



IBM Wave for z/VM Version 1.1 simplifies management of z/VM and Linux guests with intelligent visualization

Table of contents

1 Overview	7 Publications
2 Key prerequisites	8 Technical information
2 Planned availability date	10 Ordering information
3 Description	13 Terms and conditions
5 Product positioning	16 Prices
7 Program number	16 AP distribution

At a glance

IBM® Wave for z/VM® V1.1:

- Transforms the management of virtualized environments into an intuitive experience, to help reduce the cost and skills burden that can impede management of z/VM environments
- Delivers a lightweight and agentless discovery technology that helps organizations discover resources and reflect the current environment
- Helps perform critical administrative and operational tasks quickly and easily, removing complexity, and reducing the possibility of errors
- Implements a wide set of management functions, such as cloning, account management, and configuration management
- Provides a compelling user interface to view resources using an intuitive dashboard
- Provides filtering and grouping technologies, to help administer and manage virtual resources in the virtual server environment
- Supports current z/VM functions, such as live guest relocation (LGR) in a z/VM Single System Image (SSI) cluster
- Simplifies provisioning, and offers a new intelligent interface to help you configure and install Linux™ virtual servers quickly on z/VM
- Aids administrators by managing z/VM accounts for systems as well as guests including managing user profiles and permission settings
- Facilitates high-level performance monitoring to provide visibility into z/VM system performance
- Helps you manage your virtual Linux servers, creating a central visual focal point for management
- Delivers built-in report writing

Overview

Organizations that want to expand their business using virtualization technology often find that they are limited by budget, skills, management complexity, and other challenges. With IBM Wave for z/VM (IBM Wave), IT organizations can unleash the power of z/VM virtualization, improve productivity, and simplify administration and management to jump-start their journey to a highly virtualized private cloud environment.

IBM Wave allows IT organizations and service providers to simplify and automate z/VM administration and management by using an intuitive graphical, content-rich interface to manage z/VM and Linux guests. IBM Wave is designed to simplify operations, drive productivity, reduce dependency on expert skills, and help accelerate the steps typically needed to transform a virtualized environment into a private cloud infrastructure. IBM Wave helps reduce the complexity of managing a scalable z/VM infrastructure, using a powerful content-rich user interface, to help manage even the most sophisticated virtualized computing environments.

IBM Wave is a virtualization management solution designed to help you intuitively manage both Linux virtual servers and z/VM. Using IBM Wave, you can automate repeatable tasks, such as provisioning new Linux servers, to help improve quality and reduce the potential for errors. IBM Wave helps you remove management obstacles associated with administering and maintaining Linux guests so you can direct your time to more business-critical tasks. It is designed to integrate seamlessly with z/VM and Linux environments. This integration helps you view and organize resources and manage your virtualized infrastructure more cost effectively by enabling your technical teams to be more self-sufficient.

IBM Wave provides many features that can simplify and automate virtual server management:

- Dramatically reduces the learning curve to manage and administer z/VM and Linux guests to help improve administrator and system programmer productivity
 - Readily manages large-scale implementations through a powerful, convenient content-rich and task-intuitive user interface
 - Delivers enterprise-wide visualization and management of z/VM across LPARs and Central Processor Complexes (CPCs)
 - Simplifies and automates day-to-day tasks and is ideal for organizations new to z/VM, organizations needing to better extend and take advantage of existing skills, or those that need to reduce the cost of management
 - Reduces administration time and facilitates repeatable management of resources, drag-and-drop live guest relocation, and more
 - Provides rapid cloning and provisioning of Linux guests on z/VM to help systems staff easily deploy Linux images
 - Easily provisions virtual resources including Linux guests, networks, and storage
 - Performs even complex tasks, such as cloning, using only a few mouse clicks
 - Provides high-level performance monitoring and reporting by utilizing the Performance Toolkit for z/VM
 - Delivers flexible reporting and comprehensive logging capabilities
- Note:** Additional performance monitoring of z/VM and Linux guests is available with IBM OMEGAMON® XE on z/VM and Linux.
- Helps identify, expose, and aggregate resources clearly, with intelligent content-rich displays to depict resource use, performance, topology, and more
 - Delivers an advanced security architecture with delegation of authority

Key prerequisites

IBM System z® server using a currently supported release of z/VM

Planned availability date

February 28, 2014

Description

IBM Wave provides a simplified approach to the management of IBM System z servers running z/VM and Linux. System z servers can be configured with z/VM instances that can run hundreds to thousands of virtual Linux servers with each one supporting individual workloads. IBM Wave's intelligent visualization of the virtual server environment and physical infrastructure provides intuitive management of physical servers, z/VM, Linux guests, and other resources. IBM Wave provides the necessary capabilities for complete virtual server provisioning, can readily scale to handle the most complex installations, and is an ideal solution to begin transitioning to a highly virtualized cloud infrastructure. With IBM Wave, you can rapidly gain insight into your entire virtualized infrastructure topology at a glance and also accelerate the path to using private clouds.

Cloning and provisioning to accelerate the management of virtualized environments

- Provision Linux guests, network, and storage from a single user interface.
- Capture and clone virtual servers across LPARs and CPCs.
- Activate and deactivate z/VM guests in the current z/VM system.
- Lock or unlock z/VM resources.
- Create and configure virtual switches (VSWITCHes) and guest LANs.
- Provide storage management and provisioning for z/VM and Linux.
- Run shell scripts or REXX EXECs directly from the user interface for more customized management and provisioning.

Intelligent visualization for effective management

- Use a rich user interface with active graphical views of all managed objects.
- Attach digital reminder notes for display in a tool-tip for managed objects like z/VM guests, virtual networks, FCP-attached storage, disk storage components, scripts, and users. Context-aware technology integrates with these notes to help protect against unwanted actions.
- Gain an informational view of objects with icons containing vital system information. An icon for a z/VM guest, for example, can indicate the type of operating system, the current status, and if the guest can be connected.
- Use the innovative user interface to interact with the z/VM LPAR in a simple, intuitive way, such as connecting a virtual server to a virtual network or by dragging the connection between the virtual server and the virtual network.
- Identify resource and relationship changes easily with automatic GUI updates.

Management and configuration

- Display and manage virtual servers and resources, all from the convenience of a single graphical interface.
- Provide convenient management of workloads across CPCs and z/VM LPARs designed to manage an unlimited number of z/VM instances.
- Support advanced z/VM capabilities such as SSI and LGR. Perform a live guest relocation of one or more z/VM guests.
- Help manage storage and networks, managing disk storage (ECKD™ and SCSI disks), Open Systems Adapters (OSAs) and HiperSockets™ connections, and utilize graphical management abilities. For example, IBM Wave can graphically display storage utilization across the z/VM system, and allow for further examination. Define and control network devices, such as VSWITCHes and guest LANs using a graphical view of the network topology.
- Use the intelligent user interface to connect various network objects within the network viewer and automatically detect, in advance, if that connection can be made.

- Discover z/VM resources and relationships across multiple LPARs, SSI clusters, and CPCs by using an agentless discovery facility that automatically refreshes updated views.
- Collect performance information from z/VM and Linux guests for monitoring of system behavior. If the Performance Toolkit for VM is installed, performance data can be viewed for every active z/VM guest, as well as globally for the entire z/VM system. Without the Performance Toolkit for VM, the z/VM INDICATE command is utilized, in which case CPU and performance data per z/VM guest will be unavailable. Additionally, the performance data will be less accurate in terms of sampling intervals because the INDICATE command uses a broader interval than the Performance Toolkit.

Note: IBM OMEGAMON XE on z/VM and Linux can be used to provide more detailed performance monitoring and alerting.

Administration

- Administer resources such as z/VM guests, storage, and networks. Incorporate flexible filtering capabilities to group and manage resources matching your criteria for maximum flexibility and to speed management tasks.
- Delegate administrative capabilities to more precisely meet the needs of various administrative teams, all from the convenience of a single, powerful user interface.
- Assign a z/VM account to one or more z/VM guests, assign one or more z/VM guests a value for a particular attribute, or assign z/VM guests to a project. Viewing by project helps you manage the way you view resources.
- Use role-based management to control the management of z/VM and also allow delegation of administrative responsibility.
- Provide reporting through the built-in report writer to produce information on guests, users, LPARs, z/VM guests, disk storage, and more.
- Deliver security management with scopes and permissions set for each user. Support is provided for IBM RACF® Security Server and other security products.

IBM Wave helps IT staff provision resources and images easily to dramatically reduce administrative complexity and reduce needed skills. It is designed to help IT reduce labor cost and improve the quality and efficiency of operations, with centralized control to manage even the most complex and large server environments, consistently and according to your defined policies. It can help you manage systems and resources, and improve the quality of management, reducing the chance of operator error and expensive corrections.

IBM Wave can:

- Help you manage and organize resources at a glance, providing a compelling user interface that provides built-in management information designed to help reduce management steps
- Allow you to scale your management reach to manage a higher level of virtualization with the skills you already have
- Help simplify z/VM management and administrative tasks, shielding users from the complexity of z/VM commands
- Help administrators and operators visualize resources, storage, and networks, manage user accounts, and more
- Give you visibility into your z/VM environment with built-in reporting and monitoring
- Help shorten the time to deploy Linux servers as guests of z/VM
- Support LGR through drag and drop
- Help accelerate your steps to a private cloud model with simple cloning capabilities
- Help reduce the costs and effort of virtualization management, helping organizations optimize resources and focus on more business-critical tasks

IBM Wave is compatible with several versions of z/VM and can manage supported Linux distributions. It is a consumable management solution to help perform

management and provisioning of virtualized infrastructure in today's environment as well as in a highly virtualized or cloud-based infrastructure.

IBM Wave sets a new bar for the management of virtualized environments, using advanced, innovative visualization to help you gain productivity. IBM Wave is ideal for managing a dynamically changing environment or for setting up new virtualized infrastructures. Through its unique design and interface, IBM Wave simplifies resource management and helps deliver the foundation you need to manage even the most complex, virtualized environments. IBM Wave helps you manage virtualized resources and Linux guests, configure z/VM environments, provision virtual servers, clone guests, and understand storage use and network resources across CPCs. IBM Wave makes virtualization management easy so IT staff can focus their time on more business-critical tasks.

Accessibility by people with disabilities

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

http://www.ibm.com/able/product_accessibility/index.html

Engine-based Value Unit pricing

Engine-based Value Unit pricing for IBM Wave is designed to provide a decreasing price curve as hardware capacities and workload grow, which may help improve price/performance.

There may also be a price benefit when you grow your capacity. Additional capacity is not priced starting at the base with a flat price per unit. Instead, additional capacity is priced starting at the capacity (processors) on which IBM Wave has already been installed, which may result in a lower unit price.

Note: Value Units of a given product cannot be exchanged, interchanged, or aggregated with Value Units of another product.

A no-charge Subscription and Support registration record will be established for each designated machine where IBM Wave is running. These no-charge Subscription and Support registration records will be linked to the billable Subscription and Support and all billable Subscription and Support within the scope of the engine-based Value Units aggregation will be linked together.

Subscription and Support (S&S) is an annual charge and should be kept at an annual term.

Product positioning

IBM Wave is an innovative z/VM management solution that not only drives superior insight into z/VM management and administrative functions, but delivers compelling visualization capabilities, such as grouping of resources, filtering, electronic notes, and rotating displays. Designed for IT organizations as well as service providers, this solution helps simplify the management of even the most complex z/VM environments. IBM Wave combines information-rich management with visualization to provide a user experience to reduce the cost and complexity of operations, management, and administration. Innovations like digital reminder notes provide a policy-based management approach to effectively manage even the most complex z/VM infrastructures.

IBM Wave is designed to reduce errors through innovative interfaces, dramatically simplifying z/VM management, and can be suitable for staff of various skill levels. IBM Wave manages a broad spectrum of resources, clones or provisions Linux images, manages user accounts, and provides reporting functions, all quickly and intuitively. With its deep visibility into z/VM and Linux resources you can organize

and structure your environment and accelerate critical steps needed for building a private cloud.

IBM Wave provides value to system administrators, system programmers, operators, or service providers that are challenged by the lack of time for complicated management tasks. IBM Wave benefits the IT manager who must reduce the cost and delays of Linux deployment on z/VM and optimize the use of limited, highly skilled resources. It helps accelerate your path to a private cloud using the skills you may already have available. Organizations consolidating Linux on z/VM can host more virtual servers than any other platform in a single footprint. The value of this cost-effective consolidation platform is amplified even further when using the rich management environment of IBM Wave.

IBM Wave is an essential tool for simplifying and automating z/VM and Linux virtual server management. Other IBM products, such as IBM Tivoli® OMEGAMON XE on z/VM and Linux and IBM Operations Manager, are complementary products you may wish to consider for additional z/VM management capabilities. For additional z/VM systems and storage management products, visit

<http://www.ibm.com/software/stormgmt/zvm/>

Reference information

For information about IBM z/VM and the Performance Toolkit for VM, refer to:

- V6.3 Software Announcement [AP13-0295](#), dated July 23, 2013
- V6.2 Software Announcement [AP11-0390](#), dated October 12, 2011
- V5.4 Software Announcement [AP08-0242](#), dated August 05, 2008

For information about the IBM zEnterprise®, refer to:

- IBM zEnterprise EC12 Hardware Announcements:
 - [AG13-0131](#), dated July 23, 2013
 - [AG12-0167](#), dated August 28, 2012
- IBM zEnterprise BC12 Hardware Announcement:
 - [AG13-0134](#), dated July 23, 2013
- IBM zEnterprise z196 Hardware Announcements:
 - [AG11-0176](#), dated October 12, 2011
 - [AG11-0127](#), dated July 12, 2011
 - [AG10-0181](#), dated July 22, 2010
- IBM zEnterprise z114 Hardware Announcement:
 - [AG11-0139](#), dated July 12, 2011

For information about the System z10® Enterprise Class, refer to Hardware Announcements:

- [AG09-0698](#), dated October 20, 2009
- [AG09-0383](#), dated July 21, 2009
- [AG09-0203](#), dated April 28, 2009
- [AG08-0790](#), dated October 21, 2008
- [AG08-0296](#), dated May 06, 2008
- [AG08-0154](#), dated February 26, 2008

For information about the System z10 Business Class, refer to Hardware Announcements:

- [AG09-0698](#), dated October 20, 2009

- [AG09-0383](#), dated July 21, 2009
- [AG09-0203](#), dated April 28, 2009
- [AG08-0755](#), dated October 21, 2008

Program number

Program number	VRM	Program name
5648-AE1	1.1.0	IBM Wave for z/VM
5648-AE2	1.1.0	IBM Wave for z/VM S&S

IBM Wave services

IBM STG Lab Services can provide services to help you quickly deploy and exploit IBM Wave. Lab Services has a team of System z specialists with in-depth experience with z/VM, Linux, and IBM Wave and specializes in helping clients get the most out of their new System z technology. The services provide assistance with all phases of deployment (planning, installation, configuration, and training). Lab Services can work with you to help ensure you are getting the most out of the product by demonstrating use cases and configuring the product to best fit your needs. Lab Services can help with integration aspects, such as Microsoft™ Active Directory-based authentication and role definitions, so the product can be safely utilized by more than just your system programmers. In many cases, you can expect the services to be completed within a few days. Lab Services is focused on virtualization and Linux on System z, and specialized requests are accepted and handled. Lab Services have been helping System z clients build customized provisioning solutions to fit their specific business needs for years.

To learn more about our offerings, visit

http://www.ibm.com/systems/services/labservices/platforms/labservices_z.html

To discover what IBM System Lab Services and Training can do for you, contact us at

stgls@us.ibm.com

Offering Information

Product information is available via the Offering Information website

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

Publications

The IBM Wave for z/VM product information includes three publications in Adobe™ PDF format and one license information DVD:

Title	Order number
IBM Wave for z/VM Agreements and License Information (DVD)	LC27-6120
IBM Wave for z/VM: License Information (PDF)	GI13-3435
IBM Wave for z/VM: Administration and Customization (PDF)	SC27-6118
IBM Wave for z/VM: User Guide and Reference (PDF)	SC27-6119

One copy of the license information DVD is supplied with IBM Wave for z/VM when physical media is ordered. When ordering IBM Wave from Shopz, the license information can also be viewed or downloaded from Shopz.

The publication PDF files 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.

IBM Wave product page

For current information on IBM Wave and for related resources, refer to the website at

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

Redbooks® and Redpapers™

IBM Redbooks and Redpapers 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.ibm.com/redbooks>

Technical information

Specified operating environment

Hardware requirements

IBM Wave requires one of the following IBM System z servers running a currently supported release of z/VM :

- zEnterprise EC12
- zEnterprise BC12
- zEnterprise 196
- zEnterprise 114
- System z10 Enterprise Class
- System z10 Business Class

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

- DEVICE2827 for the zEnterprise EC12
- DEVICE2828 for the zEnterprise BC 12
- DEVICE2817 for the zEnterprise 196

- DEVICE2818 for the zEnterprise 114
- DEVICE2097 for the System z10 Enterprise Class
- DEVICE2098 for the System z10 Business Class

Software requirements

IBM Wave requirements

- One of the following operating systems:
 - z/VM V6.3
 - z/VM V6.2
 - z/VM V5.4

Note: For additional function announced for z/VM V6.3, refer to IBM Hardware Announcement [AG14-0009](#), dated February 24, 2014.

- IBM Wave utilizes the z/VM System Management API (SMAPI) interface and requires the optional, priced IBM Directory Maintenance Facility (DirMaint™) or an equivalent systems management product to perform various directory management functions.
- Networking:
 - TCP/IP for z/VM (IPv4) must be configured and active.
 - Telnet access must be enabled.
 - FTP server must be running.
- The following prerequisites must be met on every workstation running the IBM Wave GUI client:
 - Microsoft Windows™ with Java™ V1.7 installed
 - IP access to all managed z/VM systems and to the IBM Wave WAVESRV server
 - Secure Shell (SSH) server, Linux z/VM CP interface device driver (VMCP), and CMS File System (CMSFS) installed on all Linux on System z guests being managed by IBM Wave

Linux on System z

In order to operate Linux on System z as a guest of z/VM, a Linux on System z distribution must be obtained from a Linux Distribution Partner. IBM WAVESRV requires one of the following Linux distributions:

- Red Hat Enterprise Linux (RHEL) 6
- SUSE Linux Enterprise Server (SLES) 11

For specific function and for the most current information on Linux distributions, refer to

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

For current promotional pricing for Linux distributions, refer to

http://www.ibm.com/systems/z/os/linux/about/about_gettingstarted.html

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.

Companion products

IBM Wave utilizes the Performance Toolkit for VM feature of z/VM (Performance Toolkit for VM), if present, to collect performance information from z/VM and Linux

guests for monitoring of the system behavior. High-level performance data can be viewed for every active z/VM guest, as well as globally for the entire z/VM system.

For more detailed performance management and alerting, IBM offers OMEGAMON XE on z/VM and Linux. For additional information about OMEGAMON XE on z/VM and Linux refer to Software Announcement [AP10-0073](#), dated April 27, 2010.

Planning information

Customer responsibilities

If you want the level of service provided under the IBM ICA license agreement with S/390® and z/VM licensed products, you are strongly encouraged to order the program number for IBM Wave for z/VM S&S (5648-AE2). 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. IBM Wave for z/VM S&S will be automatically added to your order. If you do not want the S&S license for IBM Wave for z/VM, you must take specific action to decline this support.

To host Linux guests on z/VM, you must also obtain a Linux for System z distribution. Information on those Linux distributor partners that have a marketing relationship with IBM can be found at

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

Packaging

IBM Wave for z/VM

The IBM Wave for z/VM product package is distributed with the following:

- License information on DVD (LC27-6120)
- Basic machine-readable material on one DVD (LCD7-6058)

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

Pricing metric description

The product in this announcement has one pricing metric - Value Units based on the number of processors. Value Unit pricing offers a decreasing one-time charge (OTC) price per engine, subject to the tiers as documented in Value Unit Exhibit VUE021. Value Units of a given product cannot be exchanged, interchanged, or aggregated with Value Units of another product.

Engine-based Value Unit pricing of IBM Wave for z/VM is different than MSU-based Value Unit pricing, which is available on other IBM software products.

Program name	Program number	Pricing metric description
IBM wave for z/VM	5648-AE1	value units

Value Unit pricing for the IBM Wave S&S provides a lower price per processor as more Value Units are licensed with IBM Wave. You may aggregate the capacity

for all the processors running IBM Wave across the enterprise to achieve a more economical price. There may also be a price benefit when you increase your capacity. Additional capacity is not priced starting at the base with a flat price per unit. Instead, additional capacity is priced starting at the capacity on which IBM Wave for z/VM has already been installed, which may result in a lower unit price.

Engine-based Value Unit pricing is designed to provide a lower entry price and a decreasing price curve as hardware capacities and workload grow, which may help improve price/performance. Engine-based Value Unit pricing is different than MSU-based Value Unit pricing, which is available on other IBM software products. Value Unit pricing may help clients:

- Add capacity and workload with an incremental and improved price
- Manage software costs better
- Aggregate licenses acquired across machines that are part of their enterprise

Translation from Processor to Value Units

The total number of engine-based Value Units is calculated according to the following example.

If the customer has installed six processors and will be operating IBM Wave on all six processors, the applicable Value Units would be:

$$(3 * 10) + (3 * 9) = 57 \text{ value units}$$

The product in this announcement is 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 now also pay for IBM Wave for z/VM on a processor per-day basis during your peak periods. For additional information about On/Off CoD, refer to Software Announcement [AA03-3094](#), dated August 12, 2003 and Marketing Announcement 304-004, dated January 13, 2004.

The program in this announcement has Value Unit-Based pricing.

Program number	Program name	Value Unit exhibit
5648-AE1	IBM wave for z/VM	VUE021

For each System z IPLA program with Value Unit pricing, the quantity of that program needed to satisfy applicable IBM terms and conditions is referred to as the "required license capacity." Your required license capacity is based upon the following factors:

- The System z IPLA program you select
- The applicable Value Unit exhibit
- The applicable terms

Value Unit exhibit VUE021

Engine-based Value Units for a specified number of engines are determined by the following table:

Level	Engines minimum	Engines maximum	Value Units per engine
From 1 to 3	1	3	10
From 4 to 6	4	6	9
From 7 to 9	7	9	8
From 10 to 12	10	12	7
From 13 to 16	13	16	6
From 17 to 20	17	20	5
From 21 to 25	21	25	4

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: IBM Wave for z/VM

Program PID: 5648-AE1

Entitlement identifier	Description	License option/ Pricing metric
S017GXR	IBM Wave for z/VM	Basic OTC, per Value Unit
Orderable supply ID	Language	Distribution medium
S017GXP	US English	DVD

Subscription and Support PID: 5648-AE2

Entitlement identifier	Description	License option/ Pricing metric
S017GXV	IBM Wave for z/VM	Basic ASC, per Value Unit SW S&S No charge, decline SW S&S No charge, SW S&S registration
Orderable supply ID	Language	Distribution medium
S017GXT	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 and System z 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 Value Unit quantities.

On/Off CoD

IBM Wave for z/VM is eligible for On/Off CoD with a temporary use charge calculated based on processor-per-day use.

IBM Wave for z/VM (5648-AE1) Temporary Use Charge

Entitlement identifier	Description	License option/Pricing metric
S017GXR	IBM wave for z/VM	On/off CoD, Per Processor-day TUC

Terms and conditions

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® 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.

Agreement for Acquisition of Software Maintenance

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)

This program is 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. This program has 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

GI13-3435

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

Usage restriction

Yes

- IBM Wave for z/VM Version 1 Release 1 (the "Program") operates on the IBM zEnterprise EC12 (zEC12), IBM zEnterprise BC12 (zBC12), IBM zEnterprise 196 (z196), IBM zEnterprise 114 (z114), IBM System z10 Enterprise Class (z10™ EC), and IBM System z10 Business Class (z10 BC).
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S&S does not include assistance for:

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IBM Operational Support Services - SupportLine

Yes

System i® Software Maintenance applies

No

Variable charges apply

No

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