



IBM z/OS Version 2 Release 2 enhancements and statements of direction

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At a glance

The IBM[®] z/OS[®] V2.2 operating system and the IBM z13[™] server work together to deliver innovations designed to help you build the next-generation infrastructure you need. Together, they offer the capacity, scale, availability, and throughput required to help improve business performance, meet response time objectives, protect sensitive data and transactions, and deliver an exceptional customer experience.

This z/OS V2.2 announcement describes new capabilities designed to support:

- Asynchronous CF duplexing for lock structures
- z/OS platform software installation improvements
- IBM Cloud Provisioning and Management for z/OS
- ICSF enhancements for Crypto Express5S updates
- z/OS Client Web Enablement Toolkit adds REXX support
- Real-time SMF Analytics infrastructure support

Overview

Asynchronous CF duplexing for lock structures

Asynchronous CF duplexing for lock structures is designed to be a continuously available solution that makes duplexing coupling facility (CF) lock structures practical, even at extended distances. It provides substantial performance advantages for duplexing lock structures.

Asynchronous CF duplexing is designed to improve the performance of the duplexing of lock structures by reducing the z/OS coupling facility and coupling link overhead costs associated with the synchronous duplexing of lock structures while maintaining the robust failure recovery capability inherent in the redundancy of duplexing.

With asynchronous CF duplexing, secondary CF lock structure updates are performed asynchronously with respect to primary updates in order to drive out cross-CF latencies that exist today. This is intended to avoid the need for synchronous communication delays during the processing of every duplexed update operation.

Asynchronous CF Duplexing will be available on IBM z13, IBM z13s, and higher z Systems[™] generations on October 28, 2016. It requires CFCC Level 21 with service level 02.16, z/OS V2.2 SPE with PTFs for APAR OA47796 and OA49148, CF to CF connectivity via coupling links, and exploitation. Asynchronous CF duplexing for lock structures is designed to be a general-purpose interface for any transactional CF lock structure exploiters. DB2[®] V12 is the first exploiter.

Refer to the [Driver 27 Customer Exception Letter](#) for MCL bundle, PSP bucket, and the latest service levels for any CFCC firmware updates.

Note: Any distance latencies associated with the round trip to or from the primary lock structure are not avoided by this support. That is unavoidable distance latency. This support is designed to avoid the additional distance latencies associated with the duplexing protocol itself.

Software requirements

Asynchronous CF Duplexing for Lock Structures requires at a minimum:

- z/OS V2.2 with PTFs for APARs OA47796 and OA49148
- z/VM[®] V6.4, V6.3, or V6.2, each with PTFs for z/OS exploitation of the guest coupling environment
- Exploitation
 - DB2 V12 with PTFs for APAR PI66689
 - IRLM 2.3 with PTFs for APAR PI68378

z/OS platform software installation improvements

IBM and other leading industry software vendors have been collaborating on a variety of installation-related improvements. IBM intends to help drive z/OS platform-wide improvements in installation and deployment, along with functions that are intended to enable software vendors to use them. Many of the functions designed to meet these requirements are now available in the z/OS MF component of z/OS V2.2 in PTFs, others are planned for the fourth quarter of 2016 and the first quarter of 2017, and more functions are planned for the future. See the [Statements of Direction](#) section for details.

These improvements include support for:

- Non-SMP/E-packaged products in the z/OS MF Software Management task's deployment function, in addition to the existing support for SMP/E-packaged products. This function is designed to allow you to use Software Management to define software instances with arbitrary content. This is intended to enable you to use the deployment function for any software on the z/OS platform, no matter how it was installed or which service tools are used to maintain it. The new function is available now for z/OS V2.2 with the PTF for APAR PI66832 and planned for z/OSMF V2.1 in the fourth quarter of 2016, with the PTF for APAR PI67819. Software Management's deployment function already supports making local copies of defined software instances, and making remote copies within a network-connected enterprise when z/OSMF is running on the remote system.
- Creating a software instance in a portable format ("exporting" a software instance). A portable software instance is intended to be placed on media or transmitted over the network, and to be processed as input to a deployment operation using z/OS MF's Software Management task. The new function is available now for z/OS V2.2 with the PTF for APAR PI66832 and planned for z/OSMF V2.1 in the fourth quarter of 2016, with the PTF for APAR PI67819.
- An application programming interface (API) for creating a portable software instance and exporting it from a program, including a program running as a batch job. This support is planned to be made available for z/OS V2.2 in the first quarter of 2017 with PTFs.

The sets of functions above are intended to create a browser-based product software packager and installer for z/OS platform software that is built into the operating system, and to form a foundation from which IBM and other software vendors can provide further installation improvements.

In the future, IBM intends to provide a linkage between z/OSMF Software Management's deployment function and z/OSMF workflows so a workflow can be initiated by a deployment operation. See the [Statements of Direction](#) section for details. z/OSMF already supports one workflow calling another workflow. The new

function will be designed to enable workflows to be used to manage installation-related and deployment-related tasks by linking from package-level workflows to product-level and component-level workflows as needed to help you perform these activities for both initial installation (for example, on a test system) and later deployments to additional systems (such as application test, application development, and production systems).

Also, IBM intends to extend the ServerPac offering to provide the capability for it to support products packaged in ways that currently make them unavailable in ServerPac, including products that are not packaged using SMP/E. See the [Statements of Direction](#) section for details. ServerPac will be designed to support packages with SMP/E-packaged products, non-SMP/E-packaged products, and a combination of both. This improvement will be intended to enable you to standardize your installation processes for the IBM products available for the z/OS platform. ServerPac will initially continue to use the existing ISPF-based CustomPac Dialogue for installation.

The planned improvements outlined above are in addition to recent improvements made in z/OS installation, including Product ServerPac, which enables you to order z/OS platform products without requiring z/OS, IBM CICS[®], IBM DB2, or IBM WebSphere[®] to be included in the order, and the SMP/E ZONEMERGE enhancement that became available in March 2016 to allow SMP/E zones with disparate content to be merged in most instances.

IBM Cloud Provisioning and Management for z/OS

IBM Cloud Provisioning and Management for z/OS delivers enhancements to the z/OS platform's cloud capabilities that you can use to begin your transformation from an IT cost centre to a value-generating service provider, delivering world-class services internally over your intranet or over the internet. With these cloud capabilities, you can perform tasks such as these:

- Exploit automated and repeatable processes to rapidly provision z/OS software subsystems and release the resources to a shared pool when z/OS software subsystem instances are deprovisioned.
- Enable direct access of z/OS computing resources by end users through your existing self-service portal or by using IBM's sample portal.
- Create service catalogues with customized z/OS software subsystem services that exploit the multi-tenancy and rapid elasticity of z/OS.
- Track provisioned z/OS software subsystem instances and associated resources through service instance registry.
- Invoke these new functions through a web browser-based user interface or through programmable REST interfaces.

These z/OS cloud capabilities provide added benefits to simplify and improve configuration and deployment of a number of components of the z/OS software landscape, thereby allowing you to improve the agility, efficiency, and economics of your IT infrastructure. It also allows the z/OS Administrator to maintain complete control over the resources and z/OS software subsystem instances.

The z/OS platform, known throughout the industry for its outstanding vertical scalability and speed, coupled with leading-edge security and reliability, provides the foundational capabilities that are ideal for hybrid cloud service delivery. IBM plans to deliver z/OS cloud technology enhancements primarily in z/OS MF on z/OS V2.2 in December of 2016, with select functions available on z/OS V2.1 soon thereafter. See the [Statements of Direction](#) section for details.

Enabling the z/OS platform with these cloud capabilities span innovations not only in certain infrastructure elements and components of the z/OS operating system, but also in selected levels of various z/OS software subsystems such as IBM CICS Transaction Server for z/OS, IBM IMS[™] for z/OS, IBM DB2 for z/OS, IBM MQ for z/OS, and IBM WebSphere Application Server for z/OS.

ICSF enhancements for Crypto Express5S updates

Support for cryptographic updates to Crypto Express5S coprocessors available on z13™ processors are planned to be available October 17, 2016, for z/OS V2.2 and z/OS V2.1 in the Cryptographic Support for z/OS V2R1 --z/OS V2R2 (HCR77C0) web deliverable. These updates are intended to help clients meet standards and provide better cryptographic security.

On October 17, 2016, the updates can be downloaded from the [z/OS downloads](#) website.

ICSF enhancements for the Crypto Express5S updates are intended to include support to exploit new algorithm support and to extend existing support for asymmetric algorithms. This support also requires Firmware/MCL updates to both the TKE and the z13 processor. These are considered co-requisites. See the [Driver-27 Exception Letter](#) for the latest MCL bundle requirements for this announcement.

- The Digital Signature Generate (CSNDDSG), Digital Signature Verify (CSNDDSV), and PKA Key Token Build (CSNDPKB) callable services are planned to add support for RSA-PSS Signatures to provide for higher assurance and stronger signature support.
- The PKA Key Generate (CSNDPKG) and PKA Key Token Build (CSNDPKB) callable services are planned to be expanded to support selectable public exponents in the generation of RSA private/public key pairs.

These additional enhancements to ICSF are intended to provide support for:

- Improved Key Lifecycle and Key Usage auditing to assist with audit compliance and understanding of the state of keys within an environment.
- Auditing of FIPS compliance.
- New Options Data Set Refresh function through the SETICSF command or the ICSF Multi-Purpose service (CSFMPS) to help remove the need for restarting ICSF and prevent outages.
- Enhancing the PKCS #11 Secret Key Encrypt (CSFPSKE) and PKCS #11 Secret Key Decrypt (CSFPSKD) callable services to support clear key AES ciphertext stealing, specifically CS1.
- New ICSF Health Check, ICSF_UNSUPPORTED_CCA_KEYS, which displays a list of records in the active CKDS and PKDS that are no longer supported. It is also planned to implement a new option in the Key Data Set List (CSFKDSL) callable service to generate a list of records in the active key data sets of keys that are no longer supported. A program could be written using a combination of the Key Data Set List, CKDS Key Record Delete (CSNBKRD), or PKDS Key Record Delete (CSNDKRD) callable services to delete the records.
- No longer requiring the CKDSN and PKDSN keywords to be supplied in the Installation Options Data Set enables easier setup and configuration for those clients not wanting to exploit secure key operations or manage CCA symmetric or asymmetric key tokens
- Enhancements to the Digital Signature Generate (CSNDDSG) and Digital Signature Verify (CSNDDSV) callable services to now take as input the message to be signed or verified as well as the prehashed message that is currently supported.

Software requirements

Crypto Express5S (MCL P08449.16) support of RSA-PSS Signatures and selectable public exponents in the generation of RSA private/public key pairs require, at a minimum:

- z/OS V2.2 with the Cryptographic Support for z/OS V2.1 -- V2R2 web deliverable installed
- z/OS V2.1 with the Cryptographic Support for z/OS V2.1 -- V2R2 web deliverable installed

z/OS Client Web Enablement Toolkit adds REXX support

Starting in z/OS V2.2 and available in z/OS V2.1 through service updates, IBM introduced the z/OS Client Web Enablement Toolkit, which provides a high-function, security-rich web client that exploits HTTP(S) and JSON. Built into the base of z/OS, the toolkit provides an easy-to-use, lightweight solution for developers who want their applications to more easily function as clients of web services-enabled applications. It provides a built-in z/OS HTTP(S) protocol enabler using interfaces similar in nature to other industry-standard APIs, and a z/OS JSON parser to parse JSON text coming from any source with additional functionality to build new or add to existing JSON text. Programs running as batch jobs, started procedures, or almost any type of address space on a z/OS system now have native APIs that they can utilize in a similar manner to any standard z/OS APIs provided by the OS to access web services. Programming languages supported include C/C++, COBOL, PL/I, Assembler language, and now REXX.

IBM intends to make the leveraging of REST APIs in z/OS applications even easier by extending the Client Web Enablement toolkit support to the REXX programming language. IBM plans to introduce two new REXX host command environments, HWTJSON and HWTHTTP, to enable REXX applications to easily direct their requests to the toolkit using an easy-to-use "made-for-REXX" interface. REXX applications running in TSO/E, System REXX, z/OS UNIX™, or ISV-provided REXX environments will be supported. The new function is planned for both z/OS V2.2 and z/OS V2.1 in October 2016 with the PTFs for APAR OA50659. See the [Statements of Direction](#) section for details.

Real-time SMF Analytics infrastructure support

The Real-Time SMF Analytics infrastructure support provides the scalability and elasticity needed to analyze system operational data more efficiently. Providing a durable, scalable in-memory infrastructure for SMF data reduces the time it takes to get from raw data to operational insight. Utilizing a large in-memory cache enables faster processing for high-volume SMF data and provides the response time required for real-time analysis of SMF data in analytics and cloud applications. It also provides the infrastructure for enabling analytics products to keep a real-time dashboard for monitoring operational health.

Statements of general direction

In the future, IBM intends to provide a linkage between z/OSMF Software Management's deployment function and z/OSMF workflows so a workflow can be initiated by a deployment operation. z/OSMF already supports one workflow calling another workflow. The new function will be designed to allow workflows to be used to manage installation-related and deployment-related tasks by linking from package-level workflows to product-level and component-level workflows as needed to help you perform these activities both for initial installation (for example, on a test system) and later deployments to additional systems (such as application test, application development, and production systems).

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IBM previously announced in Software Announcement [A15-0526](#), dated July 28, 2015, that z/OS V2.2 would be the last release to include a number of System Data Mover (SDM) TSO/E commands. Based on client feedback, IBM now intends to continue to support these commands in the future, including the query and XSET commands. However, IBM plans no future enhancements for them. IBM recommends

you use the equivalent REXX versions of these commands instead, which are intended to be updated as needed to support any new functions in the future.

IBM plans to deliver application transparent, policy-controlled dataset encryption in IBM z™/OS. IBM DB2 for z/OS and IBM Information Management System (IMS) intend to exploit z/OS dataset encryption.

IBM intends to support new capability in z/OS for metering and capping workloads over CPU and memory consumption. This capability will be delivered in stages with the initial focus on workloads that run only on specialty engines.

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Reference information

- Software Announcement [A15-0526](#), dated July 28, 2015(z/OS V2.2)
- Hardware Announcement [A15-0001](#), dated January 14, 2015(z13)

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