

# IBM z/OS Version 2 Release 4 2Q 2020 new functions and enhancements

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## Overview

IBM<sup>®</sup> z/OS<sup>®</sup> continuous delivery (CD) offers you opportunities to use new functions, capabilities, and technologies by applying service rather than upgrading to a new z/OS release. Applying the service is designed to be nondisruptive to maintain system behavior until clients are ready to exploit the new capabilities.

This latest CD update further extends the capabilities of z/OS Version 2 Release 4 with new functions that improve the development experience, while at the same time providing significant updates in the core areas of systems management. It continues to enhance the role of IBM Z<sup>®</sup>, with support for IBM z15<sup>™</sup> including the recently announced T02 model with capabilities designed to optimize security, and operational flexibility to help organizations grow and secure their most critical transaction environments.

This latest CD update supports:

- z/OSMF Ansible<sup>®</sup> Collection: Ansible allows the automation of z/OS applications and IT infrastructure as part of your enterprise automation strategy using a proven and consistent approach. The z/OSMF Ansible Collection intends to allow Ansible to drive z/OS operation and configuration by manipulating z/OS resources and data based on z/OSMF RESTful services, such as z/OSMF workflow services.
- Web Enablement Toolkit: New enhancements to the HTTP/HTTPS Enabler portion of the z/OS client Web Enablement Toolkit include support for a new patch method and new options method, inclusion of Server Name Indication (SNI) when System SSL usage is specified, and enhanced tracing to help with debugging of complex situations with the ability to turn on verbose debug information using environment variables.
- z/OS Authorized Code Scanner: A new, optional priced feature to z/OS provides automated systems integrity testing in a dev/test environment. See Software Announcement [220-225](#), dated June 16, 2020.
- zHPF Volume Table of Content (VTOC) I/O Performance: Enhancements in DFSMS extend the use of zHPF to VTOC I/O to provide significant reduction of connect time for applications that sequentially read the entire VTOC.

In addition to base processor support, z/OS provides support for these IBM z15 functions and features:

- A new level of Coupling Facility support, CFLEVEL 24, which provides optimized latch management, improved message path resiliency, and a change to the defaults for dynamic dispatching.
- Cryptography enhancements available with Crypto Express7S with Cryptographic Support for V2R2 - V2R4 (ICSF FMID HCR77D1).

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## Description

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### IBM zERT aggregation recording interval

APARs PH25049 and PH24543 (for z/OS V2R3 and V2R4, respectively) provide the ability to specify a recording interval for z/OS Encryption Readiness Technology (zERT) aggregation SMF records that is not bound to the system's SMF recording interval. With this support, you can configure a zERT aggregation recording interval of up to 24 hours. The use of a custom aggregation recording interval can significantly reduce the number of SMF type 119 subtype 12 "zERT Summary" records that are written to SMF. This reduction can also improve the performance of the zERT Network Analyzer.

### Platform management, z/OSMF, and cloud provisioning and management

Simplifying z/OS operation is a continuous focus of IBM. z/OSMF functions are enhanced as follows:

- z/OSMF Desktop UI has several enhancements. APAR PH22303 reduces response time when loading big data sets or USS files to the z/OSMF Desktop Editor. It also supports dynamically loading data set members with the user's scrolling, which improves efficiency.
- APAR PH24527 will allow every z/OSMF user to create links on their z/OSMF desktop or folder. It will also support displaying syntax highlighting when browsing/editing for JCL, XML, and HTML types in the z/OSMF Desktop Editor.
- z/OSMF Workflows task is enhanced to support saving job output in a specified zFS directory with APAR PH21919.
- z/OS Operator Consoles plug-in is enhanced by APAR PH24072 to allow setting console properties programmatically or from the z/OSMF UI. This simplifies the configuration previously required for setting up console properties.
- z/OSMF Workflow Editor is enhanced with APAR PH24190 to use the VS code editor, already included in z/OSMF, when working with large amounts of text. The VS code editor will provide a large area to do editing as well as standard editor support such as find/replace string, line numbers, and the file overview.

Jobs REST services has several enhancements provided by APAR PH23046:

- Specifying encoding when retrieving content of spool data set
- Several search options for retrieving content of spool data set
- Returning execution data such as system name and timestamp at which job was submitted
- Optionally only returning active jobs

Data set and file REST services has several enhancements with APAR PH22030:

- Supporting an additional option "Allocate Like" for creating a z/OS data set by copying the attributes from another data set. In many cases this avoids the need to exhaustively specify every allocation parameter.
- Reducing response time by compressing the HTTP stream when retrieving content from large data sets or zFS files.
- Removing Windows Carriage Return character automatically so that applications don't have to be concerned about it when transferring data to z/OS.

Ansible is a Red Hat<sup>®</sup> technology for dev/ops automation. z/OSMF now provides z/OSMF Ansible collection "ibm\_zos\_zosmf" in Ansible Galaxy. It integrates Ansible and z/OS without any environment change to z/OS. Refer to the [z/OSMF page](#) in Ansible Galaxy for more details.

### Web Enablement Toolkit

New enhancements to the HTTP/HTTPS Enabler portion of the z/OS client Web Enablement Toolkit have been provided by the PTFs for APAR OA58707. These

include support for a new patch method and new options method, inclusion of Server Name Indication (SNI) when System SSL usage is specified, and enhanced tracing to help with debugging of complex situations with the ability to turn on verbose debug information using environment variables. These enhancements are available on z/OS V2.3 and z/OS V2.4.

In addition, the HTTP/HTTPS Enabler portion of the z/OS client Web Enablement Toolkit has been enhanced to provide TLS 1.3 support when System SSL usage is specified. This support is available on z/OS V2.4 with the PTF for APAR OA58708.

### **Faster mount of zFS file systems**

With the PTFs for APAR OA59145, new function is being added to avoid a 65 second wait time when mounting a z/OS file system (zFS) that was logically copied or dumped while it was mounted in a different sysplex. This enhancement can speed up the overall IPL time depending on how the zFS file systems were copied or dumped. This enhancement is available on z/OS V2.3 and V2.4.

### **Automatic Restart Manager (ARM) support for restarting a system task**

The XCF Automatic Restart Manager (ARM) currently does not support registering system tasks as restartable ARM elements. This kind of started task is common for elements started "early" during system initialization. Such system tasks cannot register with ARM, leaving them exposed to the possibility that they will fail and not be restarted automatically by ARM. With the enhancement to IXCARM REGISTER support provided by APAR OA59120 on z/OS V2.3 and V2.4, system tasks (for example, ICSF) may register with ARM and be restarted as started tasks in the event that they terminate abnormally, providing improved availability for the functions those system tasks represent.

### **OAM support for Db2<sup>®</sup> stored procedures**

Db2 stored procedures enable clients to develop modular programs through which a set of common code can be invoked in a Db2 environment across applications. DFSMSdfp OAM is providing a new sample, CBROSRSP, available in SYS1.SAMPLIB, that illustrates how a user application can invoke the OAM OSREQ API in a Db2 stored procedure environment, and also how to manage multiple Db2 connections within a single stored procedure, providing the flexibility of manipulating data between different databases without having to create multiple programs. Support is available on z/OS V2R2 and above with APAR OA57837.

### **zHPF VTOC I/O performance**

High Performance FICON<sup>®</sup> for System Z (zHPF) I/O technology has been used for many years to improve the performance of data set I/O for sequential, partitioned, and VSAM data sets. Enhancements in DFSMS extend the use of zHPF to VTOC (volume table of contents) I/O done by CVAF and Fast VTOC/VVDS (FVV) services and are designed to provide significant reduction of connect time for applications that sequentially read the entire VTOC. In addition, updates to the VTOC may also use zHPF. Support is available on z/OS V2R3 and above with APAR OA58111.

### **DFSMSrmm plug-in for z/OSMF**

In addition to the ISPF dialogs and TSO user interfaces available today for DFSMSrmm (RMM), support for a modern graphical user interface via a z/OSMF plug-in is now available on V2R4 with APAR OA59499. The plug-in would augment the existing TSO and ISPF dialog support with an easy-to-use graphical interface providing simplified control and management of RMM. This function satisfies the related statement of general direction in Software Announcement [219-210](#), dated December 10, 2019.

### **zHyperLink write statistics**

IBM zHyperLink is a short distance, mainframe-attached link that provides up to 10 times lower latency than high-performance FICON. Low I/O latencies deliver value through improved workload-elapsed times and faster transactional response times

and contribute to lower scaling costs. Currently there is no effective way to view zHyperLink write performance in real time, and the existing SMF fields show only the number of zHyperLink attempts and success rates. Enhancements in DFSMS provide a command to allow users to display zHyperLink write statistics for a data set and optionally clear them. In addition, new SMF fields will be created in the SMF type 42 subtype 6 record to show more information related to zHyperLink write failures. Support is available on z/OS V2R2 and above with APAR OA57718.

### **DFSMSHsm file mode hosts**

A new FILEMODE for DFSMSHsm enables a separate HSMplex to exclusively process UNIX<sup>(R)</sup> files within a sysplex that has an existing DFSMSHsm HSMplex. Any DFSMSHsm requests for UNIX files are automatically directed to the DFSMSHsm hosts configured with FILEMODE. This support enables clients with very large existing DFSMSHsm environments to add DFSMSHsm UNIX data set backup processing without impacting their classic volume and data set environment. This support is available on z/OS V2R3 and higher with APAR OA58870.

### **DFSMSHsm recover UNIX files to a new directory**

DFSMSHsm adds the capability to recover UNIX files to a directory other than the original directory from the time of the backup. This function enables users to recover files to a temporary location to verify that the recovered version is the desired level of the file. It also enables files to be recovered to a different directory and accessed directly from the new location. This support is available on z/OS V2R3 and higher with APAR OA58612.

### **Coupling Facility (CF) monopolization avoidance**

When CF requests directed to a single structure consume a disproportionate share of CF resources, workloads targeting other structures may be starved of resources and unable to achieve acceptable service times and throughput. The degradation can affect critical system components and middleware applications across the entire sysplex. APAR OA56774 exploits new function introduced by coupling facility control code level (CFLEVEL) 24 on z15<sup>TM</sup> servers to prevent a runaway sysplex application from monopolizing a disproportionate share of CF resources.

### **Cryptography enhancements**

The use of cryptography is a crucial element of modern business applications. Applications use cryptography in a variety of ways to protect the privacy and confidentiality of data, ensure its integrity, and provide user accountability through digital signature techniques. Cryptography enhancements are available with the Crypto Express7S hardware solution which is designed for improved performance and security rich services for your sensitive workloads, and to deliver high throughput for cryptographic functions. This will include Cryptographic Support for V2R2 - V2R4 (ICSF FMID HCR77D1).

- Support for CCA Release 7.1:
  - New Edwards curves, Ed448 and Ed25519, for digital signatures
  - New lattice-based algorithm for digital signatures
  - CPACF protected key support for Edwards and a subset of NIST curves
  - TR-31 Support for HMAC Keys
- Support for CCA Release 5.6 and CCA Release 6.4:
  - Enhancements to AES PIN<sup>(R)</sup> functions
  - Additional options on TR-31 export services
- ICSF EMV services updates in support of CVN-18

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[BP Attachment for Announcement Letter 220-226](#)

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## Statement of general direction

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### **Removal of RACF<sup>(R)</sup> for z/OS support for RACF database sharing between z/VM<sup>(R)</sup> and z/OS**

The release after z/OS V2.4 is intended to be the last release to support the ability to share RACF databases between z/VM and z/OS systems. While databases may remain compatible, sharing between operating systems is discouraged due to the distinct security and administration requirements of different platforms. A future z/OS release will be updated to detect whether a database is flagged as a z/VM database and reject its use if so marked. Sharing of databases between z/OS systems is not affected by this statement.

### **IBM z/OS Management Services Catalog**

In an ongoing effort to modernize how system programmers manage their z/OS environments, IBM intends to extend z/OSMF with the z/OS Management Services Catalog framework. This framework leverages the power of z/OSMF workflows to enable system programmers to run services that help complete z/OS management tasks faster and with fewer errors. In the future, experienced z/OS system programmers will be able to create a catalog of customized services, each written with unique institutional knowledge, protocols, and processes.

IBM plans to provide an initial set of services to help z/OS system programmers of all skill levels get started, demonstrate accepted practices, and simplify information sharing. These services are expected to help system programmers spend less time on routine tasks and more time leveraging their z/OS environment. In addition, the z/OS Management Services Catalog intends to offer these capabilities:

- Powerful graphical interface for creating new services, editing IBM-provided services, and updating existing services
- Step-by-step guidance for completing z/OS management tasks
- Overview of all services submitted to run on a system

To prepare for the release of the z/OS Management Services Catalog, IBM encourages z/OS system programmers to start creating their own workflow assets, with the plan that the z/OS Management Services Catalog will help maintain and manage workflows in the future. You can learn more and watch for future developments on the release at the [z/OS Management Services Catalog content page](#).

### **TCT Full Volume Dump**

z/OS DFSMSdss and DFSMSShsm plan to provide full volume dump support for transparent cloud tiering. This capability will enable all I/O for full volume dumps to be performed by a DS8000<sup>(R)</sup> directly to a TS7700 enabled as an object store, or directly to cloud object storage. To minimize the time that a volume is locked while performing this offload, an initial full volume FlashCopy<sup>(R)</sup> can be performed which can then be dumped to the object store. Because all of the I/O for the FlashCopy is also completed within the DS8000, this will provide a point-in-time full volume dump to TS7700, with none of the data passing through the z/OS host. DFSMSShsm also plans to integrate this capability into the FRBACKUP / FRRECOV functions, utilized by Db2 BACKUP / RESTORE SYSTEM.

## Program Management Binder functionality

z/OS V2.4 is planned to be the last release of the operating system to provide the transport utility, IEWTPORT. This program management binder utility converts a program object in a PDSE into a "transportable program file" in a sequential (nonexecutable) format and conversely can also reconstruct the program object from a transportable program file and store it back into a PDSE. The use of this utility has been discouraged for a number of years, as documented in the *z/OS MVS™ Program Management: User's Guide and Reference*. The appropriate utility for copying load modules and program objects is IEBCOPY.

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## Reference information

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For additional information, see:

- Software Announcement [219-344](#), dated July 23, 2019  
(IBM z/OS V2.4 GA)
- Hardware Announcement [120-006](#), dated April 14, 2020  
(IBM z15 Model T02)
- Hardware Announcement [119-027](#), dated September 12, 2019  
(IBM z15)

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