



Version 2 sets the groundwork for the next tier of mainframe computing, enabling you to pursue the innovation to drive highly scalable workloads including private clouds, support for mobile and social applications, and more. Its unrivaled security infrastructure is designed to help secure vast amounts of data; its highly optimized availability can help you deliver new data analytics solutions, and its continued improvements in management are targeted to help automate the operations of IBM zEnterprise systems.

Key prerequisites

- z/OS V2.1 runs on these z servers:
 - IBM zEnterprise EC12 (zEC12)
 - IBM zEnterprise BC12 (zBC12)
 - IBM zEnterprise 196 (z196)
 - IBM zEnterprise 114 (z114)
 - IBM System z10@ (z10TMC, z10 BC)
 - IBM System z9@ (z9@ EC, z9 BC)

Getting to the next tier of computing to support new mobile and social apps, globally connected 24x7 systems, and increasing volumes of data can be a challenging journey. Let z/OS V2.1 help you easily get the infrastructure you need to get there, today.

z/OS V2.1 supports updating the values of system symbols dynamically.

IBM urges all z/OS users to get registered for the System z Security Portal and to keep current with security and system integrity fixes.

z/OS V2.1 XL C/C++ supports new instructions and facilities available on zEC12 systems with new ARCH(10) and TUNE(10) options, designed to optimize code for zEC12 and zBC12 systems.

LE support for multiple preinitialized main environments under a single task. This is intended to enable you to call main routines in one preinitialized environment from another, and take advantage of multiple persistent preinitialized environments to improve app performance.

SYSREXX supports additional functions that are available when using REXX under TSO/E.

The Software Management application is extended to help you manage your z/OS software inventory. This function is designed to provide a number of new reporting and display capabilities.

A new z/OSMF Workflow Application is designed to allow exploiters to provide configuration assistance for functional setup tasks to simplify z/OS configuration.

- z/OS Version 2 Release 1, marks a new era of z/OS!
- Through its **unique design and qualities of service**, z/OS delivers the foundation you need to support demanding workloads such as operational analytics and clouds alongside your traditional critical applications.
- With enhancements to **management and operations**, z/OS V2.1 and z/OS Management Facility V2.1 (z/OSMF V2.1) improve ease of configuration and software service level management to help reduce the cost and improve the quality of your configuration and management processes. z/OS and z/OSMF together can help your systems administrators and other personnel handle configuration tasks with ease.
- Enhancements for z/OS V2.1 are designed to help you achieve the **scale and availability** needed for cloud, deliver a superior data serving environment, and secure your mission-critical assets.
- For instance, z/OS V2.1 is designed to help you:
 - Provide **support for zEDC**, designed to compress data with low CPU overhead and at low latency.
 - Support for **Shared Memory Communications-Remote Direct Memory Access (SMC-R)**, can help you move data quickly between z/OS images on the same CPC or a different CPC, and is designed to work without requiring changes to applications.
 - Further **optimize data placement** with significant enhancements to policy-based storage tiering.
 - Support designed to help you make batch DB2@ updates with less performance impact in a Parallel Sysplex@ when DB2 data is cached in a coupling facility.
 - Provide a top-down perspective on performance and capacity planning efforts across zEnterprise ensembles with RMF™ support for **new SMF records** for the Linux™ on System z®, and for the Linux on System x@ and AIX@ operating systems running zBX blades.
- NOTE:** RMF V2.1 also adds support for Windows™ Server running on zBX blades.
- Extend existing **batch runtime environment** support for COBOL-based applications to interoperate with PL/I programs in addition to Java™ programs, all with shared DB2 with transactional integrity, and extended support to encompass DFSMStvs processing for VSAM record-level sharing data sets. These enhancements are intended to provide flexibility in application development and provide modern programming models to help you extend business applications.
- Reduce batch run times by having **DFSMShm-migrated data sets** allocated by batch jobs recalled in parallel, in order to reduce overall elapsed recall times.
- Simplify I/O configuration tasks with improvements for **z/OS FICON@ Discovery and Auto Configuration (zDAC)**, which provides improved support for installations with less-complex I/O configurations.
- Provide for RACF@, PKI, and SSL in EP11 mode to support secure key **PKCS #11 standard** in addition to CCA and accelerator modes of operation.
- Improve interoperability, with support for Japanese Industrial Standards for **Extended UNIX™ Code** and programming services that meet the Unicode 6.0 standard, among others, better enabling you to serve new customers.
- Exploit available fonts, with **fonts included as a new base element of z/OS** to give you capabilities you need for print in a global marketplace.
- z/OSMF V2.1 introduces capabilities designed to help you manage your z/OS environment more effectively and in a more consistent manner, helping you improve overall quality:
 - Reduce resource requirements with use of the **Liberty profile in IBM WebSphere@ Application Server for z/OS V8.5** in z/OSMF V2.1.
 - Manage your **software service levels with new reporting and display capabilities**, to help you determine the currency of your installed system software portfolio at a glance
 - Use a **b** along with roles-based notifications intended to help with simplification of configuration tasks
 - Manage **On/Off Capacity on Demand** in a more intuitive way.
- These select highlights of z/OS V2.1 contribute to the foundation of a **highly secure, available, and scalable enterprise infrastructure** for efficiently running business critical applications. Some new IBM solutions well suited for this include:
 - IBM Smarter Analytics Anti-Fraud Infrastructure** to help banking, insurance, healthcare, and other customers deploy real-time, prepayment fraud-detection capabilities solutions and integrate these functions into operational systems
 - IBM Smarter Infrastructure for Social Services**, to provide a leading and highly flexible solution for end-to-end social program service delivery, ensuring privacy with a single source of secure data.
 - IBM Enterprise Key Management Foundation**, a comprehensive highly secure key management system, which is ideal for banks / payment card processors that must comply with industry standards and manage keys and certificates.
- For **cloud qualities of service**, z/OS V2.1 helps you minimize opportunities for downtime and achieve superior performance and availability.
- New enhancements around the **coupling facility** are designed to boost performance and drive even higher throughput. SMC-R supports application-transparent, efficient networking for the fast exchange of information across systems.
- Enhancements planned for **Flash Express** allow Coupling Facilities to be used to strengthen the resiliency of IBM **WebSphere MQ for z/OS Version 7** for managing messaging spikes.
- To support extraordinary qualities of service, z/OS V2.1 extends platform capabilities such as VSAM record-level sharing (RLS) for **improved catalog performance** and higher availability.
- z/OSMF V2.1, the new face of z/OS, also offers capabilities designed to help you achieve more standardized management processes and improved quality using a **single user interface** supporting multiple tasks.
 - A new workflow application is designed for exploiters to help you structure and sequence your work in a repeatable way to improve process quality and reduce errors.
- Some **highlights in Security for z/OS V2.1:**
 - In z/OS V2.1, **IBM TDS (LDAP)** is designed to allow applications, such as those running on Linux clients, to send data to z/OS to be processed by ICSF, leveraging the CryptoExpress4S cards available on zEnterprise servers.
 - This support is designed to **allow applications to request secure key cryptographic services** from z/OS without exposing the keys in memory also exploitation of these services is planned to be made available for Linux clients.
 - New ICSF functions** are designed to help banking and finance sector clients provide improved security, such as those functions that support emerging standards.
 - New Comm Server capabilities** to support security exits for z/OS FTP clients you can use to help secure file transfers.
 - The RACF database unload utility** is designed to unload additional information about digital certificates to help you more easily perform auditing activities on certificates stored in RACF databases.
 - z/OS UNIX System Services** enables you to specify whether a user should be logged off after a period of inactivity.
 - JES2 and JES3 support for **access controls on job classes**, which you can use to remove the need for exits.
 - New health checks on expiration of trusted certificates, and increased resources checked in sensitive resource class.
- These Workload Manager (WLM) enhancements are provided for z/OS V2.1:
 - WLM supports **new types of classification groups and qualifier types**, and enhanced qualifier types, that you can use in WLM service definitions enabling you to define classification rules for qualifiers such as subsystem parameter (SPM) in a way more consistent with how other classification rules are defined, and help you improve the readability of WLM service definitions and WLM **supports up to 3,000 application environments**, up from the prior limit of 999.

- Updates for z/OS V2.1 include:
 - z/OSMF V2.1** is designed to provide new browser and operating system support for:
 - Firefox ESR 17 on the 32-bit version of the Microsoft Windows XP operating system, and for both 32-bit and 64-bit versions of the Windows 7 operating system.
 - Both 32-bit and 64-bit Microsoft Internet Explorer 8 and 9 browsers on the 64-bit version of Microsoft Windows 7 OS®.
 - RMF offers enhancements to help with performance and capacity reporting, including a **new CIM-based collector** for Microsoft™ Windows Server 2008 in addition to the collectors for Linux on System z, AIX, and Linux on System z.
 - > This is designed to provide more consistent monitoring solution for operating environments across zEnterprise environments.
 - In z/OS V2.1 with **CFLEVEL 19 on zEC12 or zBC12 systems**, shared engine coupling facilities can be used in many production environments, for improved economics offering a high level of performance without requiring the use of dedicated CF engines.
 - New RMF XP support for Windows Server 2008 running on zBX blades, including SMF 104 records and complements the prior support provided for the Linux on System z, Linux on System x, and AIX operating systems running on zBX blades.
 - EXCP support for **System z High-Performance FICON (zHPF)** is designed to help you improve I/O start rates and improve bandwidth for more workloads on your existing hardware and fabric.
 - JES2 and SDSF support for over four billion (4,000,000,000) spin data sets, to help improve availability for long-running address spaces and not face limits that would require these systems to be taken down.
 - In z/OS V2.1, **Capacity Provisioning** is designed to provide support for manual and policy-based management of Defined Capacity and Group Capacity.
 - This is intended to broaden the range of automatic, policy-based responses available to help you manage capacity shortage conditions when WLM cannot meet your workload policy goals.
 - > The Capacity Provisioning commands and reports are enhanced for support of IFL, ICF, and SAP processors to provide a consistent method to handle zEnterprise processor capacity from within z/OS.
 - Further z/OS 2.1 **Capacity Provisioning** allows managing manually activated On/Off CoD capacity to let the Provisioning Manager deactivate that capacity when no longer needed according to its policy.
 - Information about the managed On/Off CoD record is available through an additional Provisioning Manager report.
NOTE: z/OS V2.1 supports the use of IBM 31-bit SDK for z/OS, Java Technology Edition, V7.0.0 (5655-W43) by the Provisioning Manager.
 - In z/OS V2.1, **DFSORT** improves its memory resource management to better balance the memory requirements of multiple large concurrent sort operations and other workloads. A new TUNE option is designed to allow you to specify that DFSORT obtain storage incrementally and check on storage availability before allocating additional storage.
 - These performance-related **z/OS V2.1 SMF enhancements** are included:
 - In z/OS V1.13, the SMF log stream dump program (IFASMFDDL) was updated with a new SMARTENDPOINT keyword. In z/OS V2.1, SMF supports similar processing in the SMF log stream subsystem exit (IFASEXIT) to avoid reading until the end of the log stream for all requests. This is intended to improve performance for IFASEXIT.
 - In z/OS V2.1, SMF enables you to specify the buffer size for SMF logging to log streams in a way similar to using the BUFSIZMAX specification for SYS1.MAN data sets.
 - > This support is designed to enable you to specify the size of each individual SMF log stream buffer using a new DPSIZMAX parameter in an SMFPRMxx member of parmib and change it dynamically using either a SET SMF command or a SETSMF command.
 - SMF also supports the use of data compression on zEC12 and zBC12 systems with the zEDC Express feature and the zEnterprise Data Compression (zEDC) feature for z/OS V2.1.
 - In z/OS V2.1, the **z/OS I/O Supervisor (IOS)** is designed to detect common points of failure for virtualized FICON switches intended to detect common hardware components within a single physical switch that has been defined as multiple virtual switches, and support these virtualized switches in the IOS single point of failure (SPOF) service and in Dynamic Channel Path Management (DCM) for FICON.
 - In z/OS V2.1, **NFS SERVER** exploits 64-bit addressing to support larger sequential data sets, PDS members, and PDSE members where this new function is designed to support processing for files as large as 4 TB, up from the prior limit of 800 MB, and is intended to help improve application performance for random access.
 - In z/OS V2.1, **System Data Mover (SDM)** is designed to allow z/OS Global Mirror (z/GM, also known as XRC) primary volumes to be offline when the XSTART and XADDPAIR commands are issued to start or restart mirroring for existing volumes and is intended to improve availability by eliminating the need to wait for all devices to be varied online.
 - Basic **HyperSwap@** is enhanced to reduce the number of "false freezes" by detecting common reasons for PPRC link suspensions that do not require a volume to be frozen when you specify a new configuration option.
 - Enhancements to the **System Logger** component are intended to help you avoid log stream primary storage full conditions that can lead to performance degradation and outages.
 - These z/OS V2.1 **UNIX System Services** enhancements are included:
 - Support for a significantly greater number of threads that can be active on the system increases the number of mutexes (mutual exclusions) and condition variables the system supports for authorized programs from 131,072 to 16,777,215, and increases the overall system limit to 4,294,967,295. This is intended to make it easier to port applications that require a large number of mutexes and condition variables to z/OS UNIX.
 - The automount facility is enhanced to support setting permission bits other than the default for file systems it creates, the use of static system symbols in the master file, and other usability improvements.
 - In z/OS V2.1, **Catalog** support for VSAM record-level sharing (RLS) is provided for user and volume catalogs in a Parallel Sysplex whereas new design is intended to substantially reduce catalog contention and improve performance.
 - Additional catalog enhancements are designed to suspend catalog requests for a specified catalog across a sysplex to enable you to minimize application disruption during catalog maintenance.
 - z/OS V2.1 **DFSMS** is enhanced as follows:
 - In z/OS V2.1, PDSE processing is enhanced with a new format, PDSE Version 2 which is designed to allow all unused space to be released, consolidate directory pages when possible, improve read performance, and reduce virtual storage utilization for PDSE processing.
 - A new type of **Extended Format data set**, Version 2, is supported where DFSMSdss is designed to support the use of FlashCopy@ for Version 2 Extended Format sequential data sets when copying nonstriped multivolume Extended Format data sets, in addition to the existing support for other Extended Format data sets.
 - DFSMSdfp** is designed to improve tape performance by processing consecutive files without reading each prior tape file's trailer labels when DISP=PASS is coded on the DD statement.
 - Processing of **catalog aliases** is improved for data set aliases with symbolic-related names, the system is designed to reorient the search with the master catalog or the appropriate user catalog. Also, creation dates are stored for alias entries and listed by the IDCAMS utility.
 - z/OS V2.1 **XML System Services** provides new control options for the programming interface that you can use to obtain additional information about parsing errors, in addition to the existing return and reason codes.
 - Support for **passing parameter lists** up to 32,760 bytes in length to a program from **JCL**.
 - Support for the use of **exported JCL symbols** that are accessible in other contexts, including programmatic access.
 - A corresponding function is available for Language Environment (LE).