z/OS V2.5 - Preview

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

IBM

Thanks to and Disclaimer

You can find the full „What's New in z/OS V 2.5 „ presentation here:
https://github.com/IBM/IBM-Z-zOS/blob/main/zOS-Education/zOS-V2.5-Education/What's%20New%20in%20zOS%20v2.5%20-%20Preview%20Edition.pdf

- **Gary Puchkoff, z/OS New Technology**
- **Barbara McDonald, DFSMS Solution OM, z Systems Software**
- **Marna Walle, Senior Technical Staff Member, z/OS System Install**
- **Ross Cooper, IBM z/OS Security Server Design and Development**
- **Cecilia Carranza Lewis, STSM - z/OS DFSMS Architecture, Design and Development**
- **...**

These are my (Rita Pleus) personal comments

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Agenda:

Hot Topics

z/OS V 2.5 Preview - Selected Release Topics

Statements of Direction and Preparation for z/OS V 2.5

Three things to remember

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Hot Topics

z/OS V 2.5 Preview - Selected Release Topics

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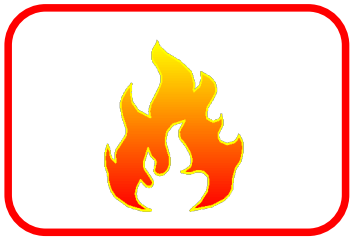
Three things to remember

Hot Topic

IBM Software Download move to TLS 1.2 for FTPS



- Planned for **April 30 2021**
- IBM will remove support for TLS 1.0 and TLS 1.1 from the IBM Download Servers
- This affects the following, for those that use FTPS:
  - Receive Order
  - PTF's from Shopz
  - PTF's ordered using ServiceLink
  - Products in ServerPac and CBPDO offerings ordered using Shopz
  - Products in CustomPac offerings

- Customers directly accessing from z/OS can convert FTPS to TLS 1.2 using AT-TLS

- **IBM recommends using HTTPS instead of FTPS. If you are using HTTPS, this change will not affect you at all.**

- **"SHARE Blog": https://blog.share.org/Article/TitleLink/marnas-musings-ibm-software-electronic-delivery-change**

~~Coming soon:~~ Done!

IBM Knowledge Center Transformation

Modernization:

Makes it easy for subject matter experts to participate in the delivery of high-value content

Improvements in content creation lets us we can deliver new content and updates faster

Updated look and feel

Personalized Content:

As a client I want content relevant to my environment

As a client I want content to be more easily discoverable

As a client, I want to see all relevant content and communities for the product I am using

Better integration:

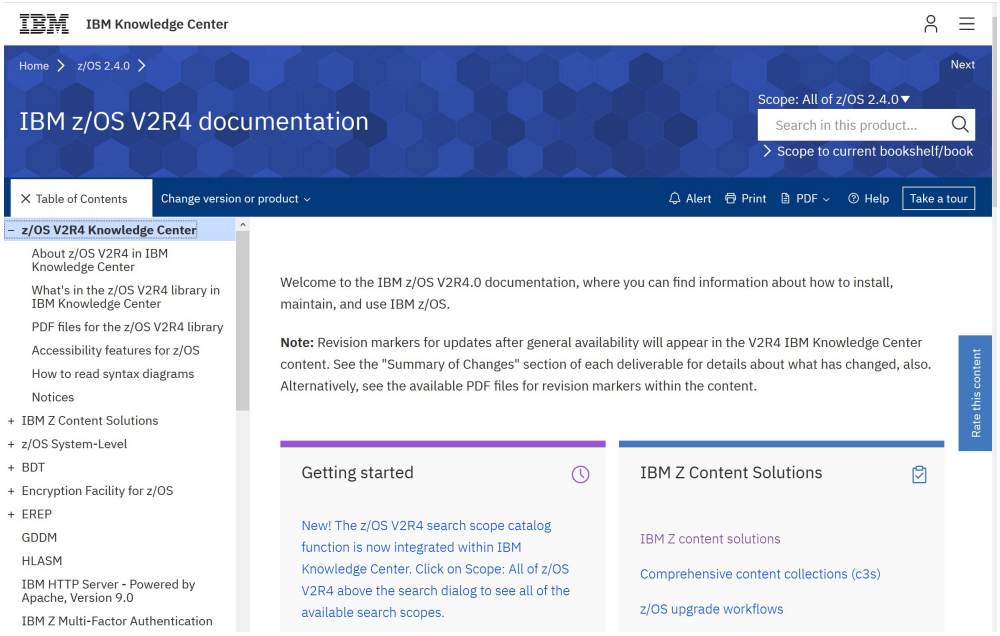
As a client, I want the ability to be able to find all related content (such as downloads, training and support) within the page that I am currently on.

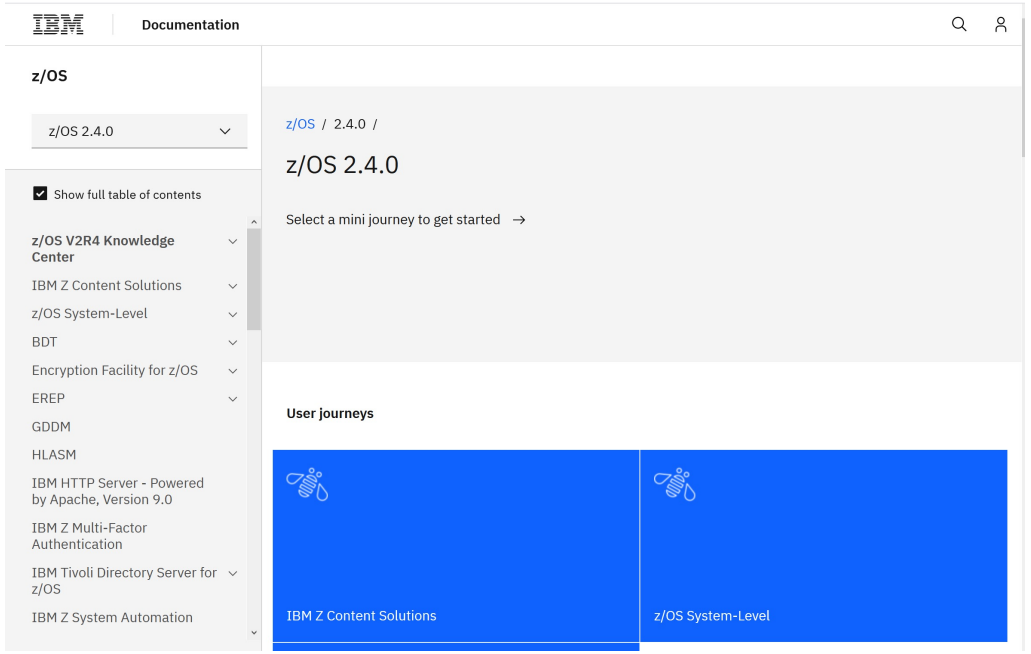
As a client, I want KC search results to include all content, regardless of who wrote it and where it lives.

Information Currency

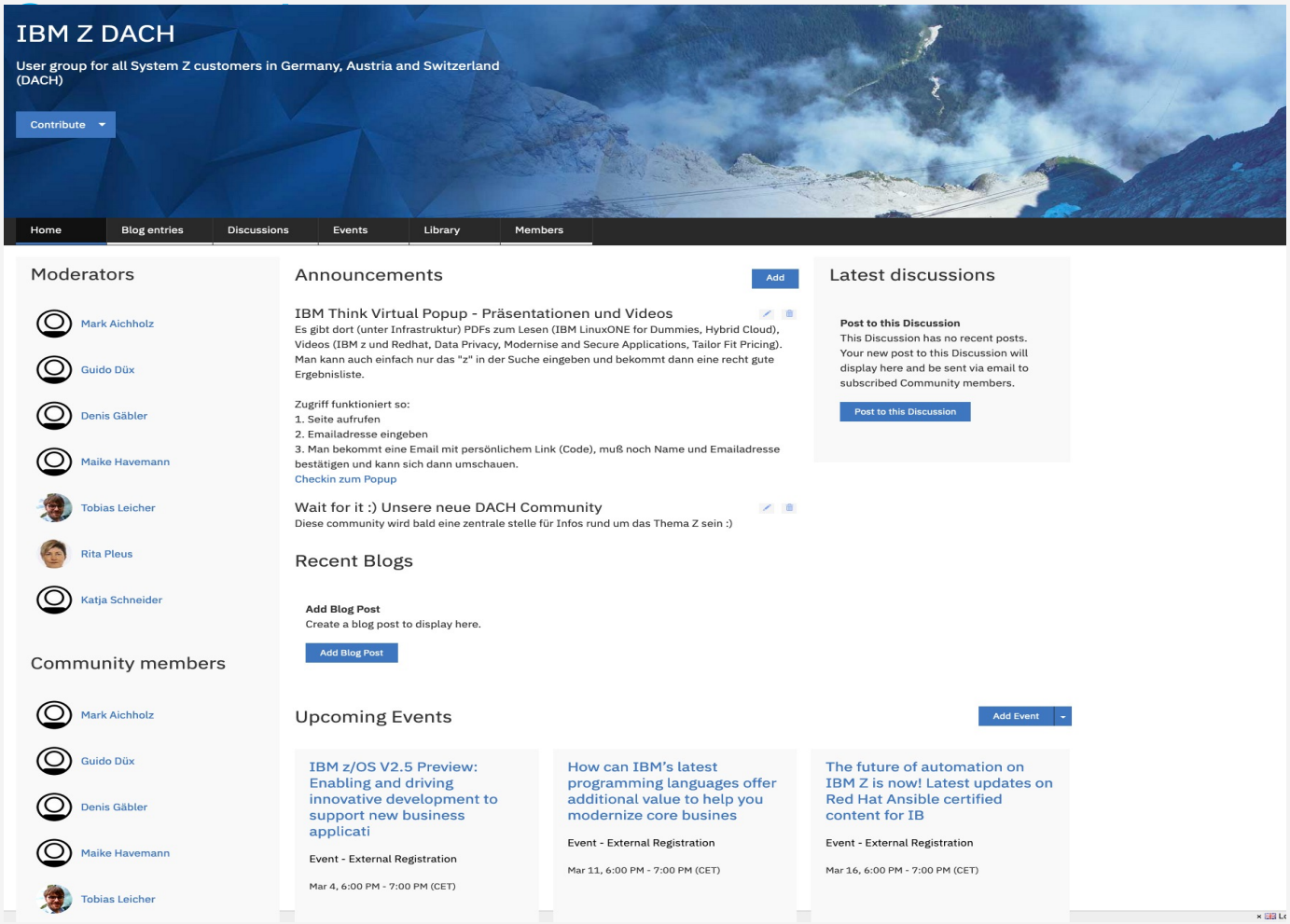
Make it easy for authors to make timely updates so clients always have the most current, most accurate information they need to do their job quickly and confidently.

IBM Knowledge Center Transformation Before and After





NEW: IBM zDACH Community



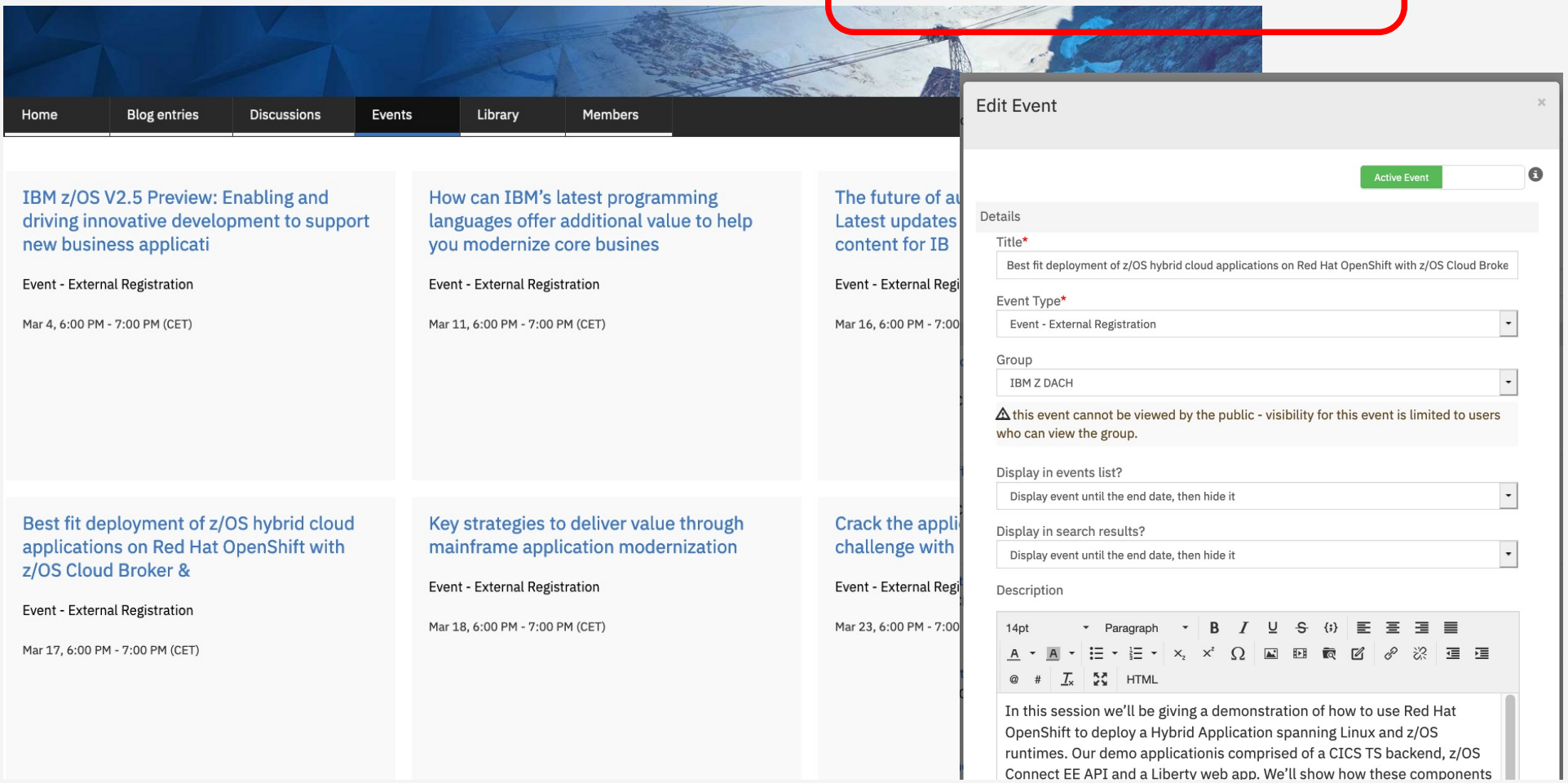
Register?!

Internet-Adresse

https://community.ibm.com/community/user/ibmz-and-linuxone/groups/community-home?CommunityKey=9a8b7fc3-b167-447a-8e14-adf93406eccc

IBM zDACH Community: Events

IBM Z Community Event
May 5, 2021 from 16:30 to 18:30



z/OS V2.5 Driving System Requirement*

Availability of the z/OS ServerPac as a portable software instance and the removal of CustomPac dialog support

IBM intends to provide z/OS V2.5 as a portable software instance. With this change, IBM plans to discontinue support for the CustomPac dialog method of installation for all IBM software products in Shopz in January 2022. Clients should prepare their driving system **with z/OSMF** now to accommodate this strategic direction and ensure that Shopz-orderable software can be installed in the future.

More – in the „z/OSMF News" presentation

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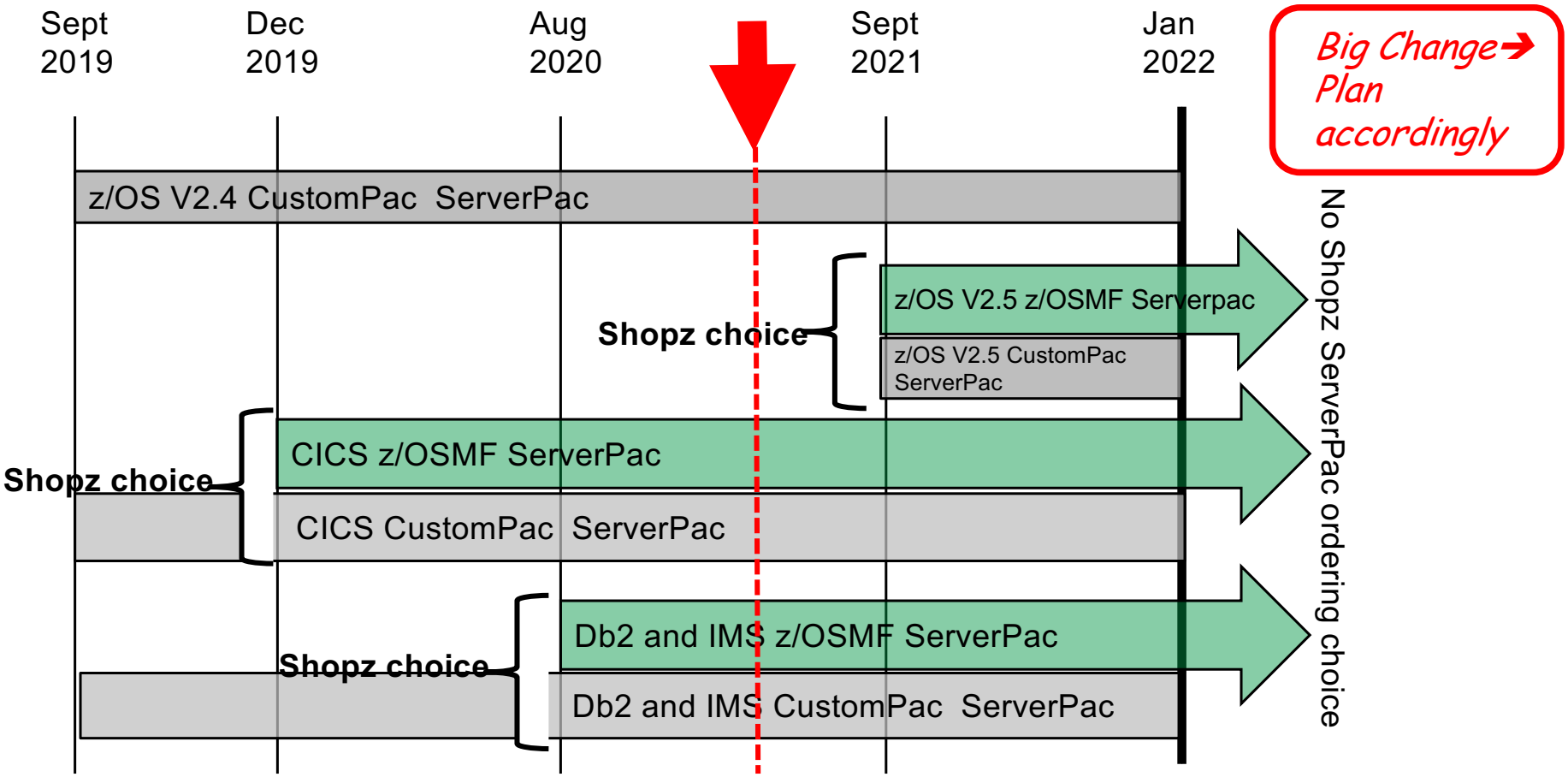
ServerPac Portable Software Instance Timeline*



Note: CBPDO is still available, but ServerPac is recommended.

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Agenda:

Hot Topics

z/OS V 2.5 Preview - Selected Release Topics

Statements of Direction and Preparation for z/OS V 2.5 ?

Three things to remember

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(CD) – Base V2.5 items that were **C**ontinuous **D**elivery on previous release(s)
(CD) – **C**ontinuous **D**elivery items post V2.5 General Availability

z/OS V2.5 Release Overview - Release Highlights

Feature	Description
Workload Enablement	**Workload Enablement:** An **Application Developer,** can treat z/OS the same as any other operating system platform with respect to hybrid cloud deployment, achieving rapid application development and provisioning, demonstrating z/OS's ability to match or exceed any other operating system.
Intelligent Resiliency	**Resiliency**: An **Infrastructure Architect** will gain enhanced resiliency capabilities that provide heightened application availability, modernized tools and automated detection/mitigation procedures, enabling them to maintain exceptionally resilient environments in half the time and with reduced skill requirements.
Cyber Threat Secure Z	**Security:** A **Security Architect** can leverage cyber security system hardening and analytics to readily exceed regulatory compliance requirements and to provide a new level of cyber resiliency for the enterprise.
OS Management Simplification	**Systems Management**: An **early tenure z/OS System Programmer**, can independently, confidently, and successfully deploy, maintain, and manage z/OS (and stack) software functions using guided and customized instructions and workflows.

z/OS V2.5 Release Overview – Workload Enablement

An Application Developer can treat z/OS the same as any other operating system platform with respect to hybrid cloud deployment, achieving rapid application development and provisioning, demonstrating z/OS's ability to match or exceed any other operating system.

UNIX Application Enablement and Standards

Cross-Platform and Cloud Interoperability / Communication

Cross-Platform and Cloud Interoperability / Filesystems

Programming Language Support

Container Extensions (zCX) Adoption items

Running LE Applications and Programs in 64-bit Memory Space

z/OS V2.5 Release Overview – Intelligent Resiliency

An Infrastructure Architect will gain new and enhanced resiliency capabilities that provide greater application availability and scalability, faster recovery, and expedited triage and resolution of potential problems, enabling his team to easily and efficiently maintain exceptionally resilient environments.

Remote Pair FlashCopy Support for GM

z/OS Anomaly Mitigation

Parallel Sysplex Resiliency

z15 System Recovery Boost Use Cases

z/OS V2.5 Release Overview – CyberThreat Secure Z

A Security Architect can leverage cyber security system hardening and analytics to readily exceed regulatory compliance requirements and to provide a new level of cyber resiliency for the enterprise.

Security Standards, Crypto Support and Security Infrastructure

Definition and Protection of Sensitive Data in Dumps

Logical Corruption Protection & Recovery

Simplified Compliance via System Hardening

Digital Certificate Simplification

Network Encryption Enforcement

Pervasive Encryption Simplification

z/OS V2.5 Release Overview – OS Management Simplification

An early tenure z/OS System Programmer can independently, confidently, and successfully deploy, maintain, and manage z/OS (and stack) software functions using guided and customized instructions and workflows.

Platform Mgmt REST APIs, GUIs, and Simplification Apps

z/OS Cloud Provisioning and Management

zOSMF Software Management: Software Installation Support

Parallel Sysplex and Coupling Management Application Enhancements

z/OS V2.5 Release Overview – z/OS support summary

Release	z9 EC z9 BC WdfM	z10 EC z10 BC WdfM	z196 z114 WdfM	zEC12 zBC12 WdfM	z13 z13s WdfM	z14 ZR1	z15	End of Service	Extended Defect Support
z/OS V2.1	X	X	X	X	X	X		9/18	9/21[2]
z/OS V2.2		X	X	X	X	X	X	9/20	9/23[2]
z/OS V2.3				X	X	X	X	9/22[1]	9/25[2]
z/OS V2.4				X	X	X	X	9/24[1]	9/27[2]
z/OS V2.5[3]					X	X	X	9/26[1]	9/29[2]

Notes:

[1] - All statements regarding IBM's plans, directions, and intent are subject to change or withdrawal without notice.

[2] - Extended support dates are projected and are subject to change or withdrawal without notice.

[3] - z/OS 2.5 is the last release of z/OS that will include IBM JES3

WdfM - Server has been withdrawn from Marketing

Legend

Defect support provided with IBM Software Support Services for z/OS
Generally supported

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Z Hardware Support

IBM z15 Model T01 functions & features

One hardware model, Five Features, 1-4 19” Frame System
z/Architecture Mode ONLY
•L1 Private 128K i & 28K d -L2 Private 2MB i & 2MB d •L3 Shared 256 MB / chip -L4 Shared 956 MB / drawer
Up to 190 processors configurable as CPs, zIIPs, IFLs, ICFs or optional SAPs • Up to 190-way on z/OS V2.1 and later (non-SMT mode)
Up to 40 TB of Redundant Array of Independent Memory (RAIM) – 1TB Memory Increment – 8TB/Drawer - Max • Up to 4 TB per z/OS LPAR with z/OS V2.1 and later
256 GB Fixed HSA
Channel Subsystem scalability • Up to 85 LPARs • Up to six (6) Channel Sub Systems (CSSs) • 4 Subchannel Sets per CSS
HiperDispatch Enhancements
Two-way SMT for zIIPs, IFLs, and SAPs
30+ New instructions: Java, Vector enhancements for Analytics and sort acceleration
Hardware Instrumentation Services (CPUMF)
z/OS V2R4 XL C/C++ ARCH(13) and TUNE(13) exploitation: • New z15 hardware instructions • Aligned Vector Load/Store Hint instructions • Vector Enhancement Facility 2 • Miscellaneous-Instruction-Extension Facility 3

(z/OS support in blue)

IBM Virtual Flash Memory & CF Exploitation of VFM Up to 12 Features – Feature Size=0.5TB
IBM System Recovery Boost – Sysplex Recovery
IBM Integrated Accelerator for Z Sort
IBM Integrated Accelerator for z Enterprise Data Compression (on-Chip Compression)
Coupling Facility Level 24 •Coupling Facility Fair Latch Manager 2 •Message Path SYID Resiliency Enhancement •DYNDISP Default THIN •Coupling Facility Monopolization Avoidance
• Coupling CHPIDs increased to 384 from 256 per CEC • ICA SR increased to 96; ICP increased to 64
Integrated Coupling Adapter (ICA-SR) links NB + CF
Coupling Express (CX3) LR, NB + CE LR CF
Next Gen RoCE 25/10 GbE RoCE-Express2.1 (CX4)
FICON Express16SA
OSA Express7S (1,10,25 GbE) • Greater than 16 Adapters support
zHyperLink® Express1.1 (FC 0451) / CF • Maximum 16 Adapters
Crypto Express7S (FC 0899 - 1 HSM, FC 0898 - 2 HSM) • Max 60, Combination of (CEX7S. CEX6S,CEX5S) • Up to 16 (CEX6S and CEX5S) can be Carried Forward but rest must be CEX7 • Support for new CCA 7.1 functions • New ECC Edward Curves support

Z Hardware Support

IBM z15 Model T02 functions & features (CD 2Q20)

One hardware model T02 19-inch frame
zArchitecture Mode ONLY
Up to 65 processors configurable as CPs, zIIPs, IFLs, ICFs or optional SAPs
•L1 Private 128K i & 28K d -L2 Private 2MB i & 2MB d •L3 Shared 256 MB / chip -L4 Shared 956 MB / drawer
Up to 16 TB of Redundant Array of Independent Memory (RAIM) • Up to 4 TB per z/OS LPAR with z/OS V2.1 and later
160 GB Fixed HSA
Channel Subsystem • Up to 40 LPARs • Up to three (3) Logical Channel Sub Systems (LCSSs) • 3 Subchannel Sets per LCSS
HiperDispatch Enhancements
Two-way simultaneous multithreading (SMT) • Support for SAPs
30+ New instructions: Java, Vector enhancements for Analytics and sort acceleration
XL C/C++ ARCH(13) and TUNE(13) exploitation: • New z15 hardware instructions • Aligned Vector Load/Store Hint instructions • Vector Enhancement Facility 2 • Miscellaneous-Instruction-Extension Facility 3
Hardware Instrumentation Services (CPUMF)

(z/OS support in blue)

IBM Virtual Flash Memory & CF Exploitation of VFM Up to 4 Features – Feature Size=0.5TB
IBM System Recovery Boost
IBM Integrated Accelerator for Z Sort
IBM Integrated Accelerator for z Enterprise Data Compression (on-Chip Compression)
CF Level 24 •CF Fair Latch Manager 2 •Message Path SYID Resiliency Enhancement •DYNDISP Default THIN •CF Monopolization Avoidance
• Coupling CHPIDs increased to 384 from 256 per CEC • ICA SR increased to 48; CE-LR to 64; ICP increased to 64
Integrated Coupling Adapter (ICA-SR) links NB + CF
Coupling Express (CX3) LR, NB + CE LR CF
Next Gen RoCE 25/10 GbE RoCE-Express2.1 (CX4)
FICON Express16S+ (Fiber Channel Endpoint Security not supported)
OSA Express6S GbE, 10GbE, 1000Base-T OSA Express7S 25 GbE SR1.1
IBM zHyperLink® Express1.1 2 Port Adapter FC0451 / CF
Crypto Express7S (FC 0899 - 1 HSM, FC 0898 - 2 HSM) • Max 40 Combination of (CEX7S. CEX6S,CEX5S) • CEX6S and CEX5S can be Carried Forward (CF) • Support for CCA 7.1 • New ECC Edward Curves support

Z Hardware Support

IBM z15 highlights

- Improved compression performance (up to 17x throughput improvement*)
- Up to 20% More coupling links and up to 50% more CHPIDs for the T01 model and 2-3x more coupling links and up to 50% more CHPIDs for the T02 model (CD 2Q20)
- CFCC improvements
  - Thin interrupt as the default for shared-engine CFs
  - Improved fairness in CF dispatching and better CF efficiency/scalability
  - Improved message path resiliency (CD)
  - CF monopolization avoidance exploitation for resiliency (CD)
- z/OS SLIP to monitor an address or range for a key change and take diagnostic action
- Sort accelerator – updates to DFSORT (CD 3Q20)
  - New **SORTL** instruction, which is standard on the z15.
  - Designed to cut the CPU costs and improve the elapsed time for eligible sort workloads
  - DFSORT and DB2 for z/OS utilities Suite exploit the SORTL instruction
  - DFSORT is available on z/OS V2.3 with PTF UI90067 and V2.4 with PTF UI90068

z15 DFSORT with the Integrated Accelerator for Z Sort vs z14 DFSORT

- *Exploiting Z Sort for DFSORT in-memory sort jobs can reduce elapsed time by up to 30% and CPU time by up to 40% for large format data sets with record lengths up to 500 bytes.**

*** All performance information was determined in a controlled environment. Actual results may vary.**
Performance information is provided "AS IS" and no warranties or guarantees are expressed or implied by IBM.

Z Hardware Support

DFSORT:
Useful Links

DFSORT - Useful References

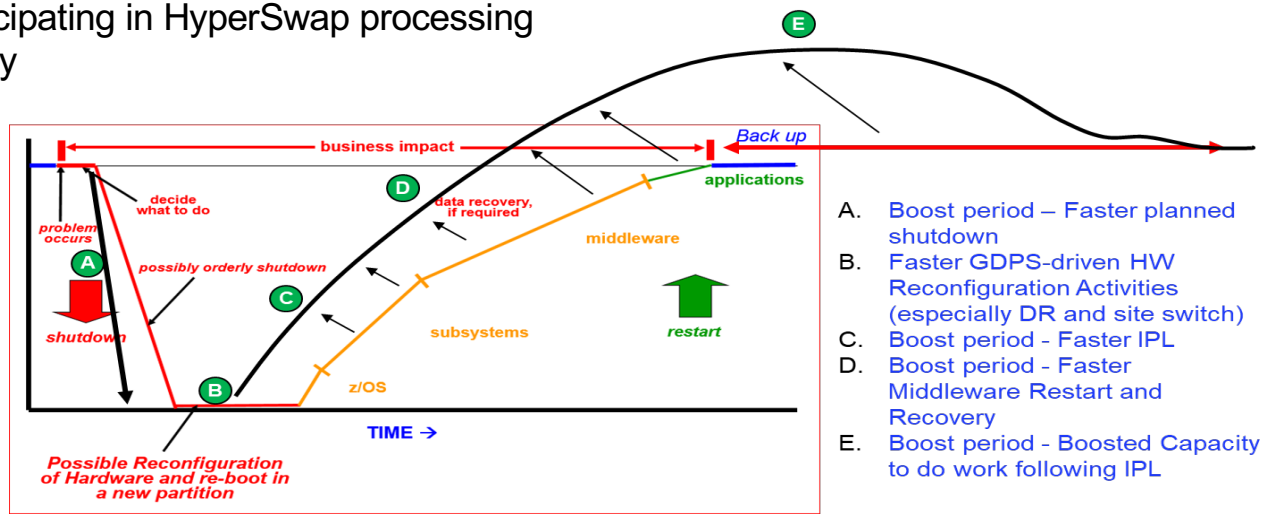
- SHARE: “Accelerate Your Sorts with DFSORT Exploitation of the Integrated Accelerator for Z Sort” with Jeff Suarez, March SHARE Virtual Summit Session 28570
- ”DFSORT User Guide IBM Integrated Accelerator for Z Sort (PH03207)” https://www.ibm.com/support/pages/sites/default/files/inline-files/DFSORT%20User%20Guide%20for%20PH03207.pdf
- IBM zBNA Website, https://www.ibm.com/support/pages/ibm-z-batch-network-analyzer-zbna-tool-0
- PH28183, REORG DFSORT Improvement, https://www.ibm.com/support/pages/apar/PH28183
- SHARE: “Peeking Under the Hood of Sort Acceleration on z15” by Joe Gentile and Anna Shugol, https://www.share.org/blog/peeking-under-the-hood-of-sort-acceleration-on-z15
- Design of the IBM z15 microprocessor, https://ieeexplore.ieee.org/document/9138680
- Enhanced-Sort Facility for Z Architecture, https://www.ibm.com/support/pages/node/6339945

Z Hardware Support

System Recovery Boost support

- IPL and Shutdown boost
  - Speed boost – run the general purpose processors at full speed if they are running sub-capacity normally
  - zIIP boost – allow general purpose work to run on the available zIIPs for increased capacity
  - Up to 60 minutes of boost at IPL and up to 30 minutes of boost at shutdown
- Sysplex Recovery (CD 3Q20) – support for recovery process boosts
  - Sysplex partitioning – boost surviving systems for recovery
  - CF structure recovery – boost systems participating in structure recovery
  - CF data sharing member recovery – boost all systems recovering
  - Hyper Swap – boost systems participating in HyperSwap processing
  - Up to 30 minutes per LPAR per Day

Planned to have no increase in IBM software licensing costs!



A. Boost period – Faster planned shutdown
B. Faster GDPS-driven HW Reconfiguration Activities (especially DR and site switch)
C. Boost period - Faster IPL
D. Boost period - Faster Middleware Restart and Recovery
E. Boost period - Boosted Capacity to do work following IPL

Z Hardware Support

No more ICSF Web Deliverables

ICSF is changing how Cryptographic HW support is delivered (CD)

- No more web deliverables. ICSF will ship new HW support via APARs with SMP/E FIXCAT tags.
- New ICSF FMIDs will be delivered with new z/OS releases only. Older FMIDs will remain in service as appropriate.
- HW exploitation on older z/OS releases will be via updates to HCR77D1 only.

ICSF updates planned for z/OS V2.5

- Key data set updates to support larger keys, such as lattice based keys asymmetric keys.
- Improved capability to demonstrate compliance with key rotation policies related to CEX master key changes
- New protections for elliptic-curve cryptography (ECC) keys – the “private key name” in the token can now be SAF checked.
- The ability to restrict the use of archived keys to “decrypt” operations only, allowing re-encrypt of old ciphertext but not creating new
- Additional HW exploitation for certain SSL/TLS ciphers

With APAR OA58880, available on z/OS V2.4 (CD 2Q20)

- Digital signature support for Edwards curves, Ed448 and Ed25519, and lattice based keys
- CPACF protected key support for a subset of ECC keys
- TR-31 key block support for HMAC keys.
- CVN-18 support for EMV (Europay MasterCard, and Visa) services

With APAR OA60317, available on z/OS V2.4 (CD 4Q20)

- Clear key capability added to Hash-based Message Authentication Code (HMAC) related callable services with CPACF exploitation.

With APAR OA59593 (z15) and OA60355 (z14), available on z/OS V2.4

- Additional ISO-4 format PIN bock integration, and the addition of AES DUKPT capability
- New Format Preserving Encryption (FPE) services exploiting FF1, FF2, and FF2.1 algorithms

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z/OS V2.5 Release Overview

Usability and Skills
z/OSMF Desktop filter and type ahead, Workflow management and logging, simpler configuration, performance improvements, SCA for external apps, Diag Assist, Sysplex Mgmt and Policy Editor, Console UI enhancements, zMSC…

Application Development
z/OS Container Extensions, Web Enablement toolkit, OAM with DB2, ISPF, ABO, Java, Node.js, Python, Go…

Scalability & Performance
VTOC I/O, zHyperLink write Stats, WLM batch improv., IWQ for zCX, TCT, RMF…

Enhancing Security
PassTicket Improv, spool encrypt, Certificate simplification, FIPS, Data Privacy for Diagnostics, TCT full volume dump, zACS…

Availability
ARM, Anomaly Mitigation, Catalog improvements, logical corruption protection, system recovery boost, CF monopolization avoidance…

Systems Management
z/OSMF install of products/fixes, DFSMShsm UNIX indiv file backup and to new directory, Multiple NFS servers on a system, JES2 MAS-wide policy support, CP&M time limits, zWIC, SDSF SRB displays, DFSMSrmm z/OSMF plug-in...

Networking
SMC-Dv2, TLS V1.3, zERT, Sysplex Network Health, stack services…

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Usability & Skills

Simplification

- Bring a browser based ecosystem to z/OS Management
  - Consistent with other platform User interfaces
  - Modern compared to ISPF 3270
  - Client platform agnostic – OS, devices etc.
  - Exploit graphics and other techniques where appropriate
- Develop Applications focused on z/OS unique needs
  - Task Oriented
  - Reduced effort
- Integrate and expand the z/OS ecosystem
  - Provide REST API's for public consumption
    - Securely and efficiently
- Reduce Reliance on Assembler Skills
  - Provide solutions that don't require code where possible
  - Support higher level language extensions of z/OS

z/OSMF

Desktop style user interface

- Built-in support for data set filter and display, browse, edit etc.
- Built-in support for Unix file filter and display, browse, edit etc.
- Built-in support for JOB filter and display, browse, cancel, purge, etc

Workflow Support – guided actions

- A series of steps to accomplish a task and a tool to track each steps status
- Can involve one person or many
- Workflow authors decide on style and technical approach
- Can be: Manual instructions, Semi-automated instructions, Fully automated actions
- Consist of Jobs, Shell scripts, REXX execs, REST calls, file updates etc.
- Optionally retains a log of what has been done
- Useful for Installation, Service, Upgrade, or any configuration actions

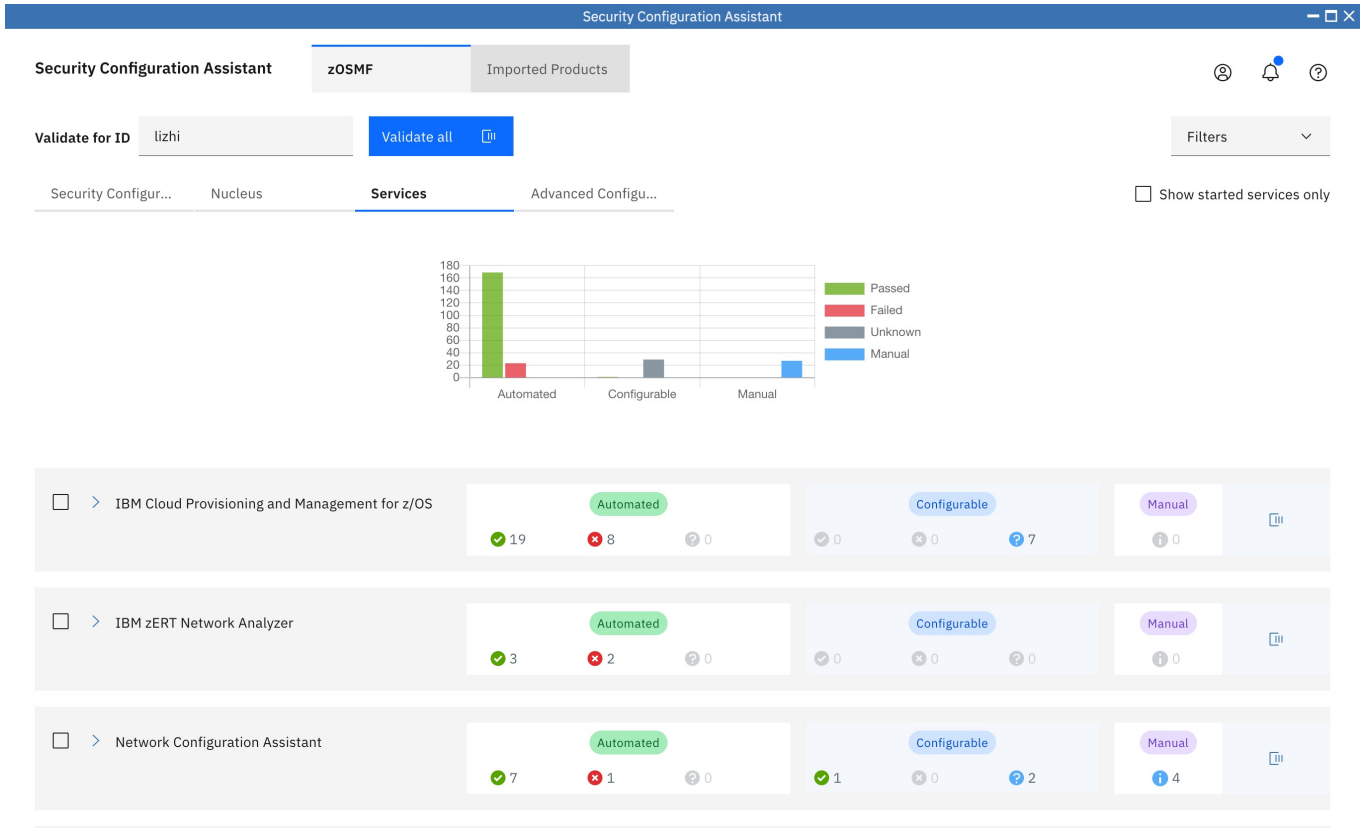
Task focused activities

- Sysplex configuration, Workload Manager Policy setup, Network Configuration, Security Configuration validation, Sending doc into IBM, Performance and status monitoring, etc.

Usability & Skills

z/OSMF Improved Configuration (CD 4Q19)

- **Security Configuration Assistant**
  - A new z/OSMF application to help in configuring security, is enhanced to support validation by user group with the PTF for APAR PH17871. (CD 1Q20)
- Support for external applications
- Support for variable substitution



Usability & Skills

Simplification via Removal of Obsolete Function

- Removal of native TLS/SSL from TN3270 Telnet server, FTP server, DCAS – replaced by AT-TLS policy
- Removal of Comm Server HFS support – use zFS
- Removal of Comm Server support for Data Power load balancing – no longer offered
- Removal of LFS support for HFS – use zFS
- Removal of ISPF support for HFS and the ISPF Workstation Agent
- Remove MAXSHAREPAGES as a limit – no longer consumes common storage

Statement of Direction: Removal of native TLS/SSL support from TN3270E Telnet server, FTP server, and DCAS
(Issued July 23, 2019)

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Scalability & Performance

- Goal is release to release equivalence
  - Ensure smooth release to release migration
  - Performance focus on selected areas
- Exploit hardware features
  - Synergistic improvements with new hardware including:
    - Hardware instructions and memory topology
    - Accelerators
    - I/O technology exploitation
  - Expand the software that can exploit features
- Constraint relief
  - Identify and remediate constraints before client impact
  - Long term - continue AMODE 64 and RMODE 64 roadmap items
- System scalability and performance metrics
  - Metrics for resource consumption
  - Capacity planning tools

Scalability & Performance

WLM Batch Initiator Enhancements

- Historically Workload Manager has managed initiators based on the available capacity of general-purpose processors. New support is planned to start and stop batch initiators **also taking into account available zIIP capacity.**
- Separation of heavy zIIP using batch jobs by service class will allow WLM to start initiators for zIIP using jobs on systems in a sysplex that have available zIIP capacity

Scalability & Performance

More Concurrently ”Open” Datasets

- More VSAM linear data sets (LDS) are planned to be able to be concurrently ”opened” in address spaces such as DB2
    - Each data set is represented by several internal z/OS data areas which reside in below the bar storage.
    - This support moves both VSAM and allocation data areas above the bar to reduce the storage usage in the below the bar storage area
- The support is optional
- DB2 Apar PH09189 is required to enable this support
- IBM also recommends Db2 Apar PH33238 get the most value out of this support

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Availability

- Provide industry-leading availability
  - For mission-critical application workload through synergy between resilient hardware, operating system, middleware, and storage technologies
- Exploit Parallel Sysplex and the coupling technology to mitigate impacts from planned or unplanned outages
  - Extend Data Sharing exploitation and efficiency
  - Provide workload balancing and routing optimizations and efficiencies
  - Enhance sysplex recovery mechanisms for improved performance and recovery time (e.g. CF structure duplexing)
  - Provide near-continuous access to data stored in Filesystems (e.g. zFS, NFS)
- Detect and Mitigate system resource problems
  - Monitor resource consumption and system/sysplex operations in real-time
  - Provide operational insight into anomalies and trends that require attention
  - To mitigate problems quickly, proactively, and autonomically
- Support dynamic modification of shared resources without incurring disruptions in which the resources are temporarily unavailable (“always on”)
- Support state-of-the-art disk replication technologies
  - Data availability (Hyperswap) – locally and at distance
  - Disaster recovery for 2-site, 3-site, and 4-site DR configurations
- Provide support for protecting data against malicious or accidental logical data corruption or deletion, through the use of multiple point-in-time protected copies of the data that can be used to restore or recover the data to its pre-corruption state, either granularly or in aggregate
- Extend Geographically Dispersed Parallel Sysplex (GDPS) environments
  - Multi-site “stretched” Parallel Sysplex across metro distances and improved isolation/availability of the GDPS k-system
  - Continuous Availability (Active/Active Sites) solution through improved software replication technologies, and innovative solutions to improve the achievement of RPO and RTO objectives to near zero

Availability

z/OS Anomaly mitigation client pain points

- WLM-based triggering based on changes in velocity metrics (and other anomalies)
- Specific **RTD** enhancements
  - Allow address spaces time to warm up before SERVERHEALTH event – avoid anomalies detected during component startup
  - Remove HIGHCPU event (CPU usage data) in favor of other instrumentation such as RTM Loop Detection
  - Add parameterization to allow RTD to analyze subsets of symptoms – messages only, for example – and to have RTD process address spaces without re-analyzing the system for all other events
- Invoke and consume the output of **Predictive Failure Analysis (PFA) and Runtime Diagnostics (RTD),** along with other diagnostic inputs, to create…
- Report-style output from analysis in these components, containing diagnostic summary *and recommended actions* – with sorting/grouping by component
  - Graphical-style output for visualization of trend lines, growth over time, etc.
  - JSON description of report contents, consumable by z/OSMF, automation, or ISV/other products
- Improve client triage of anomaly observations and predictions with IBM System Automation mechanism to capture report details, including recommended actions, in problem report

Availability

SHARE Req. 116668
Did you also wait for this?

z/OS Catalog Enhancements

- Catalog address space is planned to be re-startable and to support dynamically changing the Master Catalog. (Previously this required a re-IPL)
- Catalog Modify command plans to support comments following the command parameters
- Catalog entries can be validated for the rename in progress indicators using IDCAMS DIAGNOSE function

Access Method Services - IDCAMS

- **DELETE MASK has two new options TEST and EXCLUDE**
  - TEST will return all the objects that would have been deleted if TEST wasn't specified
  - EXCLUDE will allow a subset of objects that match the MASK to be excluded from those being deleted
- DEFINE MODEL is enhanced to also model the KEYLABEL parameter to support encryption attributes
- REPRO is enhanced to move its I/O buffers above the line to reduce the instances of out of space (878) abends

SHARE Req. 77155
Did you also wait for this?

Table of Contents

Systems Management

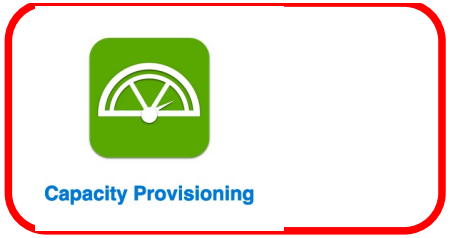
- Provides system programmer efficiency, confidence, and consistency
  - Consistent z/OS installation platform for IBM & Vendors
    - Packaging, delivery, installation, deployment, configuration, and validation
  - Simplified installation of SMP/E service
  - Improved security integration
    - Detection, validation and correction
  - Focus on common tasks
    - Deliver standard service catalog
    - Capturing site unique activities
    - Can be integrated with change management
    - Optionally self service provisioning (Cloud)
  - Enhanced z/OS release upgrade process
    - More discovery and more automated actions
- Basic facilities to 'get the job done'
  - Entitled with the operating system
- Enhanced facilities available
  - Features or products (IBM or Vendor)

Systems Management

JES2 enhancements

- Spool compression and encryption via Apar OA57466 (CD 2Q20)
- Replace exits with policies
  - JES2 will provide support for conditions and actions
  - Built-in policies that allow actions based on conditions
  - Condition: job name is ABC, action: set job class to Q
- MAS wide Policy support updated and is also available on V2.4 with the PTF for OA58190 (CD 3Q20)

Systems Management



z/OS Cloud Provisioning and Management

- Entitled part of z/OS that delivers a self service Cloud aligned Provisioning tool for Software including IBM Middleware
- Support for Red Hat OpenShift (CD 2Q20)
  - Via the IBM z/OS Cloud Broker (Announcement)
- Provision a single item or a composite within a system or Sysplex, or even across Sysplexes also available with PTF for Apar PH16513 (CD 1Q20)
- Define a time limit for a provisioned instance also available with PTF for Apar PH29813
- z/OS Cloud provisioning security and security simplification
  - Support for policy using Users and/or Groups also available with PTF for Apar PH16513 (CD 1Q20)
  - Simplified security using a domain shared resource pool Apar PH29813 (CD 1Q21)
- Metering and capping for memory and Disk in addition to CPU also available with PTF for Apar PH16513 (CD 1Q20)
  - Providers can monitor memory consumed by any instance or tenant
  - Providers can isolate Disk and apply Disk limits (caps) for a tenant
  - Providers can enforce memory maximums (caps) for a tenant
- The Workflow Editor task enhancements (CD 1Q20)
  - The Workflow Editor includes a "toolbox" of IBM-supplied steps
  - The files for a workflow, also support sequential or partitioned data
  - The editor retains long pathnames, has a large editor area, and also edits property files
- For additional details about these enhancements, see the What's new in IBM Cloud Provisioning & Management for z/OS blog.

Systems Management

zWIC – Workload Interaction Correlator (CD 1Q20)

- A priced feature of z/OS that implements a facility to report on high frequency events and can be used to improve diagnosis on z/OS
- Addresses the problem of capturing data on a production system running under load by providing an efficient way to capture and report on various diagnostic items
- **IBM priced product IBM z/OS Workload Interaction Navigator (zWIN) (CD 1Q20)** can be used to visualize the data
- This support is also available with PTFS for Apars OA57165 and OA60372

Systems Management

New Product Structure

RMF refactoring

- Resource Monitoring Facility is refactored into two components
  - RMF reporter with all the existing capability
  - Advanced Data Gatherer – ADG
- Provides a clean separation between the collection of data and the reporting of the data
- **All RMF customers are automatically entitled to ADG and will require no action to continue on z/OS 2.5**
- ADG is planned to be a new priced feature on z/OS that surfaces performance data in raw form

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Networking

- Exploit platform features and enable efficient network access
  - Support latest OSA and RoCE hardware adapters, HiperSockets, and provide for efficient network communications, including external network and intra-CPC communications
- Provide support for network security standards and enable network security monitoring and compliance
  - Support pervasive encryption by protecting data-in-flight with evolving security standards such as TLSv1.3
  - Assist in determining security compliance posture through the use of z/OS Encryption Readiness Technology (zERT) and the zERT Network Analyzer (zNA)
- Simplify network configuration through the IBM Network Configuration Assistant (NCA)
  - Simplify networking configuration, including the configuration of TCP/IP stacks as well as policy-based networking functions
- Application development and workload enablement
  - Enable efficient network access to Linux applications deployed in z/OS Container Extensions (zCX)
- Enhance availability and resilience
  - Enhance application availability in parallel sysplex environments through improved sysplex autonomics

Networking

Important part of „Pervasive Encryption

z/OS Encryption Readiness Technology (zERT)

- zERT aggregation recording interval
  - The recording interval for zERT can be customized up to one call in 24 hours. This reduces the records produced and improves the performance of the zERT Analyzer. This support is also available for z/OS 2.3 and up with PTF's for Apars PH25049 and PH24543. (CD)
- zERT Network Analyzer, a z/OSMF plug-in, that provides an easy to use web UI for analyzing zERT data reported in SMF 119 subtype 12 records
  - Significantly improves Time-To-Value of gaining insights into zERT data and driving a Pervasive Encryption strategy for all z/OS network communications
  - Enhances flexibility in the zERT Network Analyzer Db2 for z/OS database schema definitions and reduces the access privileges required by the zERT Network Analyzer's database user ID through the use of Db2 partitioned tables. Available for z/OS V2.3 and z/OS V2.4 with Apar PH24492 and Apar PH24494, respectively.(CD)

- SOD: IBM Plans to Enhance zERT to not only report but to optionally enforce cryptographic policy on TCP connections.

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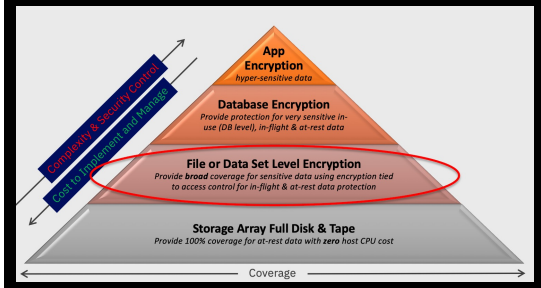
Security

- Pervasive Encryption
  - Additional support for more data (in flight and at rest)
  - Simplified ability to achieve security compliance
- System hardening
  - Detection of elevating privilege
  - Multi-Factor Authentication advancements
  - Provide password alternatives for APIs
  - Identification of common configuration concerns
- Standards
  - Continue strong encryption support for the platform
    - Evolve ahead of industry standards

z/OS data set encryption – supported data set types



2017

VSAM and Sequential extended format data sets

Availability:
V2R2 (OA50569)
V2R3 base

2019

PDSEs

Availability:
V2R2/V2R3 (OA56324)
V2R4 base

2020

Sequential basic and large format data sets

Availability:
V2R3/V2R4 (OA56622)

Security

Pervasive Encryption is a journey

Pervasive encryption / z/OS Data Set Encryption

- z/OS V2.5 plans to continue to drive pervasive encryption efforts within an enterprise:
  - z/OS policy-based encryption options that can help clients protect their critical business data have been enhanced to support additional z/OS data set types, including:
    - Basic and large format SMS data sets provided on z/OS 2.3 and later with PTF's for APAR OA56622 (CD 3Q20)
    - JES2 spool encryption (CD 2Q20)
    - Support for the EXCP API for encryption of data sets accessed via EXCP (CD)
  - These enhancements allow users the ability to encrypt data, in most cases, without application changes and simplify the task of compliance.

1. *BEST PRACTICE: extended format data sets*
2. *Access Using EXCP: Application changes are required*
3. *EKMF Web 2.0 – product for key management*

Security

RACF Enhanced PassTicket Support

- z/OS V2.5 plans to add additional RACF PassTicket support. This includes:
  - Stronger cryptographic algorithm
  - Configurable expiration time
  - Optionally Expanded character set
  - Improved diagnostics
  - Recording to SMF
  - Co-existence and Migration
- Available on z/OS 2.3 and up with PTF's for Apar OA59196 and OA59197 (CD 1Q21)

Security

RACF New Health Checks

- New Health checks are provided to:
  - Verify all datasets are protected by RACF by verifying that SETROPTS PROTECTALL(FAILURES) option
  - Ensure all residual information is erased when data sets are deleted by verifying that SETROPTS ERASE(ALL) is enabled
  - Verify that all Passticket keys are encrypted and stored in ICSF
  - Verify that the RACF Address space is active
  - Verify that either RACF Sysplex communication or datasharing mode is active

Security

Data Privacy for diagnostics (CD 4Q20)

- Support redacting sensitive user data in dumps
- Mark sensitive memory areas and remove from a dump before sending to IBM or a vendor
- New options on z/OS API's to tag known sensitive memory areas
- New optional post-processing step will remove previously tagged sensitive pages, and new z/OS Diagnostics Analyzer will detect and redact additional sensitive data in untagged pages
- All intended to be done without impacting the dump capture time.
- Required and available maintenance for Data Privacy for Diagnostics:
  - Fix Category IBM.Function.DataPrivacyForDiagnostics

z15 required
Function available on z/OS 2.3 and above

Security

z/OS Authorized Code Scanner (CD 2Q20) (feature)

- The IBM z/OS Authorized Code Scanner is an optional priced feature of z/OS that provides automated system integrity testing **in a dev/test environment** as part of DevSecOps modernization. It scans for Program Calls (PCs) and Supervisor Calls (SVCs) available to all address spaces on a z/OS image and generates a series of tests that dynamically scan them for integrity.
- The output of this scan provides in-depth diagnostics whenever a potential vulnerability is found to facilitate remediation in order to further strengthen the security posture of the client's configuration of z/OS.
- It is also available on z/OS 2.4 with PTF's for Apar OA59702 and OA60166

- **New Feature Announce** (Announce)

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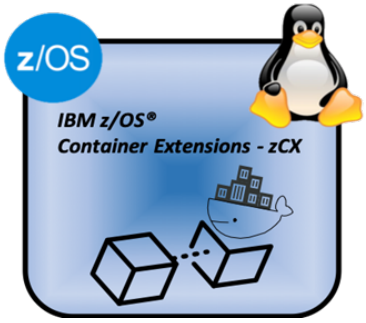
Application Development

z/OS Container Extensions – Run Linux workloads on z/OS!

- z/OS Container Extensions provides a virtual appliance for running Linux on Z workloads on z/OS
- The same binary container images that run on Linux on Z under VM or KVM will run in zCX
- The open mainframe project Ambitus provides an ecosystem for zCX



Popular new feature with z/OS V 2.4

z/OS Container Extensions Performance Enhancements (CD)

- Improved performance and reduced locking
  - zIIP eligibility improved - 95%+ ziip offload in lab measurements*
  - Also available on z/OS 2.4 via PTF for Apar OA58296
- Support for SIMD – single instruction multiple data
  - Also available on z/OS 2.4 with PTF for APAR OA59111
- Support for 1MB and 2GB Large pages, containers per server raised up to 1000, and maximum guest memory raised to 1 TB
  - Also available on z/OS 2.4 with the PTF for APAR OA59865
- The number of data and swap disks per appliance is increased to as many as 245.
  - This enables zCX to address more data at one time
  - Also available on z/OS 2.4 with the PTF for APAR OA60452

IBM Z Container Image Registry

Early Access Program

A registry for open source container images*

- Building blocks for creating workloads
- IBM Z versions of popular images
- Foundational distros, languages, databases, web serving, CI/CD infrastructure

Hosted at the IBM Container Registry

- Images are built from scratch by IBM
- IBM controls the contents of the channel
- Images are scanned by IBM Vulnerability Manager
  - Reports available to review
- Image digest hashes published to enable secure pull
- Deploys in IBM z/OS zCX and Linux on Z/LinuxONE

Security, Trust the source

Accommodate common Z security requirements by working with a source you can trust to deliver container images built using best practices

(and many more)

Contact Joe Bostian (jbostian@us.ibm.com) for an invitation

* This program has important terms and conditions for use of the images of this registry. Please see the program agreement for a full details of these terms.

z/OS V2.5 – Hybrid Cloud

z/OS has the capabilities that any operating system would require to be a server in a hybrid cloud model.

- A Robust networking component with the ability to manage networks efficiently and securely
- A highly secure environment which supports multi-factor authentication, granular security access checks and tamper proof auditing
- Industry leading cryptographic technology including even quantum safe algorithms
- Access to Cloud Object stores
- Ability to rapidly and repeatedly provision software
- Ability to run Linux workloads on z/OS
- A highly available environment which allows you to build high availability sites where an application has access to multiple system instances, running on multiple physical machines, sharing a consistent set of application data, with replicated physical data that can be recovered at long physical distances.

Agenda:

Hot Topics

z/OS V 2.5 Preview - Selected Release Topics

Statements of Direction and Preparation for z/OS V 2.5 ?

Three things to remember

IBM’s Statements of Direction

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

Note: *The statements of direction in this presentation have been edited for brevity.*

IBM's Statement of Direction

Encrypted VSAM data set support in RACF

- "IBM intends to enhance pervasive encryption through RACF support for the use of an encrypted VSAM data set as its data base in specific configurations."

IBM's Statement of Direction

Encrypted VSAM data set support in RACF

- "**IBM intends to** enhance pervasive encryption through RACF support for the use of an encrypted VSAM data set as its data base in specific configurations."

- **IBM intends to…**
  - Support for an encrypted VSAM RACF data base will not be in the base release of z/OS V2R5. Support may be delivered in a future release or as continuous delivery on V2R5.

IBM's Statement of Direction

Encrypted VSAM data set support in RACF

- "IBM intends to enhance pervasive encryption through RACF support for the use of an encrypted **VSAM data set** as its data base in specific configurations."

VSAM Data Set:

- Currently, RACF serves as its own access method. Leveraging the existing access methods for pervasive encryption means moving to an access method which supports encryption.
- RACF will add the option to use a VSAM linear data set as it's database:
  - Consistency with existing RACF database access mechanisms
  - Consistency with existing RACF serialization mechanisms
  - Ability to utilize existing VSAM diagnostics
  - Ability to rely more on standard z/OS skills
  - Ability to leverage additional I/O infrastructure improvements in the future.

IBM's Statement of Direction

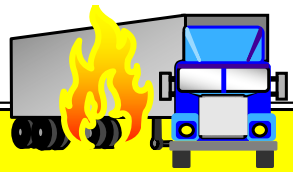
Encrypted VSAM data set support in RACF

- "IBM intends to enhance pervasive encryption through RACF support for the use of an encrypted **VSAM data set** as its data base in specific configurations."

V2R5 Support:

- In V2R5 RACF will support a non-encrypted VSAM data set used as the RACF database.

"Big Migs“ at V2.5 and Beyond*



Upgrade actions at V2.5 you should not overlook:

1. z/OSMF ServerPac driving system requirement.
2. Use only SAF-based security to protect SDSF functions
3. HFS removal
4. Move to JES2 checkpoint level z22

Future upgrade actions to do now:

A. IBM JES3 removal planning for 2023 release.

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

Agenda:

Hot Topics

z/OS V 2.5 Preview - Selected Release Topics

Statements of Direction and Preparation for z/OS V 2.5 ?

Three things to remember

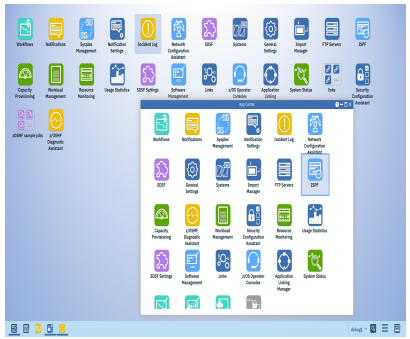
Three things to remember

- Right now z/OS V 2.5 it is “only” **a Preview** Announcement – More details will follow, but you can already **prepare now**, eg. migrate ISFPARMS to SAF-based security

- **z/OSMF** is the foundation for a lot of new topics (Security Configuration Assistant, Installation Workflows e.g. for z/OS Container Extension, Software Management, z/OS Cloud Provisioning and Management, Zowe, Driving System Requirement for Server Pac)

- **Keep current** with your z/OS Release and Hardware, for exploitation of new topics like System Recovery Boost, Data Privacy for Diagnostics, zOS Authorized Code Scanner, z/OS Container Extensions, Pervasive Encryption, further Security Capabilities ...

PREVIEW / PREPARE




IBM