



KVM for IBM z Systems delivers simple, robust, cost-effective server virtualization built on standard open source code for Linux workloads running on IBM z Systems

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At a glance

Organizations are challenged to drive new business opportunities while reducing budgets, managing increased IT complexity, and improving staff productivity. Although cost considerations are important, businesses are looking at other benefits of open source solutions, such as interoperability, flexibility, and access to the underlying code in their systems to address their challenges. With KVM for IBM z Systems™ (KVM for IBM z™), IT organizations can unleash the power of Kernel-based Virtual Machine (KVM) open virtualization, to improve productivity, and to simplify administration and management for a quick start on their journey to a highly virtualized environment on IBM z Systems.

IBM now has three strategic virtualization platforms: IBM z/VM[®], IBM PR/SM™, and KVM for IBM z Systems. KVM for IBM z provides open source virtualization for the z Systems™ platform. This open source solution for running virtual servers on z Systems servers enables cloud deployments and big data solutions while reducing complexity and cost. Using the combination of KVM virtualization and z Systems, you have the performance and flexibility to address the requirements of multiple, differing Linux™ workloads. KVM-based virtualization on z Systems allows businesses to reduce costs by deploying fewer systems to run more workloads, sharing resources, and improving service levels to meet demand. KVM for IBM z:

- Enables x86 workload consolidation and deployment on z Systems using KVM to help reduce operational costs.
- Uses standard interfaces to enable single cross-platform virtualization and help simplify systems management.
- Uses Linux administrative skills to allow for simplicity and familiarity for non-z Systems users, leading to greater operational efficiencies.
- Easily integrates into existing cloud environments and accelerates cloud deployments by seamlessly working with OpenStack.
- Runs your Linux workloads on z Systems, one of the most trusted, scalable, available, reliable, and highly secure platforms.
- Enhances performance, utilization, and delivery of service by allowing business applications to remain active while the workload is relocated for either load balancing or scheduled downtime.
- Provides flexibility and automatic provisioning of computing resources, as needed, to meet changing server demands, in order to maintain service at a constant, high utilization rate.

- Can co-exist with z/VM virtualization environments, Linux on z Systems, z/OS^(R), z/VSE^(R), and z/TPF in different LPARs.

Overview

KVM for IBM z is an open virtualization solution offered for z Systems servers that will provide simple, robust, cost-effective server virtualization for Linux workloads running on the z Systems platform. KVM for IBM z delivers server virtualization based on open source KVM Linux technology. KVM for IBM z virtualization technology enables you to share real compute, memory, and I/O resources through server virtualization. KVM for IBM z is installed on z Systems processors similar to an operating system and can coexist with z/VM virtualization environments, Linux on z Systems, z/OS, z/VSE, and z/TPF. KVM for IBM z is optimized for the z Systems architecture for scalability, performance, security, and resiliency and provides standard Linux and KVM interfaces for simplified operational control of the environment.

KVM for IBM z virtualization enables optimization through the overcommitment of resources like CPU and memory, providing superior resource usage, flexibility, and agility to help reduce costs through economies of scale. With KVM for IBM z, you can move virtual servers and workloads using live migration without taking application downtime to help increase overall availability and flexibility to meet client demands. KVM for IBM z is managed like other platforms, with **libvirt**, OpenStack, and other open Linux tools. Standard KVM interfaces allow for simplicity and familiarity for non-z Systems Linux users, reducing operational inefficiencies.

This is the initial release of KVM for IBM z and is just the beginning. IBM will drive a more agile development approach with KVM for IBM z to react faster to client and marketplace requirements.

KVM for IBM z provides many features that enable open server virtualization:

- KVM hypervisor supports running multiple disparate Linux instances on a single system.
- Processor sharing supports the sharing of CPU resources by virtual servers.
- I/O virtualization enables sharing of I/O resources among virtual servers to enable better utilization.
- Live virtual server migration enables workload migration with minimal impact.
- Dynamic addition and deletion of virtual I/O devices helps eliminate downtime to modify I/O device configurations for virtual servers.
- Thin-provisioned virtual servers support copy-on-write virtual disks which saves on storage by not needing full disks until used.
- Support is provided for policy-based, goal-oriented monitoring and management of virtual server CPU resources.
- Installation and configuration tools are provided to install and configure KVM.

Key prerequisites

KVM for IBM z requires one of the following z Systems:

- IBM z13TM
- IBM zEnterprise^(R) EC12 (zEC12)
- IBM zEnterprise BC12 (zBC12)

KVM for IBM z requires SUSE Linux Enterprise Server (SLES) 12 SP1.

Refer to *KVM for IBM z Systems: Planning and Installation Guide*(SC27-8236) for the most current information.

Planned availability date

September 18, 2015

Description

Functional capabilities

- **Processor virtualization:** Processor resources are scheduled out of a shared pool of resources for the virtual servers running on the host. Using KVM's processor virtualization on z Systems allows businesses to reduce costs by deploying fewer physical systems to run more workloads, sharing resources and improving service levels.
- **Input/output (I/O) virtualization:** KVM for IBM z supports an array of virtualized I/O configurations including Fibre Channel (FC) and Enhanced Count Key Data (ECKD™) storage and OSA network cards.
- **Memory virtualization:** The memory given to a guest virtual server is virtualized memory that is managed just as in a regular Linux system so that memory can be overcommitted and swapped out when inactive.
- **Live virtual server migration:** KVM for IBM z supports live migration of virtual servers between z Systems servers virtualized with the KVM for IBM z technology, allowing business applications to remain active while the workload is relocated for either load balancing or scheduled downtime.

KVM for IBM z includes the following functions:

- KVM hypervisor: Supports running multiple disparate Linux instances on a single system
- Processor sharing: Supports sharing of CPU resources by virtual servers
- I/O virtualization: Enables sharing of physical I/O resources among virtual servers to enable better utilization
- Memory and CPU overcommitment: Supports overcommitment of memory and swapping of inactive memory
- Live virtual server migration: Enables workload migration with minimal impact
- Dynamic addition and deletion of virtual I/O devices: Helps eliminate downtime to modify I/O device configurations for virtual servers
- Thin provisioned virtual servers: Supports copy-on-write virtual disks which saves on storage by not needing full disks until used
- Hypervisor performance management: Supports policy-based goal-oriented monitoring and management of virtual server CPU resources
- Installation and configuration tools: Supplies tools to install and configure KVM
- Transactional Execution (TX) exploitation: Supports improved performance of multi-threaded applications when running on supported servers

Management

KVM for IBM z is built from a Linux base. Therefore, Linux administration command line interfaces (CLIs) can be used to administer the hypervisor. In addition, KVM for IBM z supports the **libvirt** APIs. Tools that support these CLIs and APIs can be used for virtualization and hypervisor management.

IBM advanced virtualization and cloud administration solutions, such as IBM Cloud Manager, can also be used to manage KVM for IBM z.

Accessibility by people with disabilities

A US Section 508 Voluntary Product Accessibility Template (VPAT) containing details on accessibility compliance can be requested at

Product positioning

KVM for IBM z is an open virtualization alternative for z Systems built on Linux and KVM. This offering is an ideal choice for clients who want open virtualization while taking advantage of the robustness, scalability, and security of the z Systems platform. KVM delivers a Linux-familiar administrator experience that can enable simplified virtualization management and operation. The standard interfaces that it provides allow for easy integration into existing infrastructure and cloud offerings.

Reference information

For information about IBM Cloud Manager for OpenStack for z Systems, refer to Software Announcements [AP15-0103](#), dated February 24, 2015 and [AP14-0361](#), dated September 9, 2014.

For information about the IBM z Systems servers, refer to:

- IBM z13 Hardware Announcement [AG15-0001](#), dated January 14, 2015.
- IBM zEnterprise EC12 Hardware Announcements
 - [AG13-0131](#), dated July 23, 2013.
 - [WP12-0095](#), dated August 14, 2012.
- IBM zEnterprise BC12 Hardware Announcement [AG13-0134](#), dated July 23, 2013.

Program number

Program number	VRM	Program name
5648-KVM	1.1.0	KVM for IBM z Systems
5648-KVS	1.1.0	KVM for IBM z Systems S&S

Education support

IBM training provides education to support many IBM offerings. Descriptions of courses for IT professionals and managers are on the IBM training website

<http://www.ibm.com/services/learning/>

Contact your IBM representative for course information.

Offering Information

Product information is available via the Offering Information website

<http://www.ibm.com/common/ssi>

Publications

The KVM for IBM z product information includes publications in Adobe™ PDF format and one license information DVD:

Title	Order number
KVM for IBM z Systems: License Information	GI13-3465
KVM for IBM z Systems: Planning and Installation Guide	SC27-8236
KVM for IBM z Systems: System Administration Guide	SC27-8237
Linux on z Systems: Virtual Server Management	SC34-2752
Linux on z Systems: Virtual Server Quick Start	SC34-2753
Linux on z Systems: Device Drivers, Features, and Commands for Linux as a KVM Guest	SC34-2754
Linux on z Systems: Installing SUSE Linux Enterprise Server 12 as a KVM Guest	SC34-2755

One copy of the license information DVD (*KVM for IBM z Systems V1.1 Agreements and License Information*, LY27-8238) is supplied with KVM for IBM z Systems when physical media is ordered. When ordering KVM from Shopz, the license information can also be viewed or downloaded from Shopz.

The IBM Knowledge Center provides access to KVM documentation at product availability and can be accessed at

<http://www.ibm.com/support/knowledgecenter/linuxonibm/>

The IBM Knowledge Center is the new home for IBM product documentation. You can customize the Knowledge Center to design the experience that you want with the technology, products, and versions that you use and by creating your own collection of documents, and you can also interact with IBM and with your colleagues.

The KVM for IBM z publications in PDF format can be obtained from the IBM Publications Center at

<http://www.ibm.com/e-business/linkweb/publications/servlet/pbi.wss>

The IBM 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 languages and file formats, and they can be downloaded by all countries, free of charge. Payment options for orders of physical media are via credit card (in the USA) or customer number for 20 countries.

You can view a PDF file using the Adobe Reader, which is available free from the Adobe website at

<http://www.adobe.com>

You can also print the entire publication or just the section in which you are interested.

KVM for IBM z product page

For current information on KVM and for related resources, refer to the following websites:

<http://www.ibm.com/systems/z/solutions/virtualization>

<http://www.ibm.com/systems/z/solutions/virtualization/kvm/>

<http://www.ibm.com/systems/kvm/>

IBM Redbooks^(R) and Redpapers^(TM) are developed and published by the IBM International Technical Support Organization (ITSO). They are intended to develop

and deliver skills, technical know-how, and materials to IBM technical professionals, IBM Business Partners, clients, and the marketplace in general.

IBM Redbooks can be found at

<http://www.redbooks.ibm.com>

Technical information

Specified operating environment

Hardware requirements

KVM for IBM z requires one of the following IBM z Systems servers:

- z13™
- zEnterprise EC12
- zEnterprise BC12
- IBM LinuxONE Emperor
- IBM LinuxONE Rockhopper

For additional information on IBM LinuxONE, refer to

<http://www.ibm.com/systems/z/os/linux/linux-one.html>

Prior to installing, refer to the following Preventive Service Planning (PSP) buckets for the minimum MCL level and any required updates or PTFs:

- 2964DEVICE for the z13
- 2827DEVICE for the zEnterprise EC12 (zEC12)
- 2828DEVICE for the zEnterprise BC12 (zBC12)

The following networking features are supported:

- IBM OSA-Express5S.
- IBM OSA-Express4S.
- IBM OSA-Express3S (zEC12 and zBC12 only) - OSA-Express3S in KVM for IBM z does not support using VLANs or flat networks together with OpenVSwitch.

Note: Refer to the PSP bucket for your particular z Systems server for the required microcode level for IBM OSA-Express5S and IBM OSA-Express4S.

The following storage devices are supported:

- ECKD™ DASD:
 - DS8000^(R) (FICON-attached)
- FCP SCSI disks:
 - XIV^(R)
 - Storwize^(R) V7000
 - FlashSystems
 - SAN Volume Controller
 - DS8000 (FCP-attached)

Refer to *KVM for IBM z Systems: Planning and Installation Guide*(SC27-8236) for the most current information.

Software requirements

KVM for IBM z requires Linux on z Systems.

- In order to operate Linux on z Systems as a guest of KVM for IBM z, a Linux on z Systems distribution must be obtained from a Linux Distribution Partner.
- KVM for IBM z supports SUSE Linux Enterprise Server (SLES) 12 SP1.

Refer to *KVM for IBM z Systems: Planning and Installation Guide* (SC27-8236) for the most current information.

For current promotional pricing for Linux distributions, refer to

<http://www.ibm.com/systems/z/os/linux/index.html>

For guest installation information, see documentation listed in the [Publications](#) section.

The program's specifications and specified operating environment information may be found in documentation accompanying the program, if available, such as a readme file, or other information published by IBM, such as an announcement letter. Documentation and other program content may be supplied only in the English language.

Limitations

Refer to usage restrictions in the [Terms and conditions](#) section of this announcement, or to the license information document that is available on the IBM Software License Agreement website

<http://www.ibm.com/software/sla/sladb.nsf>

Planning information

Customer responsibilities

If you want the level of service provided under the IBM ICA license agreement with z Systems, you are strongly encouraged to order the program number for KVM for IBM z Systems Subscription and Support (S&S), 5648-KVS. This program number provides enhanced support that includes telephone assistance (voice support for defects during normal business hours) and access to updates, releases, and versions of the program for as long as support is in effect. KVM for IBM z Systems S&S will be automatically added to your order. If you do not want the S&S license for KVM for IBM z Systems, you must take specific action to decline this support.

Packaging

KVM for IBM z

The KVM for IBM z product package is distributed with the following:

- License information on DVD (LY27-8238)
- Basic machine-readable material on one DVD (LCD7-6700)

Security, auditability, and control

The announced product uses the security and auditability features and functions of host hardware, host software, and application software.

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

Ordering information

Charge metric

Pricing metric description

Program name	Program number	Pricing metric description
KVM for IBM z Systems	5648-KVM	Per engine
KVM for IBM z Systems S&S	5648-KVS	Per engine

The product in this announcement is also available with IBM Software On/Off Capacity on Demand (On/Off CoD). If you are running On/Off CoD on your IBM servers, you can also pay for KVM for IBM z on a processor per-day basis during your peak periods. However, for additional information on how effectively KVM can exploit On/Off CoD, refer to the KVM for IBM z Frequently Asked Questions (FAQ) at

<http://www.ibm.com/common/ssi/cgi-bin/ssialias?subtype=ST&infotype=SA&htmlfid=ZSQ03090U SEN&attachment=ZSQ03090USEN.PDF>

Engine

Engine is a unit of measure by which the Program can be licensed. An Engine is a central processor or an Integrated Facility for Linux (IFL) processor, configured for use on a server. Licensee must obtain sufficient entitlements to cover the total number of Engines by each varying type of Engine where the Program will run. If the Program runs on IFL processors, Licensee must obtain entitlements to cover the total number of IFL processors on Licensee's servers. If the Program runs on central processors, Licensee must obtain sufficient entitlements to cover the total number of central processors on Licensee's servers.

Basic license

To order, specify the program product number and the appropriate license or charge option. Also, specify the desired distribution medium. To suppress shipment of media, select the license-only option in CFSW.

Program name: KVM for IBM z Systems

Program PID: 5648-KVM

Entitlement identifier	Description	License option/Pricing metric
S017TKJ	KVM for IBM z Systems	Use-based OTC, per engine
Orderable supply ID	Language	Distribution medium
S017TKH	US English	DVD

Subscription and support PID: 5648-KVS

Entitlement identifier	Description	License option/Pricing metric
S017TKM	KVM for IBM z Systems	Basic ASC, per engine SW S&S
		No charge, decline SW S&S
		No charge, SW S&S registration
Orderable supply ID	Language	Distribution medium
S017TKL	US English	DVD

Subscription and Support

To receive voice technical support via telephone and future releases and versions at no additional charge, Subscription and Support must be ordered. The capacity of Subscription and Support (Value Units) must be the same as the capacity ordered for the product licenses.

To order, specify the Subscription and Support program number (PID) referenced above and the appropriate license or charge option.

IBM is also providing Subscription and Support for these products via a separately purchased offering under the terms of the IBM International Agreement for Acquisition of Software Maintenance. This offering:

- Includes and extends the support services provided in the base support to include technical support via telephone.
- Entitles you to future releases and versions, at no additional charge. Note that you are not entitled to new products.

When Subscription and Support is ordered, the charges will automatically renew annually unless cancelled by you.

The combined effect of the IPLA license and the Agreement for Acquisition of Software Maintenance gives you rights and support services comparable to those under the traditional ICA S/390^(R) and z Systems license or its equivalent. To ensure that you continue to enjoy the level of support you are used to in the ICA business model, you must order **both** the license for the program **and** the support for the selected programs at the same Engine quantities.

On/Off CoD

KVM for IBM z is eligible for On/Off CoD with a temporary use charge calculated based on processor-per-day usage. However, for additional information on how effectively KVM can exploit On/Off CoD, refer to the KVM for IBM z Frequently Asked Questions (FAQ) at

<http://www.ibm.com/common/ssi/cgi-bin/ssialias?subtype=ST&infotype=SA&htmlfid=ZSQ03090U SEN&attachment=ZSQ03090USEN.PDF>

KVM for IBM z Systems (5648-KVM) temporary use charge

Entitlement identifier	Description	License option/Pricing metric
S017TKJ	KVM for IBM z Systems	Basic OTC, per processor-day TUC

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The information provided in this announcement letter is for reference and convenience purposes only. The terms and conditions that govern any transaction with IBM are contained in the applicable contract documents such as the IBM International Program License Agreement, IBM International Passport Advantage^(R) Agreement, and IBM Agreement for Acquisition of Software Maintenance.

Licensing

IBM International Program License Agreement including the License Information document and Proof of Entitlement (PoE) govern your use of the program. PoEs are required for all authorized use.

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The following agreement applies for Software Subscription and Support (Software Maintenance) and does not require customer signatures:

- IBM Agreement for Acquisition of Software Maintenance (Z125-6011)

These programs are licensed under the IBM Program License Agreement (IPLA) and the associated Agreement for Acquisition of Software Maintenance, which provide for support with ongoing access to releases and versions of the program. These programs have a one-time license charge for use of the program and an annual renewable charge for the enhanced support that includes telephone assistance (voice support for defects during normal business hours), as well as access to updates, releases, and versions of the program as long as support is in effect.

License Information number

GI13-3465-00

The program's License Information will be available for review on the IBM Software License Agreement website

<http://www.ibm.com/software/sla/sladb.nsf>

Limited warranty applies

Yes

Limited warranty

IBM warrants that when the program is used in the specified operating environment, it will conform to its specifications. The warranty applies only to the unmodified portion of the program. IBM does not warrant uninterrupted or error-free operation of the program or that IBM will correct all program defects. You are responsible for the results obtained from the use of the program.

IBM provides you with access to IBM databases containing information on known program defects, defect corrections, restrictions, and bypasses at no additional charge. For further information, consult the *IBM Software Support Handbook* found at

<http://www.ibm.com/support/handbook>

IBM will maintain this information for at least one year after the original licensee acquires the program (warranty period).

Program support

Enhanced support, called Subscription and Support, includes telephone assistance, as well as access to updates, releases, and versions of the program as long as support is in effect. You will be notified of discontinuance of support with 12 months' notice.

Money-back guarantee

If for any reason you are dissatisfied with the program and you are the original licensee, you may obtain a refund of the amount you paid for it, if within 30 days of your invoice date you return the program and its PoE to the party from whom you obtained it. If you downloaded the program, you may contact the party from whom you acquired it for instructions on how to obtain the refund.

For clarification, note that for programs acquired under any of IBM's On/Off Capacity on Demand (On/Off CoD) software offerings, this term does not apply since these offerings apply to programs already acquired and in use by you.

Volume orders (IVO)

No

Passport Advantage applies

No

Software Subscription and Support applies

Yes. During the S&S period, for the unmodified portion of a Program, and to the extent problems can be recreated in the specified operating environment, IBM will provide the following:

- Defect correction information, a restriction, or a bypass.
- Program updates: Periodic releases of collections of code corrections, fixes, functional enhancements and new versions and releases to the Program and documentation.
- Technical assistance: A reasonable amount of remote assistance via telephone or electronically to address suspected Program defects. Technical assistance is available from the IBM support center in the Customer's geography.

Additional details regarding Technical Assistance, including IBM contact information, are provided in the *IBM Software Support Handbook* at

<http://www.ibm.com/support/handbook>

S&S does not include assistance for:

- The design and development of applications
- Customer's use of Programs in other than their specified operating environment, or
- Failures caused by products for which IBM is not responsible under the IBM Agreement for Acquisition of Software Maintenance.

S&S is provided only if the Program is within its support timeframe as specified in the Software Support Lifecycle policy for the Program.

System i Software Maintenance applies

No

Variable charges apply

No

Educational allowance available

15% to qualified educational institution customers.

On/Off CoD

To be eligible for On/Off CoD pricing, you must be enabled for temporary capacity on the corresponding hardware, and the required contract, Attachment for IBM z Systems On/Off Capacity on Demand (Z125-7883), must be signed prior to use.

Statement of good security practices

IT system security involves protecting systems and information through prevention, detection, and response to improper access from within and outside your enterprise. Improper access can result in information being altered, destroyed, or misappropriated or can result in misuse of your systems to attack others. Without a comprehensive approach to security, no IT system or product should be considered completely secure and no single product or security measure can be completely effective in preventing improper access. IBM systems and products are designed to be part of a comprehensive security approach, which will necessarily involve additional operational procedures, and may require other systems, products, or services to be most effective. IBM does not warrant that systems and products are immune from the malicious or illegal conduct of any party.

Prices

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AP distribution

Country/Region	Announced
AP IOT	
ASEAN *	Yes
India/South Asia **	Yes
Australia	Yes
Hong Kong	Yes
Macao	Yes
New Zealand	Yes
People's Republic of China	Yes
South Korea	Yes
Taiwan	Yes
Japan IOT	
Japan	Yes

* Brunei Darussalam, Cambodia, Indonesia, Lao People's Democratic Republic, Malaysia, Philippines, Singapore, Thailand, Timor-Leste, and Vietnam

** Bangladesh, Bhutan, India, Maldives, Nepal, and Sri Lanka

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<http://www.ibm.com/planetwide/>

Corrections

(Corrected on October 8, 2015)

Changes were made to the "Technical information" section.

(Corrected on September 14, 2015)

Changes were made to the "Ordering information" section.