IBM

IBM z/OS 3.1, an AI-infused operating system for the next generation of computing

IBM z14®

IBM z14
Model ZR1

IBM z15®
Model T01

IBM z15
Model T02

IBM z16™
Model A01

IBM z16
Model A02

IBM z16
AGZ rack mount

IBM z/OS® 3.1 marks a new era in operating system intelligence. The new version of z/OS provides a framework for infusing AI throughout the system, enabling intelligent systems administration guidance and automation that learns and improves. With z/OS 3.1 as the foundation of a hybrid cloud strategy, enterprises can deploy and co-locate Linux-based applications together with core business workloads and enjoy the unique value propositions of both environments. Built on over 50 years of continuous innovation, research, and development, z/OS is the core computing platform for the world's top financial institutions, insurers, retailers, utilities, governments and more. Designed for high availability with quantum-safe technologies, the new z/OS 3.1 is a resilient platform for the future of industry's most critical workloads.

– Scale the value of data and drive digital transformation powered by AI and intelligent automation, including support for a new AI Framework for system operations, and a certified Ansible collection for automation.
– Manage and optimize technology infrastructure with industry-popular interfaces for system programmers of all experience levels, including a new priced feature called IBM z/OS Change Tracker.
– Protect and thrive with exceptional cyber resilient capabilities, including a new Authorized Code Monitor to guard against potential vulnerabilities, expanded System Recovery Boost solutions, and new interfaces for runtime diagnostics and resource monitoring.
– Build new and modernize existing applications with a flexible hybrid cloud strategy based on modern APIs and DevOps platforms, including continued enhancements to z/OS Container Extensions (zCX), NoSQL interfaces to z/OS data sets, and Cloud Data Access to cloud object storage from core business z/OS applications.
– Nurture their investment in critical core business applications with new and enhanced functions that enforce the availability, scalability, and efficiency of the operating system clients have known and trusted for decades, including enhancements to Parallel Sysplex®, JES2, Catalog, and many more.

z/OS Version 3 is the basis for an AI-infused, hybrid cloud operating system, and z/OS 3.1 is the first release in that journey. IBM plans to work collaboratively with clients to design, develop, and release new functions in these areas over time. Join us, and let's create a world-leading operating system for the future of business around the globe.

Highlights

Exploits the latest
IBM z16™ Servers

- Supports up to 200 configurable processors and up to 16TB of memory in a z/OS image
- New capabilities to infuse AI into z/OS products while simplifying management by clients
- Enhanced management infrastructure with modern browser-based interfaces that simplify and automate the management of z/OS
- Performance and ease of use enhancements to modernize applications across a hybrid cloud environment with zCX
- Enhanced cyber resiliency capabilities for enhanced metric visualization and greater insights into anomalous behavior
- Security and compliance solutions that achieve heightened levels of availability and improve capabilities for diagnosing and recovering from anomalous behavior

Overview

In z/OS 3.1, AI and analytics solutions such as the following are infused into the operating system using intelligent automation and accelerated inferencing at scale to extract and leverage valuable data insights:

– AI Framework support augments z/OS with intelligence that optimizes IT processes, simplifies management, improves performance, and reduces skill requirements
– The AI ecosystem extends z/OS by supporting a leading AI portfolio with the ability to deploy AI co-located with z/OS applications, designed for low latency response times
– AI-Powered WLM intelligently predicts upcoming batch workload and reacts accordingly for optimized system resources
– IBM SMF Explorer is a data access and analysis toolkit designed to help even novice users access SMF data and extract insights in an easy and modern way, leveraging Python and Jupyter Notebooks

z/OS 3.1 embraces aspects of cloud-native management of z/OS based on industry standards and access to consistent and modern browser-based interfaces, enabling users to efficiently update and configure z/OS and related software. With enhanced management infrastructure and self-service access to tasks, z/OS 3.1 continues simplifying and automating the management of the operating system to help guide the next generation of system programmers. z/OS 3.1 includes the following:

– A range of new and enhanced z/OS Management Facility (z/OSMF) functionalities to help system programmers more easily manage and administer z/OS day-to-day operations. The z/OSMF Desktop continues to modernize and optimize the user experience through new multifunctional widgets, and Security Configuration is simplified through new verification abilities. System programmers can use z/OSMF to manage Coupling Facility Resource Management (CFRM) policies and coupling facility structures and calculate and define their CF structure sizes.. Additionally, they can take advantage of new workflows designed to perform tasks with less manual effort. The need for CIM has been eliminated for job notification and Workload Manager to help reduce complexities. The z/OSMF WLM task supports the new Policy Advisor view to analyze WLM policies.
– New z/OS Management Services Catalog user experience enhancements extend the range of supported intuitive processes such as importing and exporting services. New available sample services allow for a broader range of z/OS management tasks to be performed.
– Support for IBM z/OS Change Tracker, a priced feature, used as a z/OSMF plug-in, providing a graphical user interface for comprehensively tracking changes across software libraries and configuration data.
– New support for generating a universally unique identifier (UUID) during the installation and deployment of z/OS.
– Any ServerPac for z/OS, IBM CICS®, IBM Db2®, IBM IMS™, or program products ordered through Shopz are packaged and installable only with z/OSMF, which is designed to make installation faster and easier.

z/OS 3.1 is designed for clients to leverage industry standard technology to increase development velocity and modernize their application with new environments and APIs to consistently build, deploy, and manage workloads, both Linux® and z/OS, across a hybrid cloud environment: z/OS Container Extensions (zCX) offers improved performance and security, with new features and capabilities to support NFS, HTTPS, and IBM WebSphere® Hybrid Edition.

– Data Set File System serves as a new physical file system designed for z/OS UNIX® utilities to provide transparent access to data in a secure and consistent manner.
– Enhanced COBOL-Java™ interoperability for 31-bit COBOL applications is extended to call 64-bit Java programs using the IBM Semeru Runtime Certified Edition for z/OS, Version 11 (Java).

z/OS security provides ever-greater defense-in-depth functionality that is focused on mitigating the increased risk to data privacy and protection for overall system hardening. With additional simplification enhancements and compliance support, z/OS 3.1 enables clients in leveraging functions such as the following:

– Digital signatures for z/OSMF ServerPac® and CBPDO software packages designed to help to provide higher security and integrity standards for clients.
– Support for performing a Validated Boot (IPL) of z/OS systems, using digital signatures to provide an IPL-time check that the z/OS system is intact, untampered with, and originates from a trusted source from the time it was built and signed.
– ICSF exploitation of the new cryptographic capabilities of the IBM z16, simplified crypto interfaces, and additional abilities to distribute the ownership of master key parts.
– Enhancements to IBM z/OS Authorized Code Scanner, a priced feature, designed to provide greater coverage to scan for potential vulnerabilities along with a new z/OSMF plug-in, as well as the introduction of the z/OS Authorized Code Monitor to be used as a nondisruptive tool in production systems.
– z/OS HyperSwap enhancements to allow for RACF® PassTickets to be used for authentication to remove the need to send RACF passwords or phrases over the network.
– Enhanced compliance support for z/OS that uses new SMF 1154 record subtypes and modernized reporting to collect compliance evidence data from a variety of z/OS components.

High-performing infrastructure components that help to achieve heightened levels of service availability, reduce or eliminate the impact of disruptions, improve capabilities for diagnosing and recovering from anomalous behavior, and support business continuity throughout the enterprise plan to be critical components of z/OS 3.1 and include the following:

– System Recovery Boost solutions expanded with additional recovery process boost use cases to provide value for a new set of z/OS recovery and diagnostic events.

– IBM z/OS Workload Interaction Correlator, a priced feature, provides a greater level of insight into z/OS environments and can now be leveraged at no additional charge through an RMF® license. In addition, support for IBM z/OS Workload Interaction Correlator will enable subject matter experts to proactively identify workload anomalies so they have an opportunity to be diagnosed and addressed before workload impacts, critical situations, and outages occur.
– A new REST API obtains data from Runtime Diagnostics to help facilitate a consolidated view by certain management products.
– Resource Measurement Facility (RMF), a priced feature, provides a new modern web-based user interface supporting Monitor III Metrics and Reports.

z/OS 3.1 is designed to create a resilient, modern infrastructure that integrates mainframe data, operations, and applications with hybrid cloud environments, allowing them to operate for peak agility, flexibility, and performance to extract value from mission critical data and optimize the value of mainframe assets for new business innovation:

– A new z/OS callable service, Cloud Data Access (CDA), enables access to data in cloud object stores and the ability to incorporate cloud object data into z/OS workloads.
– A set of modern APIs, with a Java and C-based, key-value interface, simplifies the application effort needed to access NoSQL VSAMDB data sets on z/OS.
– Enhancements in DFSMSrmm™ (RMM), a priced feature, provides improved enforcement of security controls and customizable z/OSMF plug-in displays.
– New enhancements in Catalog plan provide simplified ICF Catalog recovery, improved Catalog management and maintenance, and simplified Catalog Address Space (CAS) startup.

In addition, z/OS 3.1 supports the performance and optimization of z/OS supported hardware, as well as support for the following functions that enforce the scalability, availability, network efficiency, and general simplification of the operating system:

– z/OS Parallel Sysplex enhancements for the IBM z16 CFLEVEL 25, which provides a variety of enhancements for improved Parallel Sysplex performance, scalability, and resiliency
– Support for JES2 job completion notifications and new JES2 Policy functions intended to improve their flexibility and usability
– New support for dedicated real memory pools, designed to improve the behavior of applications that have a high memory requirement
– New enhancements to the priced feature System Display and Search Facility (SDSF) that further expand system monitoring abilities for system programmers

IBM z/OS 3.1 leverages the IBM z16 capabilities

z/OS 3.1 supports IBM z16 with capabilities designed to optimize high availability, performance, security, and operational flexibility that can help organizations grow and secure their most critical transaction environments.

In addition to base processor support, z/OS provides the support for these IBM z16 functions and features:

– System Recovery Boost enhancements provide boosted processor capacity and parallelism for the following specific events:
  • SVC Dump Processing: Boosts systems that are performing diagnostic data capture via an SVC Dump that is estimated to be over a certain size threshold.
  • Customer-selected middleware starts/restarts: Boosts systems that are performing startup/restart for customer-selected started-task middleware regions.
  • HyperSwap Configuration Load/Reload: Boosts systems that are participating in a load/ reload of a HyperSwap configuration policy.
– Cryptography enhancements available with Crypto Express8S.
– IBM Z Flexible Capacity for Cyber Resiliency is a new Capacity on Demand offering available on IBM Z machines, that allows processing capacity flexibility between primary site and alternate data centers.
– A key strength of the IBM enterprise compilers is the focus on exploiting the new capabilities of the new IBM Z® hardware. The latest releases of the compilers (Enterprise COBOL for z/OS V6.3,
– Enterprise PL/I for z/OS V6.1, and z/OS V2R4 XL C/C++ new web deliverable) make available a new ARCH-14 level to exploit the majority of the enhanced vector instructions available on the IBM z16 models in z/Architecture® mode. Using ABO 2.2 to optimize existing Enterprise COBOL 4.2 to VS COBOL II modules allows the IBM z16 to obtain improved computation performance without the need to do recompilation.
– Java is a popular, general-purpose, highly portable object-oriented language that is widely used for application software and web-based applications. It is designed to have few hardware and platform dependencies and is useful in developing new, and extending traditional, web-based applications, and porting other applications to your IBM Z platform. The SDK for z/OS Java Technology Edition is useful in helping developers who want to take advantage of the Java application programming interfaces (APIs) for z/OS, write or run Java applications across multiple platforms, or use Java to access IBM z data.
– Node.js is one of the fastest growing language runtimes in the market with a large open source community. Available and supported on the IBM z16 and on z/OS, IBM SDK for Node.js - z/OS, V8.0 is upgraded to the open source Node.js V8.0 level which is designed to provide extra security and performance by leveraging the capabilities of IBM z16.

Support for open standards

z/OS supports a number of languages to develop software. Language Environment is the prerequisite runtime environment for applications generated with the following IBM compiler products:

– XL C/C++
– Enterprise COBOL for z/OS Enterprise PL/I for z/OS IBM REXX™ – Java

Some industry standards and protocols that are supported include, at minimum, full or partial implementations:

– Java
– XML (z/OS XML System Services) Unicode – METAL C facility
– C language standard
– Eclipse
– Web services standards SOAP
– IPv4, IPv6 JIS
– JIS X 0201, JIS X 0208, and JIS X 0212 – EMVCo
– FIPS
– PKCS #11 #12 PCI DSS
– ISO Common Criteria IETF standards
– ANSI standards OASIS
– NIST
– Others

Compatibility

z/OS delivers compatibility and flexibility as you migrate systems in a multisystem configuration by enabling multiple releases of z/OS to coexist. This includes non-Parallel Sysplex and Parallel Sysplex multisystem configurations. For example, see the following coexistence capabilities:

– z/OS V2.4 coexists with: z/OS V2.2, z/OS V2.3, z/OS V2.4,
– z/OS V2.5 coexists with: z/OS V2.3, z/OS V2.4, z/OS V2.5
– z/OS 3.1 coexists with: z/OS V2.4, z/OS V2.5, z/OS 3.1

Upgrade

– IBM Health Checks for z/OS along with the z/OS Upgrade Workflow provide comprehensive technical material to simplify your z/OS release upgrade and your IBM z16 upgrade. The IBM Health Checks for z/OS can help determine if an upgrade action was completed properly. These checks do not change the system but can be used to determine if the
– upgrade action is even applicable. As of z/OS V2.5, the z/OS Upgrade Workflow is provided within the product, ensuring that you have world-class support of the IBM Service organization. For those that choose not to use the z/OS Upgrade Workflow in its native format, you can find the export material on the IBM Documentation:
https://www.ibm.com/docs/en/zos/2.5.0

Support

z/OS 3.1operates on the following IBM z servers:

– IBM z16 Model A01, A02 and AGZ Rack Mount
– IBM z15® Models T01 and T02
– IBM z14® Models M01-M05
– IBM z14 Model ZR1

If you run z/OS 3.1 as a guest of IBM z/VM®, z/VM must be at a supported level.

For a complete description of z/OS 3.1 hardware requirements, see z/OS Planning for Installation (GA32-0890) in IBM Documentation.

General product availability

z/OS 3.1 is available as of September 29, 2023. For additional operating system availability dates, see:
ibm.com/systems/z/os/zos/support/zos_eos_dates.html

z/OS 3.1 features many other functions to allow you to harness the value of your transactional and operational data by strengthening efficiencies and capabilities of batch processing and providing a robust and high-performing I/O infrastructure, including enhancements to file systems and access methods.

Why IBM?

As you transform your business by examining your business processes, technology, products and services, IBM remains your trusted business partner. IBM can help you with your transformation to support cloud, analytics and mobile workloads while preserving the needed qualities of service for your existing mission critical workloads.

IBM can help you drive revenue growth and reduce costs using proven technology solutions.

Our experts can help you configure, design and implement a z/OS solution optimized for the needs of your business.

IBM has the business and technical expertise in systems, software, delivery and financing to help you optimize your technology environment to meet the opportunities and challenges of the digital economy.

For more information

Please also refer to IBM z/OS 3.1 System-Level, Planning for Installation, Learning about z/OS—List of base elements and optional features.

Additionally, IBM Global Financing provides numerous payment options to help you acquire the technology you need to grow your business. We provide full lifecycle management of IT products and services, from acquisition to disposition. For more information, visit: ibm.com/financing.

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