
IBM zSystems
Introduction
April 2022

z/OS V2.5
April 5th, 2022

Frequently Asked Questions

Worldwide



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Announcement Questions

When was IBM z/OS V2.5 announced and what are the highlights?

- IBM z/OS®, Version 2 Release 5, was announced on July 27, 2021 and was made generally available on September 30, 2021. This release enables innovative development to support hybrid cloud and AI business applications. This is accomplished by enabling next-generation systems operators and developers to have easy access and a simplified experience with IBM z/OS, all while relying on the most optimal usage of computing power and resources of IBM zSystems platform for scale, security, and business continuity.

z/OS V2.5 delivers values and capabilities to help organizations succeed in their modernization efforts, including the following:

- Continued drive of performance and ease-of-use enhancements for z/OS Container Extensions (zCX). Solution architects are provided with collocation agility and access to z/OS qualities of service for Linux applications by integrating Linux applications and utilities into z/OS.
- Enterprise modernization with more seamless Java™-COBOL interoperability. This gives application developers full application transparency by extending application programming models.
- Easier integration of z/OS into hybrid cloud environments through IBM Cloud® Provisioning and Management, which offers a robust software provisioning platform on z/OS. New capabilities to IBM z/OS Cloud storage through DFSMS™ transparent cloud tiering and the Object Access Method enable z/OS to utilize hybrid cloud as an additional storage tier for structured and unstructured data. z/OS use of cloud storage is designed to reduce capital and operating expenses with data transfer to hybrid cloud storage environments for simplified data archiving and data protection on IBM zSystems.
- New capabilities and additional enhancements to z/OSMF that drive the effort of automating traditional tasks and simplifying areas of system management to help reduce the level of expertise needed for managing a system.
- ServerPac® for z/OS V2.5 as a portable software instance, which is a new delivery format that enables an efficient and accelerated installation path using a common, simple, and guided process within z/OS Management Facility (z/OSMF) without requiring extensive z/OS systems skills.
- z/OS Upgrade Workflow, which provides the steps for upgrading to this new release of z/OS and is pre-installed in z/OS V2.5. This workflow drastically reduces installation barriers to provide an improved upgrade experience.
- An anomaly mitigation solution leveraging Predictive Failure Analysis (PFA), Runtime diagnostics, Workload Manager (WLM), and JES2 that further enable clients to detect anomalous behavior in near real-time, so they can proactively address potential problems before an availability-impacting event can develop.
- Pervasive encryption simplification, with support for additional z/OS data set types, including sequential basic format and large format SMS-managed data sets, providing users with the capability to encrypt data without application changes and to simplify the task of compliance.
- z/OS Encryption Readiness Technology (zERT) enhancements that provide policy- based enforcement of local network cryptography requirements. When TCP connections match user- defined zERT enforcement rules, clients can obtain immediate notification of questionable or unacceptable network cryptographic protection through messages, SMF audit records, and even automatic termination of connections.
- and much more ...

What are the implications of the z/OS Continuous Delivery model?

The z/OS continuous delivery (CD) model offers clients the flexibility and opportunity to use new z/OS functions, capabilities, and technologies by applying service rather than upgrading to a new z/OS release. After the initial release, new and enhanced z/OS capabilities are made available each quarter with no impact to stability, complexity, or costs. New Function APARs for the z/OS Platform are collected here in a convenient reference format. This information can be used to review the latest enhancements from IBM and determine which ones to implement within your organization.

Where can I find more information about z/OS V2.5?

To learn more about what z/OS can do for you, visit the z/OS homepage:
<https://www.ibm.com/it-infrastructure/z/zos>

Coexistence, Support and Upgrade Planning

Which servers are supported with z/OS V2.5?

z/OS V2.5 leverages the capabilities of current server technology with support for: IBM z13[®], IBM z13s[®], IBM z14[®], z14 ZR1, IBM z15™ Models T01 and T02 and IBM z16™.



What levels of compatibility does z/OS offer?

z/OS delivers compatibility and flexibility to run multiple releases of z/OS together on the same system, or within a multisystem Parallel Sysplex[®]. See the following coexistence capabilities:

- z/OS V2.2 coexists with: z/OS V1.13, z/OS V2.1, z/OS V2.2, z/OS V2.3, z/OS V2.4
- z/OS V2.3 coexists with: z/OS V2.1, z/OS V2.2, z/OS V2.3, z/OS V2.4, z/OS V2.5
- z/OS V2.4 coexists with: z/OS V2.2, z/OS V2.3, z/OS V2.4, z/OS V2.5
- z/OS V2.5 coexists with: z/OS V2.3, z/OS V2.4, z/OS V2.5

Does IBM expect different upgrade efforts to be required to upgrade to z/OS V2.5?

z/OS V2.5 does not require special migration efforts differing substantially from those associated with prior upgrades. As of z/OS V2.4, IBM no longer provides a z/OS Migration publication.

Starting in z/OS V2.5, IBM is shipping z/OS V2.5 Upgrade Workflow and z/OS IBM z16 Upgrade Workflow as part of the z/OS product deliverable and includes IBM service and support, which provide the steps for upgrading to this new release of z/OS. Depending on whether you are upgrading from z/OS V2.4 or z/OS V2.3, select the workflow that applies to your upgrade path and open it in z/OSMF to begin the upgrade process. In the workflow, discovery functions run automatically to further streamline your upgrade experience. The z/OS IBM z16 Upgrade Workflow, which provides all the necessary information to position z/OS on the IBM z16 server, will be provided in a z/OS program temporary fix (PTF).

Any updates and fixes for the Upgrade Workflows are delivered through the standard z/OS service process. By including these two Upgrade Workflows into the z/OS product, the acquisition of these important technical upgrade materials is faster and more convenient than supplying them in a different location.

To learn more about simplifying your upgrade to z/OS, visit the z/OS Upgrade Workflows page:

<https://www.ibm.com/docs/en/zos/2.4.0?topic=level-zos-upgrade-workflow>

Are there resources available to help me upgrade to a newer z/OS level?

Yes, IBM Systems Lab Services provides assistance to clients with Currency and Upgrades. You can contact IBM Systems Lab Services via:

<https://www.ibm.com/it-infrastructure/services/lab-services> or send an email to ibmsls@us.ibm.com

Benefits of z/OS V2.5

Why IBM z/OS?

IBM z/OS is a highly secure and scalable operating system for running mission critical applications. It is designed to keep applications and data available, systems secure, server utilization high, and development agile. It maintains compatibility for existing applications and runs Linux® on IBM Z containers on premises and in hybrid clouds. Together with IBM z16, z/OS gives you more performance, data privacy and cyber resiliency than ever before.

z/OS V2.5 creates better experiences for users through application modernization and fuels business growth through a standard cloud-native approach. Clients can innovate with integrity through security solutions that address evolving threats and new regulations, as well as build competitive advantage through the cyber-resilient infrastructure provided on z/OS V2.5 that predicts, responds, and recovers.

By leveraging the strengths of the IBM zSystems platform's computing power and resources, IBM z/OS plays an important role in providing a secure, scalable environment for the underlying transformation process in which organizations are embarking to deliver swift innovation.

How can Application Developers benefit from z/OS V2.5?

Applications are at the heart of both transactional and batch workloads running on z/OS. Fundamentally, developing new applications while modernizing existing applications is part of the digital transformation journey occurring in many enterprises. z/OS V2.5 delivers enhancements to enable Application Developers to run Linux on IBM Z software directly in z/OS with increased ease-of-use, use new hash utilities to maintain data integrity in files, new TLS support when using the z/OS client Web Enablement Toolkit, new memory-map service support, BCPII enhancements to better control the operations of IBM zSystems hardware, and transparent interoperability between high-level languages when running in different addressing modes. All of these benefits and more allow an Application Development team to achieve rapid application development and provisioning for their hybrid cloud deployment.

How can z/OS System Programmers benefit from z/OS V2.5?

z/OS System Programmers, including early-tenure system programmers, can independently and confidently deploy, maintain, and manage z/OS (and stack) software functions using guided and customized instructions and workflows. Functions such as z/OS Management Facility (z/OSMF) provide an intuitive user-interface as well as automated instructions. Improvements to z/OS V2.5 Upgrade Workflow drastically reduces barriers to installing the new release, saving users time and effort, and providing a significantly improved upgrade experience. Simplified and modern experiences like these are designed to enable easier installation, management, and use of z/OS by programmers and administrators of all levels, with no special skills required for increased agility.

How can Architecture teams benefit from z/OS V2.5?

In the current world environment, there is a clear need for enterprises to further strengthen their overall cyber-security posture. Compliance regulations correspondingly continue to emerge that help clarify new risk use cases and demand functionality to mitigate them. z/OS V2.5 is uniquely positioned to address these needs and includes a broad spectrum of enhancements that can benefit Security Architects in the areas of authentication, authorization, logging, system integrity, system and data availability, encryption for data in flight and at rest, and overall data privacy.

Resiliency and high availability are also traditional strengths of the IBM zSystems and z/OS platforms, with mature and well-established support for Parallel Sysplex clustering to provide redundancy and recovery mechanisms to avoid many planned and unplanned outages that can affect single systems, as well as robust recovery mechanisms to mitigate many single-system events. z/OS V2.5 builds on these strengths with improvements to data resiliency through improved cloud tiering and backup and restore of data to mitigate against data loss or corruption. New System Recovery Boost support provides additional capacity to power you through sysplex recovery activities. An Infrastructure Architect can equip their team with modern and less complex tools that offer new mitigation enhancements to help quickly identify anomalous behavior as it occurs and provide information to expedite root-cause analysis and corrective actions to be taken. Additional improvements provide an even higher level of availability, serviceability, and disaster recovery capabilities for z/OS workloads, all of which help to provide a new level of cyber resiliency for an enterprise.

zCX Foundation for Red Hat OpenShift (zCX for OpenShift)

What is z/OS Container Extensions?

IBM z/OS Container Extensions (zCX) enables clients to deploy Linux on Z applications as Docker containers in a z/OS system to directly support z/OS workloads. This is done without provisioning a separate Linux server, maintains operational control within z/OS, and is supported by z/OS Qualities of Service.

What is zCX Foundation for Red Hat OpenShift?

zCX Foundation for Red Hat® OpenShift® is an IBM Product which delivers Red Hat OpenShift for z/OS. zCX is the virtualization engine which allows Linux to run on z/OS and Red Hat OpenShift is an enterprise grade Kubernetes platform. It is called a foundation because on z/OS it will be the foundation for future capabilities.

What are the benefits of z/OS Container Extensions and zCX Foundation for Red Hat OpenShift?

z/OS Container Extensions expands and modernizes the software ecosystem for z/OS to include Linux on IBM Z applications. Most applications (including Systems Management components and development utilities/tools) that are currently only available to run on Linux will be able to run on z/OS as Docker containers.

Linux on IBM Z applications can run on z/OS, using existing z/OS operations staff and reusing the existing z/OS environment.

z/OS Container Extensions runs Linux on IBM Z applications on z/OS while maintaining operational control within z/OS and z/OS Qualities of Service (scalability, availability, integrated disaster recovery, backup, WLM, and integration with z/OS security).

With zCX Foundation for Red Hat OpenShift, clients get the same benefits above as well as the benefits of Red Hat OpenShift (an enterprise-ready Kubernetes container platform).

On which machine(s) does z/OS Container Extensions and zCX Foundation for Red Hat OpenShift run?

z/OS Container Extensions and zCX for OpenShift run on the IBM z14 platform and higher.

On which engine types can z/OS Container Extensions and zCX Foundation for Red Hat OpenShift run?

zCX address spaces are zIIP-eligible. Most zCX processing (including Docker containers deployed within zCX) can be dispatched on available zIIP processors. Some zCX processing will be dispatched on standard processors. This will generally be a much smaller percentage of processor cycles compared to what can execute on zIIPs. Running the Acme Air benchmark on zCX, up to 98% of the zCX CPU consumption was measured to be zIIP eligible.*

A good first assumption is that the new work running in the zCX environment will be zIIP eligible. However, your zCX environment may be more or less zIIP eligible depending on characteristics of the workload. Capacity planning should be based on the measured zIIP eligibility of your specific zCX applications. zCX can be deployed exclusively on standard processors if no zIIP processors are available.

See "Exploiting zIIP and general purpose processors for zCX workloads" in the IBM z/OS Container Extensions Guide for more information.

*Results were extrapolated from internal IBM benchmarks performed in a controlled environment using a single z14 z/OS 2.4 LPAR with TCP/IP inbound workload queuing (IWQ) for inbound traffic and two zCX containers: one running Node.js and one running a MongoDB database. zIIP eligibility is based on the CPU consumption of the work running on the zCX address spaces and the associated work on the TCPIP and VTAM address spaces. Results may vary.

Can I try z/OS Container Extensions, to see if it is right for me, without having to purchase HW Feature code 0104 or IBM Container Hosting Foundation for z/OS?

Clients have the option of trying z/OS Container Extensions for 90 days before purchasing the HW feature code or software PID. Enablement of the trial uses a z/OS parmlib option. Throughout the trial, you will receive a daily message indicating the time left. The trial will terminate after the 90 days.

Note: zCX is entitled and is included in the z/OS base. It does not require obtaining any additional z/OS Software. 90-day trial is free subject to normal hardware and software consumption when adding a workload to z/OS.

Can I try zCX Foundation for Red Hat OpenShift, to see if it is right for me, without having to purchase the separate PID (IBM zCX Foundation for Red Hat OpenShift)?

Clients have the option to work with their IBM representative to enable a 60 day trial for zCX Foundation for Red Hat OpenShift that aligns with the Red Hat OpenShift trial.

Where can I find more information on z/OS Container Extensions and zCX Foundation for Red Hat OpenShift?

Current information can be found on the z/OS Container Extensions content solution page:

<https://www.ibm.com/support/z-content-solutions/container-extensions/>

Current information can be found on the zCX Foundation for Red Hat OpenShift product page and content solution page:

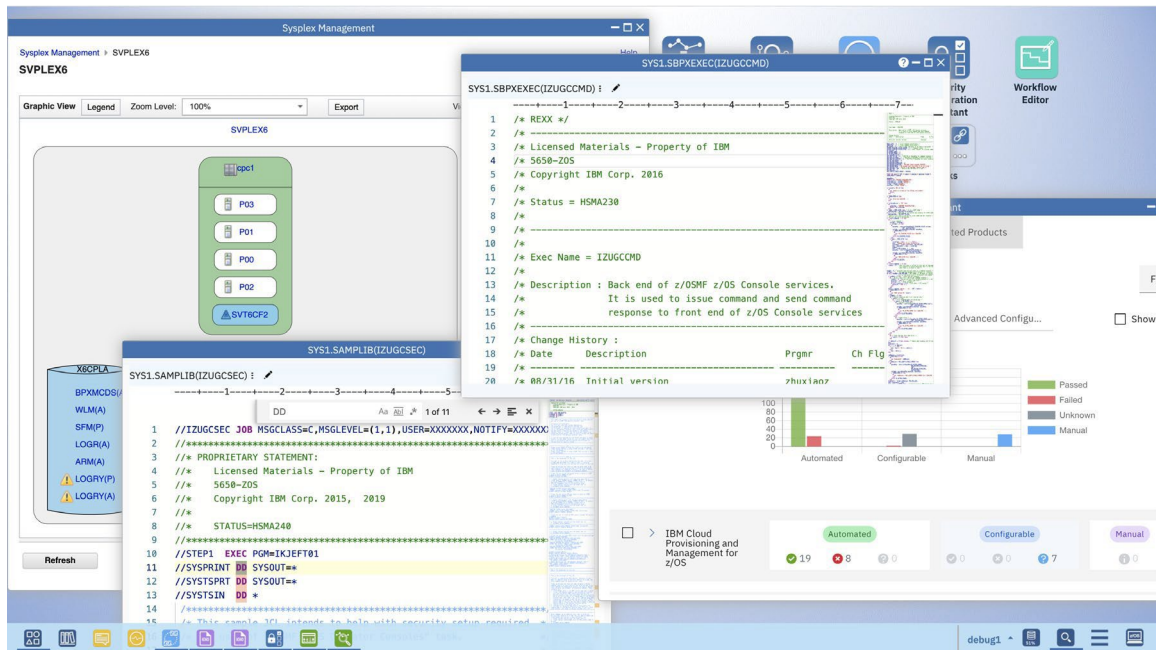
<https://www.ibm.com/products/zcx-openshift>

<https://www.ibm.com/support/z-content-solutions/zcx-openshift/>

z/OS Management Facility (z/OSMF)

What are some of the new enhancements to z/OSMF?

z/OSMF, the modernization platform of z/OS management, continues to deliver a number of significant new functions with z/OS V2.5. Together, they enable higher efficiency, lower skill requirements, and more industry-popular interfaces to drive z/OS operations.



z/OSMF Sysplex Management provides graphic interface and operations for z/OS Sysplex Management. In V2.5, Sysplex Management makes great strides to support editing CFRM policy definitions. The CFRM policy can be viewed, updated and activated in graphic interface reducing the learning curve required to edit CFRM policy via JCL utility. Best practices are also built into the graphic interface to reduce human error. The structures can be updated in batch to improve efficiency.

Enhancements to z/OSMF Workflow provides better auditability and workflow management experience as well as support for saving job output in a specified z/OS UNIX® directory. While enhancing the z/OSMF Workflow Engine, the Workflow Editor task is also enhanced to simplify workflow creation.

The z/OSMF Security Configuration Assistant (SCA) plug-in is enhanced to support z/OS components, features, and products. Previously, the SCA was only able to give detailed information to a system programmer about the missing security rules for the z/OSMF component. In z/OS V2.5, this capability is extended to any piece of software.

Support for a z/OSMF plug-in is now provided in DFSMSrmm™ to simplify the control and management of Removable Media Manager (RMM).

Clients are now able to order z/OS V2.5 as a ServerPac in a portable software instance format, to be installed with z/OSMF Software Management. For the driving system requirements for installing ServerPac

with z/OSMF Software Management and the steps to follow, see the ServerPac Installation using z/OSMF content solution. Here, clients can find a sample portable software instance that can be used to verify that their z/OS driving system is operational for installing a CICS®, IMS™, Db2®, or z/OS ServerPac.

Because performing updates to z/OS software can be a complicated and time-consuming task, a z/OSMF task has been made available in z/OSMF Software Management called Software Update for z/OS V2.5. The graphical user interface in Software Update provides a simplified and guided process to install any SMP/E-packaged PTF, regardless of the software vendor. With use cases for installing corrective, recommended, and functional updates to a client's system, Software Update with z/OSMF achieves the same results as the traditional method, while requiring less time and experience to perform. To learn more about z/OSMF Software Update, including helpful instructions about how to get started, see the Software Update with z/OSMF content solution.

To support installing z/OS V2.5 using z/OSMF, additional enhancements were added in z/OSMF Software Management to define a new master catalog. This support enables z/OS to be installed with a new master catalog and is valuable for many clients who wish to define and deploy a new master catalog with new user catalogs when upgrading to a new z/OS release level.

Many other z/OSMF functions have been provided via Continuous Delivery and are applicable not just to z/OS V2.5, but to prior releases as well. See the z/OSMF new function APAR website for all the recent new functions.

For more information on the z/OS Management Facility, see <https://www.ibm.com/us-en/marketplace/zos-management-facility>

Miscellaneous Questions

How does z/OS V2.5 enable the use of AI in mission- critical applications?

In V2.5, clients can improve their business outcomes by utilizing z/OS Container Extensions to broadly expand their choices of AI tools, frameworks, or libraries to deploy co-located with z/OS applications. To accelerate the adoption of AI on IBM zSystems, a client can deploy prebuilt container images for popular machine learning frameworks such as TensorFlow, available through the IBM zSystems platform and LinuxONE Container Image Repository. IBM Watson® Machine Learning for z/OS 2.3 also allows users to build, deploy, and operationalize machine learning models on z/OS. The latest release is designed to easily import deep learning models in ONNX format and deploy them into an. Optimized scoring service running in zCX, enabling deep learning inferencing workloads with IBM WMLz 2.3 to be zIIP eligible.

To learn more about AI enablement, including how to get started, see the Journey to AI on IBM zSystems and LinuxONE content solution.

What advancements have been made to Shared Memory Communications (SMC) Version 2? Last year, IBM announced Shared Memory Communications Version 2 providing multiple IP subnet support for SMC initially for SMC-D for z/OS V2.4 and the IBM z15. Today, in z/OS V2.5, IBM announces the next phase of SMCv2 support with SMC-R along with support for RoCEv2 ("Routable RoCE"). The SMC- Rv2 multiple IP subnet support is an enterprise data center solution that expands the benefits of SMC-R capability to additional z/OS application workloads and to new use cases by extending the reach of SMC-R beyond a single IP subnet. RoCEv2 uses your existing IP routing topology to provide support for updated RoCE industry standards allowing SMC-Rv2 to now cross IP subnets. RoCEv2 support is provided by the IBM RoCE Express2 (10 and 25GbE) features on the IBM z15.

What changes have been made to the priced feature Resource Management Facility?

In z/OS V2.5, the priced feature is delivered in two parts, the Resource Management Facility (RMF™) and the Advanced Data Gatherer (ADG). The RMF feature continues to provide performance reports, which are based on the metrics from the ADG feature. The ADG is a new, separately priced feature of z/OS V2.5 that provides the function of gathering performance data in raw form. The RMF priced feature includes entitlement to the ADG priced feature. The existing RMF functions continue to be provided with this delivery restructure.

A new entitlement structure has been implemented for IBM z/OS Workload Interaction Correlator. z/OS Workload Interaction Correlator enables z/OS components and middleware to generate cost-effective summary data enriched with exceptionalism every 5 seconds. z/OS Workload Interaction Correlator data is First Failure Data Capture (FFDC) for transient performance problems. When z/OS Workload Interaction Correlator data is used with an analytics product like the IBM z/OS Workload Interaction Navigator, a Subject Matter Expert can reduce the time required to diagnose a problem root cause.

For z/OS V2.5 clients, there are three ways to get the z/OS Workload Interaction Correlator:

- It is entitled at no additional charge when RMF is licensed
- It is entitled at no additional charge when ADG is licensed
- License z/OS Workload Interaction Correlator, if RMF or ADG is currently not licensed

(Note: ADG it is entitled at no additional charge when RMF is licensed)

Any client who has not purchased RMF or ADG can still purchase the z/OS Workload Interaction Correlator independently as a z/OS priced feature, just as they could prior to this new entitlement structure.

Is z/OS V2.5 the last release in which IBM intends to include JES3?

Yes, as previously announced for clients that use JES3, z/OS V2.5 is the last release for which IBM plans to include the JES3 feature. Clients should be making plans to migrate to JES2 or an alternative.

What is Tailored Fit Pricing for IBM Z?

Tailored Fit Pricing is a flexible software pricing model that dramatically simplifies the existing pricing landscape through flexible deployment options tailored to your IBM zSystems environment. Designed to deliver unmatched simplicity, transparency, and predictability of pricing in this era of hybrid cloud, there are several comprehensive alternatives to the rolling four-hour average. These solutions include the Software Consumption Solution, Hardware Consumption Solution, Application Development and Test Solution, and new Application and Enterprise Capacity Solutions. These solutions allow you to embrace the best technical fit, greatly reducing need to architect for software costs.

Technology in z/OS provides the framework to enable Tailored Fit Pricing. It provides the capability to meter and report on specific workloads in a similar manner, regardless of the solution deployed. This can be done without manual tagging and tracking or other increased monthly overhead.

Where can I find more information on Tailored Fit Pricing for IBM Z? On the Tailored Fit Pricing content solution page: <https://www.ibm.com/support/z-content-solutions/tailored-fit-pricing/>

What support services does IBM provide for IBM zSystems?

IBM Technology Support Services (TSS) offers turnkey support and technical services on IBM zSystems and IBM LinuxONE.

Basic support includes IBM Support Insights, a security-rich cloud-based portal which provides a holistic view of clients' hybrid IT infrastructure and can help improve IT uptime and address vulnerabilities. By continually monitoring hybrid IT assets and support contract data, analytics-driven insights provide asset management and preventive maintenance recommendations, with automatic risk or exposure notifications.

IBM Proactive Support includes premium services for personalized support from a skilled, dedicated IBM specialist as well as providing alerts and recommended actions to help avoid problems and reduce unplanned downtime and risk. When you need managed support across your enterprise, Enterprise Accelerated Value Program provides cross-platform Incident management for your hardware and software portfolio. Clients benefit from a single point of contact in IBM and are provided support for enterprise-wide account orchestration.

Technical infrastructure services enable clients to leverage the unique capabilities of IBM zSystems and LinuxONE by offering deep technical expertise, valuable tools and successful methodologies. TSS promotes best practices and addresses complex infrastructure challenges, helping clients solve business challenges, gain new skills and apply best practices.



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