What's New in z/OS

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z/OS and the IBM z13

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Planned IBM z13 System Functions and Features*

- Five hardware models
- Up to 141 processors configurable as CPs, zIIPs, IFLs, ICFs or optional SAPs (no zAAPs)
  - •100-way on z/OS® V1.12 or V1.13
  - •Up to 141-way on z/OS V2.1 (non-SMT mode)
  - •Up to 128-way on z/OS V2.1 (SMT mode)
    - max active threads in SMT mode is 213
- Up to 10 TB of Redundant Array of Independent Memory (RAIM)
  - ▪1 TB per z/OS LPAR on z/OS V1.12 or V1.13
  - ▪Up to 4 TB per z/OS LPAR plan for z/OS V2.2
    - − Also available for z/OS V2.1
- Changed (node) cache structure
- 96 GB Fixed HSA
- Up to 85 LPARs (Up to 60 LPARs with z/OS V1.12 on any LPAR)
- Up to six logical channel subsystems (CSSs)
- 4 Subchannel Sets per CSS
- Single Instruction Multiple Data (SIMD) instruction set
- Two-way simultaneous multithreading (SMT) support for up to 128 cores (IFLs and zIIPs)
- New and enhanced instructions
- XL C/C++ ARCH(11) and TUNE(11) exploitation: New z13 hardware instruction support, SIMD (Vector support) and Vector data, Decimal Floating Point packed conversion facility support, Performance improvements

(z/OS support in blue)

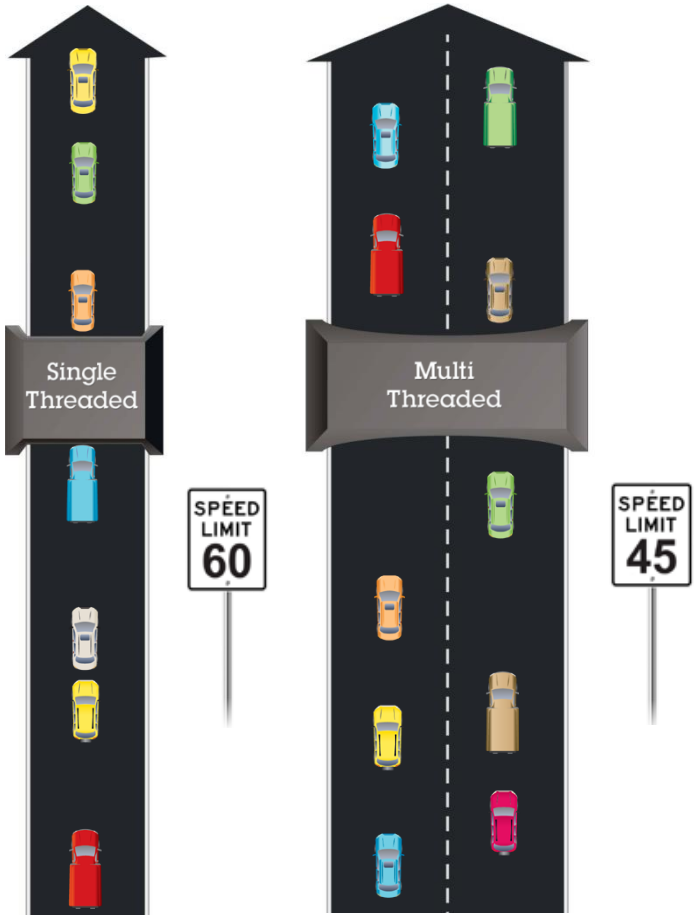
IBM z13™ (z13)New Features and Functions Parts 1 & 2 Tuesday 3:15 & 4:30

- IBM zAware: z/OS and Linux® on IBM zSystems™
- CPU Measurement Facility
- Flash Express (Storage Class Memory-SCM)
- CF exploitation of Flash Express
- IBM z Systems Data Compression (zEDC) capability using zEDC Express
- OSA Express5S
- Shared RoCE Express Support
- Greater than 256 PFID support
- PCIe extended address translation
- Enhanced the PCIe function definition
- PCIe function measurement block changes
- FICON Express16S
- FICON® Dynamic Routing
- High Performance FICON for System z (including zHPF extended distance II)
- Fabric Priority for I/O write requests
- CryptoExpress5S: Next Generation Coprocessor support, Support architecture for up to 85 Domains, Format Preserving Encryption (FPE)
- Integrated Coupling Adapter (ICA) Links
- Increased number of coupling CHPIDs, from 128 to 256 per CEC
- zBX Model 004 support

* Statements regarding IBM future direction and intent are subject to change or withdrawal, and represent goals and objectives only.

SMT*

- "Simultaneous multithreading (SMT) permits multiple independent threads of execution to better utilize the resources provided by modern processor architectures."[1]
- With z13, SMT allows up to two instructions per core to run simultaneously to get better overall throughput
- SMT is designed to make better use of processors
- On z/OS, SMT is available for zIIP processing:
  - Two concurrent threads are available per core and can be turned on or off
  - Capacity (throughput) usually increases
  - Performance may in some cases be superior using single threading



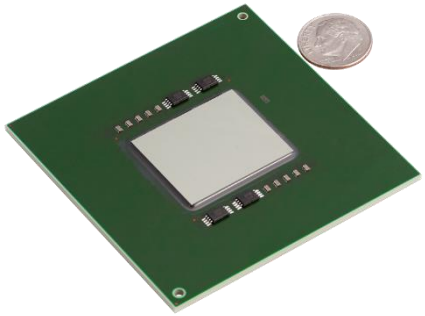
*Two lanes process more traffic overall***

[1] *Wikipedia®*

Note: Speed limit signs for illustration only

New z/OS n-Way Limits with z13*

- z13 has up to 141 processors that can be configured as CPs or zIIPs for z/OS systems…and;
- …z/OS Version 2 has a 256-way architectural limit for multiprocessing



IBM z13 processor chip

- In non-SMT mode, core=processor, and as 141 < 256, z/OS will be designed to support up to 141 processors in a single image

- In SMT mode, z/OS views *every* core as *two* processors
  - One or two processors can be online for zIIP cores, but…
  - One processor per CP core is always offline
- Thus, z/OS is planned to support up to 128 cores in a single image when SMT-2 mode is enabled for zIIPs
  - There is a CP:zIIP ratio of 1:2, so…with 43 CPs and 85 zIIPs, maximum active threads in SMT-2 mode is 213

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SMT Support*

z/OS V2.2 Planned to Add…

- Parmlib (IEAOPTxx) support for SMT enablement
- Operator commands for dynamically switching in and out of SMT mode
- SMF30 fields with normalized CPU time values in SMT mode
- SMF70 records with new SMT-related fields
- XES use of SMT mode for zIIP workloads to help improve physical processor utilization for synchronous requests
- Hardware Instrumentation Services (HIS) updates to provide measurement data in SMT mode
- RMF metrics for capacity planning and performance analysis

- **…all these planned to be available for z/OS V2.1 with PTFs***

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SIMD (Single Instruction Multiple Data)

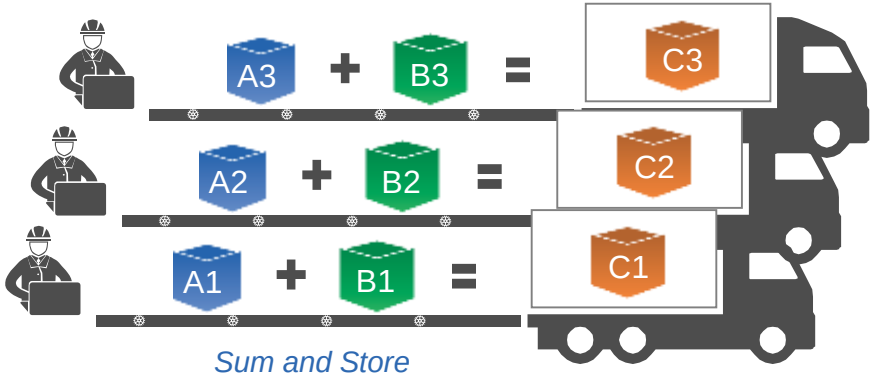
Increased parallelism to enable analytics processing

- Smaller amount of code helps improve execution efficiency
- Process elements in parallel enabling more iterations
- Supports analytics, compression, cryptography, video/imaging processing

Value

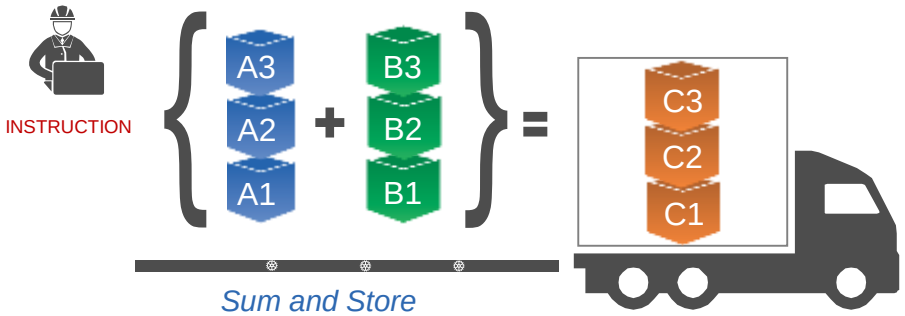
- ✓ Enable new applications
- ✓ Offload CPU
- ✓ Simplify coding

Scalar
Single Instruction, Single Data



Instruction is performed for *every data element*

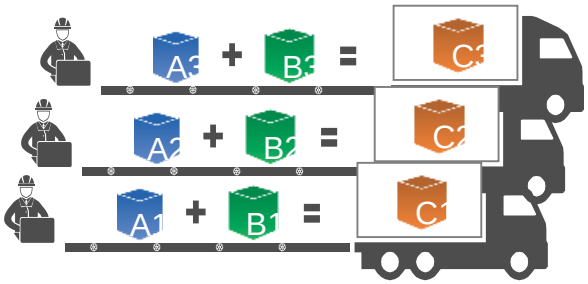
SIMD
Single Instruction, Multiple Data



Perform instructions on *every element at once*

SIMD Support

z/OS V2.2 planned to include*…



- HLASM support for new SIMD OpCodes
- MASS and ATLAS libraries included in z/OS
- Language Environment® enablement, dbx support
- z/OS XML System Services exploitation
- Various infrastructure enhancements to support new registers, etc.

…all these planned to be available for z/OS V2.1 with PTFs

Also, we have support planned for:

- z/OS XL C/C++ compiler, with new ARCH(11) and TUNE(11) parameters, in a web deliverable for z/OS V2.1 and planned for z/OS V2.2
- IBM 31-bit SDK for z/OS, Java Technology Edition, Version 8 (5655-DGG) and IBM 64-bit SDK for z/OS, Java Technology Edition, Version 8 (5655-DGH)
- Enterprise PL/I for z/OS, V4.5 (5655-W67)
- Enterprise COBOL for z/OS, V5.2 (5655-W32) in February 2015

WebSphere Application Server for z/OS Liberty Profile V8.5.5.5 (5655-W65) applications using the Liberty profile and running with Java 8 are expected to benefit from SIMD exploitation.

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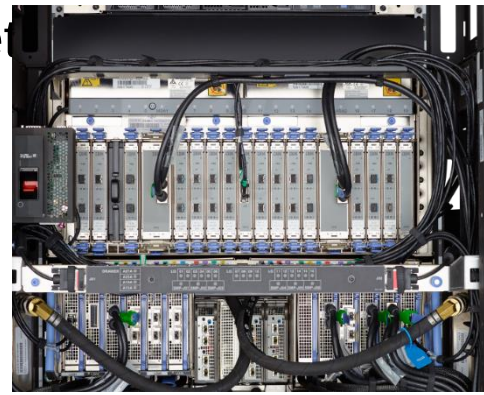
z/OS System Limits with z13*

- **Up to 4 TB of real memory per LPAR planned**
  - For z/OS V2.2 at GA
  - Also available for z/OS V2.1 with the PTF for APAR OA44436
  - (Note: HW limits to 1 TB per LPAR if old channel cards are carried forward)
- **Up to 4 subchannel sets planned**
  - Maximum primary device limit unchanged, at 65,280
    - Limited by available subchannels in Subchannel Set
  - PPRC secondaries, PAV aliases, FlashCopy® targets can be defined in Subchannel Sets 0-3
  - Larger *practical* I/O configurations using advanced storage-related I/O functions can be supported with more subchannel sets



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Fabric I/O Priority*

- z/OS V2.2 planned to support additional I/O priority capabilities
  - I/O priority already set by IOS and WLM
  - Used today by channel subsystem and IBM System Storage® DS8000® series for both read and write operations
- Planned to be extended to provide additional prioritization data for the FICON fabric
- Intended to get highest priority write operations done first when fabric is congested
- Will require:
  - A z13 processor
  - z/OS V2.2; or, z/OS V1.13 or z/OS V2.1 with PTFs for APARs OA47297 and OA44431
- Intended to provide end-to-end I/O prioritization according to WLM policy
- Availability planned for 25 September 2015

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More Hardware Support*

- RoCE Virtualization, designed to allow:
  - Sharing RoCE (RDMA over Converged Ethernet) cards across up to 31 z/OS images in a processor
  - Use of both 10GbE ports on the same adapter

IBM z13 Trends and Directions Parts 1 and 2:

z13 Processor Design, Server Structure and z/Architecture®
Tuesday 10:00

z13 I/O Subsystem Design, I/O Features and Functions
Tuesday 11:15

IBM z13 Deep Dive: The I/O SuperComputer
Wednesday 1:45

IBM zAware - Even More Aware Now
Thursday 11:15

z/OS V2R1 Communications Server: New Shared Memory Communications over RDMA (SMC-R) Protocol - Concepts and User Experience Parts 1 and 2

Tuesday 1:45 & 3:15

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A Whole Lot of Crypto*

- z13 CPACF speed approximately double that of the zEC12's
  - Encryption and hashing both expected to be markedly faster
- New functions in Crypto Express5S with corresponding support, exploitation, and other improvements in ICSF Web Deliverable for z/OS V1.13 and z/OS V2.1 (not all require Express5S) designed to:
  - Support emerging standards for EMVCo in CCA-based callable services for key management, generation, transport, and derivation
  - Enhance support in the Remote Key Export callable service for key wrapping
  - Provide AES MAC enhancements to the Symmetric MAC Generate & Verify
  - Support some UDX callable services to CCA firmware:
    - Recover PIN From Offset, Symmetric Key Export with Data, Authentication Parameter Generate
  - Enhance Enterprise PKCS #11 mode to add secure key support for the Diffie-Hellman , Elliptic Curve Diffie-Hellman , RSA-PSS algorithms, and Secure DSA Domain Parameter Generation.

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Even More Crypto*

Crypto*, continued…

z/OS Crypto 201: ICSF Overview
Monday 4:30

- New functions designed to provide...
  - Support for Enterprise PKCS #11 applications, intended to allow them to change a key's compliance mode using the Set Attribute Value function
  - Support for ECC keys generated using Brainpool curves in FIPS mode
  - Designs to help you improve the performance of applications that call the One Way Hash and Random Number Generate services, cyptographic processor configuration, provide a new, easier-to-use callable service to retrieve status information about the cryptographic environment
  - VISA Format Preserving Encryption (VFPE) algorithms in CCA-based callable services
  - Enhanced Random Number generation exploiting the CPACF Deterministic Random Number Generate (DRNG) instruction intended to be compliant with NIST standard SP 800-131A
  - Support allowing you to disable the RNG Cache
  - Support for sharing cryptographic coprocessors across up to 85 domains
  - (And, a number of other small enhancements)

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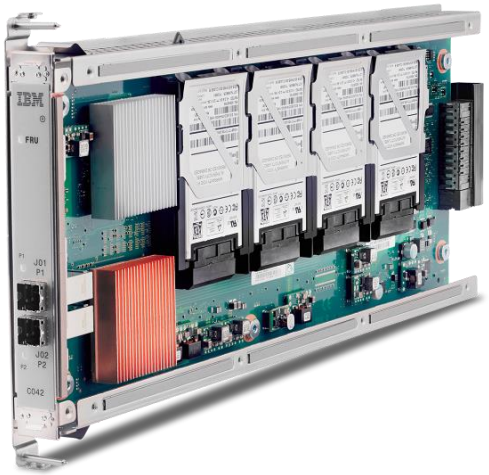
Flash Express Support

- **Available for z/OS V1.13 with…**
  - A z13*, IBM zEnterprise® EC12, or IBM zEnterprise BC12 server with Flash Express
  - z/OS V1R13 RSM Enablement Offering web deliverable
    - http://www.ibm.com/systems/z/os/zos/downloads/
  - Dynamic Reconfiguration and optional PLPA/COMMON page data sets in enabling PTFs
  - …all these functions are included in z/OS V2.1
- **z/OS designed to use Flash Express for:**
  - Pageable large pages
  - Paging, when performance would be improved vs. disk-based paging
  - SVC and Standalone Dump
  - Speculative page-ins to help buffer workload spikes (such as market open)



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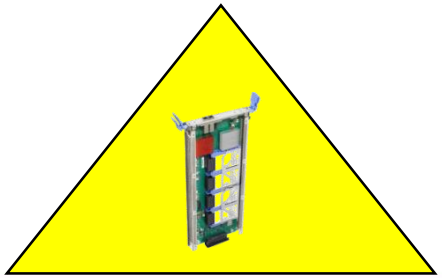
z/Architecture Extensions

- **CF support for Flash Express**
  - Requires z/OS V2.1 running on a z13*; or, on a zEC12 or zBC12 with CFLEVEL 19
  - Support Flash Express for certain Coupling Facility list structures
  - Can allow keyed list structure data to be migrated to Flash Express memory
    - For example, when data consumers do not keep up with creators
    - Designed to migrate it back to real memory to be processed
  - With WebSphere® MQ for z/OS Version 7 (5655-R36):
    - Can buffer enterprise messaging workload spikes
    - Provide support for storing very large amounts of data in shared queue structures
    - Potentially allow several hours' worth of data to be stored without causing interruptions in processing
  - z/OS V2.1 RMF™ designed to provide measurement data and reporting capabilities for Flash Express on Coupling Facilities
  - **Available with the PTF for APAR OA40747**
  - CFSIZER also updated for Flash Express:
    - http://www.ibm.com/systems/support/z/cfsizer/



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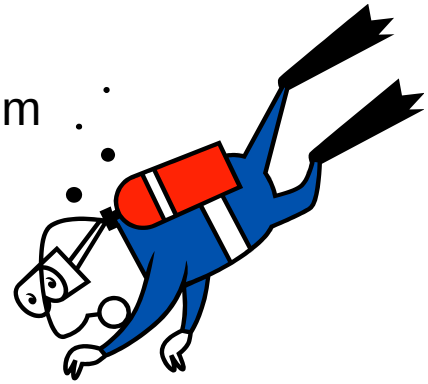
Three Ways to Compress (and Decompress) on z/OS

- **Software compression**
  - CPU-intensive
  - Much slower
  - Data can be inflated on anything supporting the same algorithm

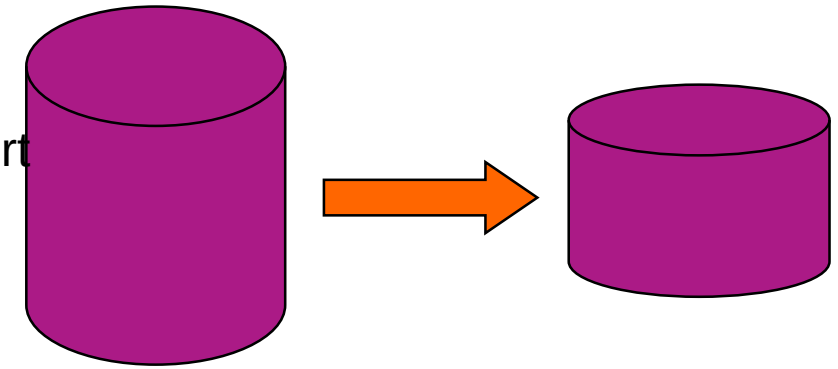


- **Compression coprocessor-based instructions**
  - Dictionary-based compression, generic or tailored
  - Can be inflated on a System z processor
  - All compression consumes apparent CP cycles
    - Compression done on the coprocessor, but accounted for as CP busy time because the CP is unavailable until the coprocessor is done

- **New zEDC Express adapter for z13, zEC12, and zBC12 and zEnterprise Data Compression (zEDC) for z/OS V2.1**
  - Compression work is offloaded to the card
  - Minimal CP cycles consumed
  - zlib-based, industry-standard deflate compression
  - Data can be inflated anywhere zlib processing is available

zEnterprise Data Compression

- Now available:
  - Compression Card on z13, zEC12, zBC12
  - z/OS feature
  - zBNA support
  - SMF and RMF support
  - Support for industry standard zlib compression
  - zlib library in z/OS V2.1
  - SMF data compression on z/OS V2.1
  - Software-based decompression support for SMF data on z/OS V1.12 and V1.13
  - Java® support
  - IBM Encryption Facility support
  - Extended Format BSAM/QSAM support
  - WebSphere MQSeries support
  - IBM Sterling Connect:Direct support



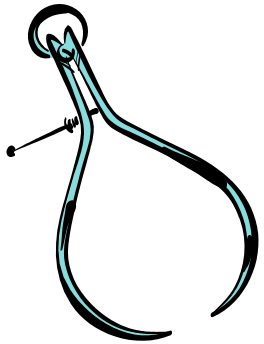
SMF Data Compression

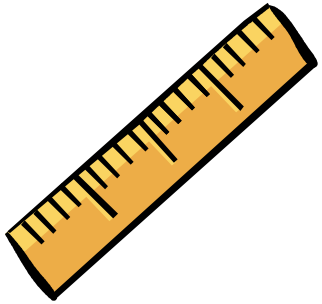
- **For SMF data written to log streams**
  - We expect about a 4:1 compression ratio for SMF data
  - Designed to significantly increase SMF recording rates
  - Can specify that all SMF data or SMF data written to selected log streams be compressed
  - New SMFPRMxx COMPRESS keyword on LSNAME and DEFAULTLSNAME
  - New PERMFIX subparameter of COMPRESS to balance fix/unfix overhead with available real memory

- *Corresponding IFASMFDL support*
  - Automatic inflation on z/OS V2.1 with feature and Hardware support
  - SOFTINFLATE parameter for software-based decompression
    - For z/OS V1.12 & z/OS V1.13, with the PTF for APAR OA41156
    - Included in z/OS V2.1
    - Intended to be used when zEDC is not available

Measurements

- **SMF and RMF support**
  - SMF14 and SMF15 records show compression ratios
  - SMF14CDS has the size of the compressed-format data set
  - SMF14UDS is the uncompressed size
  - New SMF14CMPTYPEzEDC field
  - SMF 74 subtype 9 records created by RMF include new PCIe, zEDC Express data
  - RMF Monitor I PCIE Activity Report:
    - I/O queue and execution time
    - Compressed and uncompressed data transfer rates
    - Number of compression and decompression requests





IBM System z Batch Network Analyzer

- **Helping determine if you have files that are candidates for zEDC: the IBM System z Batch Network Analyzer**
  - A free, Microsoft Windows-based “as is” tool to analyze batch windows using SMF data
  - Available to Customers, Business Partners and IBMers
  - Replaces the old BWATOOL
  - PC based, graphical and text reports
    - Including Gantt charts and support for Alternate Processors

- **Available from NA Advanced Technical Support**
  - http://w3.ibm.com/support/techdocs/atsmastr.nsf/WebIndex/PRS5126
- **zBNA can help identify zEDC Compression Candidates**
  - Identify zEDC compression candidates across specified time spans, like batch windows
  - Help estimate utilization of a zEDC feature and help size number of features needed
  - Generate a list of data sets by job which already do hardware compression and may be candidates for zEDC
  - Generate lists of data sets by job which might be zEDC candidates but are not in extended format
- **Get the current version (zEDC updates made in early 2014)**

More Compression Support

- **Extended Format BSAM and QSAM Compression**
  - Compressed Format data set support available with PTF for APAR OA42195
  - In addition to generic (DBBLIB) and tailored (supply a dictionary) compression
  - New COMPACTION option in DATACLAS definition
  - New values on COMPRESS parameter in IGDSMSxx
- **DFSMSdss™ data compression**
  - Now available for DUMP & COPY, and when DFSMSdss is used as the data mover by DFSMShsm™ **with the PTF for APAR OA42243**
    - Up to 80% decrease in DFSMShsm CPU expected for L0-ML1 migration and up to 69% decrease for ML1 recall with zEDC compared to software-based compression & inflation*
    - Up to 50% less ML1 space with zEDC compared to software-based compression*

* Based on projections and/or measurements completed in a controlled environment. Results may vary by customer based on individual workload, configuration and software levels.

DFSMS Exploitation of z/OS zEnterprise Data Compression (Revised from Pittsburgh!) Monday 3:15

System z Batch Network Analyzer (zBNA) Tool – Because Batch is Back! Thursday 10:00

DFSMS Latest and Greatest Tuesday 10:00

Compression Ratios and Performance*

- **Compression rates will vary with the data…**
  - But internal testing shows us ~4X compression for SMF data
  - For BSAM/QSAM we see:
    - Up to 4X compression for zEDC

      That's as much as *2X better* than generic or tailored compression
    - 80% or more CPU time reduction compared to tailored and generic compression

      CPU cost for zEDC is ~0.1sec/GB in testing on a zEC12

*Based on projections and/or measurements completed in a controlled environment. Results may vary by customer based on individual workload, configuration and software levels.

(Note: LZ compression is used in the tape controllers already)

What You'll Need to Use zEDC

- **New Hardware and z/OS features:**
  - zEDC Express adapter for z13*, zEC12, or zBC12
  - zEnterprise Data Compression (zEDC) for z/OS V2.1
  - For software inflation of compressed SMF data, the PTF for APAR OA41156 on z/OS V1.13
  - For Extended Format BSAM/QSAM support on z/OS V2.1, the PTF for APAR OA42195
  - For DUMP & COPY support for DFSMSdss with disk targets, and when DFSMSdss is used as the data mover by DFSMShsm, the PTF for APAR OA42243
  - zlib on other platforms where you want to process compressed data
- **Other products:**
  - Java support in IBM 31-bit and 64-bit SDK for z/OS Java Technology Edition, Version 7 Release 1 (5655-W43 and 5655-W44) (IBM SDK 7 for z/OS Java) or later
  - IBM Encryption Facility for z/OS support with PTF UA72250

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RDMA over Converged Ethernet

- **RoCE Support for SMC-R**
  - Requires z/OS V2.1 running on z13*, zEC12, zBC12 servers with the RoCE Express feature
  - Shares memory between peer z/OS images
  - Read/write access to the same memory buffers without application changes
  - Designed to help increase transaction rates with low latency and reduced CPU cost
  - RMF support with new SMF74-9 records and PCIE Activity Report
  - Java support in IBM 31-bit and 64-bit SDK for z/OS Java Technology Edition, Version 7 (Java7R1, 5655-W43 and 5655-W44)

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- **New zHyperWrite Function with TPC-R/GDPS HyperSwap®**
  - Substantially better DB2 log write performance expected
    - Acceleration of DB2 Log Writes when Metro Mirror is in use
    - Local response reduced up to 43% in IBM testing
      - * Based on projections and/or measurements completed in a controlled environment. Results may vary by customer based on individual workload, configuration and software levels.
    - Less-than-local response benefit percentage varies with distance
    - Requires:
      - HyperWrite function in z/OS 2.1, with the PTF for APAR OA45662
      - DB2 10 or DB2 11
      - IBM DS8870 Storage Subsystem with an MCL

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z/OS Support Summary

Out of service

Service Extension available

Service Withdrawal Dates

z/OS	z9® EC z9 BC	z10 EC™ z10 BC™	z196 z114	zBX	zEC12 zBC12	z13	DS8000®	TS1140 TS7700	End of Service	Coexists with z/OS...	Planned Ship Date[2]
R11	x	x	x	x	x		x	x	9/12	R13	
R12	x	x	x	x	x	x[3]	x	x	9/14[1]	V2R1	
R13	x	x	x	x	x	x	x	x	9/16[2]	V2R2[2]	
V2R1	x	x	x	x	x	x	x	x	2H18[2]	V2R3[2]	
V2R2[2]		x	x	x	x	x	x	x	2H20[2]	V2R4[2]	2H15[2]

Migrating to z/OS 2.1: Parts 1 and 2
Tuesday 10:00 & 11:15

1. Fee-based service extension available
2. All statements regarding IBM future direction and intent are subject to change or withdrawal without notice, and represent goals and objectives only.
3. Fee-based service extension required for support, or for some features

z/OS V2.2 Preview*

A smarter operating system with designs intended for*:

Usability and Skills

z/OSMF as a base element of z/OS; TCP/IP configuration; z/OSMF plug-in setup workflow; Updates to WLM, RMF, Incident Log, Software Management, WebISPF applications; New z/OSMF External Applications API; DJC and Deadline Scheduling for JES2; System Symbol enhancements…

Application Development

Web Enablement Toolkit, EU ordering rules for Unicode, ISPF improvements, DFSORT Date Functions, Enhanced RESTful data set and file APIs, Parallel Batch Scheduling, Improved JES3 symbol and JCL support, …

Scalability & Performance

More threads for z/OS UNIX® System Services, AMODE64 File System Services for zFS & NFS, CA-Level Locking for RLS, zFS performance, Even More Jobs for JES2, …

Enhancing Security

Signed SMF records, RFC 4556 X.509 support in Kerberos, RRSF Dynamic Node Reassignment, Multiple certificate approvers, PKI RFC 6277 Support, System SSL RFC 2560 OCSP Support, z/OS UNIX security improvements, BCPii audit records, …

Availability

Dynamic JES2 Checkpoint Tuning & Expansion, Private Area Virtual Storage Tracking in PFA, Dynamic TDS (LDAP) Compatibility Upgrades, Multi-target PPRC, Incremental FlashCopy, XCF message processing, LOGREC deallocation, O/C/EOV Dynamic Exits, …

Systems Management

Smarter Subsystem Interface processing, DFSMShsm Storage Tiers Extensions, Health-Based Workload Routing, RMF Reporting Enhancements, Generic Tracker Improvements, …

Networking

64-bit TCP/IP Stack, RoCE Improvements, DVIPA Limit, CICS Sockets, Enterprise Extender Scalability, NIST SP800-131a, TLS Session Reuse, Resolver Improvements, …

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Usability and Skills

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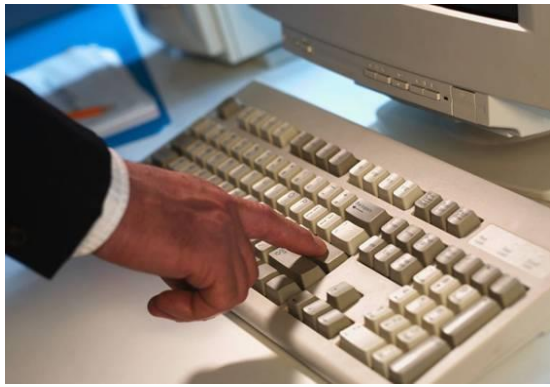
Usability & Skills*

- **z/OSMF planned to be a base element of z/OS**
  - No need to order separately
- **z/OSMF setup**
  - Plug-in configuration planned to make more use of workflows
- **New External Applications API**
  - Designed to provide a new way to hook in an application so it shows up persistently in the z/OSMF navigation tree
  - Intended to allow an application owner to supply a properties file, and allow the user import to the application



z/OSMF Roundtable
Tuesday 12:30

The New and Improved z/OSMF 2.1
Tuesday 1:45

Lab: z/OSMF Hands-On Labs - Choose Your Own I, II, & III

Wednesday 10:00
Thursday 11:15
Friday 8:30

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Usability & Skills*

- **More planned z/OSMF enhancements**
  - Support to allow one workflow to call another
    - Intended to support reusable workflow building blocks
    - Can be used to provide configuration action support
  - Support for the definition of systems and user-defined groups
    - Intended to allow you to drive actions across appropriate groups, in addition to driving actions for specific members
    - Graphical display support planned to make it easy to see the topology
  - New REST APIs and some enhancements (about which more, later)

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Usability & Skills*

- **z/OSMF V2.1 enhancements introduced by the PTF for APARs PM98630, PM98630, and PI20151:**
  - A new task to support importing external applications
  - Improvements to the workflow engine
  - Support in the REST Jobs API to hold and release jobs, and to work with jobs using a secondary JES2 subsystem
  - z/OSMF REST services designed to allow you to view lists of data sets and to view lists of z/OS UNIX files and directories
  - An enhanced workflow designed to help you configure z/OSMF plug-ins quickly and easily
  - Resource Monitoring application display for recent historical information and export
  - Support for comments in WLM service definition actions
  - Software Management application support for an easier ways to add non-SMP/E-managed data sets to a software instance and edit mount points for the z/OS UNIX file system; also, job management support for generated jobs and SFTP support for software deployment
  - Support in the ISPF task for using the Ctrl key as Enter on most keyboards

Usability & Skills*

- **z/OS V2.2 Communications Server planned to extend the IBM Configuration Assistant**
  - Will be designed to support creating and storing new configuration profiles for TCP/IP stacks with integrated help
  - Intended to make it faster and easier to create and maintain TCP/IP configurations
- **Incident Log improvements planned:**
  - View and manage problems for multiple sysplexes from an aggregated view
  - SFTP support for sending diagnostic data to vendors
- **Capacity Provisioning plug-in**
  - Planned to support capacity provisioning based on overall CPC-wide utilization
- **Related Support:**
  - z/OS V2.2 CEA planned to support CEAPRMxx controls for how many TSO/E address spaces are available for the ISPF task and allowed per user

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Usability & Skills*

- **"Dependent Job Control" planned for JES2**
  - Conceptually similar to //*NET JECL for JES3 but different
  - Designed to allow you to specify that **job groups** run in particular ways
    - No job (except the first, of course) runs until other jobs it depends on have run
    - Support for parallel execution (with available INITs) so that multiple jobs can start once prerequisite jobs have finished
  - Intended for ad hoc scheduling of jobs that do not need formal production control
  - Corresponding operator command support for job groups
  - Corresponding SDSF support
- **"Deadline Scheduling" planned for JES2**
  - Similar to some of the JES3 //*MAIN DEADLINE= function
    - But: "STARTBY" and "HOLDUNTL" vs. "DEADLINE"
  - As above, intended for ad hoc job scheduling
    - Jobs can tend to run at quiet, less-expensive times of day
    - Stop setting your alarm for oh-dark-thirty!

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Usability & Skills*

- **JES2 Dynamic Checkpoint Tuning**
  - JES2 checkpoints defined in a multi-access spool (MAS) configuration must be tuned for hold and dormancy times on the MASDEF statement
  - You can pick good values…
  - …but it's hard to pick ones that are good all the time
  - z/OS V2.2 JES2 planned to be designed to tune them automatically

- **JES2 Step-Level Completion Codes planned**
  - In addition to existing support for job-level information
  - Summary-oriented information can help you interpret job output
  - New machine-readable JES2 EVENTLOG data set
  - Optional SMF30 support
  - SDSF support

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Usability & Skills*

- **Planned SMP/E ZONEMERGE enhancements:**
  - New ZONEMERGE CHECK function
  - Better processing of CIFREQ entries during ZONEMERGE

- **System Symbol enhancements, planned to support:**
  - Longer system symbols, up to 16 characters
  - Symbol values longer than the corresponding symbol names, up to 44 characters long
    - Data set names, IP addresses, etc.
  - Larger symbol table

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Usability & Skills*

- **Support for More GDG Generations planned**
  - New GDGE data set type with support for up to 999 generations
    - More than a year's worth at last!
    - Enablement via IGGCATxx: GDGEXTENDED(YES|NO)
    - New IDCAMS DEFINE keywords: EXTENDED|NOEXTENDED
  - Also, IDCAMS planned to allow you to specify that unexpired GDSs be deleted when they would prevent creating a new generation

What's New with DFSMS ICF Catalog and IDCAMS Weds 4:30

- **Planned ISPF improvements**
  - New ISPF Configuration Utility option to create a new keyword file from an active ISPF configuration table, providing an easy way to recover a missing keyword source file
    - Available now for z/OS V2.1 with the PTF for APAR OA42680
  - Support for browsing data sets and members with over 2 billion (2,000,000,000) records
    - Old limit was 99,999,999 records
- **bpxmtext support for NFS messages**
  - In addition to existing support for z/OS UNIX, Language Environment, Communications Server, zFS, and TFS

z/OS Little Enhancements: Many Small Potatoes Can Make a Big Meal Weds 8:30

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Usability & Skills*

- **Infoprint Server usability improvements**
  - Infoprint Server designed to support a new TSO/E command so authorized users can start and stop Infoprint® Server PrintWay extended mode printers
    - Intended to support interactive and batch environments, and to work with printers managed by an instance of Infoprint Server running in the same Parallel Sysplex®
  - Infoprint Central will be designed to allow you to select TSO/E address space-related output data sets (those associated with TSUnnnnn job IDs) and display them in JES2 environments
- **Generic Tracker Support for JES3 JECL**
  - z/OS V2.2 JES3 designed to use the z/OS Generic Tracker to help you identify use of a number of JES3 JECL statements
  - Intended to help you write JES-neutral JCL and help those who want to migrate from JES3 to JES2

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Usability & Skills*

- **DFSMS usability:**
  - Improved processing planned for DEVSUPxx parmlib members:
    - Allow a subset to be specified with SET DEVSUP
    - Allow you to specify multiple DEVSUPxx members in one SET command
    - Continue processing keywords if an error is detected during IPL
    - More information about tape-related DEVSUPxx parameters from DEVSERV QLIB for:
      - TAPEAUTHDSN
      - TAPEAUTHF1
      - TAPEAUTHRC4
      - TAPEAUTHRC8

  - Say “adieu” to Abend A13 RC 18!
    - z/OS planned to select the correct volume during Open for multivolume tape data sets automatically
  - Support planned so you can restore catalogs to any like volume with enough space
  - Health check planned for catalog SHAREOPTIONS on volumes defined as shared in the active IODF

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Scalability and Performance

Scalability and Performance*

- **CA-Level Locking for RLS**
  - Today an entire data set's index is locked for a number of operations
    - Notably CI splits, CI reclaims, spanned-record processing
  - z/OS V2.2 planned to be designed to lock the index at the CA level
  - For all KSDS and RRDS (including AIXes and Catalogs)
  - CA split and reclaim still need the data set level lock
  - Expected to improve performance and make much larger data sets practical with high update activity
- **Support for more jobs with JES2 planned:**
  - Up to 1,000,000 jobs (from 400,000)
  - More JQEs, BERTs

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Scalability and Performance

- **DFSORT™ support for zHPF**
  - z/OS V2.2 DFSORT planned to support zHPF
    - For SORTIN, SORTOUT, and OUTFIL
  - Expected to provide significant performance benefits where zHPF is available

What's New with DFSORT? (V2R1 and V2R2 Features) Wednesday 8:30

- **zFS Performance**
  - z/OS V2.2 zFS designed to provide significant performance improvements for directory updates
  - zFS kernel planned to support AMODE64, allowing much larger data and object caches
  - Support also planned to allow you to run zFS in the z/OS UNIX (OMVS) address space, which is expected to yield gains for all workloads using zFS file systems

Is zFS Ready for Prime Time? Monday 3:15

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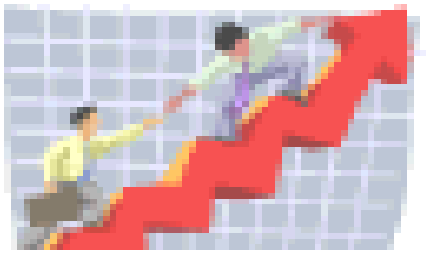
Scalability and Performance

- **DSMShsm Fast Replication processing improvements**
  - Distributed dump processing across multiple LPARs for Fast Replication operations in a Parallel Sysplex
    - Intended to speed processing time for large DB2® copy pools
  - Allow stacking multiple copy pools on a single tape
  - Allow you to specify multitasking for processing Fast Replication requests even when it would use more tapes
  - Optionally write messages issued during the operation to a data set.

These enhancements are expected to be particularly valuable in DB2 environments.



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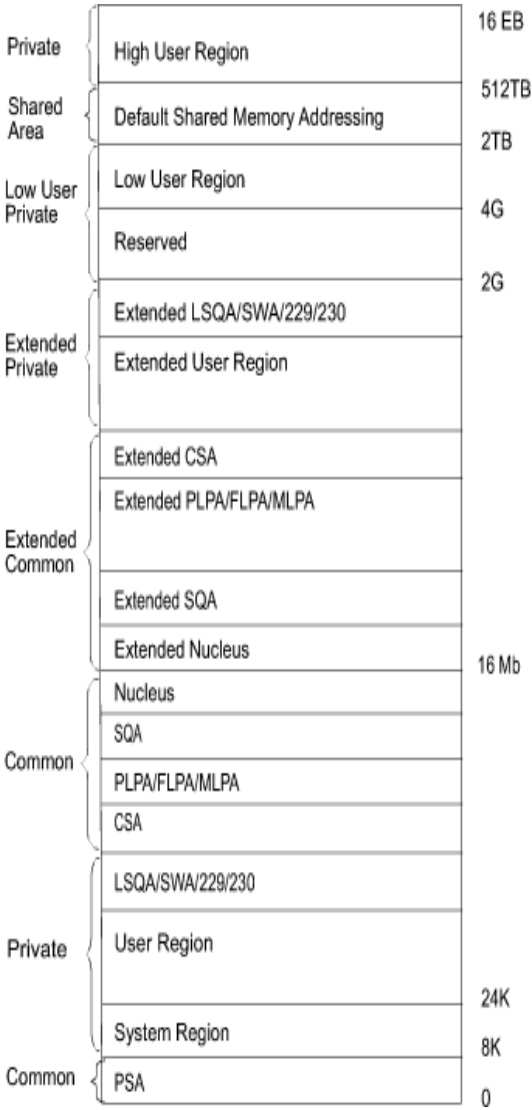
Scalability and Performance

- **AMODE64 File System Services**
  - z/OS UNIX file system services planned to be callable in AMODE64
  - Eliminate need for 64-bit programs to reset mode to AMODE31 for file system operations
  - Removing the need to set mode should help improve performance
- **PKI Services support for AMODE 64 callers planned**
- **Binder support planned for new DLL for C/C++ language AMODE 64 callers**
- **64-bit NFS Client Support planned**
  - In support of the item above
  - Note: 64-bit NFS Server was in z/OS V2.1
- **Communications Server AMODE 64 support planned for TCP/IP stack and for:**
  - OSA-Express QDIO
  - HiperSockets™
  - RoCE



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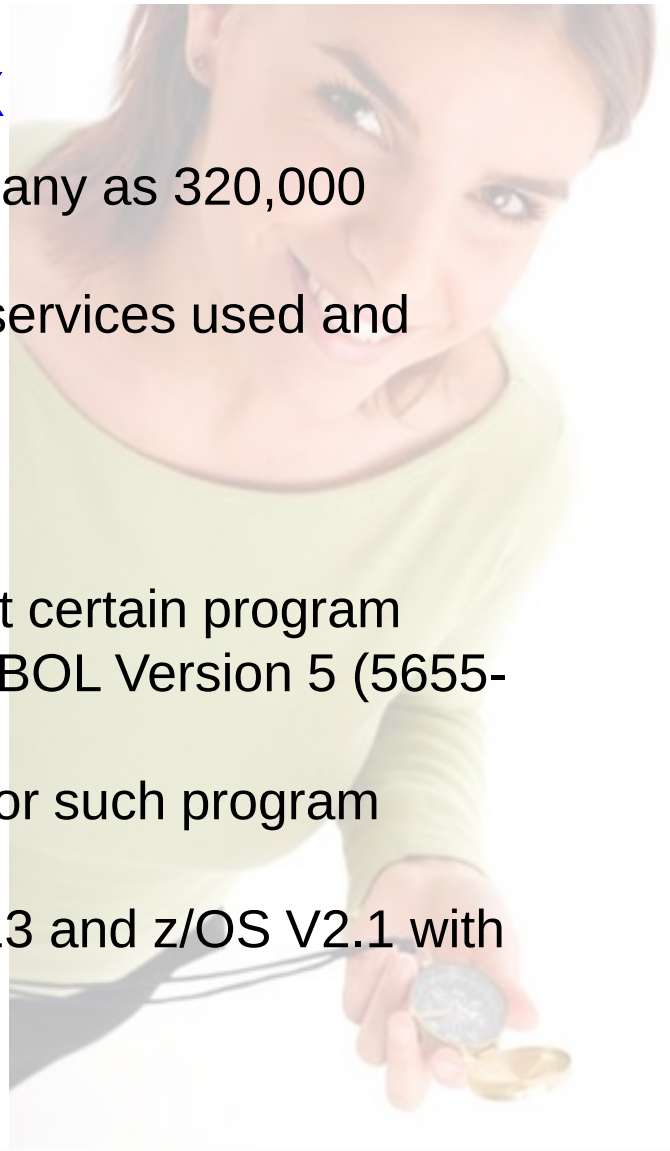
Scalability and Performance

- **XRC Write Pacing**
  - z/OS Global Mirror (XRC) designed to work with…
    - z/OS WLM; and,
    - DS8000 with the z/OS Global Mirror feature…
  - …to throttle low-priority writes when they would cause significant delays that might affect response time
  - Will be designed to allow you to specify that write delays be imposed for different classes of work based on WLM definitions when needed
  - Intended to:
    - Make it unnecessary to adjust write pacing settings and monitor data set residency
    - Improve system responsiveness to more important work
  - Requires a DS8870 with an MCL
  - Available now for z/OS V1.13 and z/OS V2.1 with the PTFs for APARs OA41906, OA44004, and OA43453

Scalability and Performance

- **(Lots!) more threads for z/OS UNIX**
  - z/OS V2.2 UNIX designed to support as many as 320,000 threads, up from approximately 32,000
    - Actual practical limit for depends on services used and additional storage they require

- **LLA improvements**
  - Will be designed to make it more likely that certain program objects, such as those compiled using COBOL Version 5 (5655-W32), can be cached by LLA in VLF
  - Intended to help to improve performance for such program objects in LLA-managed libraries
  - Also planned to be available for z/OS V1.13 and z/OS V2.1 with the PTF for APAR OA45127.



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Availability

Availability*

Top 50

- **Private Area Virtual Storage Tracking in PFA planned**
  - New function designed to track data based on new fields in VSM's LDA
- **Support for dynamic TDS (LDAP) Compatibility Upgrades planned**
  - New "transition mode" designed for LDAP server
  - TM intended to allow higher compatibility level and new back ends to be specified
  - Support for directing LDAP requests to the TM server
  - Designed to allow new specifications to be effective for the Parallel Sysplex once other LDAP servers in the 'plex have been shut down
  - Subsequently restarted servers will be designed to use the new specifications
  - Restart the original TM server to complete the process
- **Dynamic JES2 Checkpoint Expansion**
  - Assuming enough space, will be designed to allow you to increase Checkpoint size without a cold start

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Availability*

- **JES3 DSI Change**
  - *Not* Dynamic System Interchange; that "other" DSI": Data Set Integrity
  - In "recent" releases before z/OS V2.2, PPTNDSI must be set in IEFSDPPT (and not overridden by specifying DSI in SCHEDxx)
    - Default PPT entry for IATINTK remains:
      - C9C1 E3C9 D5E3 D240 ED10 (byte 8 bit 5 is PPTNDSI)
  - This causes JES3 to use S99NORES ("don't ENQ") for its allocations
  - z/OS V2.2 planned to support specifying DSI for JES3 in SCHEDxx
  - Default PPT still planned to contain PPTNDSI for JES3 for now
- **Better Subsystem Interface (SSI) Initialization Processing planned:**
  - SSCVT entry no longer intended to be built when initialization routines (INITRTNs) are not found
  - Support for a new command to delete a subsystem planned:
    - SETSSI DELETE,SUBNAME=ssss,FORCE
    - (There will be some restrictions!)
- **Dynamic Exit support for O/C/EOV**
  - Support for the Tape Installation Exits planned: Volume Mount, File Start, File Validate, File End and Label Anomaly

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Availability*

- **XCF group isolation**
  - XCF planned to delay and, if necessary, reject messages when group members are not keeping up
  - Intended to better isolate XCF groups so problems with one are less likely to impact signal delivery for others
- **HyperSwap support for Multi-Target Peer-to-Peer Replication (MT-PPRC) planned**
  - Define up to *two* PPRC targets
  - HyperSwap support for marking:
    - One as a preferred failover target
    - One as an alternative failover target
  - Will require z/OS V1.13 or z/OS V2.1 with the PTFs for APARs OA43661 and OA46683, or z/OS V2.2*
  - Also requires:
    - DS8000 with 7.4 microcode and MT-PPRC features
    - GDPS®/Multitarget Metro Mirror, planned for 1Q15; or,
    - IBM Tivoli® Storage Productivity Center for Replication for System z V5.2 (5698-Z11), support planned for 2Q15*

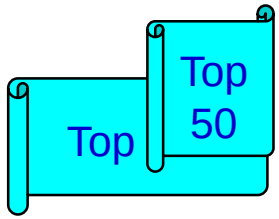
z/OS Resilience Enhancements Tuesday 10:00

Multi-Target Replication with IBM DS8870 Thursday 8:15

Availability*

- **Multiple Incremental FlashCopy**
  - z/OS V2.2 designed to support up to 12 targets for incremental FlashCopy
  - Can copy a number of faster than repetitive, full-volume FlashCopy
  - Intended to help:
    - Provide more flexibility and resilience
    - Better protect application availability
    - Provide improved data protection across physical volume failures
  - Available now for z/OS V1.13 and z/OS V2.1 with PTFs for APARs OA45412 and PI22256
  - Requires IBM DS8870 Storage Subsystem with the 7.4 microcode feature

- **Support for moving LOGREC**



  - z/OS V2.2 designed to allow LOGREC data sets to be deallocated
  - Updated SETLOGRC command planned to allow you to deallocate an in-use LOGREC data set and allow you to specify a new data set name
  - Intended to allow you to discontinue the use of a particular LOGREC data set when switching to either a log stream or a different LOGREC data set

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Availability*

- **Log stream offload data set preallocation**
  - Intended to help avoid situations offload delays from causing system problems and provide more time to react
  - Support planned for IXGCNFxx parmlib members, Logger policy, an API, and an operator command
- **SLIP command enhancements**
  - z/OS V2.2 SLIP processing planned to allow you to specify an operator command
    - Designed to be issued when the trap is matched
    - Intended to provide an easy way to issue commands during problem diagnosis
  - PER SLIPs planned to capture the BEAR (Breaking Event Address Register, the last “branch-from” address) in a more accessible spot

Top 50

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Systems Management

Systems Management*

- **Health-Based Workload Routing Enhancement**
  - WLM “anti-storm drain” infrastructure planned to support:
    - Health value tracking, query API including ASID-level support for retrieving health weight values
    - Health weight adjustment based on “finger-pointing”
      - “That’s not working right” in addition to “I’m not working right”
    - Function-specific health weight values
    - XCF planned to exploit when a Parallel Sysplex member is not keeping up with its messages
    - RTD to report servers with health values less than 100 (the maximum)
- **Guaranteed Space* (“*Some Conditions Apply”)**
  - Based on a new DATACLAS parameter, planned to allow “guaranteed” space to be reduced by up to a specified percentage
    - So the space specified becomes a “strong suggestion”
  - Default is that Guaranteed Space remains “guaranteed” (assuming it succeeds)

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Systems Management*

- **DFSMShsm Storage Tiers Extensions planned, designed to support:**
  - Command-initiated transitions for tier demotion within L0 for storage admins:
    - MIGRATE VOLUME|STORAGEGROUP support for new MIGRATIONONLY and TRANSITIONONLY keywords
    - MIGRATE DATASETNAME support for new TRANSITION keyword
  - A corresponding user-level HMIGRATE command, ARCHMIG service
  - MIGRATE STORAGEGROUP
  - *Lateral* transitions with MIGRATE STORAGEGROUP MOVE
- **Start/Stop Support for Infoprint Server Daemons planned:**
  - Will be designed to let you use started tasks in place of daemons
  - Much better integration with typical recovery tools (MPF, SA, ARM, SFM, NetView, etc.) expected
- **Generic Tracker Improvements**
  - GTZTRACK planned to create new SMF 117 records
  - Expected to allow you to split GTZTRACK records into a dedicated log stream and run IFASMFDL later to retrieve all tracked program events after some period of time (e.g., to find migration actions)
  - REXX™ interface also planned

Transitioning to Transitions Wednesday 3:15

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Systems Management*

- **DFSMS planned improvements**
  - Support for setting up to three values for a variable in IGDSMSxx members to be used within ACS routines
    - SETSMS command support for dynamic changes
  - DISPLAY SMS,SG command will be designed to display the space usage statistics for a specified pool storage group
  - Support for specifying storage group space warning thresholds
    - *Set lower thresholds for warning messages!*
  - New secondary space reduction specification on DATACLAS intended to allow data sets to extend by less than specified secondary space when it avoids allocating space on additional volumes
    - Will be designed to provide support for SMS-managed unstriped VSAM data sets and non-VSAM data sets
  - Support for modifying SMS Space parameters in the DADSM preprocessing exit (IGGPRE00)

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Systems Management*

- **FICON Dynamic Routing health check**
  - Will require:
    - Function planned for z13 processors
    - IBM System Storage DS8000 series devices with a minimum MCL
  - Will be designed to:
    - Check fabric, channel subsystem, disk control units
    - Help assure dynamic routing requirements are met when dynamic routing has been enabled for one or more FICON switches
  - Also planned to be available for z/OS V1.13 and z/OS V2.1 with the PTF for APAR OA43308 in September 2015
  - Intended to help you identify misconfiguration errors that can result in data integrity exposures

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Systems Management*

- **Parmlib Specification of Storage Limits**
  - Intended to cover the common cases for limits on 24-bit, 31-bit, and 64-bit storage
  - Intended to help reduce the need for IEFUSI exits
  - Also, JCL support to allow you to specify individual limits for 24-bit, 31-bit, and 64-bit storage

Top 50

Top 50

- **More Easy Tier® Integration**
  - z/OS V2.2 planned to support a new interface provided by IBM System Storage Easy Tier
  - Designed to allow software to help steer data placement within Easy Tier volumes to meet performance objectives
  - Intended to help guide appropriate tier placement
  - Requires z/OS V1.13 or z/OS V2.1 with the PTF for APAR OA45236 and IBM DS8870 Storage Subsystem with the 7.4 microcode feature
  - Exploitation planned by DB2 2Q 2015

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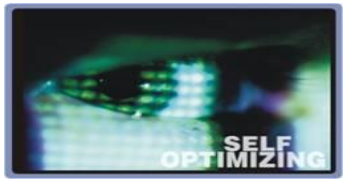
Systems Management*

- **RMF Enhancements**
  - z/OS V2.2 RMF will be designed to support new Monitor III reports:
    - A Job USAGE report to display information about address space resource consumption, including I/O-related, CPU-related, memory-related, and GRS-related information
      - The Monitor III Job USAGE report is also planned to be added to the report list for the RMF Distributed Data Server
      - Similar information planned to be returned by the RMF DDS in XML format when requested
    - RMF Monitor III support for a new PCIE Activity report for zEDC and RoCE features available on zEC12 and later servers
      - Also, support for an RMF DDS XML format



- **Capacity Provisioning Enhancements**
  - z/OS V2.2 Capacity Provisioning Manager and its z/OSMF plug-in planned to support provisioning based on overall CPC-wide utilization
  - Also be designed to support relinquishing capacity when CPC utilization falls

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Systems Management*

- **ISPF Edit Pack Disablement**
  - z/OS V2.2 ISPF planned to provide a new option you can use to completely disable the use of ISPF Edit Pack
  - Designed to allow you to help control CPU utilization and help assure that new data sets processed by ISPF can be easily processed by other programs
- **SMF Recording Extensions**
  - z/OS V2.2 DFSMSdfp will be designed to add job ID (such as Jnnnnnnn, to SMF14 and SMF15 (non-VSAM data set activity) records
  - z/OS V2.2 IBM Tivoli Directory Server (ITDS, LDAP) will be designed to allow you to specify that a number of additional events be recorded in the LDAP activity log and in SMF83 records

Top 75

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Enhancing Security

Enhancing Security*

- **SMF record signing planned**
  - Improved trust of SMF's repository of audit data by providing tamper protection
  - Designed to be available for SMF data written to System Logger
  - Planned to use both CPACF symmetric algorithm for hashing to support needed data rates and CEXnC card for signatures
  - Groups of records planned to be signed
  - Each group intended to have a new SMF2 trailer record with the signature
  - IFASMFDP support planned for verifying the signatures
    - To verify signatures:
      1. Unload using IFASMFDL
      2. Process the SMF data with IFASMFDP
  - We plan to document the SMF2 record format to allow signature verification

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Enhancing Security*

- **z/OS V2.2 PKI Services planned to support:**
  - Optionally requiring multiple approvers to create new certificates, to help prevent the creation of unauthorized certificates
  - Signing OCSP responses with the client-specified algorithm per RFC 6277 to improve interoperability of PKI Services and OCSP clients
  - SHA-224 and SHA-256 with DSA for signing certificates, CRLs, OCSP responses, and verify certificate requests

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Enhancing Security*

- **PKINIT (RFC 4556) support planned**
  - X.590 certificate-based authentication for Kerberos
- **Separate OPERCMDS profiles for display/change aspects of F CATALOG**
  - Designed to support a new profile
    - MVS.MODIFY.STC.CATALOG.CATALOG.SECURE
  - Intended to restrict access to the two different flavors of MODIFY CATALOG:
    - READ access to allow display commands
    - UDPATE to allow actual changes to Catalog behavior

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Enhancing Security*

- **New z/OS V2.2 SAF and RACF functions for z/OS UNIX**
  - –Planned to provide two new functions:
    - Allow users with access to a new UNIXPRIV profile to perform additional file system-related operations, such as listing files in a directory, without being authorized to alter the files
    - Allow you to protect file system directories with a new NOEXEC attribute intended to prevent programs stored in them from being run
  - –Intended to help you improve z/OS UNIX security

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Enhancing Security*

- **Planned RRSF Improvements**
  - Support for ignoring inbound updates for specified systems
    - For example, specify on production systems that updates made to test systems be ignored
    - Intended to help prevent inadvertent escalations of privilege
  - Operator command-based dynamic movement of the MAIN RRSF node
    - Intended to make this process much simpler
- **BCPii SMF Audit Records**
  - New SMF Type 106 records planned for HWISET and HWICMD events
  - Intended to allow you to audit updates to attribute values for CPC processor weights, image profiles, and activation profiles; and, for operations affecting a CPC or image such as image activations

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Enhancing Security*

- **RACF password encryption algorithm change (we did a prior Statement of Direction):**
  - Planned to allow you to transition from 56-bit single DES to AES
  - Now available on z/OS V1.13 and z/OS V2.1 with PTFs for APARs OA43998 (SAF) & OA43999 (RACF)

- **Other planned password-related enhancements for RACF:**
  - No default passwords for new users
  - No need for an ICHDEX01 exit to use password encryption!
  - Allow password phrases to be used with the RACLINK DEFINE command

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Enhancing Security*

- **System SSL:**
  - OCSP Support, designed to:
    - Retrieve revocation status information for x.509 certificates as described by RFC 2560; retrieve CRL information as described by RFC 3280 and 5280
    - Intended to help you ensure valid certificates used for SSL and TLS
    - z/OS V2.2 Communications Server planned to provide corresponding AT-TLS support
  - Support for PKCS #12 certificate files for applications
    - Intended to provide better interoperation for applications that create PKCS #12 key store files, such as Java-based applications
    - Available for z/OS V1.13 and z/OS V2.1 with the PTF for APAR OA45216
  - Support for the secure key functions available with CEX4 and later crypto features on zEC12 and later processors when configured in EP11 mode
    - Supporting secure DSA keys for signing and fixed ECDH key exchanges
  - Support for allowing SSL sessions to be reused across different TCP ports; corresponding support to allow FTP data connections to reuse associated SSL sessions for AT-TLS and native SSL users of FTP

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Enhancing Security*

- **More RACF Sensitive Resource Health Checks planned, for**:
  - ICSF
  - RACF password encryption technique
  - Password controls
  - RRSF work data sets
  - More z/OS UNIX System Services resources

- **Read-Only AUDITOR support will be designed to provide:**
  - A new ROAUDIT attribute intended to be a “look but don’t touch” setting
  - Designed to preclude changes to RACF audit events;
  - Otherwise, the same as AUDITOR

- **Console auto-logoff support planned:**
  - Designed to allow you to specify a timeout for consoles
  - Intended to be similar to timeouts for TSO/E and z/OS UNIX users
  - Automatically logging users from unattended consoles is intended to help you improve security
  - Also, support for SAF-based control over whether the same user can log on to more than one console at a time

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Enhancing Security*

- **Crypto Enhancements, Part 1A**
  - Planned for z/OS V2.2 ICSF and available for zEC12, zBC12, and z13 processors for z/OS V2.1 and z/OS V1.13 from: http://www.ibm.com/systems/z/os/zos/downloads/
  - Intended to help banking and finance sector clients meet standards and provide better cryptographic security with designs intended to provide:
    - Support for emerging standards for American Express, JCB, MasterCard, and Visa payment systems (EMVCo) in CCA-based callable services for key management, generation, transport, and derivation.
    - Requires minimum MCLs for Crypto Express3 and Crypto Express4S coprocessors.
  - Enhanced support in the Remote Key Export callable service to allow you to specify the desired key-wrapping method generation and transport
    - Requires minimum MCLs for Crypto Express3 and Crypto Express4S coprocessors.
  - Support for AES MAC enhancements to callable services, allowing for key lengths greater than 128 bits for XCBC-MAC processing and frequently-used UDXs to help you reduce costs
  - This support, which requires minimum MCLs for CEX3 and CEX42, is designed to provide these new services:
    - Recover PIN From Offset
    - Symmetric Key Export with Data
    - Authentication Parameter Generate

z/OS Crypto 201:
ICSF Overview
Monday 4:30

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Enhancing Security*

- **Crypto Enhancements, Part 1B**
  - New functions for public sector customers intended to provide better interoperability with other platforms and help improve application portability with minimum levels of EP11 firmware and microcode level for CEX4S:
    - Enhanced Enterprise PKCS #11 mode support designed to add secure key support for Diffie-Hellman, Elliptic Curve Diffie-Hellman, RSA-PSS algorithms, and Secure DSA Domain Parameter Generation
    - Support for Enterprise PKCS #11 applications intended to allow them to change a key's compliance mode using the Set Attribute Value function
    - Support for ECC keys generated using Brainpool curves while executing in FIPS mode

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System z Security Portal

- **Want to be notified about Security and Integrity APARs? Sign up!**
  - IBM recommends that you promptly install security and integrity PTFs
  - SECINT PTFs are included in RSUs periodically
  - The System z Security Portal can help you stay more current with SECINT PTFs by providing SMP/E HOLDDATA you can use to identify these fixes before they are marked RSU
  - The System z Security Portal also provides associated Common Vulnerability Scoring System (CVSS) V2 ratings for new APARs*
  - To get this information you must register!
    - Because widespread specifics about a vulnerability could increase the likelihood that an attacker could successfully exploit it
    - In response to customer requests to maintain the confidentiality
    - Other requirements on the website
  - IBM recommends that you visit the System z Security Portal site at http://www.ibm.com/systems/z/advantages/security/integrity_zos.html to get the information you need to register
  - Questions can be directed to: syszsec@us.ibm.com

- Note: According to the Forum of Incident Response and Security Teams (FIRST), the Common Vulnerability Scoring System (CVSS) is an "industry open standard designed to convey vulnerability severity and help to determine urgency and priority of response." IBM PROVIDES THE CVSS SCORES "AS IS" WITHOUT WARRANTY OF ANY KIND, INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. CUSTOMERS ARE RESPONSIBLE FOR ASSESSING THE IMPACT OF ANY ACTUAL OR POTENTIAL SECURITY VULNERABILITY IN THEIR SPECIFIC ENVIRONMENT. IBM DOES NOT PROVIDE A CVSS ENVIRONMENT SCORE. THE CVSS ENVIRONMENT SCORE IS CUSTOMER ENVIRONMENT SPECIFIC AND WILL IMPACT THE OVERALL CVSS SCORE. CUSTOMERS SHOULD EVALUATE THE IMPACT OF ANY ACTUAL OR POTENTIAL SECURITY VULNERABILITY IN THEIR SPECIFIC ENVIRONMENT.
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Application Development

Application Development*

- **Client Web Enablement Toolkit**
  - Will be designed to enable applications written in C/C++, COBOL, PL/I, and HLASM to participate easily as a REST client
  - Planned to provide:
    - A z/OS JSON parser, able to build or modify JSON text
    - An HTTP/HTTPS protocol enabler
  - JSON parser also planned to be available for z/OS V2.1 in the first quarter of 2015 with the PTF for APAR OA46575
  - HTTP enabler planned to be available for z/OS V2.1 at z/OS V2.2 availability with the PTF for OA46622

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Application Development*

- **DFSORT date functions**
  - WEEKNUM will be designed to convert input dates to numbers representing corresponding weeks of the year
  - AGE will be designed to calculate the time between a given date and the current date
  - These will be intended to provide additional flexibility in creating reports and to help improve the usability of reports generated with these new functions
- **Infoprint Server Customized Text**
  - z/OS V2.2 Infoprint Server planned to provide new function in IP PrintWay™ extended mode for adding personalized text to emailed notes that include print output
  - For example, add a greeting (such as "Dear Ms. Doe,") at the beginning of a note with an attachment

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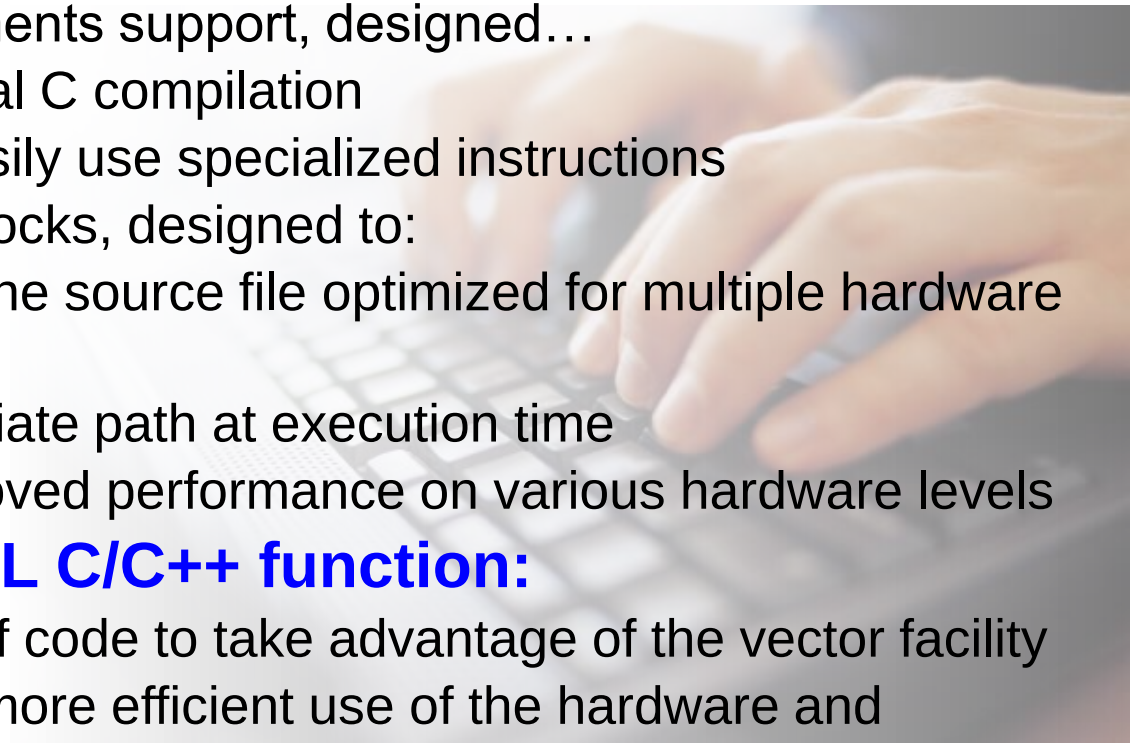
Application Development*

- **New XL C/C++ functions available now with a Web Deliverable:**
  - Inline assembler statements support, designed…
    - Not to require Metal C compilation
    - To allow you to easily use specialized instructions
  - Runtime architecture blocks, designed to:
    - Allow you to use one source file optimized for multiple hardware architecture levels
    - Select the appropriate path at execution time
    - Help provide improved performance on various hardware levels
- **Planned z/OS V2.2 XL C/C++ function:**
  - Automatic conversion of code to take advantage of the vector facility
    - Intended to allow more efficient use of the hardware and improve application performance
    - dbx also planned to provide support for debugging C/C++ programs using SIMD instructions running under z/OS UNIX



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Application Development*

- **Support for 64-bit shared large (1 MB) Pages**
  - Planned to allow you to specify that the system should try to back shared memory objects above the bar using 1M pages
- **New and improved symbol support in JES3**
  - Instream substitution, longer symbols, and ENF78 support planned
- **Improved batch support in JES3 planned**
  - //OUTPUT JCL statement improvements
  - DDNAME, MERGE, and PROCLIB JCL support
- **CIM planned to include Version 2.2 of the SBLIM CIM client for Java**
  - Designed to be a JSR48-compliant implementation

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Application Development*

- **Enhanced RESTful data set and file APIs in z/OSMF designed to allow you to:**
  - Get a list of data sets matching a pattern
  - Get a list of files in a z/OS UNIX directory
  - Retrieve information about a data set or file (e.g., attributes, member lists)
  - Create, delete, rename, copy, or move a data set or file
  - Browse or edit a data set or file (up to 8 MB in size)
- **New Workflow launch API in z/OSMF**
  - Planned to allow exploiters to initiate, monitor, and terminate workflows
- **Jobs REST API update**
  - Planned to allow you to retrieve the new step-level completion codes in JES2 environments

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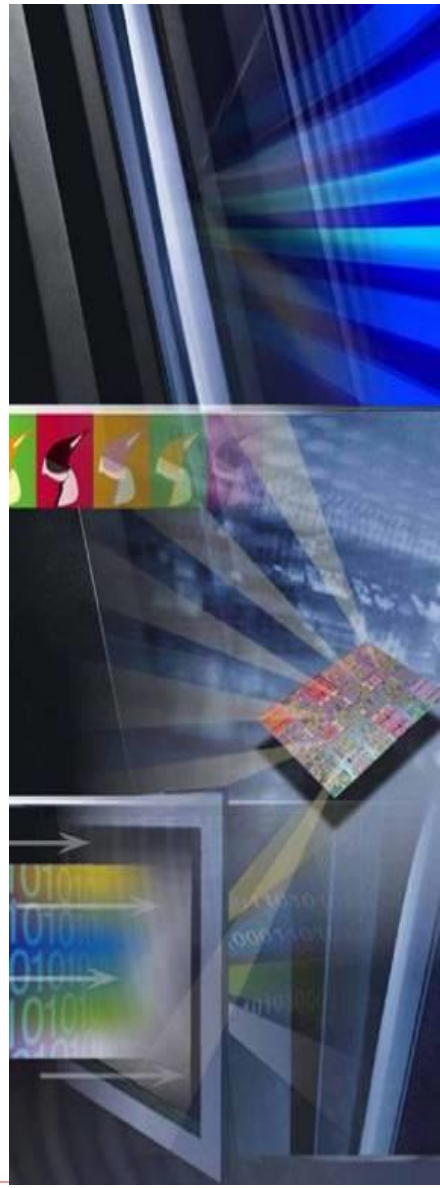
Application Development*

- **OpenSSH 6.4p1 planned to be part of z/OS:**
  - Same level included in IBM Ported Tools V1.3.0 (5655-M23)
  - Also, IBM plans to provide future enhancements to OpenSSH in z/OS (see the Statements of general direction in the z/OS V2.2 preview announcement)
- **EU Ordering Rules for Unicode and HKSCS conversions support planned:**
  - Common collation sequence across the EU
    - EOR / EN 13710 standard and German tailoring defined by the European Committee for Standardization (CEN)
    - (e.g., how do you sort “a,” “ã,” “à,” “á,” “æ,” “ä,” and “ą”?)
  - Also, 4-byte HKSCS-2008 conversions



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Networking

Networking*

- **RoCE Improvements, planned to support**
  - z/OS V2.2 Communications Server planned to support the new RoCE virtualization capability on z13 processors* and support sharing across up to 31 z/OS images
    - Also be designed to allow you to use both ports in the RoCE adapter
  - Support also planned to support selecting between TCP/IP and RoCE transport layer protocols automatically based on traffic characteristics and to support MTU sizes up to 4K for RoCE adapters
  - Planned to be available on z/OS V2.1 with the PTF for APARs OA44576 and PI12223; corresponding RMF support with the PTF for OA44524
  - z/OS V2.2 Communications Server planned to provide a tool designed to show the percentage of RoCE-eligible TCP traffic; also planned for z/OS V1.13 with the PTF for PI27252 and z/OS V2.1 with the PTF for APAR PI29165

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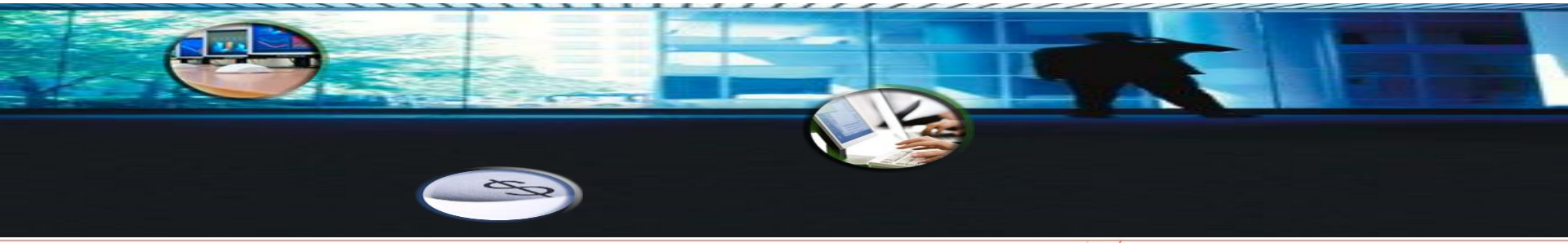
Networking*

- **64-bit TCP/IP Stack**
  - TCP/IP stack will be designed to support AMODE 64
- **Enterprise Extender (EE) scalability**
  - Intended to improve performance for configurations with very large number of EE endpoints
- **DVIPA Limit**
  - Single-stack limit will be designed to be increased from 1K to 4K for application instance DVIPAs
- **Automatic Segment Sizes for VIPAROUTEs**
  - Will be designed to automatically set the appropriate maximum segment size for each IPv4 route, to simplify VIPAROUTE configuration and help improve performance

z/OS V2R1 Communications Server Technical Update, Parts 1 & 2 Monday 10:00 & 11:15



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Networking*

- **NIST SP800-131a support will be designed for:**
  - TLSv1.1, TLSv1.2, SHA-2 hashes, and encryption key strengths of more than 111 bits in sendmail
  - SNMP Agent, SNMP command, and SNMP manager API support for the 128-bit AES
  - Updated Digital Certificate Access Server (DCAS) support, for TLSv1.1 and TLSv1.2, including 2-byte ciphers
  - Support for centralized policy agent client/server communication using TLSv1.1 and TLSv1.2, including support for 2-byte ciphers
  - These capabilities available now on z/OS V2.1 with the PTFs for APARs PM96891, PM96896, PM96898, and PM96901 (PTFs UI13120, UI13138, UI13139, and UI13140)

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Networking*

- **TLS Session Reuse planned to provide:**
  - Reduced overhead
  - One less opportunity to intercept a connection
- **CICS Sockets**
  - Communications Server planned to enhance the CICS® Sockets Listener interface
  - Will be designed to provide CICS additional information about local and remote session partners
  - Intended to be used by CICS Explorer® or Session Monitor to provide transaction tracking capabilities
  - Requires IBM CICS Transaction Server for z/OS, V4.2 (5655-S97) or CICS Transaction Server for z/OS, V5.1 (5655-Y04)
- **Resolver Improvements planned to support:**
  - Round-robin reordering of cached IP address lists for each host name
  - Nondisruptive tracing for long-running address spaces
    - New CTRACE option to capture same data as the Trace Resolver; dynamic start & stop; IPCS formatting support

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Two other things to highlight:

- **Product ServerPac**
  - Most products now available without a “base product” (such as z/OS, IMS™, CICS, DB2)

- **Standalone DFSMSdss no longer requires a labeled volume for full-volume RESTORE**
  - DR procedures can be simplified a bit if you don’t mind using NVFY

Secure Software Delivery, Part MMXV

- **April 11, 2012:**
  - Said we'd require FTPS for z/OS products and service downloads October 31, 2013
- **April – June 2013:**
  - A number of customers and account teams contact us to express concern
  - Most had setup issues we are able to resolve (big thanks to Kurt Quackenbush!)
  - Some have more intractable issues such as:
    - Current hardware implementations do not support FTPS
    - Executive-level exceptions or legislative authorization needed to poke FTPS-sized holes in the firewalls
- **July 23, 2013:**
  - Announced "OK, we didn't mean it" (well, we did, but…) and deferred, no date
- **July 2013 – Present:**
  - August 2013 SHARE closed door topic
  - IBM-MAIN survey
  - Individually contacted all the customers we knew about
  - Helped with setup (where we could), discussed alternatives…
  - March 2014 zBLC call
  - March 2014 SHARE closed door topic

Where We're At Now With Secure Software Delivery

- So far, all the customers who have returned our cards and letters who could not use FTPS have said they can use HTTPS
  - Or they can use RECEIVE ORDER, which amounts to the same thing
- **We added HTTPS as a protocol for secure delivery**
  - **FTPS to remain supported**
- This was done with a native z/OS client added to SMP/E
  - Transfers can be direct from IBM servers to z/OS
  - No requirement for Download Director
    - (Download Director still planned to be supported for store-and-forward downloads)
  - **We will require secure download starting: 1Q2016***
  - Does this NOT work for you?
    - If not, send a note to eells@us.ibm.com and tell us why!

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IBM z Systems

The innovation continues

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