IBM Z and IBM® LinuxONE
May 2025

IBM z/VM Frequently Asked Questions for z/VM 7.4 and z/VM 7.3

Worldwide

LUQ12358-USEN-22

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General questions

What is IBM Z® and IBM® LinuxONE virtualization technology?

IBM Z and IBM® LinuxONE virtualization technology allows clients to create virtual processors, communications, memory, I/O, and networking resources, thus helping to reduce the overhead of planning, buying and installing new hardware to deploy, consolidate and support new workloads. The virtualization technology for IBM Z and IBM® LinuxONE platforms has multiple layers. which are considered when the IBM Z and IBM® LinuxONE servers are designed. IBM Z and IBM® LinuxONE virtualization is not an afterthought; it is designed into hardware, firmware, and software from the ground up. Unlike distributed hardware-based solutions, z/VM® virtualization technology allows you to virtualize processor, communications, storage, I/O, and networking resources to help reduce the need to duplicate hardware, programming, and data resources. Additional virtualization technologies for IBM Z and IBM® LinuxONE are the open source based KVM and Red Hat® OpenShift® Virtualization.

What do the hardware and firmware provide for IBM Z and IBM® LinuxONE virtualization technology?

The IBM Z and IBM® LinuxONE hardware and firmware provide the virtualization foundation with functions critical to its success, particularly on a large scale, such as the ability to partition the machine, share devices, and communicate between partitions. It also provides built-in capabilities to support running guests on hypervisors at native speeds while allowing hypervisor interception of functions that require additional virtualization.

What does the virtualization layer provide for IBM Z and IBM® LinuxONE?

The virtualization layer extends the capabilities of the hardware and firmware from the standpoint of sharing hardware resources, virtualizing resources, and communication. It also introduces the flexibility needed to support large numbers of virtual servers in an on-demand enterprise. Operational support, control, accountability, and maintenance are a large part of the operation of any group of servers. The z/VM hypervisor is the IBM Z and IBM® LinuxONE product providing the software virtualization layer functionality.

How does IBM Z and IBM® LinuxONE virtualization technology help a business become more efficient and responsive?

With virtualization technology as its foundation, z/VM provides new function and technology exploitation on IBM Z and IBM® LinuxONE that helps enable clients to virtualize processors, communications, memory, I/O, and networking resources, with the potential to help reduce the need to plan for, purchase, and install hardware to deploy, consolidate, and support new workloads.

With support for IBM Z and IBM® LinuxONE dynamic reconfiguration capabilities, z/VM helps enable resources, such as processors and memory, to be added to an active LPAR running z/VM non-disruptively. Clients can configure their systems to help reduce the need to restart z/VM. They can dynamically add processors, channels, OSA adapters, I/O, and memory to both the z/VM system itself and to individual guests.

Does z/VM help to run a hybrid and private cloud on IBM Z or IBM® LinuxONE?

Yes, the z/VM hypervisor extends the capabilities of the IBM Z and IBM® LinuxONE enterprise platforms from the standpoint of sharing hardware assets, virtualization facilities, and communication resources.

IBM z/VM delivers extremely high levels of security, scalability, and efficiency, providing a robust foundation for on-premises private cloud computing and enterprise hybrid cloud computing. z/VM virtualization technology is designed to run hundreds to thousands of Linux® servers and IBM Cloud Paks® based on Red Hat OpenShift Container Platform on a single IBM Z or IBM® LinuxONE server with the highest degrees of efficiency, elasticity, and security.

z/VM, together with Linux and IBM Cloud Paks based on Red Hat OpenShift Container Platform, IBM Z and IBM® LinuxONE, provides a highly scalable, secure, and efficient on-premises private cloud infrastructure as part of a hybrid cloud approach.

Realizing the benefits of cloud computing requires an infrastructure that delivers availability, reliability, security, and performance, while also providing strong virtualization technology. Virtualization is foundational to delivering Infrastructure as a Service, a basic building block for cloud.

IBM Cloud Infrastructure Center can help administrators and development teams to provide a consistent, industry-standard user experience for defining, instantiating, and managing the lifecycle of virtual infrastructure, and deployment of images. It also integrates with higher-level cloud automation tools, such as IBM Cloud Paks®, IBM Instana®, Red Hat Ansible®, Terraform, or VMware vRealize Automation.

Where can I find more information about IBM z/VM?

The z/VM Websites are the primary location for detailed information and material about z/VM's capabilities. See: ibm.com/it-infrastructure/z/zvm and www.vm.ibm.com/library.

In addition, the z/VM Sponsor User program and the z/VM Council pages might be of interest.

Where do I find education videos about IBM z/VM?

The z/VM team provides education videos on YouTube, please check out the following:

- z/VM education roadmap
- z/VM Basic Education Roadmap
- z/VM: How to guides

What are the options to interact with the z/VM community?

IBM has a long history of collaborating with clients to deliver capabilities to improve z/VM. IBM takes this interaction to a new level:

z/VM clients may enlist as "Sponsor Users" and participate in the z/VM Council to advise IBM throughout the design process for many z/VM development projects. These clients may also evaluate early versions of the new support before its delivery to the marketplace to ensure their expectations are met or exceeded. IBM finds the Sponsor User relationship to be beneficial and is soliciting more z/VM clients to become involved in this process. To learn more, see the z/VM Sponsor User program and z/VM Council web pages.

IBM publishes information about many of its z/VM development projects to help users decide if they want to volunteer as Sponsor Users and help the community at large plan for the introduction of new z/VM function. This new level of communication between IBM and the z/VM user community facilitates

discussion regarding implications of the planned support, such as operational incompatibilities, changes to system behavior, and software vendor impacts. These plans are posted and updated on the z/VM Continuous Delivery News web page.

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

New z/VM capabilities will be delivered in the service stream of the current release as Small Programming Enhancements (SPE). When a new release is introduced, SPEs are delivered on that release going forward and, with a few exceptions, earlier releases receive corrective service only and no new function. With the availability of z/VM 7.4, licensed users of z/VM 7.3 receive only corrective service. The most notable exceptions from corrective service only policy for z/VM 7.3 will be features required for hardware toleration and security compliance.

- Beginning with Version 7, IBM delivers z/VM releases on a fixed, 24-month cycle. These releases are a rollup of:
  - Previously released new function APARs (previously known as SPEs)
  - New function that is too disruptive or pervasive to ship in the z/VM service stream
  - Fixes that were shipped in the service stream of the earlier release
- IBM services each z/VM release for 54 months.
- A z/VM release remains orderable for 18 months after the general availability of its follow-on release. This enables clients who are running older levels of z/VM the option of:
  - Moving to the most current release, to receive new function APARs
  - Moving to the service-only release, to receive corrective service only

Starting with z/VM 7, IBM enabled the z/VM documentation for Continuous Delivery capability to update topics in IBM Knowledge Center and publications in PDF format as the need arises. For more information, see the z/VM General Information manual (GC24-6286-10) on the z/VM Internet Library.

Which servers are supported by z/VM?

z/VM 7.4 requires one of the following IBM Z and IBM® LinuxONE servers, or later: IBM z15 Models T01 and T02 and IBM® LinuxONE III Models LT1 and LT2.

z/VM 7.3 requires one of the following IBM Z and IBM® LinuxONE servers, or later: IBM z14® (z14), z14 ZR1, and IBM® LinuxONE II family servers.

Refer to the IBM Support Portal for the most current support lifecycle information for z/VM.

Which operating systems are supported by z/VM?

IBM z/VM 7.4 and z/VM 7.3 support the Linux distributions from Canonical, Red Hat and SUSE, Red Hat OpenShift Container Platform and the IBM Z operating systems IBM z/OS®, IBM z/TPF, and 21CS VSE^{n}. z/VM can also host guest virtual machines running supported copies of z/VM.

What is IBM Cloud Infrastructure Center?

IBM Cloud Infrastructure Center is an advanced infrastructure management solution that supports on-premises, private cloud deployments of z/VM-based Linux virtual machines on IBM Z and IBM® LinuxONE. It is an Infrastructure as a Service solution that provides a consistent, industry-standard user experience to:

- Manage private cloud infrastructure (server, storage, and network), including deployments of Linux images from Red Hat, SUSE, and Canonical on z/VM and Red Hat KVM-based Linux virtual machines on IBM Z and IBM® LinuxONE,
- Deploy images of multiple Linux operating systems (see also above) for noncontainerized workloads from IBM, open source, or other ISV software,
- Aid in the simplification and automation of Red Hat OpenShift cluster deployments, and
- Integrate with enterprise cloud management tools to provision and orchestrate cloud workloads, using OpenStack-compatible APIs, implementing Infrastructure as Code.

Based on these capabilities, Cloud Infrastructure Center shows the following adoption patterns in the market:

- Deployment of on-premises database-as-a-service
- Support to help simplify and automate Red Hat OpenShift cluster deployments
- Infrastructure-as-a-service management for service providers
- Simplified experience with virtualization on IBM Z and IBM® LinuxONE

It fits perfectly in the hybrid cloud strategy, providing infrastructure management for on-premises deployments of noncontainerized and containerized workloads. For additional information, see ibm.com/products/cloud-infrastructure-center

What is Infrastructure Suite for z/VM and Linux?

The management of z/VM environments and Linux on IBM Z guests, as well as support for backup and recovery of the entire system, is now available in one solution - IBM Infrastructure Suite for z/VM and Linux. It provides you with comprehensive insight to efficiently control and support your IBM z/VM and Linux on IBM Z environment with:

- Performance monitoring of z/VM and Linux guests.
- Ability to facilitate automated operations.
- Infrastructure-as-a-Service (IaaS) management for non-containerized and containerized workloads based on industry standards.
- Backup and restore of the z/VM and Linux on IBM Z environment.

For additional information, see ibm.com/products/infrastructure-suite-zvm-and-linux

How is z/VM licensed?

z/VM is licensed per Value Unit. Value Unit entitlements are based on the number of units of a specific designated measure used or managed by the Program. A licensee must obtain sufficient entitlements for the number of Value Units required for their environment for the designated measure specified in the Value Unit Exhibit (VUE). The Value Unit Exhibit for z/VM is VUE021. Value Unit entitlements are specific to the Program and may not be exchanged, interchanged, aggregated with Value Unit entitlements of another Program.

The designated measure for the purpose of Value Unit calculation for z/VM is Engines. An Engine is a central processor (CP) or a specialty processor, such as an Integrated Facility for Linux (IFL) processor, configured for use on an IBM Z or IBM® LinuxONE server. If the Program is used on any CP Engine on a Z server, Licensee must acquire entitlements for all CP Engines on that Z server. If the Program is used on any IFL Engine on an IBM Z or IBM® LinuxONE server, Licensee must acquire entitlements for all IFL Engines on that IBM Z or IBM® LinuxONE server.

For more information see Buy/Order z/VM.

Is Sub-capacity pricing available on z/VM?

Sub-Capacity pricing for z/VM 7 is available for clients running z/VM 7. It allows for software pricing at less than full machine capacity and can provide more flexibility and improved cost of computing as a client manages the volatility and growth of new workloads. For more information read: Sub-Capacity for z/VM

What can clients do with the implementation of sub-capacity pricing for select z/VM programs?

- Pay for z/VM programs based on defined workload requirements and not necessarily the full engine capacity of the machine.
- Add hardware capacity for new workloads, capabilities, and functions, e.g., KVM or IBM Secure Service Container-appliances, and not have IBM software pricing for z/VM programs automatically increase for the existing workload
- Buy new hardware capacity for future growth with no immediate increase to their IBM software bill provided that no additional software capacity is required at that time.
- Potentially benefit from improved price performance as workloads grow.

What are the pre-requisites for z/VM Sub-capacity exploitation?

Sub-capacity terms and conditions for z/VM are only available for eligible IBM Z programs and only on IBM Z machines that have implemented z/VM sub-capacity pricing.

Prerequisites:

- Run z/VM 7.4 or z/VM 7.3
- Install and configure the most recent version of the IBM License Metric Tool (ILMT).
- Install and configure the z/VM Hypervisor Proxy in each logical partition (LPAR) running z/VM.
- Run ILMT to prepare ILMT Reports on a monthly basis and keep these reports on file for presentation to IBM upon request.
- Each month, determine from the ILMT Report if any additional program license entitlements are required, and if so, promptly place an order for those additional entitlements.

For information about supported platforms and hardware requirements for use of ILMT administrative server and its agents, visit: Buy/Order z/VM (www.vm.ibm.com/buy/index.html)

ILMT and instructions for its ordering and installation and use are available from ibm.com/software/passportadvantage/ibmlicensemetrictool.html

The z/VM Hypervisor Proxy and instructions for its installation and use are available from ibm.com/systems/z/swprice/subcap/zVM.html

What is the IBM License Metric Tool?

The IBM License Metric Tool (ILMT) is used to determine z/VM sub-capacity program licensing requirements, and is the same tool used to support sub-capacity pricing for Linux on IBM Z and IBM® LinuxONE middleware programs from IBM.

What is IBM Dynamic Partition Manager?

IBM Dynamic Partition Manager (DPM) is a new administrative mode of PR/SM that is designed to perform simplified configuration for Linux environments. It allows LPARs to be configured and manages system resources, including integrated dynamic I/O management, as quickly and easily as other virtualized environments. It was developed for new-to-Z users working on servers with z/VM, KVM on IBM Z, and Linux for IBM Z as a partition-hosted operating system.

DPM is not a replacement for PR/SM™ – it is part of PR/SM. More specifically, it is a new administrative mode of PR/SM that simplifies configuration of partitions, associated resources, and I/O.

Dynamic Partition Manager (DPM), provided with all z14, and IBM® LinuxONE II servers or later, supports Linux running on z/VM.

DPM provides simplified, consumable, and enhanced partition lifecycle and dynamic I/O management capabilities via the Hardware Management Console (HMC) to:

- Create and provision an environment includes the creation of new partitions, assignment of processors and memory, and configuration of I/O adapters (network, FCP storage, crypto, and accelerators)
- Manage the environment by modifying system resources without disrupting running workloads
- Monitor and troubleshoot the environment to identify the source identification of system failures, conditions, states, or events that may lead to workload degradation

IBM z/VM is a supported environment using IBM Dynamic Partition Manager (DPM) with SCSI storage and/or ECKD™ DASD. Starting with driver D51C bundle 28 for the IBM z16® family server, DPM management support is provided for FICON® Channel-to-Channel within the same CPC, allowing a DPM managed system to configure a z/VM SSI cluster within the same IBM z16 family server.

I am new to Linux on IBM Z or IBM® LinuxONE. Should I use z/VM, KVM or Red Hat OpenShift Virtualization?

You should use the hypervisor that best meets your operational needs. If you need server virtualization that requires deep IBM Z or IBM® LinuxONE integration, or you plan to run Oracle in a virtualized environment, or you want your Linux workload to be part of an Enterprise ready HA/DR environment like IBM GDPS® with HyperSwap® support, then z/VM is the better option to use. However, if you're already running Red Hat OpenShift on IBM Z / IBM® LinuxONE, or using KVM on x86, it's likely a natural fit to leverage OpenShift Virtualization or KVM for deployment on IBM Z or IBM® LinuxONE, building on your existing and expertise. OpenShift Virtualization streamlines the management by providing a unified view of virtual machines and containers, allowing for side-by-side monitoring of health and performance using the same Red Hat OpenShift tooling. Additionally, the management interfaces, administrative functions, tools, and techniques are consistent across the IBM Z, IBM® LinuxONE, and x86 platforms.

IBM z/VM Support for IBM z17™ and IBM® LinuxONE 5

z/VM 7.4 and z/VM 7.3 will support host and guests on IBM z17 / IBM® LinuxONE 5 at the IBM z16 / IBM® LinuxONE 4 functional level with selected exploitation of new functions, while some of the new functions will be transparent.

What guest exploitation support will be provided by z/VM for the following the feature functions of IBM z17 / IBM® LinuxONE 5?

- RoCE Network Express Adapter Hybrid (NETH) support
- Networking Express Adapter EQDIO OSA Hybrid (OSH) CHPID support
- AI Accelerator Adapter

What guest compatibility support will be provided by z/VM for the following new feature functions of IBM z17 / IBM® LinuxONE 5?

- Vector-Enhancements Facility 3
- Vector-Packed-Decimal-Enhancement 3
- Workload-Instrumentation
- Message-Security-Assist Extensions
- Reduced support for TX
- Perform Lock Operation (PLO)
- Concurrent-Functions

What host support will be provided by z/VM for the following the feature functions of IBM z17 / IBM® LinuxONE 5?

- Network Express Adapter EQDIO Support within the z/VM VSwitch and a new TCP/IP device driver
- Power Consumption metrics provided within z/VM monitor that can be visualized by the z/VM performance datapump power metric dashboard
- CPU-Measurement Facility (CPU-MF) enhancements
- Data Processing Unit Next Generation I/O accelerator Instrumentation provided within z/VM monitor
- Dynamic I/O support and guest exploitation for the following:
- 25G LR for Long Distance Coupling CHPID type CL6 (Dynamic I/O support only; no guest exploitation)
- Network Express Adapter CHPID type OSH and PCI Function Types NETH
- AI Accelerator Adapter PCI Function Type PAIA

What are the z/VM service requirements for the IBM z17 / IBM® LinuxONE 5?

Support for IBM z17 / IBM® LinuxONE 5 is available for both z/VM 7.4 and z/VM 7.3, with PTFs provided for each release at the general availability of IBM z17 / IBM® LinuxONE 5.

For detailed information on the new function support and PTFs, please refer to the z/VM service requirements for IBM z17 / IBM® LinuxONE 5 family servers (www.vm.ibm.com/service/vmreqz17.html).

IBM z/VM 7.4

What was announced for z/VM 7.4 with the August 6, 2024 announcement?

IBM z/VM 7.4 provides clients with a premier hypervisor for their existing workloads while also providing support for a modernization journey to hybrid cloud, hosting enterprise-class virtual servers to exploit the advantages in scalability, performance, high availability, and security of IBM Z and IBM® LinuxONE.

z/VM 7.4 provides timely, client-driven function, previously delivered in the service stream of z/VM 7.3. New function delivered with z/VM 7.3 positions z/VM 7.4 with improved:

- Consumability. Through the performance data pump.
- Performance. With reduced large guest logoff time.
- Scalability. Supporting 2 TB guest virtual memory, improved CPU handling, and providing 8-member single system image (SSI) support.
- Resilience and usability. Provided by many enhancements for z/VM system programmers.
- Security. With secure guest IPL, a new compliance interface, and digital signature verification of service.

For a detailed description of function delivered in the z/VM 7.3 service stream, see the z/VM Continuous Delivery News web page.

A new strategy for applying z/VM service in a linear fashion that provides a simpler approach for servicing z/VM systems. In a linear service model, applying a PTF will require all previous service for the same component to be installed.

New format for service level. The product service level, as reported by z/VM 7.4 for all components using the environment variables, uses new format ffxx:

- ff indicates the latest feature pack number.
- xx indicates the fix pack number for the latest feature pack.

A new Architecture Level Set (ALS) that requires one of the following IBM Z and IBM® LinuxONE servers, or later:

- IBM z15® Models T01 and T02
- IBM® LinuxONE III Models LT1 and LT2

Statements of direction

- Security evaluation of z/VM 7.4: IBM intends to pursue evaluations of z/VM V7.4 against the Common Criteria standard for IT security, ISO/IEC 15408. The target of evaluation will include the RACF® Security Server and Single System Image features, with targets of conformance to the National Information Assurance Partnership (NIAP) Virtualization Protection Profile (VPP) with Server Virtualization Extended Package, including labeled security, and to the Operating System Protection Profile (OSPP) at Evaluation Assurance Level (EAL) 4+.
- FIPS certification of z/VM 7.4: IBM intends to pursue an evaluation of the Federal Information Processing Standard (FIPS) 140-3 using National Institute of Standards and Technology's (NIST) Cryptographic Module Validation Program (CMVP) for the System SSL implementation delivered with z/VM 7.4.

- Removal of support for the LDAP Server: z/VM V7.4 is planned to be the last z/VM release to support the z/VM LDAP server. This server, a re-host of the z/OS Directory Server, will be removed from z/VM TCP/IP in a future release. This includes the LDAPSRV virtual machine and associated components. All future releases will continue to support ldap-bind as an authentication factor through the IBM Z Multi-Factor Authentication program (5655-MA1). CMS-based LDAP client utilities, and the RACF r_admin interface, are not affected by this statement.
- Removal of z/VM NFS support: z/VM V7.4 is planned to be the last z/VM release to provide NFS client and server support. NFS client and server support will be removed from z/VM TCP/IP in a future release.
- z/CMS as the default CMS: z/VM 7.4 is planned to be the last z/VM release to have ESA/390 CMS as the default. A future z/VM release will use z/CMS, renamed "CMS", as the default. ESA/390 CMS, renamed "CMS390", is planned to remain available for guests that are dependent on ESA/390 or 370 accommodation.
- Stabilization of z/VM support for the IBM z15 family: z/VM 7.4 is planned to be the last z/VM release to support the z15 family, which includes IBM® LinuxONE III. An IBM z16 family server, which includes IBM® LinuxONE 4, will be the required minimum level for future z/VM releases.
- Full-part-replacement: IBM intends to change how z/VM service is delivered in a future z/VM release. Instead of CMS update files, full-part-replacement files will be provided. In addition, full-part-replacement files will no longer contain sequence numbers, which are character line identifiers in the last eight characters of every line in a fixed record file. z/VM source files will be encoded using the CP1047 code page, unless stated otherwise. Tooling will be provided to assist customers or vendors who still have a need to update z/VM source files.

IBM z/VM 7.3

What was announced for z/VM 7.3 with the September 13, 2022 announcement?

z/VM 7.3 will provide IBM clients with a premier hypervisor for hosting enterprise-class virtual servers to exploit the IBM Z and IBM® LinuxONE advantages in scalability, performance, high availability, and security.

IBM z/VM 7.3 enhancements include support for the following:

- 8-member Single System Image (SSI) support doubles the maximum size of an SSI cluster from four members to eight, enabling clients to grow their SSI clusters to allow for more workload and providing more flexibility to use live guest relocation (LGR) for nondisruptive upgrades and workload balancing.
- NVMe emulated device (EDEVICE) support enables NVMe devices connected through PCI Express (PCIe) adapters to be defined and managed as Fixed-Block Architecture (FBA) EDEVICEs. As such, all host and guest FBA functions are supported except those that require stand-alone support such as Warm Start and Checkpoint. Linux guests exploiting EDEVICEs defined on NVMe adapters are not eligible for LGR. NVMe Adapters are only available on IBM® LinuxONE servers.
- New Architecture Level Set (ALS). z/VM 7.3 includes an ALS that requires an IBM z14 server and higher.
- External Security Manager interface enhancements. These interfaces have been enhanced to allow control of the CP DEFINE MDISK command. They are exploited by IBM RACF/VM and enable a z/VM security administrator to restrict and audit all means of creating a minidisk.
- z/VM Language Environment runtime libraries have been upgraded to z/OS V2.5 equivalency.
- z/VM 7.3 has been enhanced to support 4-character time zone identifiers within the Control Program.
- z/VM displays mnemonics for instructions in CP TRACE output regardless of whether the instruction is fully supported by the TRACE function.
- Select RACF utilities for database installation, maintenance, and operations along with select RACF reports are now allowed to run if the 490 disk was IPLed. In addition, the RACUT100, RACUT200, and RACFCONV utilities require the IPL of disk 490 to support reserve/release of the RACF database.
- z/VM V7.3 prohibits the sharing of RACF databases between z/VM and z/OS systems. While databases remain compatible, sharing between operating systems has long been discouraged due to distinct security and administrative requirements of each platform. z/VM V7.3 formally flags a RACF database as belonging either to z/VM or z/OS, and will reject its use if flagged as the latter. This satisfies the Statement of Direction announced on April 14, 2020.
- Centralized Service Management (CSM) usability enhancements have been made, providing:
  - QUERY processing for service levels now allows queries specific to individual components in a service level.
  - The addition of wildcard support to the SRVLVL QUERY command.
  - The ability to query CSM managed systems for current PUT2PROD status.
  - More details when querying local modifications.

- System default changes:
  - Default password for user directory
    z/VM 7.3 provides the ability to select a default password when installing or upgrading a z/VM system.
  - ACCOUNT Statement in IBM-provided User Directory
    The user directory shipped by IBM will include an ACCOUNT IBM statement for all guest definitions. For an upgrade-in-place installation, new guest definitions that are added to the current user directory will include an ACCOUNT IBM statement, but existing guest definitions will remain unchanged.
  - User Directory TODENABLE
    Some capabilities that previously required OPTION TODENABLE in the user's directory definition will be standard for all users in z/VM 7.3. Specifically, all virtual machines on z/VM 7.3 will be able to alter their virtual time-of-day (TOD) clocks using the SET CLOCK instruction. In addition, class G users no longer need TODENABLE to set the virtual clock to a specified value using the 'SET VTOD' command with the DATE, TIME, and SYSTEM options. TODENABLE is still required for the FROMUSER and MSGPROC options of 'SET VTOD', which involve access to another virtual machine's clock.
  - Transport Layer Security (TLS) 1.1 disabled by default
    Use of the TLS 1.1 protocol has been changed to be disabled by default unless explicitly enabled in the DCTPARMS file.
  - TCP/IP configuration statement changes
    In z/VM 7.3, the NOUDPQUEUELIMIT option of the ASSORTEDPARMS statement is being replaced by a new UDPQUEUELIMIT configuration statement. This new statement will allow a numerical limit to be specified for the maximum number of incoming datagrams queued on a UDP port. The default limit is 20 datagrams. If 0 is specified, there will be no limit, which is the equivalent of NOUDPQUEUELIMIT. The NOUDPQUEUELIMIT option will still be accepted in z/VM 7.3, but UDPQUEUELIMIT takes precedence. In addition, the FOREIGNIPCONLIMIT default will be changed to a set value of 256 and will no longer be based on the initial TCBPOOLSIZE.
  - Host crypto polling default change
    In z/VM 7.3, the default for the POLLING parameter of the CRYPTO configuration statement has changed to OFF. This eliminates the need for the host to poll cryptographic resources for replies that are ready to be delivered to the guest.
  - SCSI EDEVICE attribute handling when defining EDEVICEs:
    In z/VM 7.3, when defining a SCSI EDEVICE with the SET EDEVICE command or configuration file statement, the actual device characteristics will be updated to the device attributes of the backing device when brought online and CP is able to identify the backing device. The specified attribute will be used when device attributes for the backing device cannot be determined. Subsequent queries of the EDEVICE will show the actual attribute in use rather than what was passed with the initial SET command or EDEVICE statement. The attribute will be ignored when modifying an existing EDEVICE with SET EDEVICE to add or remove paths.
  - Removal of CMSDESK support
    The CMS CMSDESK, SET WORKSTATION, and QUERY WORKSTATION commands have been removed, along with many of the remaining CMS GUI references.
  - Change in location and size of the MONDCSS and PERFOUT saved segments

The default CP MONITOR MONDCSS saved segment starting virtual address has been changed to 1 GB and the size has been increased to 96 MB. The IBM Performance Toolkit PERFOUT saved segment starting virtual address has been changed to 1120 MB, immediately following the new MONDCSS. The reasons for these changes include:

- Moving the segment starting locations addresses a problem with the Linux kdump configuration, which failed in a virtual machine with 1 GB of virtual memory that had attached one or both current versions of these segments.
- Increasing the size of the MONDCSS segment accommodates the increased volume of CP Monitor data produced and provides room for its future growth.

These changes will not affect existing versions of these segments; they must be recreated for the new defaults to take effect.

Continuous delivery enhancements for z/VM 7.3:

- CMS Tape Block Size Increase
  This enhancement increases the block size supported by CMS native tape I/O functions from 64K-1 to roughly 1 Megabyte.
- MONWRITE CLOSE Option Enhancement
  This enhancement allows the file mode of the Monitor data file collected by MONWRITE to be specified so that they are no longer restricted to being written to the A-disk.
- Warning Track Interruption Facility
  It will be exploited at z/VM host level to receive warnings that PR/SM will undispatch a logical CPU from its backing physical CPU.
- System SSL 2.5 Uplift
  An update of the cryptographic services library is planned to allow for enhanced certificate diagnostic enhancements, improved algorithmic support, and future enablement of TLS 1.3 for secure connectivity to the z/VM platform.
- Greater than 1TB Guest Support
  Support guests that are defined with more than 1TB of memory.
- Large Guest Reset Time Mitigation
  Provides support for up to 2TB virtual memory within a single virtual machine under a set of restrictions while also providing a mitigation for long logoff times of guests with a large amount of instantiated virtual memory. Details on the set of restrictions can be found at https://www.vm.ibm.com/memman/gt1guest.html
- Support Larger NVMe EDEVICE Page Space Allocations
  Allows paging space to be allocated anywhere on an NVMe EDEVICE and to be of any size up to the available capacity.
- Thin Stack Adapter Interrupt Support
  This enhancement updates the Thin Stack FCP SCSI device driver and associated IO routines to exploit adapter interruptions.
- Performance Data Pump
  The z/VM Performance Data Pump extends Performance Toolkit with the ability to extract real-time performance data and send that to enterprise observability products for visualization and analysis, leveraging the customer processes for alerting and reporting.

- Query z/VM System Security Settings
  Provides a centralized 'collector' program which gathers security-relevant configuration information from the running z/VM system and its services and provides them to a system programmer or security administrator via a single pane of glass.
- Key Vault Utility
  A new CMS password/key management utility is planned to allow applications to securely store and retrieve user ID keys that are needed for data transfers or automated login procedures.
- Support Larger NVMe EDEVICE Page Space Allocations
  Target is to allow that the paging space can be allocated anywhere on an NVMe EDEVICE and to be of any size up to the available capacity.
- VMEVENT Enhancements
  Target is to provide additional information through the *VMEVENT CP system service.
- Guest Secure-IPL
  Provides support to allow guest secure IPL (load and dump) for both ECKD and SCSI devices.
- Crypto Stateless-Command Filtering
  The enhancement provides support for the Stateless-Command Filtering (SLCF) facility available on CEX8C adapters.
- SMAPI FCP EQID API Support. A new z/VM System Management API (SMAPI) called System_FCP_EQID_Set is created to provide a SMAPI API to enable modification of device equivalency IDs (EQID) for real FCP Adapter devices. This new API is particularly beneficial for clients who use SCSI disks connected via FCP (not edevices) and desire to utilize Live Guest Relocation (LGR) in an SSI environment.

For more information about this and other enhancements, see z/VM Continuous Delivery News

Enhancements available with previous release are in the base of z/VM 7.3, providing additional IBM z16 and IBM® LinuxONE 4 benefit for z/VM workloads; here a few examples:

- 4 TB Real Memory support. Support for up to 4 TB of real memory will allow z/VM systems to address a full 4 TB of first level (real) memory, doubling the previous supported limit of 2 TB.
- Dynamic Memory Downgrade support. Dynamic Memory Downgrade extends the real storage dynamic management characteristics of z/VM by allowing up to 50% of the real memory to be removed from a running z/VM system. A minimum hardware bundle level is required to avoid a downgrade stall. For additional details, see the Dynamic Memory Downgrade information web page.
- Improved LGR for shared crypto users. LGR for APVIRT shared crypto environments is enabled when the type of shared crypto resource on the source system does not match the type on the target system.
- z/Architecture® Extended Configuration (z/XC) support. CMS applications that run in IBM z/Architecture can use multiple address spaces. Programs can use z/Architecture instructions and registers, within the limits of z/CMS support, and can use VM data spaces in the same CMS session. IBM z16 and IBM® LinuxONE 4 servers requires z/CMS and z/XC support to be configured within guest virtual machines that exploit z/VM HCD support. IOCP support is in the base of z/VM 7.3 and requires z/CMS.

- Direct to Host Service Download support. Provides an optional way to download service to your z/VM system. A web interface is provided that simplifies the downloading of z/VM service ordered through IBM Shopz. The service files can now be transferred through a direct-to-host connection. The data is verified and unpacked during the transfer to the z/VM host system.

z/VM supports the following guest operating systems: Linux, IBM z/OS, IBM z/TPF, and z/VM itself, as well as the Red Hat OpenShift Container Platform.

In addition, the z/VM hypervisor helps ensure continuous infrastructure availability by tightly integrating with IBM GDPS resiliency-focused offerings and Live Guest Relocation support.

With z/VM 7.3, IBM continues to deliver enhancements to its z/VM advanced virtualization technology on IBM Z and IBM® LinuxONE servers using the z/VM continuous delivery (CD) model. This CD model for new function offers clients timely support for recent technology throughout the life of a z/VM product release using a delivery mechanism that is familiar to clients and time tested. The z/VM CD model allows schedule flexibility as IBM partners with the z/VM community in the design, development, and delivery of new functions that are not centered around a specific release date.

IBM z/VM Support for IBM z16 and IBM® LinuxONE 4 product portfolio

What are the feature functions of IBM z16 A01 and IBM® LinuxONE Emperor 4 supported by z/VM?

Support for the IBM z16 Model A01 and IBM® LinuxONE Emperor 4 servers includes:

- Guest enablement to exploit the following functions:
  - Imbedded Artificial Intelligence Acceleration is designed to reduce the overall time required to execute CPU operations for neural networking processing functions and help support real-time applications like fraud detection.
  - Compliance-ready Central Processor Assist for Cryptographic Functions (CPACF) counters support enables guests to track crypto compliance and instruction usage.
  - The Breaking Event Address Register (BEAR) enhancement facility improves the ability to debug wild branches.
  - Vector Packed Decimal Enhancements 2 delivers new instructions intended to provide performance improvements.
  - The Reset DAT Protection Facility provides a more efficient way to disable DAT protection, such as during copy-on-write or page change tracking operations.
  - Support for the Consolidated Boot Loader provides guest IPL from a SCSI LUN. Note: Guest IPL from SCSI, with or without the DUMP option, will now require a minimum guest virtual memory size of 768 MB.
  - The RoCE Express3 adapter allows guests to exploit Routable RoCE, Zero Touch RoCE, and SMC-R (Shared Memory Communications Remote) V2 support.
  - The Crypto Express8S (CEX8S) adapter is supported as a dedicated or shared resource. Dedicated guests will be able to take advantage of all functionalities available with the CEX8S adapters, including assorted new enhancements and new Quantum Safe APIs.
  - IBM Adapter for NVMe 1.1, which is supported on IBM® LinuxONE Emperor 4 only. z/VM provides guest exploitation support. In addition, z/VM 7.3 supports defining Fixed-Block Architecture (FBA) EDEVICEs on IBM Adapter for NVMe devices.
- Support for CPU and Core topology location information will be included in z/VM monitor data, providing a better picture of the system for diagnostic and tuning purposes.

  - The following infrastructure support must be installed on all members within a z/VM SSI cluster before any member of the cluster is IPLed on an IBM z16 or IBM® LinuxONE Emperor 4 server: z/VM 7.3: Base.

  For further information on z/VM support of the IBM z16 and IBM® LinuxONE Emperor 4 servers, see the z/VM IBM z16 required service web page and the IBM Support - Preventive Service Planning bucket Upgrade 3931DEVICE, Subset 3931/ZVM.

What are the feature functions of IBM z16 A02 and IBM® LinuxONE Rockhopper 4 supported by z/VM?

Support for the IBM z16 Model A02 and IBM® LinuxONE Rockhopper 4 servers includes:

- Guest Exploitation Support for Secure Boot: z/VM extends support for hardware secure boot by providing guest secure boot for both Load and Dump operations from ECKD and SCSI devices. This support provides the ability for a Linux guest to exploit hardware to validate the code being booted, helping to ensure it is signed by the client or its supplier.

  Secure Boot uses digital signatures to provide an IPL-time check that helps ensure IPL data is intact, unaltered, and originates from a trusted build-time source, enabling detection of unauthorized changes to those software executables. The machine loader verifies the digitally signed hashes of the code, using verification certificates that the client has loaded into the HMC certificate store. z/VM makes these same certificates available to guests so that the OS can verify the authenticity of additional code loaded after IPL.

  z/VM 7.3 support is provided with the PTFs for APARs VM66434, VM66424, and VM66650.

- Crypto stateless-command filtering: z/VM V7.3 provides support for new capabilities of the Crypto Express8S adapter, when configured in CCA Co-processor mode, to enforce restrictions on classes of requests. z/VM exploits this new capability to prohibit secure-key operations on shared (APVIRT) crypto resources, eliminating the need for future z/VM updates to allow stateless CCA operations beyond those currently supported. The z/VM hypervisor specifies the policy, and the Crypto Express8S adapter enforces it.

  z/VM 7.3 support is provided with the PTF for APAR VM66423.

- z/VM security settings and compliance interfaces: z/VM V7.3 provides security settings and compliance API and command interfaces for compliance status extractors. The output from these new extractor interfaces will contain security-relevant configuration data that can be analyzed for Payment Card Industry Data Security Standard (PCI DSS) compliance or for adherence to security configuration baselines. The API is provided through a new Systems Management interface that passes data to the extractor program.

  z/VM 7.3 support is provided with the PTF for APAR VM66646.

For further details on z/VM support of the IBM z16 A02 and IBM® LinuxONE Rockhopper 4 servers, see the z/VM IBM z16 required service web page and the IBM Support - Preventive Service Planning bucket Upgrade 3932DEVICE, Subset 3932/ZVM.

What are the pre-requisites for installing z/VM on an IBM z16 or IBM® LinuxONE 4 server?

z/VM can be installed directly on an IBM z16 or IBM® LinuxONE 4 servers.

For further information on z/VM support of the IBM z16 A01 and IBM® LinuxONE Emperor 4 servers, see the z/VM IBM z16 required service web page and the IBM Support - Preventive Service Planning bucket Upgrade 3931DEVICE, Subset 3931/ZVM.

For further details on z/VM support of the IBM z16 A02 and IBM® LinuxONE Rockhopper 4 servers, see the z/VM IBM z16 required service web page and the IBM Support - Preventive Service Planning bucket Upgrade 3932DEVICE, Subset 3932/ZVM.

IBM z/VM Support for IBM z15 and IBM® LinuxONE III product portfolio

What are the feature functions of z15 and IBM® LinuxONE III supported by z/VM?

z/VM supports z15 and IBM® LinuxONE III. See the z/VM Required Service website for details on the PTFs required.

Enable guest exploitation of:

- Synchronous execution support for on-chip data compression
- Enhanced sort acceleration and optimization
- Enhanced Vector and Vector packed decimal processing
- Crypto Express7S adapter and cryptographic enhancements
- FICON® Express16SA, OSA adapters
- Dynamic I/O enhancements, providing support for the configuration management of OSAExpress7S, Crypto Express7S, FICON Express16SA FC and FCP CHPIDs, RoCE Express2, and Coupling Express3 LR adapters
- IBM Fibre Channel Endpoint Security between an z15 Model T01 or IBM® LinuxONE III Model LT1 and the IBM DS8900F

In addition, z/VM supports IBM System Recovery Boost, by providing a temporary boost of the sub-capacity general purpose processors (CPs) to full capacity during z/VM system initialization and workload bring-up, workload quiesce and system shutdown, and during system abend processing. System Recovery Boost will return the system to doing normal work faster, after any kind of planned or unplanned disruption. Support is primarily targeted to the z/TPF and 21CS VSE^{n} guest environment and only for sub-capacity systems.

More focal areas

Efficiency and scalability

What is Encrypted Paging support?

z/VM provides encrypted paging, in support of the philosophy of encrypting all data in flight and at rest. Ciphering will occur as data moves between active memory and a paging volume owned by CP. Included in the support is the ability to dynamically control whether a running z/VM system is encrypting this data.

What is guest exploitation support for the Instruction Execution Protection Facility?

The Instruction Execution Protection Facility (IEPF) provides functionality to improve the security of programs running on IBM Z and IBM® LinuxONE by allowing virtual memory elements to be identified as containing only data. If an attempt is made to fetch an instruction from an address in such an element or if an address in such an element is the target of an Execute-type instruction, a protection exception will occur. z/VM provides support for guest exploitation of the IEPF.

What is Guest exploitation support for Pause-Less Garbage Collection?

The guarded storage facility (GSF) is designed to improve the performance of garbage-collection processing by various languages, particularly Java™. z/VM provides support for guest exploitation of the GSF.

What are the z/VM real memory and guest virtual memory support limits?

The maximum amount of real memory that z/VM exploits is 4 TB. The maximum supported virtual memory for a single guest remains at 1 TB. When configured with 4 TB of real storage and keeping the same over-commitment ratio for virtual-to-real memory, this can double the amount of virtual memory that can be efficiently used compared to the previous limit of 2 TB.

What is HyperPAV technology exploitation?

z/VM exploits the ability of an IBM DS8000® device to execute concurrent I/O requests to an ECKD paging volume. In HyperPAV mode, if the base volume is busy, z/VM selects a free alias device from a pool, binds the alias to the base device, and starts the I/O. When the I/O completes, the alias device is returned to the pool to be used for another I/O to the same logical subsystem (LSS). The primary benefit of exploiting HyperPAV is to improve paging throughput during periods of high-volume disk I/O, which will increase the efficiency of z/VM memory management for memory over-committed workloads. HyperPAV paging also enables the management of fewer and larger CPOWNED volumes.

With HyperPAV paging taking advantage of DS8000® features, the bandwidth for paging increases to allow managing dozens of page volumes rather than 100s and to permit more efficient memory management of over-committed workloads.

HyperPAV is exploited by the z/VM hypervisor not only for paging but also for:

- The SYSRES volume, and volumes containing checkpoint and warm start data
- Volumes used for spooling, and the z/VM user directory
- Minidisk pools, as defined by a guest's use of MAPMDISK IDENTIFY

Does z/VM provide support for the Enhanced-DAT facility?

z/VM provides support for the Enhanced-DAT facility, which allows a guest to exploit large (1 MB) pages. A larger page size decreases the amount of guest memory needed for dynamic address translation (DAT) tables and also decreases the hardware overhead required to perform address translation. In all cases, guest memory is mapped into 4 KB pages at the host level. With Guest Large Page support, Linux on Z, z/OS® and 21CS VSE[n] virtual machines can benefit from reduced memory footprints and address translation times, which in turn can decrease overhead and improved throughput.

Does z/VM support Guest Transaction Execution (TX) support?

z/VM supports guest exploitation of Transactional Execution (TX) on machines that provide the facility. The TX facility allows a program to issue multiple instructions that appear to operate atomically, offering an alternative to costly mutual-exclusion mechanisms such as software locks. This support can improve the efficiency and scalability of multithreaded software such as Java or guest operating system functions.

Note, in the IBM z16 A01 hardware announcement from April 5, 2022 was a related statement of general direction announced: Removal of support of the transactional execution and constrained transactional execution facility: In a future IBM Z hardware system family, the transactional execution and constrained transactional execution facility will no longer be supported. Users of the facility on current servers should always check the facility indications before use.

System ease of use

What are z/VM Control Program environment variables?

z/VM CP environment variables allow automation procedures to adapt more easily to changes in operating environments to help simplify the control and testing of a system setup. For example, an operator can indicate at IPL time that the system is running in a disaster recovery or test environment, which in turn enables automation routines to modify the devices used and alter the choice and sequence in which virtual machines are activated, as well as perform other environment-dependent functions.

What is the z/VM Query Shutdown command?

The QUERY SHUTDOWN command has been enhanced to enable a z/VM system programmer or a guest virtual machine to determine whether a system shutdown is in progress and obtain additional information about the shutdown. This can help automate an orderly shutdown of the z/VM system and its virtual servers. This function can be particularly valuable to virtual machines that coordinate the shutdown of other virtual machines. The coordinating virtual machines would receive the signal that the system is shutting down, issue the new QUERY command to get additional information, and take the appropriate action for an orderly shutdown.

What are the SCSI enhancements for z/VM?

Improved Small Computer System Interface (SCSI) support for guest attachment of disk and other peripherals to IBM Z and IBM® LinuxONE servers to:

- Enable ease of use with enhanced management for SCSI devices to provide information needed about device configuration characteristics.
- Enhance interoperability between the SCSI driver and SAN Volume Controller (SVC) and devices incorporating SVC technology such as the IBM Storwize® V7000 and IBM FlashSystem® V840 and V9000.
- A z/VM storage administrator can use FlashSystem storage as a z/VM-system-attached disk without the need for an intermediate SAN Volume Controller (SVC). Previously, while FlashSystem could be used by a Linux virtual machine without an SVC, to use it for z/VM system volumes or EDEVs for virtual machines, an external or internal SVC was required
- Improve reliability when SCSI disk devices are attached to the z/VM hypervisor for system use, without the need to be attached behind an SVC.

SCSI management QUERY support provides enhancements to the commands for EDEVICEs within z/VM to improve the usability and problem diagnosis for EDEV-intensive environments and provide a clearer end-to-end view of the storage configuration. This simplifies the process of verifying that the storage configuration is consistent between z/VM and the disk storage subsystem.

The following updates are designed to further enhance the reliability of SCSI devices:

- The CP missing interrupt handler is disabled for EDEVICEs, allowing the SCSI driver to manage its outstanding requests in a more appropriate manner.
- The SCSI driver is updated to provide additional path recovery.
- Debug facilities within the SCSI driver are enhanced, allowing IBM support teams to more quickly diagnose and debug issues in the field.
- Guidelines for multi-path configuration are provided for SVC and devices incorporating SVC technology to ensure path recovery is optimal.
- Concurrent code loads on the SVC and devices incorporating SVC technology are supported without quiescing EDEVICE I/O.

What is the z/VM CMS Pipelines update?

Integration of new CMS Pipelines functionality, which previously was not formally incorporated in the z/VM product, provides a much more inclusive set of tools for application developers. This upgrade addresses client concerns with using downloaded code, includes fixes not previously integrated into the z/VM product, broadens the ecosystem, enables innovation for clients and ISVs, and includes additional functionality.

How has the DirMaint™ RACF connector been modernized with z/VM?

The DirMaint RACF connector is modernized with a collection of functional enhancements that improve how z/VM security is handled in a RACF-managed environment. The Connector allows appropriate security policy changes to be passed directly to RACF. This allows a z/VM environment managed by IBM Wave for z/VM or via an OpenStack® environment to function properly with RACF installed on the system.

How does z/VM RACF automate control of access list authority?

The ADDCREATOR and NOADDCREATOR options on the RACF SETROPTS command determine whether the creator of a RACF profile is automatically added to its access control list. This enhancement removes the need for manual intervention in RACF resource configuration and eliminates a point of potential human error from security policy management.

What are the z/VM Performance Toolkit enhancements?

Performance Toolkit for VM™ function exploits z/Architecture and its expanded set of instructions. Consequently, the PERFSVM virtual machine must run on z/Architecture CMS (z/CMS).

New and updated performance reports are providing within the Performance Toolkit Feature in support of HyperPAV Paging. These new reports include information that will help clients tune the z/VM HyperPAV Paging Subsystem.

What are the Network Security enhancements?

NICDEF Security Controls introduces a Directory Network Authorization capability that allows each virtual NIC to be configured and authorized entirely within the user directory. This eliminates the need to use SET VSWITCH and COUPLE commands to configure virtual network connections.

Can TCPNJE connections be encrypted?

RSCS TCPNJE traffic can be encrypted by directing the data flow through an SSL server. The secure TCP/IP protocols that were previously implemented to support VMCF clients and servers are extended for IUCV clients and servers.

Hardware currency

What is z-Thin Provisioning support for z/VM?

DS8880 z-Thin Provisioning and Extent Space-Efficient (ESE) volumes enables guests to exploit thin-provisioned volumes and allows CPOWNED volumes be defined on thin-provisioned volumes.

What is Shared Memory Communications Direct support for z/VM?

Shared Memory Communications Direct (SMC-D) protocol support provides support for fast, low-latency LPAR-to-LPAR TCP/IP traffic using Direct Memory Access over firmware-provided Internal Shared Memory (ISM) devices. Supported for z/VM guest exploitation, SMC-D and ISM are designed to use shared memory areas to provide low-latency, high-bandwidth, cross-LPAR connections for applications. This support is intended to provide application-transparent DMA communications to TCP endpoints for sockets-based connections. SMC-D is expected to provide substantial performance, throughput, response time, and CPU consumption benefits compared with standard TCP/IP communications over HiperSockets™. z/VM supports dynamic I/O and guest use of the Internal Shared Memory (ISM) PCI function type. See the z/OS subset within the 2964DEVICE or 2965DEVICE PSP bucket for z/OS service required in support of SMC-D connectivity.

What is Dynamic Simultaneous Multithreading Level support for z/VM?

Support for Simultaneous Multithreading (SMT) is enhanced with the addition of the SET MULTITHREAD command. Once z/VM has been IPLed with multithreading enabled in the system configuration file, this command can be used to switch non-disruptively between one and two activated threads per IFL core. Performance of a system and workload with multithreading enabled and one active thread per core is comparable to that of the same system and workload with multithreading disabled. Thus, the Dynamic SMT Level capability allows the benefit of multithreading to be evaluated for a workload without requiring an outage to enable or disable SMT. The SET MULTITHREAD command is allowed only when the system has been enabled for multithreading in the system configuration file, which can specify activating either one or two threads per core. It is not possible to revert to a non-SMT configuration without an IPL. SMT-enabled configurations are restricted to forty cores even when operating in single-threaded mode due to the logical processor addressing limit.

Installation, migration, and serviceability

Are there services available to migrate to a newer z/VM level?

Yes, IBM Systems Lab Service helps clients with currency and migration. You can contact IBM Systems Lab Services via an email to ibmsls@us.ibm.com

Statements of direction from announcements

Statements by IBM regarding its plans, directions, and intent are subject to change or withdrawal without notice at the sole discretion of IBM. Information regarding potential future products is intended to outline general product direction and should not be relied on in making a purchasing decision. The information mentioned regarding potential future products is not a commitment, promise, or legal obligation to deliver any material, code, or functionality. Information about potential future products may not be incorporated into any contract. The development, release, and timing of any future features or functionality described for IBM products remain at the sole discretion of IBM.

What z/VM statements of direction were included with the April 04, 2023 announcement?

Linear service

z/VM V7.3 is the last z/VM release planned to support the ability to apply service in a selective fashion. Currently, PTFs within the same component can be applied without requiring all previous service to also be applied, based on requisite rules. A future z/VM release intends to implement a linear service model whereby applying one PTF will require all previous service for the same component to be installed.

Full-part-replacement

IBM intends to change how z/VM service is delivered in a future z/VM release. Instead of CMS update files, full-part-replacement files will be provided. In addition, full-part-replacement files will no longer contain sequence numbers, which are character line identifiers in the last 8 characters of every line in a fixed record file. z/VM source files will be encoded using the CP1047 code page, unless stated otherwise. Tooling will be provided to assist clients or vendors who still have a need to update z/VM source files.

Digitally signed service

IBM plans to provide the capability to verify digitally signed, electronically delivered z/VM service in a future z/VM deliverable. This new capability is being designed to allow a user to ensure that service packages have not been tampered with by verifying that they were signed by the expected provider.

Removal of DVD support

IBM intends to remove DVD as a medium to receive an order for the z/VM product or z/VM service in a future z/VM release. Electronic delivery, packaged as a .zip and an .ISO file, will be the only supported mechanism. Clients can copy the contents of an electronic image to a USB device by following instructions provided with their order. Only USB devices supported by the HMC can be used.

What z/VM statements of direction were included with the September 13, 2022 announcement?

Withdrawal of support for TCP/IP LAN Channel Station (LCS) devices

Many IBM Z clients continue to rely on Systems Network Architecture (SNA) applications for mission-critical workloads, and IBM has no plans to discontinue support of the SNA protocol, including the SNA APIs. IBM z16 and IBM® LinuxONE 4 are planned to be the last server to support the OSE CHPID type, which enables the host to send and receive native SNA-format Ethernet frames using the OSA Express

1000Base-T adapters. IBM z/VM systems that rely on VTAM and utilize External Communications Adapter (XCA) major nodes as the transport should be updated to utilize Channel-to-Channel connections to z/OS so that Enterprise Extender or some other form of SNA-over-IP technology can be used. The OSE CHPID type also is used to provide LAN Channel Station (LCS) emulation. With its withdrawal, IBM intends z/VM 7.3 to be the last z/VM release to provide TCP/IP support for the LCS device driver.

z/CMS as the default CMS

The previous Statement of Direction that z/VM 7.3 was planned to be the last z/VM release to have ESA/390 CMS as the default has been withdrawn. The release after z/VM 7.3 will continue to support ESA/390 CMS as the default. A future z/VM release will use z/CMS, renamed "CMS", as the default. ESA/390 CMS, renamed "CMS390", at that time is planned to be available for guests that are dependent on ESA/390 or 370 accommodation.

Stabilization of z/VM support for the IBM z14 family

z/VM 7.3 is the last z/VM release planned to support the z14 family, including IBM® LinuxONE II. An IBM z15 family, including IBM® LinuxONE III, server will be the required minimum level for future z/VM releases. See the IBM Software Support Lifecycle Policy website for the most current z/VM support lifecycle information.

Stabilization of ProxyArp support

IBM has no plans to include support for ProxyArp with any z/VM TCP/IP device drivers developed in the future.

Removal of DVD support

IBM intends to remove DVD as a delivery medium for the z/VM product or z/VM service in a future z/VM release. Electronic delivery, packaged as a .zip and an .ISO file, will be the only supported mechanism. Clients can copy the contents of an electronic image to a USB device by following instructions provided with their order. Only USB devices supported by the HMC can be used.

What z/VM statements of direction were included with the April 05, 2022 announcement?

Withdrawal of support for TCP/IP LAN Channel Station (LCS) devices

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IBM z16 and IBM® LinuxONE 4 are planned to be the last IBM Z / IBM® LinuxONE server to support the OSE CHPID type, which enables the host to send and receive native SNA-format Ethernet frames using the OSA Express 1000Base-T adapters. z/VM systems that rely on VTAM and utilize External Communications Adapter (XCA) major nodes as the transport should be updated to utilize Channel-to-Channel connections to z/OS so that Enterprise Extender or some other form of SNA-over-IP technology can be used. The OSE chpid type also is used to provide LAN Channel Station (LCS) emulation. With its withdrawal, IBM intends z/VM 7.3 to be the last z/VM release to provide TCP/IP support for the LCS device driver.

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z/VM 7.3 is planned to be the last z/VM release planned to have ESA/390 CMS as the default. A future z/VM release will use z/CMS, renamed "CMS", as the default. ESA/390 CMS, renamed "CMS390", is planned to be available for guests that are dependent on ESA/390 or 370 accommodation.

Resources

IBM z/VM virtualization	www.ibm.com/products/zvm and www.vm.ibm.com/news/
About z/VM	www.vm.ibm.com/overview
z/VM education	z/VM education roadmap z/VM Basic Education Roadmap (videos) z/VM: How to guides (videos)
z/VM Continuous Delivery News	www.vm.ibm.com/newfunction
z/VM Sponsor User program	www.vm.ibm.com/sponsor_user/index.html
z/VM Council	www.vm.ibm.com/sponsor_user/zvm_council.html
IBM Infrastructure Suite for z/VM and Linux	ibm.com/products/infrastructure-suite-zvm-and-linux
IBM Cloud Infrastructure Center	ibm.com/products/cloud-infrastructure-center
Linux on IBM Z	ibm.com/z/linux
KVM on IBM Z and IBM® LinuxONE	ibm.com/products/kvm
IBM Dynamic Partition Manager	ibm.com/docs/en/search/IBM Dynamic Partition Manager (DPM) Guide
Storage Interoperation Center (SSIC)	ibm.com/systems/support/storage/ssic/interoperability.wss
IBM Z	ibm.com/z
IBM® LinuxONE	ibm.com/linuxone
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IBM Corporation
New Orchard Road
Armonk, NY 10504
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LUQ12358-USEN-22