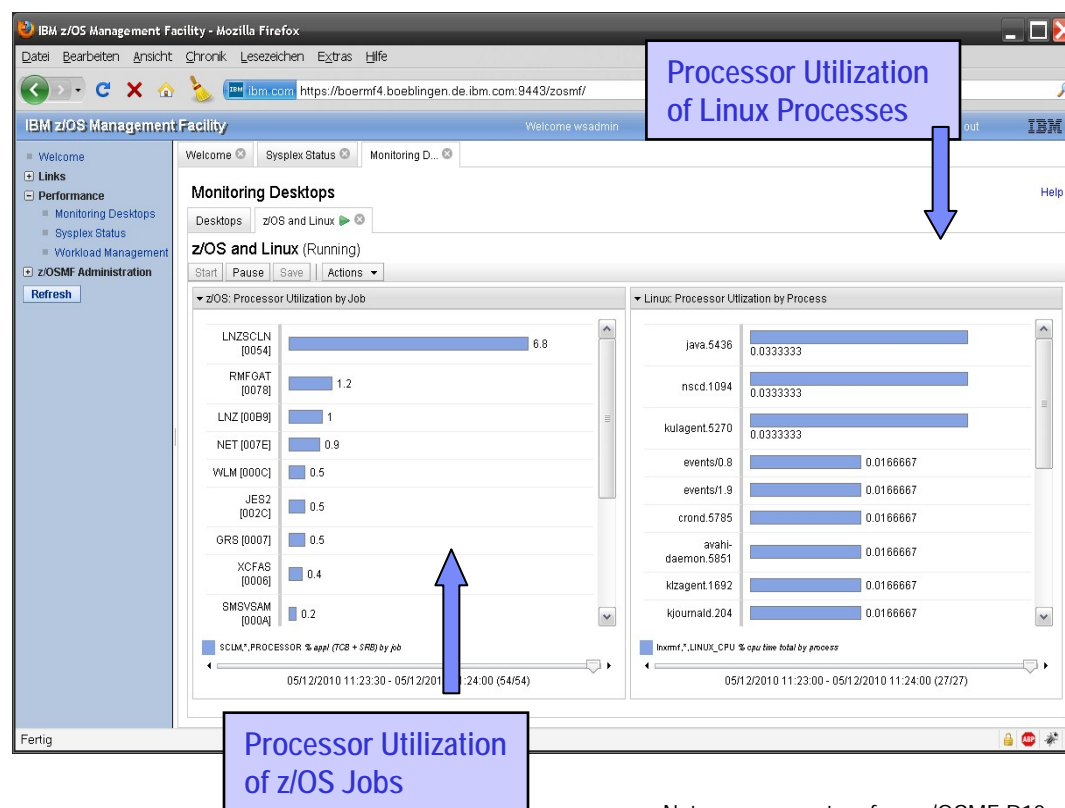
- Ideal for use with System z Enterprise System

- For z/OSMF R12

- Use separate as-is, no-charge web-download tool to gather resource information for Linux systems.

- For z/OSMF R13

- New integrated performance data gatherers for Linux on System z, Linux on IBM System x®, and AIX® systems
 - Additional monitoring capabilities for your zEnterprise zBX System



Note, screen capture from z/OSMF R12

z/OSMF Configuration Assistant for z/OS Comm Server (R11)

Configure TCP/IP networks

▪ Powerful!

- Configure z/OS TCP/IP networks from one comprehensive interface

▪ No delay!

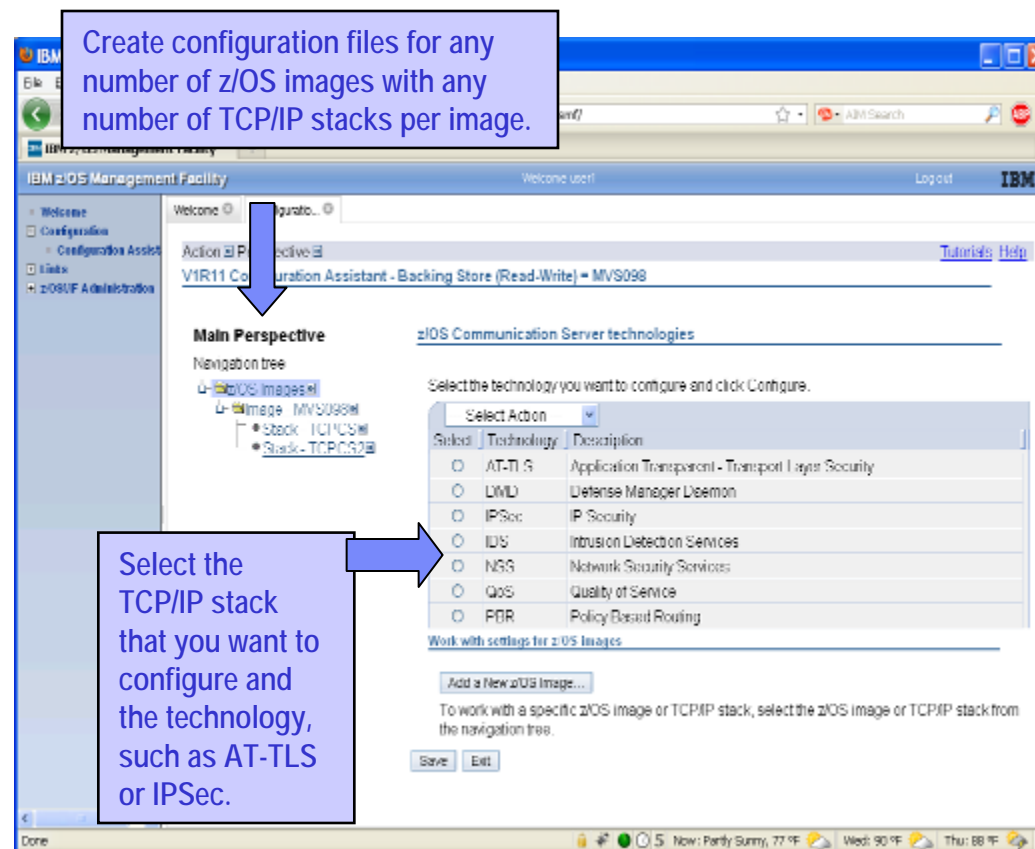
- New networking / security features in z/OS are available for use with the same release of z/OSMF

▪ For z/OSMF R12

- Support for Internet Key Exchange (IKE) version 2
- Support for FIPS-140 cryptographic mode for IPSec and IKE
- Simpler AT-TLS rules

▪ For z/OSMF R13

- Configure networks for both z/OS R12 and R13 mixed environments
- Import existing stack settings
- Define policies once and use for multiple stacks
- Improved Intrusion Detection – added IPv6 and Enterprise Extender traffic.



Note, screen capture from z/OSMF R12

z/OSMF Incident Log (R11)

Save time when diagnosing incidents

- **Respond to and manage incidents quickly and efficiently**

- View, sort, and act on incidents (identified by subsystem)
- Package dump data for transmission in minutes

- **For z/OSMF R12**

- Added additional comments and diagnostic data
- Encrypted parallel FTP of the incident files, to IBM
- Sending additional user-defined data with an incident

- **For z/OSMF R13**

- New APAR search
- View job status via SDSF launch
- Utilizes new Problem Documentation Upload utility in base of z/OS R13

IBM z/OS Management Facility - Mozilla Firefox: IBM Edition

https://mysystemz:32208/zosmf/

IBM z/OS Management Facility

Welcome Incident Log

Incident Log

Many fields, set tracking IDs
Can identify which subsystem

Select incident, get popup with actions

Problem Number	Tracking ID	Notes
ER=BPXMIPCE 0005	XR-8265745	Screen team analyzing
ER=BPXMIPCE +????,ABEND=S0EC3,REASON=04130007		
OS, ER=BBORADMP,ABEND P	12345,001,001	8562(12)
OS, ER=BBORLEXT,ABEND VOWND	DB: 5888, Scr: XR-125	Application problem
CPX1,ISSUER=BPXMIPCE SON=04130007		
CPX1,ISSUER=BPXMIPCE SON=0005005		
COMPID=6655N0200,ISSU R=BBORFRR,ABEND IN BB00SRBF		
COMPON=ZTT TC=ZTTABND ISSUER=ZTTVDUMP - ABEND FOR PDWB 1		

Total: 8, Filtered: 8, Selected: 0

Refresh Last refresh: Jan 21, 2010 5:25:52 PM local time (Jan 21, 2010 11:25:52 PM GMT)

Transferring data from localhost...

localhost:9443

Note, screen capture from z/OSMF R12

z/OS V1R13 at a glance

Improving Usability and Skills

New and updated z/OSMF applications & web-enabled ISPF, User-level mount command for z/OS UNIX® System Services, Automatic UCB updates, SDSF Sysplex functions to work without MQ, Catalog parmlib member, Better O/C/EOV Messages, Health Checks, ...

Integrating new Applications and Supporting Industry and Open Standards

Java™/COBOL interoperability, RESTful API for batch, Improved Support for unnamed sections, ISPF Edit Macros, Subsystem and Unauthorized XTIO support, dbx hookless debug, DFSORT™ improvements, Job level return codes, ...

Scalability & Performance

Fully-shared zFS in a sysplex, IEBCOPY performance, RMODE 64 extensions, IFASMF DL improvements, 500K+ aliases per user catalog, Larger VVDSs, FREEVOL=EOV, FTP support for large format data sets and EAS,...



Enhancing Security

RRSF over TCP/IP, LDAP improvements, enhanced SAF security for z/OSMF, NAS address checking and encryption negotiation, New restricted QNAMEs, PKI support for DB2® backstore, ICSF support for new HMACs, FTP & TN3270 password phrase support, ...

Improving Availability

Warn before TIOT exhaustion, CMDS enhancements, Parallel FTP for dump transfers, PFA ENQ tracking, RTD improvements, zFS Refresh, DADSM Dynamic Exits, JES2 spool migration, JES3 dynamic spool addition, Better channel recovery, More ASID reuse, ...

Self Managing Capabilities

WLM and RMF to provide response time distribution for all goals, DFSMSHsm™ Journal Backup and space management improvements, Hybrid-wide monitoring...

Extending the Network

IDS IPv6 support, NAT Traversal for IKEV2, NMI extensions, More VLANs per OSA port, more 64-bit TCP/IP, EE improvements, ...

z/OS support z196 Functions and Features (GA2)

Five hardware models
Quad-core 5.2 GHz processor chips
Up to 80 processors configurable as CPs, zAAPs, zIIPs, IFLs, ICFs, or optional SAPs (up to 32-way on R7, 64-way on R9, 80-way on R11)
Out of order instruction execution
Improved processor cache design
Up to 15 subcapacity CPs at capacity settings 4, 5, or 6
Up to 3TB real memory (1TB per LPAR)
Improved availability with Redundant Array of Independent Memory (RAIM)
Power save functions
On Demand enhancements
IBM zEnterprise Unified Resource Manager (from HMC)
New and enhanced instructions
Changes to the Common Cryptographic Architecture, Crypto Express3, and Trusted Key Entry
IPL from an alternate sub channel set
PCIe-based I/O infrastructure -- FICON Express8S and OSA Express4S
32 sub channels per CHPID for PSIFB links
Large send for IPv6 packets



(z/OS support in blue)
(Sept 2011 support in red)

Capacity Provisioning enhanced
6.0 GB/sec InfiniBand I/O interrupt
Three subchannel sets per LCSS
FICON Discovery and AutoConfiguration (zDAC)
OSA-Express3 Inbound Workload Queing (IWQ)
IWQ for Enterprise Extender
Low latency virtual network between logical partitions with HiperSockets Completion Queue (preview)
CFCC Level 17 enhancements
Up to 104 External Coupling Link
Up to 128 Coupling Link CHPIDs Defined
Optional water cooling
Optional High Voltage DC power
Optional overhead I/O cable exit
Support for OSX and OSM CHPIDs
zBX-002 IBM Smart Analytics Optimizer
zBX-002 select POWER7 and IBM System x Blades
zBX-002 IBM WebSphere DataPower Integration Appliance X150z for zEnterprise
HiperSockets optimization for IntraEnsemble Data Network (preview)

zEnterprise 114 Functions and Features

(GA Driver 93 – September, 2011)

Two hardware models
Up to 10 processors configurable as CPs, zAAPs, zIIPs, IFLs, ICFs, or optional SAPs
Up to 26 subcapacity settings across a maximum of 5 CPs
Up to 256 GB of Redundant Array of Independent Memory (RAIM) for System
Dedicated Spares on the Model M10
Increased capacity processors
Out of order instruction execution
Improved processor cache design
New and additional instructions
On Demand enhancements
CFCC Level 17 enhancements
Cryptographic enhancements
6 and 8 GBps interconnects
2 New OSA CHPIDs – OSX and OSM



Doubled HiperSockets to 32
Additional STP enhancements
Doubled Coupling CHPIDs to 128
Improved PSIFB Coupling Link
Physical Coupling Links increased to 72 (Model M10)
New 32 slot PCIe Based I/O Drawer
Increased granularity of I/O adapters
New form factor I/O adapters i.e FICON Express8S and OSA-Expres4S
Humidity and altimeter smart sensors
Optional High Voltage DC power
Optional overhead I/O cable exit
zBX-002 with ISAOPT, POWER7, DataPower XI50z and IBM System x Blades

Improving Usability and Skills

- JCL Improvements with JES2
 - Stop journaled jobs on step boundaries
 - Forces job out of execution when the current step ends and requeued for execution and held if requested
 - \$Ejxxx,STEP[,HOLD]
 - Job-level return codes
 - ✓ JOBRC=HIGHEST(MAXRC), LAST(LASTRC), STEPRC(STEP,STEPNAME)
 - ✓ \$T JOBCCLASS(x) is enhanced with JOBRC operand
 - Support for instream data sets in PROCs
 - ✓ //ddname DD *
 - SPIN= DD JCL (and dynamic allocation) support for spin interval specification similar to that on JESLOG
 - ✓ SPIN=(UNALLOC,interval|time|size)
- Remaining SDSF Sysplex functions no longer to require WebSphereMQ:
 - WLM enclaves (ENC)
 - z/OS UNIX processes (PS)
 - Health checks (CK)
 - Resource monitor (RM) (JES2 only)

Improving Usability and Skills

- New Catalog PARMLIB Member IGGCATxx
 - CATALOG=(xx,yy, ...) in IEASYSxx
 - Default is IGGCAT00
 - PARMLIB concatenation & multiple members supported
 - Catalog defaults taken if no PARMLIB member found
 - Support for specifying:
 - ✓ VVDSSAPCE - VVDS space defaults
 - ✓ NOTIFYEXTENT – desired percent threshold of the extents allocated for a catalog before system issues IEC361I to warn that the catalog is becoming full
 - ✓ TASKMAX – Upper limit on CAS service tasks
 - ✓ Whether to enable extension records for user catalog aliases
- Warning message for usercatalog delete
 - Confirmation WTOR IDC1999I will be issued if a DELETE UCAT RECOVERY command is issued
 - DELRECOVWNG(YES) in IGGCATxx
 - You can enable/disable this enhancement by:
MODIFY CATALOG,{ENABLE|DISABLE},DELRECOVWNG
- Automatically fix SMS CDS data set attributes
 - Health check for NOREUSE in R12
 - The CDS is automatically altered to **REUSE** in R13 when it is defined as being NOREUSE

Improving Usability and Skills

- Automatic cross-sysplex UCB updates for DFSMSdss™ COPY or RESTORE operation and DFSMSHsm Fast Replication Backup and Recovery processing
 - Specify a new REFUCB keyword in DEVSUPxx:
 - ENABLE|DISABLE(REFUCB)
 - Designed to issue VARY automatically on sharing systems when these operations change volume serial, VTOC pointer
- Better O/C/EOV Messages
 - Additional information so you don't have to look up the message
 - New DEVSUPxx parameter to activate:
 - ✓ OCE_ABEND_DESCRIP = YES | NO
 - Example:

```
IEC145I 413-40,IFG0194F,RDASL1,RDSL1,SYSUT1,0920,,DATASETX
```

```
ERROR DESCRIPTION:
```

```
THE DEVICE DOES NOT SUPPORT THE RECORDING MODE REQUESTED BY THE USER  
OR DETERMINED BY THE SYSTEM.
```

```
END ERROR DESCRIPTION: IEC145I
```

z/OS R13 Simplification Enhancements

- Health Checker Framework enhancements
 - Greater ability to schedule health checks
 - New SYNCVAL keyword in HZSPRMxx and MODIFY
 - Ability for checks to raise message severity as conditions change
- New Health Checks:
 - Two new checks for Allocation – intended to warn about potential Allocation deadlock conditions
 - Detects tape library initialization errors with suggestions on how to resolve.
- New Migration Checks for:
 - Warn when zFS configuration option is not set to sysplex=filesys
 - Verify new sysmlinks added to enable read-only root in R13
 - OA35636 and OA35605 for R11 and R12
 - Warn the z/OS Console Mode has not been set
 - Available for R10 and later with OA32930

Scalability and Performance

True cross-system sharing of zFS across a sysplex

- Direct I/O from all sharing systems
- No more function-shipping
- Significant zFS file system performance improvements expected; most measurements showed a 50-150% improvement*

IEBCOPY improvements

- Much better performance expected for some operations; we measured elapsed time reductions from 19-70%* for:
 - PDS-to-PDS COPY
 - PDS-to-sequential unload
 - PDS compress
- Removed requirement for APF authorization

* Note: Performance improvements are based on internal IBM laboratory tests. Your results will vary. I/O performance improvements measured for fully shared zFS ranged from very small to 900%, with the majority of workload conditions tested falling between 50% and 150%. The actual amount of improvement will depend on the environment (monoplex or Parallel Sysplex) and the type of file processing being done. IEBCOPY improvement will depend on the amount of data being copied, the record format, the record length, and the block size.

Scalability and Performance

High-Performance FICON (zHPF) improvements planned for 4Q2011*

- zHPF to support certain I/O transfers for QSAM, BPAM, and BSAM
- Better I/O performance expected with no application changes
- Extends current zHPF support for VSAM, Extended Format sequential, zFS, and PDSE data sets to support:
 - Basic nonextended format Physical Sequential data sets
 - Basic and large format sequential data sets
- Requirements:
 - z/OS V1.13, z/OS V1.12, or z/OS V1.11 with PTFs
 - zEnterprise System server with channels that support zHPF and a minimum Machine Change Level (MCL)
 - HMC V2.11.1
 - Support Element V2.11.1
 - IBM System Storage DS8700 or DS8800 series with new DS8000 licensed machine code
- Enable in IGDSMSxx member of PARMLIB: SAM_USE_HPF(YES|NO)
 - Default NO on z/OS R11-R12, YES on z/OS R13
- See Statements of Direction

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Taking z/OS Storage Volumes to the Extreme - EAV

- z/OS R10 introduced Extended Address Volumes with support for VSAM (incl. zFS)
- z/OS R11 added Extended Format Sequential and support for data sets spanning the 64K cylinder line
- z/OS R12 added:
 - PDS and PDSE (including load modules and program objects libraries)
 - Sequential, BDAM, GDG, LPALIB, LPA list, link list data sets, SYSn.IPLPARM, SVCLIB
 - Catalogs, VVDSs, JES2 and JES3 spool and checkpoint, JES3 JCT
 - DFSMSrmm, DFSMSHsm™ data sets
 - Standalone Dump data set and AMASPZAP support
 - VSAM AIX support in Language Environment
- **z/OS R13:**
 - SDSF support for output data sets
 - FTP support for SMS-managed and non-SMS-managed PS; basic and large format; PDS and PDSE; and GDG data sets
- No support for above the line for:
 - Imbed and Keyrange attributes, incompatible CA sizes for VSAM
 - NUCLEUS, SVCLIB, LOGREC, VTOC, VTOCIX,
 - RACF databases, Page data sets, HFS data sets
 - PARMLIB concatenation data sets
 - XRC Control, Master, or Cluster non-VSAM data sets

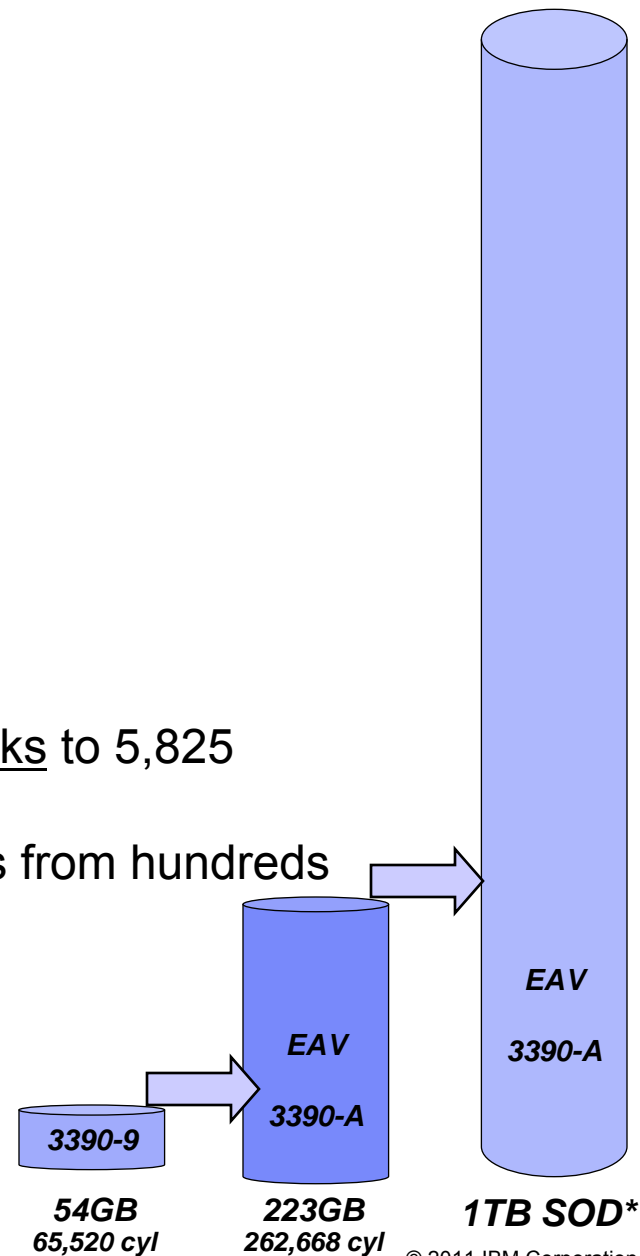
Scalability and Performance

One TB Extended Address Volumes*

- z/OS R13 planned to support EAVs up to 1 TB volume
- Requirements:
 - IBM System Storage DS8700 or DS8800
 - New DS8000 licensed machine code
 - Availability planned for 4Q11 (SoD)
- Also planned for z/OS R12 with PTFs

VVDS maximum size increase

- For VVDSs in and out of EAS
- Maximum VVDS space increased from 5,460 tracks to 5,825 cylinders
- Increases practical maximum number of data sets from hundreds of thousands per volume to millions per volume



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Scalability and Performance

New JCL parameter, FREEVOL=EOV

- Specifies that a tape for part of a multivolume data set be available at end of volume rather than end of step
- Allow other jobs to use the tape immediately
- Allow overlapped processing of multivolume tape data sets

Support for more aliases per user catalog

- z/OS R12 increased the maximum catalog size dramatically
- Existing limit on number of aliases is about 3,500 (depending on alias lengths)
- New limit in z/OS R13 is over 500,000 (depending on alias lengths)
- New catalog connector extension record (Type V)
- Catalog PARMLIB member (IGGCATxx) keyword
 - EXTENDEDALIAS(YES|NO)
 - ✓ **Do not specify YES until all systems that will process the catalog are at R13!**
- New command:
 - ✓ MODIFY CATALOG,[ENABLE|DISABLE](EXTENDEDALIAS)
 - ✓ **Do not issue until all systems that will process the catalog are at R13!**

Scalability and Performance

IFASMF DL Improvements

- Avoid reading to end of log stream
 - IFASMF DL starts reading a log stream at a point (approximately) representing a specified time
 - New SMARTENDPOINT keyword specifies that IFASMF DL should stop reading a log stream when a point representing double the maximum MAXDORM value (2 hours) is reached
 - SMARTEPOVER keyword tells IFASMF DL to use a specified value rather than 2 hours
 - SMARTENDPOINT available on z/OS R10 and up with OA31737
 - SMARTEPOVER available on z/OS R10 and up with OA34374
- Allow entire log stream to be archived or deleted
 - Treat log streams as though they were SMF data sets
 - Will reset log stream starting point to next new block
 - Available for z/OS R11 and up with the PTF for APAR OA34589

RMODE 64 The next step...

- Allow execution of enabled code above 2G
- Support for code above 2G that calls no system services and is not loaded by normal system “load” methods
- Handle and resume after I/O and external interrupts

Improving Availability

JES2 SPOOL Migration*

- Dynamically remove a SPOOL volume using \$T M SPOOL
- Also, can enlarge an existing spool data set using \$TSPPOOL,SPACE
 - For example, in combination with Dynamic Volume Expansion
- Planned availability 4Q11 with the PTF for APAR OA36158

JES3 Dynamic SPOOL Addition

- Add a SPOOL volume without a JES3 restart using the *MODIFY CONFIG command

Improved Channel Recovery

- Remove paths to all devices affected by a path error
 - Avoids repeated recovery for path errors as I/Os are driven to more devices along the path

zFS Internal Restart

- Automatic recovery from severe PFS layer problems
- Remounts all mounted zFS filesystems
- Accessing open files may result in I/O errors or EAGAIN until refresh completes
- No configuration changes incorporated during restart
- Can also be operator initiated with new commands
 - ✓ MODIFY ZFS,REFRESH to refresh zFS
 - ✓ MODIFY ZFS,NSVALIDATE to validate control blocks and refresh if needed

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Improving Availability

CMDS Command enhancements

- CMDS ABEND,CMD=xxxxxxxx,ID=nnnn introduced many releases ago
- Enhanced in R12 to enforce “non-abendable” commands
- CMDS FORCE command added for z/OS R13; intended to be used when only alternative is IPL

Parallel FTP tool now part of z/OS

- IBM z/OS Problem Documentation Upload Utility
- New program name, **AMAPDUPL**
 - ✓ Alias **MTFTPS** for compatibility

Message flood automation processing improvements:

- Increase message ID limit from 50 to 1024
- Allow up to 128 address spaces to be tracked per system
- Allow the default message set to be identified in a PARMLIB member
- Intended to increase the scope of message flood automation, improve its usability, and help improve system availability

Improving Availability

- IPL devices in subchannel sets other than 0
 - IPL, IODF, SADMP volumes supported for IPL from Subchannel Set 1 or 2
 - Allow use of PPRC secondary devices for IPL after primary fails
 - Requires:
 - zEnterprise System (z196 or z114)
 - HMC V2.11.1
 - Support Element V2.11.1
 - Minimum Machine Change Level (MCL)
 - Also available for z/OS R11 and R12 with the PTF for APAR OA35140
- DADSM dynamic exits support
 - IGGPRE00
 - IGGPOST0
- DADSM and CVAF support for concurrent service
 - Dynamically update without IPL to help improve system and application availability
- ASID Reuse
 - DEVMAN address space now reusable
 - CATALOG, LLA, VLF, z/OS UNIX RESOLVER, TCP/IP, DFSMSrmm, and TN3270 already reusable

z/OS Predictive Failure Analysis and Runtime Diagnostics

- **z/OS PFA checks intelligently analyze the rate and trends of specific z/OS system resources and report on z/OS system anomalies, potentially helping you to identify and avoid failures. PFA checks analyze:**
 - ▶ Common storage usage checking (R10), LOGREC arrival rate detection (R10)
 - ▶ Frame and slot usage checking (R11), Message arrival rate detection (with z/OS R11)
 - ▶ SMF Message Arrival rate detection (R12), ENQ and SPOOL utilization tracking (R13)
 - ▶ **Additional customization (R12)**
 - You can specify atypical jobs and address spaces to be excluded from learning algorithms
- **Runtime Diagnostics helps you to pin point the source of a 'soft failure' by looking at z/OS system resources in real time and reporting on areas of contention. RTD checks for:**
 - ▶ Select critical messages in the Operlog (z/OS R12)
 - ▶ Address spaces with high CPU usage or which might be in a loop (z/OS R12)
 - ▶ Address spaces suspended in local lock contention (z/OS R12)
 - ▶ System address spaces that are ENQ "waiters" (z/OS R12)
 - ▶ Evaluates GRS latch and z/OS UNIX System Services file system latch contention (z/OS R13)
- **Autonomics (R13)** - RTD is automatically invoked from PFA when PFA detects very low SMF arrival rates, RTD problem notification sent to PFA. (R13)
- F HZR,ANALYZE

Integrating new Applications and Supporting

Simplified XCF interfaces for passing messages in a Parallel Sysplex®

- New services allow a server to be established to process messages and for messages to be sent across the sysplex without first joining an XCF group
- Intended to make it easier to exploit XCF services for applications that do not require the member management and monitoring provided by the XCF group services interfaces

Support to allow tasks having subtasks in a WLM enclave to leave it, and for subtasks of a task joining an enclave to be joined

- Available now on z/OS V1.11 and z/OS V1.12 with the PTFs for APARs OA33344 and OA33406

z/OS XML System Services will support a binary XML format

- Extensible Dynamic Binary XML (XDBX)
- XDBX supports a subset of XML
- Expected to provide performance improvements for validating parsing operations compared to conventional XML text documents
- Planned to be enabled on z/OS V1.13 with the PTF for APAR OA36712 in 4Q11

Enhancements in Security (R13)

▪ IKEv2

- ▶ Initial support with z/OS R12 Communications Server. z/OS R13 adds Network Address Translation (NAT) traversal support for IKEv2 over IPv4.

▪ System SSL, ECC

- ▶ z/OS R12 Communications Server added support for Elliptic Curve Cryptography (ECC), ECDSA (Elliptic Curve Digital Signature Algorithm).
- ▶ z/OS R13 to extend System SSL ECC support for :
 - Creating ECC-style certificates in key database files or ICSF PKCS#11 tokens
 - Creating ECC-style certificates through the Certificate Management Services (CMS) API
 - Enabling ECC for TLS V1.0 and TLS V1.1 handshakes (RFC4492)
 - ECC certificate support with Crypto Express3 Coprocessor (on zEnterprise server)

▪ ICSF support for additional HMAC algorithms

- ▶ Support for FIPS-198, support planned for SHA-1, SHA-224, SHA-256, SHA-384, and SHA-512

▪ TN3270 and FTP support for password phrases

▪ SAF Based security for z/OSMF

- ▶ New general resource class ZMFAPLA
- ▶ Similar to EJBROLES
- ▶ Intended to use instead of repository based security

z/OS Security Server – RACF

*Helping to address security and compliance** guidelines*

Enhancements with z/OS R13

▪ RACF

- RACF Remote Sharing Facility (RRSF) support for TCP/IP (in addition to SNA APPC)
- Support for generating Elliptic Curve Cryptography (ECC) secure keys (using Crypto Express3 Cryptographic Coprocessors (CEX3C) available with zEnterprise servers)

▪ Tivoli Directory Server for z/OS (LDAP)

- Support for SHA-2 and salted SHA-2 hashing of user password attributes. Addresses:
 - Need for stronger hashing and cryptographic algorithms
 - Enhanced interoperability with distributed IBM TDS, openLDAP, and other LDAP servers.
 - The National Institute of Standards and Technology (NIST) policy for the use of hash functions.
- Support for LDAP administrators to delegate LDAP administrative authority
 - Can improve LDAP administration flexibility, help improve auditability, and help improve security
- Support for DB2 9 for z/OS (5635-DB2) backend for scalability of large LDAP deployments
- Improved interoperability between z/OS applications and Microsoft Active Directory environments for Kerberos
- Support for RFC 2696 and RFC 2891 for improved LDAP sorted search performance

** It is the customer's responsibility to identify, interpret, and comply with laws or regulatory requirements that affect its business. IBM does not represent that its products or services will ensure that the customer is in compliance with the law.

z/OS and the IBM zEnterprise Unified Resource Manager

- **z/OS on zEnterprise (z196 or z114) connects with the zEnterprise BladeCenter Extension seamlessly**

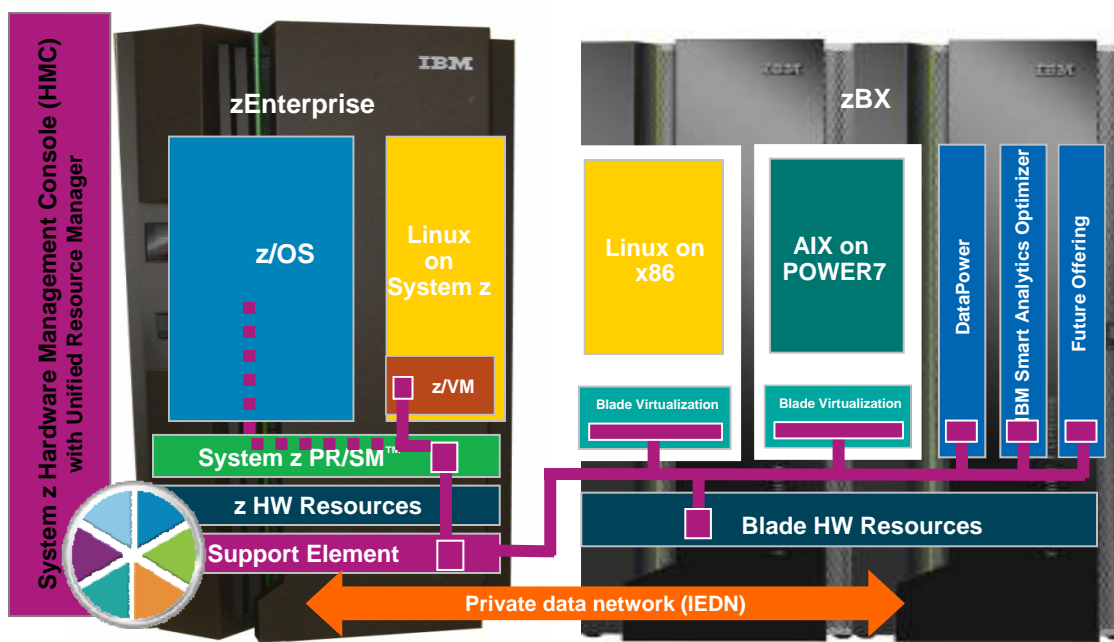
z/OS needs

- New HCD (or HCM) definitions for the new networks
 - New OSA CHPIDs: OSM for management network and OSX for data network
 - IBM SOD* HiperSockets
- z/OS Communications Server configuration to enable z/OS to participate in a zEnterprise ensemble

Additional z/OS function ...

- New z/OS agent (Guest Platform Management Provider) can send high level z/OS WLM data to zEnterprise Unified Resource Manager
- z/OSMF Resource Monitoring can monitor z/OS and Linux workloads

- **Unified Resource Manager defines the ensemble, provisions the new management and data networks, and can manage virtual environment.**
- **IBM zEnterprise Unified Resource Manager:**
 - can manage 'virtual servers' (z/VM and blade)
 - can monitor 'virtual server' workloads and z/OS workloads.



Self-Managing Capabilities

RMF monitoring for zEnterprise ensembles

- RMF provides CIM-based performance data gatherers for:
 - Linux on System z, AIX® Systems and Linux on IBM System x®
- Designed to provide a consistent monitoring solution for zEnterprise ensembles

Response time distributions calculated by WLM and reported by RMF for velocity and discretionary goals

- As for response time goals, reported in 14 “buckets”
- Unlike response time goal reporting, mid-points can be recalculated and changed from time to time

RMF support for additional contention reporting

- For system suspend lock, GRS enqueue, and GRS latch contention
- New Postprocessor Serialization Report available in XML output format
- New SMF Type 72 subtype 5 records
- Help make it easier to respond to serialization-related performance issues.

z/OS R13 - The foundation for modern batch

- Expand existing COBOL applications!
 - ▶ **The z/OS Batch Runtime environment**, provides Java-to-COBOL interoperability, for transactional updates to DB2®, and for sharing database connections between Java and COBOL (R13)*
Ideal for processing for computationally intensive programs and extensions
 - ▶ Use JZOS Batch Toolkit for z/OS for efficient use of z/OS System interfaces for Java batch (IBM Java SDKs for z/OS)
 - ▶ Leverage specialty engines!
- Simplified programming!
 - ▶ JES2 JCL enhancements provide in-stream data in catalogue procedures, more options on setting job return codes, and the ability to stop and hold a job at the end of a step (not just at the end of the job) give much more granularity and control (z/OS R13)
 - ▶ An new REST API allows you to submit z/OS batch jobs and retrieve z/OS batch job information from distributed systems as well as z/OS systems; and is intended to make z/OS batch processing much more accessible to distributed systems and web-based processes (z/OS and z/OSMF R13)
- Shorter batch windows
 - ▶ Allow overlapping processing for multi-volume data sets (FREEVOL=EOV, R13)
 - ▶ Avoid recalling migrated datasets, just to delete them (IEFBR14, R11)
 - ▶ “Pipe” data between two batch jobs to enable these jobs to perform reads and writes concurrently (BatchPipes®, 5655-D45)
- Real time batch
 - ▶ WebSphere Compute Grid delivers a resilient, highly available, secure, and scalable runtime with container-managed services for batch applications
 - ▶ Capable of supporting 24x7 batch and OLTP processing, and parallel computing

* Prerequisites:

IBM 31-bit SDK for z/OS, Java Technology Edition, Version 6.0.1 (5655-R31)
DB2 V9.1 for z/OS (5635-DB2) or later with PTFs
IBM Enterprise COBOL for z/OS V4.1 (5655-S71) or later

z/OS and IPv6

- IPv4 address pool is exhausted February 3, 2011
 - <http://www.ipv6news.info/2011/02/04/ipv4-address-pool-is-exhausted/>
 - Now the IPv4 Internet only has the stock of IPv4 addresses held by the regional registrars and Internet Service Providers (ISPs) to keep it going.
- z/OS is IPv6 certified! (http://jitc.fhu.disa.mil/adv_ip/register/certs/ibmzosv110_dec08.pdf)
- z/OS Communications Server is adding function for IPv6 networks:
 - **For z/OS R11**
 - Support RFC4941 and RFC5095; and the AES-based AES-XCBC-MAC-96 and AES-XCBC-PRF-128 algorithms - intended to meet new government IPv6 standards
 - **For z/OS R12**
 - Health checks for IPv4 and IPv6 routing
 - Support for DFSMSrmm, IKEv2, ability to Send DNS Queries over IPv6, support for security-related RFC3484 and RFC5014
 - **For z/OS R13**
 - Support for IPv6 intrusion detection security equivalent to that provided for IPv4, integrated with the Configuration Assistant (in z/OSMF)
 - Support for IPv6 checksum and segmentation offload enhancements and for LPAR-to-LPAR checksum offload for both IPv4 and IPv6 packets available with OSA-Express4S QDIO (announced July 12 2011)
 - TCP/IP segmentation and checksum processing on OSA card and not on CP



Networking

- More flexibility for specifying reserved TCP/IP port ranges
- New CSSMTP server design for better memory and JES resource management when retrying mail send operations
- Improved z/OS system resolver processing when name servers are unresponsive
- More VLANs per OSA port
 - Define up to 32 VLANs per OSA port per IP version
- Autonomic recovery for APPN routing tree corruption
- New design to monitor for CSM-constrained conditions and taking specified recovery actions
- Enterprise Extender connectivity tests initiated using the
DISPLAY NET,EEDIAG,TEST=YES
command when firewalls block ICMP messages expected to complete more quickly

Microsoft® Windows Support

- The Microsoft® Windows®-based Capacity Provisioning Manager application supports 32- and 64-bit versions of Microsoft Windows 7 Professional Edition
- DFS SMB Server supports clients running both the 32- and 64-bit versions of Microsoft Windows 7 Professional, Microsoft Windows 7 Enterprise, and Microsoft Windows 7 Ultimate Editions
 - Also planned to be available for z/OS R11 and R12 with the PTF for APAR OA36149 by z/OS R13 general availability.
- NFS supports 32- and 64-bit versions of Microsoft Windows 7 Professional Edition with Open Text NFS Client or Open Text NFS Server installed
- HCM supports the 32- and 64-bit versions of Microsoft Windows 7 Professional Edition
- z/OS PKI Services provides support to enable Mozilla-based web browsers on Windows and Linux platforms to use smart cards when generating certificates and to enable Microsoft Internet Explorer 6, Internet Explorer 7, and Internet Explorer 8 to use an updated PKI application that includes its own ActiveX controls, which allows users to install renewed certificates

IBM statements of direction - July 12, 2011*

Synergies with IBM System Storage and zEnterprise Server

- z/OS V1.13 and IBM System Storage DS8700 and DS8800 series (with new licensed machine code) planned to support **1TB EAVs**.
 - Helps relieve storage constraints and simplify storage management with the ability to manage fewer, larger volumes as opposed to many small volumes
- z/OS V1.13 Workload Manager (WLM) and IBM System Storage DS8700 and DS8800 series (with new licensed machine code) planned to support improved **I/O and workload prioritization within in the disk controller**.
 - Disk resource management from z/OS WLM. Working toward the goal of true end-to-end workload management
- z/OS V1.13, zEnterprise System z **High Performance FICON (zHPF)**, and IBM System Storage is planned to support certain **QSAM, BPAM, and BSAM** access methods.
 - Potentially faster batch
- z/OS V1.13, IBM System Storage DS8700 or DS8800, and GDPS V3.8, Hyperswap support is planned to be enhanced to **improve recovery in Hyperswap-enabled configurations**.
- z/OS V1.13 (and z/VM) and zEnterprise server are planned to **integrate HiperSockets™ with the intraensemble data network (IEDN)**
 - Seamless exploitation of HiperSockets in multi tier zEnterprise workloads
 - High performance HiperSockets
 - Exploit zIIP-Assisted HiperSockets for Large Messages

Statements of Direction*

- z/OS V1.13 is planned to be the last release to support multi-file system zFS aggregates, including zFS clones
 - Support for the zfsadm clone command and mount support for zFS file system data sets containing a cloned (.bak) file system will be removed
 - IBM recommends that you use copy functions such as pax and DFSMSdss to back up z/OS UNIX file systems to separate file systems.
 - Support for zFS compatibility mode aggregates will remain.
- z/OS V1.13 is planned to be the last release to support BPX.DEFAULT.USER
 - IBM recommends that you either use the BPX.UNIQUE.USER support that was introduced in z/OS V1.11, or assign unique UIDs to users who need them and assign GIDs for their groups.
- z/OS V1.13 is planned to be the last release to provide the z/OS Capacity Provisioning support that utilizes the System z API for communication with the Support Element (SE) or Hardware Management Console (HMC).
 - This protocol is based on IP network connection using SNMP.
 - IBM recommends configuring the Capacity Provisioning Manager for communication via the z/OS BCP Internal Interface (BCPii) protocol. The SE and HMC support for the System z API remains, and is not affected by this withdrawal of support.
- z/OS V1.13 is planned to be the last release in which the BIND 9.2.0 function will be available.
 - If you use the z/OS BIND 9.2.0 function as a caching-only name server, use the resolver function, which became generally available in z/OS V1.11, to cache Domain Name Server (DNS) responses.
 - If you use the z/OS BIND 9.2.0 function as a primary or secondary authoritative name server, investigate using BIND on Linux for System z or BIND on an IBM blade in an IBM zEnterprise BladeCenter® Extension (zBX).

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Thank
you