IBM z15 Model T01 and IBM z15 Model T02 provide increased security, resiliency, performance, and flexibility for mission-critical workloads in a hybrid cloud

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Overview

IBM(R) z15(TM) Model T01 and IBM z15 Model T02 are enhanced to help extend the capabilities of the IBM Z(R) family of servers as the platform for mission-critical workloads on a hybrid cloud.

- Tailored Fit Pricing for IBM Z - Hardware Consumption Solution provides always-on additional capacity for short, unpredictable spikes in business-critical IBM z/OS(R) workloads.
- Remote Code Load for IBM Z Firmware optimizes resilience and keeps your IBM Z system up-to-date with the latest features, fixes, and maintenance without requiring a person to be inside the data center to monitor planned updates to your system. Remote Code Load for IBM Z Firmware is available to remotely update the firmware on your IBM Z system.
- Sustainability, as delivered by IBM z15, is designed to support on-going data center sustainability initiatives through integration into modern data center infrastructure management (DCIM) tools.
- IBM Hardware Management Console (HMC) is a hardware appliance that can be used to configure and control one or many managed systems.
- Red Hat(R) OpenShift(R) Container Platform for IBM Z is key to elevating a hybrid cloud journey that combines the containerization and modernization of applications with the strengths of IBM Z.
- IBM Cloud(R) Paks are AI-powered software for hybrid cloud that can help fully implement intelligent workflows in businesses to accelerate digital transformation.
- IBM Cloud Pak(R) for Data on IBM Z accelerates your journey to AI and cloud and is available on Red Hat OpenShift 4.6.
- IBM Cloud Infrastructure Center 1.1.3 provides simplified IaaS management to higher-level cloud automation tools, which includes resizing and live migration for virtual machines and integration.
- Red Hat Ansible(R) Certified Content for IBM Z is an easy-to-use industry standard automation platform for automating IBM Z processes, including z/OS, Linux(R) on Z, IBM Z Hardware Management Console, IBM Z System Automation, IBM Z CICS(R), IBM Z IMS, IBM z/OS Connect Enterprise Edition, IBM UrbanCode(R) Deploy, and more.
- AI on Z is updated to extend the AI capabilities on IBM Z by enriching the ecosystem with Anaconda on Linux on Z and deep learning support.
- IBM Fully Homomorphic Encryption Tool Kit (built with HElib v2.0) can be deployed on IBM Z through z/OS Container Extensions (zCX) or Linux on Z.

- IBM z/OS V2.5 is designed to drive innovative development to support new hybrid cloud and AI business applications. This is accomplished by enabling next-generation systems operators and developers to have easy access and a simplified experience with IBM z/OS, all while relying on the most optimal usage of computing power and resources of IBM Z servers for scale, security, and business continuity.
- IBM z/VM(R) 7.2 is continually improving virtualization technology for traditional and hybrid cloud workloads. Virtualization improvements were delivered post z/VM 7.2 availability through continuous delivery of new functionality in support of this virtualization. Additional z/VM 7.2 new functionality is planned through the first half of 2021.
- KVM virtualization technology for Linux workloads remains available through the Linux Distributor Partners with further enhancements in scalability, security, and resiliency. Contact your Linux distributor partner (Red Hat, SUSE, or Canonical) to confirm the latest supported versions. KVM also supports deployment to RHOCP 4.7 and IBM Cloud Paks, and can be managed by IBM Cloud Infrastructure Center 1.1.3.
- IBM Enterprise Key Management Foundation - Web Edition V2.1 continues to deliver efficient and security-rich centralized key management for IBM z/OS data set encryption. It also supports keys for zkey on Linux on Z and public cloud key management systems on Amazon Web Services, Microsoft™ Azure, and IBM Cloud.
- IBM Z Forward Acceleration Initiative is now extended to the IBM z15 T02 single-frame system to help those clients make the most of their IBM Z investment and accelerate the transformation of their IT infrastructure. The IBM Z Forward Acceleration Initiative enables clients to automatically earn rewards on eligible IBM Z hardware. These rewards can be used for a select set of services. To learn more about this initiative, go to the IBM Z Forward Acceleration Initiative website.

For more information about Tailored Fit Pricing for IBM Z, see the IT Infrastructure website.

Go to the IBM Z and LinuxOne Community to get access to a rich community of business and technical expert blogs and forums. Join the community.

Learn how to maintain the highest levels of availability with personalized, proactive technical support for your IBM systems. Get proactive support.

Key requirements

See the Hardware requirements and Software requirements sections of this announcement.

Planned availability date

May 20, 2021

Description

IBM continues to invest in the IBM Z platform to deliver the capabilities clients' need to meet new business requirements. The IBM z15 family of servers is the result of four years of technological development. IBM continues to enhance IBM z15 by extending the capabilities of the platform for mission-critical workloads in a hybrid cloud. These enhancements make IBM z15 even more flexible, fast, and secure. The latest IBM z15 innovations benefit you across the main pillars of cloud native, encryption everywhere, cyber resiliency, and flexible compute.

Cloud native

Tailored Fit Pricing for IBM Z- Hardware Consumption Solution

- The Tailored Fit Pricing for IBM Z - Software Consumption Solution provides price stability, particularly in an unpredictable hybrid cloud environment. A transformational pricing option with consumption-based pricing for both IBM Monthly License Charge and One Time Charge software at its core, it provides simple, transparent, and predictable pricing for IBM Z software running on the IBM z/OS platform within a given country. The IBM Tailored Fit Pricing options maximize cost predictability, while still supporting optimal response times and SLA compliance.

The new Tailored Fit Pricing for IBM Z- Hardware Consumption Solution provides an always on, consumption-based capacity corridor that provides hybrid cloud flexibility and control for unpredictable workload spikes throughout the day. It helps to scale IT demands and control behavior with a pay-for-use buffer and granular usage measurements.

To be eligible for the new Tailored Fit Pricing for IBM Z- Hardware Consumption Solution, clients are required to be on the latest IBM z15 generation, be utilizing the Tailored Fit Pricing for IBM Z Software Consumption Solution, be committed to IBM Z as a strategic growth platform, and have completed a workload analysis. If you are not yet using the Tailored Fit Pricing for IBM Z Software Consumption Solution, contact your IBM Z Software Representative for more information.

Contact your IBM Z Hardware Representative to determine if you qualify for this offering. If it is determined that Tailored Fit Pricing for IBM Z- Hardware Consumption Solution may be an appropriate solution for a client's unpredictable daily workload, the subscription and maintenance fee will be based upon the size of the clients' variable capacity corridor and the fee for measured usage will be charged if the workload spikes into the corridor. Clients that are outsourcing service providers are not eligible for the Hardware Consumption Solution offering.

IBM Cloud Infrastructure Center 1.1.3

IBM Cloud Infrastructure Center 1.1.3 delivers simplified IaaS management and provides integration to higher-level cloud automation tools. The IBM Cloud Infrastructure Center 1.1.3 benefits include:

- Resizing the IBM z/VM-based and Red Hat Enterprise Linux KVM-based virtual machines through a command-line interface or API
- Live migration for Red Hat Enterprise Linux KVM-based virtual machines from one host to another host with little or no downtime
- Telemetry support through API to consume telemetry monitoring data
- Support for the definition of availability zones and collocation rules to place infrastructure resources into a desired location
- Boot support for persistent storage from IBM System Storage DS8000$^{(R)}$ series, IBM SAN Volume Controller (SVC), and IBM FlashSystem$^{(R)}$ family (FS9200, FS9250, and others) for z/VM
- The ability to attach and detach persistent storage volumes supported for KVM-based virtual machines from DS8000 series, SVC, and the FlashSystem family
- Support for Red Hat Enterprise Linux 7.9 and 8.3 as a guest operating system

IBM Cloud Paks

IBM Cloud Paks tap into the power of IBM Watson$^{(R)}$ to apply AI to your clients' business to help predict and shape future outcomes, automate complex processes, optimize a client's employees' time, and create more meaningful and secure customer experiences. IBM Cloud Paks are built on Red Hat Open Shift so clients can develop applications once and deploy them anywhere on any cloud. Clients can integrate security features across their IT estate and automate operations with management visibility. IBM Cloud Paks have a common foundation of enterprise components that accelerate development, deliver seamless integration, and help enhance collaboration and efficiency.

- IBM Cloud Pak for Integration helps deliver a new, AI-accelerated approach to integration. This approach enables extended teams to create integrations, leverage a complete set of integration styles, and embed AI and automation across the integration lifecycle. IBM Cloud Pak for Integration enables you to meet escalating demand, help reduce costs, and increase operational agility with the capability to include API management, application and data integration, messaging and events, high-speed transfer, and end-to-end security.
- IBM Cloud Pak for Watson AIOps is an AIOps solution that lets you deploy advanced, explainable AI across the ITOps toolchain so that you can confidently assess, diagnose, and resolve incidents across mission-critical workloads. It is a unique application-centric approach to ITOps that helps you automate labor-intensive IT processes and proactively mitigate high-impact events. You can improve responsiveness and reduce risk with AI at the core of your IT operations mission. IBM Cloud Pak for MultiCloud Management (CP4MCM) will be merged as a Hybrid Multi-Cloud Application Management into the AIOps Cloud Pak. As many clients face challenges managing their infrastructure, clusters, and cloud resources using discrete tools, CP4MCM provides a single pane of glass using management interface.

IBM Cloud Pak for Data on Z

IBM Cloud Pak for Data on Z accelerates the journey to AI and cloud and is now available on OpenShift 4.6. It is also still available on OpenShift 4.5. IBM Cloud Pak for Data on IBM Z offers the IBM Cloud Pak for Data capabilities, including the Red Hat OpenShift Container Platform and pre-integrated, certified software to your existing IBM Z infrastructure. This initial release, which was available in November 2020, is focused on the "collect" rung of the AI ladder and includes IBM Cloud Pak foundational services, IBM Db2$^{(R)}$ Management Console, and IBM Db2 Warehouse. Also available is IBM Db2 Advanced Enterprise Server Edition (AESE) and IBM Db2 for z/OS Data Gate (no longer beta).

Cloud Pak for Data on IBM Z helps adapt and transform your enterprise infrastructure as a vital component within your hybrid cloud architecture to compete in today's digital environment.

- Start your journey to AI and the cloud by modernizing your data infrastructure for simpler administration, faster time-to-value, and lower operational costs
- Access your most valuable enterprise data securely within modern hybrid cloud applications
- Provide a modern, private cloud platform while leveraging your existing infrastructure and skills
- Reduce cost and complexity by consolidating existing Db2 databases without cloud-specific rewrites
- Colocate data with business applications that also run on IBM Z to reduce latency, improve performance, and meet SLAs
- Synchronize data between Db2 for z/OS on Z and IBM Cloud Pak for Data on LinuxONE using Db2 Data Gate

Red Hat OpenShift Container Platform 4.7 for IBM Z

Red Hat OpenShift Container Platform 4.7 for IBM Z is an enterprise Kubernetes platform that enables you to develop, deploy, run, and manage your cloud-native solutions. It is the foundation for the IBM Cloud Paks, IBM z/OS Cloud Broker, and other containerized workloads. With Red Hat OpenShift Container Platform 4.7, the platform support is extended to run on Red Hat Enterprise Linux 8.3 KVM-based virtual machines and IBM z/VM-based virtual machines. Red Hat OpenShift add-ons extend the portfolio, such as Red Hat CodeReady Workspaces, Red Hat OpenShift Do developer CLI, Red Hat OpenShift Service Mesh, and Red Hat OpenShift Pipelines Technology.

Red Hat Ansible Certified Content for IBM Z

Red Hat Ansible Certified Content for IBM Z provides the easy-to-use, industry-leading standard automation platform for automating IBM Z processes. On top of the capable and powerful Ansible Automation Platform, Ansible Certified Content

for IBM Z enables users to manage IBM Z resources more simply with Ansible. This enables all IT employees to leverage a single automation platform, with support from both Red Hat and IBM. You can automate use cases today across z/OS, Linux on Z, IBM Z HMC, IBM Z System Automation, IBM Z CICS, IBM Z IMS, IBM z/OS Connect Enterprise Edition, and IBM UrbanCode Deploy.

Encryption everywhere

IBM Enterprise Key Management Foundation - Web Edition V2.1

With IBM Enterprise Key Management Foundation (EKMF) - Web Edition V2.1, all keys are stored in a central repository with metadata, such as activation dates and usage. Backup of these keys is more easily achieved by including the database in existing DB backup procedures. This helps facilitate easy recovery if keys are lost. EKMF can enable your organization to effectively manage high key volumes and potentially improve workflows. Keys are generated based on key templates that determine the attributes of keys, which allows keys to be consistently created on-demand according to the National Institute of Standards Technology (NIST) key state model.

Key generation takes place within the tamper-responsive IBM Crypto Express Card (CEX). Validated by NIST at FIPS 140-2 Level 4, these standards meet the highest level of hardware security module (HSM) certification achievable for commercial cryptographic devices. Configurations can be adjusted to require that two or more persons must be involved to generate, activate, and distribute keys, thus providing dual control for critical operations. Every important activity is logged in an IBM Db2 table for compliance and auditing.

EKMF Web 2.1 generates and manages keys to be used for z/OS data set encryption. It provides a user interface for centralized management of multiple z/OS systems. Existing keys can be imported and managed. A data set dashboard provides an overview of data sets encryption status. EKMF Web 2.1 also supports zkey on Linux on Z and public cloud key management systems on Amazon Web Services, Microsoft Azure, and IBM Cloud.

Flexible compute

HMC features (available in HMC z15 MCL Bundle H25 and z15 SE Bundle S38) include the following:

- BCPii v2: This new BCPii v2 infrastructure provides the ability to send REST API information through the z/OS Base Control Program internal interface (BCPii). These features immediately provide significant additional HMC/SE functionality over what is currently available through BCPii. This also enables future HMC/SE automation across BCPii to immediately become available as new Web Services API support becomes available in the HMC/SE.
- LDAP group membership: The HMC and SE will now let HMC users become a part of LDAP group membership. This enables users to manage elevating HMC user privileges by defining the prioritized order of LDAP groups associated with HMC user templates. It then enables centralized management for those HMC users by enabling clients to manage the LDAP group membership of the HMC users at the LDAP server.
- Remote Syslog Server enhancements: HMC support for Remote Syslog Servers for IBM Z HMC log/message consolidation was first released on IBM z15 HMC version 2.15.0. Since its initial offering, enhancements are now available for support of IBM z14[R] Central Processor Complex (CPCs), HMC Data Replication, Transport Layer Security (TLS) connections, and IBM QRadar[R].
- The IBM Z Forward Acceleration Initiative was announced for the IBM z15 multi-frame system in 2020. IBM is now extending this program to include the IBM z15 T02 single-frame system to help clients make the most of their IBM Z investment and help accelerate the transformation of their IT infrastructure. Clients earn reward weeks on their purchased, eligible IBM z15 hardware, which can be used on a select set of IBM Z Forward Acceleration Initiative services to help expedite the adoption of new technologies. For IBM z15 T02, rewards will be granted on

all eligible systems shipped on, or after, April 1, 2021. To learn more about this initiative, go to the IBM Z Forward Acceleration Initiative website.

Sustainability

IBM has had long-standing corporate policies aimed at protecting the environment and conserving energy and natural resources. The IBM Product Design for the Environment program was established in 1991 to focus on product environmental design. The IBM z15 is a transformed system that was designed for overall data center sustainability. IBM Z provides several tools, available with IBM z15, to help support data center sustainability initiatives.

- Single-system performance reduces energy consumption by 50% compared to the x86 systems running a similar workload.[1]

- IBM z15 can be integrated into modern data center infrastructure management system through a set of security-enabled, REST-based Web Services APIs. The Web Service API metrics groups allow IBM z15 to report key environmental and power consumption data, including ambient temperature and humidity, heat load, exhaust temperature, system power consumption, and power on each line cord phase.

  Available on Github, the zhmcclient package is a client library written in pure Python that interacts with the Web Services API of the HMC on Z machines. This package is designed to make the HMC Web Services API more easily consumable for Python programmers.

- IBM Z Energy Optimization Advisor provides insights into the operation of the IBM Z system and recommends data center actions that can be taken to reduce the overall system power. The advisor provides insight to data center operators, accessed through the user interface on the SE and HMC or through the Web Services API endpoints, about what actions they can take to save power.

Remote Code Load for IBM Z Firmware

Remote Code Load for IBM Z Firmware optimizes resilience and keeps your IBM Z system up-to-date with the latest features, fixes, and maintenance without requiring a person to be inside the data center monitoring planned updates to your system. Remote Code Load for IBM Z Firmware is available to remotely update the firmware on your IBM Z system.

z/VM 7.2 continuous improvements

z/VM 7.2 continually improves virtual server scalability, management, security, and resiliency through continuous delivery through New function APARs. An overview of available and planned new function visualization enhancements can be found on the z/VM Continuous Delivery News web page. Significant z/VM 7.2 New function APARs that are planned to be available during the first half of 2021 include:

Scalability

- 4 TB real memory support: With the available PTF for APAR VM66173, z/VM delivers support for up to 4 TB of real memory, enabling z/VM systems to address a full 4 TB of first-level (real) memory, doubling the previous supported limit of 2 TB. With the advanced memory management capabilities available in the z/VM product, clients can now have the ability to run workloads that exceed 4 TB of virtual memory across all hosted guest systems, depending on workload characteristics. In conjunction with z/VM support for 80 processors, IBM Z servers can now host even more work in a single z/VM partition, or across multiple z/VM partitions on one system. APAR VM66173 also delivers various system command updates and an enhancement to the CP DEFINE STORAGE command. With automatic STANDBY memory for guests, your system administrator can code a more generic DEFINE STORAGE command that does not need to be updated every time the guest's directory entry storage size changes.
- Improved PCIe adapter guest performance: With the available PTF for APAR VM66467, improvements in how z/VM simulates certain guest instructions to

enable z/VM to reduce the number of corresponding real instructions it issues on behalf of the guest. This may result in a performance improvement for guest workloads using RoCE and NVMe PCI devices.

Management

- IPv6 Layer 2 Query Support: With the planned PTF for APAR VM66485, VSwitch support is enhanced to collect and report IPv6 addresses on the Query Vswitch, Query Virtual NIC, and DIAG 26C. As IPv6 usage becomes more prevalent, this information will be more important for diagnostics.
- Spool information enhancements for storage migrations and backups: With the available PTF for APAR VM66479, z/VM enhances spool subsystem interfaces to provide additional information. These extensions to the existing interfaces enable clients to manage spool files and volumes more effectively. This support enables spool management software, such as the IBM Operations Manager for z/VM, to facilitate client DASD migration and backup activities.

Security

- TLS / SSL OCSP Support: With the available PTF for APAR PH28216, z/VM provides general peer certificate cross-checking against an external source, through the Online Certificate Status Protocol (OCSP) and Certificate Revocation List (CRL) Distribution Point (CDP) mechanisms that are part of the z/VM System SSL Cryptographic library, when the peer certificate is built with the extensions for CDP and OCSP.
- TLS Server Upgrade based on z/OS 2.3: With the planned PTF for PAR PH33088, the System SSL cryptographic library is updated to be based on z/OS 2.3 equivalency. This enhancement includes the addition of RFC 7507, which implements support for TLS Fallback Signaling Cipher Suite Value for Preventing Protocol Downgrade Attacks.

Resiliency

- Dynamic Memory Downgrade Support: With the planned PTF for APAR VM66271, 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. Dynamic Memory Downgrade complements the existing ability to add memory to a system.
- Dump improvements

  - Fast z/VM Dump Distiller: With the available PTF for APAR VM66430, clients can distill a hard abend or snap dump to create an abridged dump, which can be submitted to IBM Customer Support for diagnosis. The abridged dump alleviates the problems and delays that can occur when submitting a large hard abend dump or snap dump to IBM. The original dump remains available as a spool file and can be loaded into a CMS file for later transmission to IBM, if necessary.
  - Improve I/O time for dump processing: With the available PTF for APAR VM66431, z/VM exploits IBM Z High Performance FICON I/O technology (zHPF), when available, during the process of writing CP hard abend and snap dumps to CP dump/spool space. This reduces the amount of time a system is unavailable while a dump is being taken, before the system restarts.

- Improved Live Guest Relocation for Shared Crypto Users: With the planned PTF for APAR VM66496, Live Guest Relocation (LGR) for APVIRT crypto environments is enabled when the type of the shared crypto resource on the source system does not match the type of shared crypto resource on the target system. QUERY VIRTUAL CRYPTO on any system in a relocation domain will report the lowest level of crypto express adapters available in the shared pools of all systems in a relocation domain. By reporting the functional capability of the lowest level adapter, APVIRT crypto users will be able to determine the level of functionality that can be used to enable relocation between systems in the relocation domain without using the FORCE ARCHITECTURE option.

[1] **Disclaimer:** The compared z15 T01 model consists of three CPC drawers containing 108 IFLs and one I/O drawer to support both network and external storage. Power$^{(R)}$ consumption for the z15 T01 is estimated using the Power Estimation Tool for 8561 assuming a "normal" workload. x86 systems ran at various CPU utilizations according to 15 customer surveys, representing

Development, Test, Quality Assurance, and Production levels of CPU utilization and throughput. Three workloads were tested, consisting of a mix of leading databases and application servers. Each workload ran at the same throughput and SLA response time on IBM Z and x86. Power consumption on x86 was measured while each system was under load.

z15 T01 performance data and the number of IFLs were projected from actual z14 performance data, including a performance improvement of 10% on z15 T01. Compared x86 models were seventy-eight 2-socket servers containing a mix of 8-core, 12-core, and 14-core Xeon x86 processors.

External storage is common to both platforms and is not included in power consumption and assumes IBM Z and x86 are running 24/7/365. Power consumption may vary depending on factors such as configuration, workloads, and so on. Energy cost savings on a US national average commercial power rate of $0.10 per kWh, based on US Energy Information Administration (EIA) data (individual rates may vary). Savings assumes a power usage effectiveness (PUE) ratio of 1.66 to calculate additional power for data center cooling. PUE is based on IBM and the Environment - Climate protection - Data center energy efficiency data.

Section 508 of the US Rehabilitation Act

When used in accordance with the IBM associated documentation, z15 servers are capable on delivery of satisfying the applicable requirements of Section 508 of the Rehabilitation Act of 1973, 29 U.S.C. Section 794d, as implemented by 36 C.F.R. Part 1194, provided that any assistive technology used with the product properly interoperates with it.

IBM makes no representation about the Section 508 status of third-party products included in this offering. Contact the vendor for specific, current information on the Section 508 status of these products.

Statement of general direction

Capacity for Planned Events (CPE): IBM z15 is planned to be the last server to offer Capacity for Planned Events.

CF Dynamic Dispatching (DYNDISP) Options: IBM z15 is planned to be the last server to support CF DYNDISP options other than Thin Interrupt (THIN) for coupling facility images with shared processors.

HMC (Hardware Management Console)/SE (Support Element) Default Users: IBM z15 is planned to be the last server to ship HMC (Hardware Management Console) and SE (Support Element) default user IDs of ADVANCED, OPERATOR, STORAGEADMIN, and SYSPROG. For future systems, the default user roles for ADVANCED, OPERATOR, STORAGEADMIN, and SYSPROG will be shipped, but the user IDs will no longer be included. HMC/SE default user IDs for ACSADMIN and SERVICE will continue to be shipped on future systems.

Future OSE elimination: Many IBM Z clients continue to rely on SNA applications for mission-critical workloads, and IBM has no current plans to discontinue support of the SNA protocol, including the SNA APIs. However, IBM Z support for the Systems Network Architecture (SNA) protocol being transported natively out of the server using OSA Express 1000BASE-T adapters configured as channel type "OSE" will be eliminated in a future hardware system family. Client applications that rely on the SNA protocol and utilize OSE networking channels as the transport (as opposed to FICON[R] CTC) must either modernize to utilize TCP/IP or the networking configuration of the operating system image must be updated to make use of some form of SNA over IP technology, where possible, such as z/OS Enterprise Extender. Across the computer industry, support for the native SNA protocol, LLC2, on distributed platforms is now being withdrawn, such that native SNA connectivity to the mainframe will eventually be rendered largely useless. As these accommodations may take a significant amount of time to implement, IBM Z is providing notice of these plans and is encouraging clients to begin or accelerate their

SNA modernization efforts now in order to ensure they do not experience a business interruption in the future.

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.

Reference information

For more information about z/VM 7.2, see Software Announcement 220-305, dated August 04, 2020.

For more information about the z/VM 7.2 Preview, see Software Announcement 220-088, dated April 14, 2020.

For more information about IBM z15 T02, see Hardware Announcement 120-006, dated April 14, 2020.

For more information about IBM LinuxONE III, see Hardware Announcement 119-012, dated September 12, 2019.

For more information about IBM Wave for z/VM 1.2, see Software Announcement 219-413, dated September 12, 2019.

For more information about IBM Data Privacy Passports 1.0 beta program, see Software Announcement 219-452, dated September 12, 2019.

For more information about IBM Data Privacy Passports 1.0, see Software Announcement 220-062, dated March 10, 2020.

For more information about the IBM z/OS 2.5 Preview, see Software Announcement 221-057, dated March 01, 2021.

For more information about IBM z/OS 2.4, see Software Announcement 219-344, dated July 23, 2019.

For more information about IBM z14[R] ZR1, see Hardware Announcement 118-018, dated April 10, 2018.

Product number

Description	Machine type	Model	Feature number
IBM z15	8561	T01	
IBM z15	8562	T02	
TFP Monthly Sub 1 MSU			0253
TFP Monthly Sub 100 MSU			0254
TFP Monthly Sub 10000 MSU			0255
Prepaid TFP Sub 1 MSU			0256
Prepaid TFP Sub 100 MSU			0257
Prepaid TFP Sub 10000 MSU			0258

TFP Subscription Months			0259
TFP Hourly 1 MSU			0260
TFP Hourly 100 MSU			0261
TFP Hourly 10000 MSU			0262
TFP Daily 1 MSU			0263
TFP Daily 100 MSU			0264
TFP Daily 10000 MSU			0265
TFP for Z HW Authorization			9932

Note: If field installed on a purchased machine, parts removed or replaced become the property of IBM and must be returned.

Feature conversions

Not applicable.

Publications

The following publications are available now in the Library section of the Resource Link(R) website:

Title	Order number
IBM 8561 Installation Manual for Physical Planning (IMPP)	GC28-7002
IBM 8562 Installation Manual for Physical Planning (IMPP)	GC28-7011
IBM 8561 Installation Manual for Physical Planning (IMPP) - Russian version	GC28-7004
IBM 8562 Installation Manual for Physical Planning (IMPP) - Russian version	GC28-7008
PR/SM Planning Guide	SB10-7175
IOCP User's Guide for ICP IOCP	SB10-7172
Planning for Fiber Optic Links (FICON/ FCP, Coupling Links, OSA, and zHyperLink Express)	GA23-1408

The following publications are shipped with the product and will be available at planned availability in the Library section of the Resource Link website:

Title	Order number
IBM 8561 Installation Manual	GC28-6997
IBM 8562 Installation Manual	GC28-7009
IBM 8561 Service Guide	GC28-6998
IBM 8562 Service Guide	GC28-7010
IBM 8561 Safety Inspection	GC28-6996
IBM 8562 Safety Inspection	GC28-7007
Service Guide for TKE Workstations (Version 7.0)	GC28-6980
Systems Safety Notices	G229-9054
IBM Important Notices	G229-9056
IBM Z Statement of Limited Warranty	GC28-6979
License Agreement for Machine Code	SC28-6872
License Agreement for Machine Code Addendum for Cryptography	GC27-2635
Systems Environmental Notices and User Guide	Z125-5823

The following publications will be available at planned availability in the Library section of the Resource Link website:

Title	Order number
IBM 8561 Parts Catalog	GC28-7003
IBM 8562 Parts Catalog	GC28-7012
Service Guide for 2461 Hardware Management Console	GC28-6990
Service Guide for 2461 Support Element	GC28-6991
SNMP Application Programming Interfaces	SB10-7171
Capacity on Demand User's Guide	SC28-6985
CHPID Mapping Tool User's Guide	GC28-6984
Hardware Management Console Web Services API (V2.15.0)	SC27-2638
IBM Dynamic Partition Manager (DPM) Guide	SB10-7176
Secure Service Container User's Guide	SC28-7005
Stand-Alone IOCP User's Guide	SB10-7173
FICON CTC Reference	SB10-7174
Maintenance Information for Fiber Optics (FICON/FCP, Coupling Links, OSA, and zHyperLink Express)	SY27-7696
Integrating the HMC's Broadband RSF into your Enterprise	SC28-6986
Hardware Management Console Security	SC28-6987
SCSI IPL - Machine Loader Messages	SC28-7006
OSA-Express Customer's Guide and Reference	SA22-7935
OSA/SF on the Hardware Management Console	SC14-7580
OSA Integrated Console Controller User's Guide	SC27-9003

Resource Link: Publications for IBM Z can be obtained at the Resource Link website.

Using the instructions on the Resource Link panels, obtain a user ID and password. The Resource Link website has been designed for easy access and navigation.

HMC and SE console documentation

At planned availability, the Hardware Management Console (HMC) and Support Element (SE) console documentation (Version 2.15.0) will be available from the Resource Link website and the consoles.

You can also find HMC videos at the IBM Z Hardware Management Console Videos website.

To access the IBM Publications Center Portal, go to the IBM Publications Center website.

The Publications Center is a worldwide central repository for IBM product publications and marketing material with a catalog of 70,000 items. Extensive search facilities are provided. A large number of publications are available online in various file formats, which can currently be downloaded.

Services

IBM Lab Services

IBM Lab Services offers a wide array of services available for your enterprise. It brings expertise on the latest technologies from the IBM development community and can help with your most difficult technical challenges.

IBM Lab Services exists to help you successfully implement emerging technologies so as to accelerate your return on investment and improve your satisfaction with your IBM systems and solutions. Services examples include initial implementation, integration, migration, and skills transfer on IBM systems solution capabilities and recommended practices. IBM Lab Services is one of the service organizations of IBM's world-renowned IBM Systems Group development labs.

For details on available services, contact your IBM representative or go to the Lab Services website.

Global Technology Services

IBM services include business consulting, outsourcing, hosting services, applications, and other technology management.

These services help you learn about, plan, install, manage, or optimize your IT infrastructure to be an on-demand business. They can help you integrate your high-speed networks, storage systems, application servers, wireless protocols, and an array of platforms, middleware, and communications software for IBM and many non-IBM offerings. IBM is your one-stop shop for IT support needs.

For details on available services, contact your IBM representative or go to the IBM Global Technology Services[R] website.

For details on available IBM Business Continuity and Recovery Services, contact your IBM representative or go to the Resiliency Services website.

Details on education offerings related to specific products can be found on the IBM Skills Gateway website.

Technical information

Specified operating environment

Hardware requirements

The hardware requirements for the IBM Z servers, features, and functions are included below.

Hardware Management Console (HMC) 2.15.0 plus MCLs and the Support Element 2.15.0 became available on September 23, 2019. Review the PSP buckets for minimum Machine Change Levels (MCLs) and software PTF levels before restarting your operating systems.

The new functions available on HMC 2.15.0, as described, apply to IBM z15. However, HMC 2.15.0 will also support the systems listed in the table below:

Machine family	Machine type	Firmware driver	SE version
z14	3906	36	2.14.1
z14	3906	32	2.14.0
z14 ZR1	3907	36	2.14.1
z14 ZR1	3907	32	2.14.0
z13[R]	2964	27	2.13.1
z13s[R]	2965	27	2.13.1

The hardware requirements for Tailored Fit Pricing for the IBM Z Hardware Consumption Solution include:

- All machines must be IBM z15 Models T01 or z15 Model T02.

- Tailored Fit Pricing for IBM Z Software Consumption Solution.
- IBM z/OS V2.2, or later, operating system.
- Resource Link enablement.
- Tailored Fit Pricing for IBM Z Hardware Consumption Solution workload analysis.
- Outsourcing service providers are not eligible.
- Additional requirements for the Hardware Consumption Solution include:
  - Use of the IBM Sub-Capacity Reporting Tool (SCRT) V28.1, or later, according to the requirements and guidelines in the SCRT Users Guide.
  - Use of SCRT for each reporting period and submission of the resulting SCRT report to IBM monthly.

Software requirements

Tailored Fit Pricing for IBM Z- Hardware Consumption Solution requires at a minimum:

- z/OS 2.4 with PTFs
- z/OS 2.3 with PTFs
- z/OS 2.2 with PTFs
- SCRT 28.1

IBM Hardware Management Console Enhancements requires at a minimum:

- z/OS 2.4 with APAR OA60351

IBM Fully Homomorphic Encryption requires at a minimum:

- Docker 20 (running on a Linux distribution)
- Docker 19 (running on a Linux distribution)
- z/OS Container Extensions (zCX)

AI on Z requires at a minimum:

- z/OS 2.4
- z/OS 2.3
- z/OS 2.2
- Watson Machine Learning for z/OS 2
- Watson Machine Learning for z/OS 2.1
- Red Hat OpenShift Container Platform 4.6
- Red Hat OpenShift Container Platform 4.5
- IzODA 1.1.0
- z/VM 7.2 for Guest Exploitation
- z/VM 7.1 for Guest Exploitation

IBM Cloud Infrastructure Center requires at a minimum:
- As a managed hypervisor, one of the following:
  - z/VM 7.2
  - z/VM 7.1
  - KVM based on Red Hat Enterprise Linux (RHEL) 8.3
  - KVM based on RHEL 8.2

- As a host environment on z/VM or KVM one of the following:
  - RHEL 8.3
  - RHEL 8.2

Red Hat OpenShift Container Platform 4.7 requires at a minimum a virtual machine based on one of the following:

- z/VM 7.2
- z/VM 7.1
- KVM based on RHEL 8.3

Red Hat OpenShift Container Platform 4.6 requires at a minimum a virtual machine based on one of the following:
- z/VM 7.2
- z/VM 7.1

IBM Cloud Paks requires at a minimum:

- Red Hat OpenShift Container Platform 4.6

IBM Cloud Pak for Data on Z requires at a minimum:

- Red Hat OpenShift Container Platform 4.6

KVM virtualization technology for Linux workloads requires at a minimum:

- RHEL 8.3
- RHEL 8.2
- RHEL 8.1
- SUSE Linux Enterprise Server (SLES) 15 SP2 maintweb
- SLES 15 SP1 maintweb
- SLES 12 SP5 maintweb
- SLES 12 SP4 maintweb
- SLES 12 SP3 maintweb
- Canonical Ubuntu 20.04 LTS
- Canonical Ubuntu 18.04 LTS
- Canonical Ubuntu 16.04 LTS

IBM Enterprise Key Management Foundation - Web Edition V2.1 requires at a minimum:
- IBM WebSphere[(R)] Liberty 21.0.0.3
- Java[TM] SDK80 SR6 FP26 with APAR PH34993
- z/OS V2.4
- z/OS V2.3
- Db2[(R)] V12
- Runtime libraries for Language Environment[(R)] (LE)
- Integrated Cryptographic Service Facility (ICSF)
- IBM Crypto Express Card (CEX)

Planning information

Client responsibilities

Information on customer responsibilities for site preparation can be found in the Library section of the Resource Link website.

Cable orders

Not applicable.

Security, auditability, and control

IBM z15 uses the security and auditability features and functions of host hardware, host software, and application software.

The client is responsible for evaluation, selection, and implementation of security features, administrative procedures, and appropriate controls in application systems and communications facilities.

IBM Lab Services

For details on available services, contact your IBM representative or go to the Lab Services website.

Terms and conditions

For terms and conditions for IBM z15 machine types 8561 and 8562, see the hardware announcements listed in the Reference information section.

Prices

For additional information and current prices, contact your local IBM representative or IBM Business Partner.

Description	Machine type	Model	Feature number	Price	**	EWFe	MMMC indicator	INIT/ MES
IBM z15	8561	T01			**		x	
IBM z15	8562	T02			**		x	
TFP Monthly Sub 1 MSU			0253		**			MES
TFP Monthly Sub 100 MSU			0254		**			MES
TFP Monthly Sub 10000 MSU			0255		**			MES
Prepaid TFP Sub 1 MSU			0256		**			Both
Prepaid TFP Sub 100 MSU			0257		**			Both

Prepaid TFP Sub 10000 MSU	0258	**		Both
TFP Subscription Months	0259	**		Both
TFP Hourly 1 MSU	0260	**		MES
TFP Hourly 100 MSU	0261	**		MES
TFP Hourly 10000 MSU	0262	**		MES
TFP Daily 1 MSU	0263	**		MES
TFP Daily 100 MSU	0264	**		MES
TFP Daily 10000 MSU	0265	**		MES
TFP for Z HW Authorization	9932	**		Both

** If field installed on a purchased machine, parts removed or replaced become the property of IBM and must be returned.

Feature conversion purchase price

Not applicable.

Trademarks

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