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**IBM z/VM V6.2 - Accelerate the Journey to Smarter  
Computing  
November 2011**

**z/VM Version 6 Release 2**  
Frequently Asked Questions

Worldwide



## Table of Contents

z/VM Positioning .....	3
z/VM V6.2 General Availability Announcement – October 12, 2011 .....	5
z/VM V6.2 Content October 12, 2011 .....	9
IBM System z server and IBM System Storage information .....	18
z/VM General .....	22
z/VM Marketing .....	23
z/VM and Linux .....	24
Pricing, Licensing, & Ordering .....	31
Service and Support .....	38
Education .....	41
Related Information .....	42

## z/VM Positioning

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**Question:**

What is IBM System z<sup>®</sup> virtualization technology?

**Answer:**

System z virtualization technology allows customers to create virtual processors, communications, memory, I/O, and networking resources, thus helping to reduce the overhead of planning, purchasing and installing new hardware to consolidate and support new workloads.

Notice that the virtualization technology for System z platforms is composed of multiple dimensions. There is a hardware dimension and a software dimension, and both dimensions are considered at the time that the System z servers are designed. System z virtualization is not an afterthought; it is designed in from the bottom up.

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**Question:**

What does the hardware dimension provide for System z virtualization technology?

**Answer:**

The IBM System z hardware provide the foundation dimension with functions critical to the success of virtualization, particularly on a large scale, such as the ability to partition the machine, device sharing, and inter-partition communication.

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**Question:**

What does the software dimension provide for System z virtualization technology?

**Answer:**

The software dimension can extend the capabilities of the hardware from the standpoint of sharing hardware, virtualizing resource, and communication. It also introduces the flexibility required to support large numbers of virtual servers in an on-demand enterprise. Operational support, control, accountability and maintenance are a large part of the operation of any group of servers.

The z/VM<sup>®</sup> hypervisor is the IBM System z product providing the software dimension functionality.

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**Question:**

Why is z/VM vital in the area of system virtualization?

**Answer:**

z/VM is vital because it helps to:

- Provide the flexibility for Smarter Computing
- Maximize the value of your IT investments
- Make your business become more efficient and responsive
- Integrate your business

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**Question:**

What does z/VM contribute to Smarter Computing?

**Answer:**

Smarter Computing can be characterized by several attributes, one of them is virtualization. z/VM is the virtualization technology on System z servers and is a critical component of the Linux® on System z environment. For Linux on System z to embrace on demand business, z/VM provides significant virtualization support for Linux virtual servers, including exploitation of the System z capabilities, nondisruptive dynamic addition of memory and processors, improved systems management, ease of use enhancements, performance improvements for Linux guests, and enhanced networking for guests. The virtualized Linux environment on System z can provide you with the flexibility for Smarter Computing

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**Question:**

How does System z virtualization technology help your business become more efficient and responsive?

**Answer:**

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

With support for System z dynamic reconfiguration capabilities, z/VM helps enable resources, such as processors and memory, to be added to an active LPAR running z/VM nondisruptively. Customers can configure their systems to help reduce the need to re-IPL z/VM. They can dynamically add processors, channels, OSA adapters, I/O, and memory to both the z/VM system itself and to individual guests.

## **z/VM V6.2 General Availability Announcement – October 12, 2011**

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### **Question:**

When is z/VM V6.2 planned to be generally available and when can it be ordered?

### **Answer:**

z/VM 6.2 will be generally available December 2, 2011

z/VM 6.2 will be available for ordering on November 29, 2011. At that time all version orders will be fulfilled with z/VM V6.2 instead of V6.1

This also means that the last day to order V6.1 is November 28, 2011.

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### **Question:**

What did IBM announce related to z/VM on October 12, 2011?

### **Answer:**

IBM announced the new release of z/VM v6.2: Some key pieces of functionality include:

- Multi-system virtualization in the form of the IBM z/VM Single System Image Feature (VMSSI)
- z/VM Live guest relocation of running Linux Guest. This new release also provides simplified systems management for maintaining multiple z/VM systems as a complex of systems and better Sharing of resources across VM systems.

For additional z/VM V6.2 release announcement from October 12, 2011, refer to the z/VM V6.2 Preview section.

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### **Question:**

Have any price changes been announced for z/VM V6.2?

### **Answer:**

No. Pricing for z/VM V6.2 remains the same as V5 & V6.1 and continues to use the Engine-based Value Unit pricing metric. Pricing information is available at:

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

Choose the option under "Purchase / upgrade tools" link under Electronic Services.

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### **Question:**

How long does IBM plan to support z/VM V6.2?

### **Answer:**

IBM announced plans to support z/VM V6.2 until April 30, 2015

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### **Question:**

How long does IBM plan to support z/VM V5.4 & V6.1?

### **Answer:**

IBM announced plans to support z/VM V5.4 until September 30, 2013

IBM announced plans to support z/VM V6.1 until April 30, 2013

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**Question:**

Have there been any changes for IBM Business Partners to remarket S&S?

**Answer:**

Yes, with this announcement, IBM Business Partners can now remarket the z/VM V5.4, V6.1 and V6.2 S&S (5741-SNS) for up to 3 years if ordered at the same time as the associated IPLA license that is remarketed by that partner. Prior to this announcement, S&S could only be remarketed for 1 year and only by IBM Business Partners in EMEA. This is also applicable to the priced, optional features of z/VM V5.4, V6.1 and V6.2.

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**Question:**

Have there been any changes for IBM Business Partners to remarket S&S for any other IPLA products associated with z/VM?

**Answer:**

Yes, prior to this Effective October 23, 2009, IBM Business Partners in all geographies will now have the option to remarket the associated S&S for the products listed in the following table for up to 3 years if ordered at the same time as the associated IPLA license that is remarketed by that partner. Previous to this announcement, S&S for these products could only be remarketed for 1 year and only by IBM Business Partners in EMEA.

Program Name	S&S	
	Program Number	Program Number
IBM Tivoli® OMEGAMON® XE on z/VM and Linux, V4.1	5698-A36	5608-S73
IBM Tivoli zSecure Manager for RACF® z/VM	5655-T13	5655-T14
IBM Tape Manager for z/VM	5697-J08	5697-J11
IBM Archive Manager for z/VM	5697-J05	5697-J12
IBM Backup and Restore Manager for z/VM	5697-J06	5697-J13
IBM Operations Manager for z/VM	5697-J10	5697-J15

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**Question:**

Where can I find more details on this announcement?

**Answer:**

Refer to the IBM Business Partner attachment of the IBM Software Announcement for z/VM V6.1 209-401 (US), dated October 20, 2009.

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**Question:**

Where can I find more question and answers regarding z/VM V6.2?

**Answer:**

Refer to the question and answers within the next section of this document or the z/VM Web site at: <http://www.ibm.com/vm/zvm620>

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**Question:**

Where can I find more information for the z/VM announcement on October 12, 2011?

**Answer:**

Refer to IBM Software Announcement of IBM V6.2 - Accelerate the Journey to Smarter Computing 211-409 (US), dated October 12, 2011 or the z/VM Web site at: <http://www.ibm.com/vm/zvm620>

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**Question:**

Where can I find more information for the System z hardware announcement on October 20, 2009?

**Answer:**

Refer to IBM Hardware Announcement 109-678 (US), dated October 20, 2009.

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**Question:**

What z/VM statements of direction were included with the October 12, 2011 announcement?

**Answer:**

From the October 12, 2011 Announcement letter:

Statement of Direction:

- **Support for HiperSockets Completion Queue**

IBM plans to support transferring HiperSockets™ messages asynchronously, in addition to the current synchronous manner on IBM zEnterprise™ 196 (z196) and IBM zEnterprise 114 (z114). This data transfer method can be especially helpful in burst situations. The Completion Queue function is designed to allow HiperSockets to transfer data synchronously if possible and asynchronously if necessary, thus combining ultra-low latency with more tolerance for traffic peaks. HiperSockets Completion Queue is planned to be supported in a future z/VM deliverable.

- **Support for HiperSockets integration with the Intraensemble Data Network (IEDN)**

Within a zEnterprise environment, it is planned for HiperSockets to be integrated with the intraensemble data network (IEDN), extending the reach of the HiperSockets network outside of the central processor complex (CPC) to the entire ensemble, appearing as a single Layer 2 network. HiperSockets integration with the IEDN is planned to be supported in a future z/VM deliverable.

- **Support for High Performance FICON (zHPF) Guest Exploitation**

IBM intends to provide support for guest virtual machines utilizing the High Performance FICON for System z (zHPF) I/O protocol. z/VM will support guest operating systems that issue single track as well as multiple track zHPF I/O.

- **Stabilization of z/VM Performance Toolkit rmfpm support**

z/VM Performance Toolkit support for rmfpm has been stabilized and may cease to function as the underlying Linux system evolves. Support for the Linux rmfpm agent has already been withdrawn and is available on an as-is basis.

- **Withdrawal of HMC z/VM Tower Systems Management**

z/VM V6.2 is intended to be the last release supported by the HMC z/VM Tower systems management support originally introduced with IBM System z9®. The alternative implementation of virtual server and virtual resource management for z/VM V6 continues to be supported by the zEnterprise Unified Resource Manager on zEnterprise or later.

- **Withdrawal of Support for A220 and CLAW Device Drivers**  
z/VM V6.2 is intended to be the last release to support HYPERchannel Processor Adapter 42990007 and HYPERchannel Series A devices and HYPERchannel Series DX devices which are functioning as Series A devices.
- **Withdrawal of z/VM Dynamic Host Configuration Protocol (DHCP) Server**  
z/VM V6.2 is intended to be the last release to support a native Dynamic Host Configuration Protocol (DHCP) server.
- **Withdrawal of z/VM Line Printer Daemon (LPD) Server Support**  
z/VM V6.2 is intended to be the last release to support a native Line Printer Daemon (LPD) link driver. IBM recommends using RSCS for remote printing instead, but plans to continue to support the LPR client for use with LPD on other platforms.
- **Withdrawal of the OVERRIDE Utility and UCR Support**  
z/VM V6.2 is intended to be the last release to support the OVERRIDE utility and User Class Restructuring (UCR). IBM supports native CP commands for the creation and modification of privilege classes, and recommends the use of these commands instead of OVERRIDE today.
- **Withdrawal of CSE**  
z/VM V6.2 is intended to be the last release to support the Cross System Extensions (CSE) environment. The z/VM VMSSI feature, introduced in z/VM V6.2, includes most of the functionality in CSE, and extends it with new capabilities such as Live Guest Relocation and autonomic minidisk cache management. VMSSI is the new technology for clustering z/VM systems.
- **Support for GDPS 3.8 Hyperswap**  
IBM intends to provide in a future z/VM release support for Disk subsystem pre-emptive HyperSwap™ and Summary event notification for PPRC suspend scalability. These two new functions are applicable to GDPS®/PPRC 3.8 and supporting IBM DASD hardware. In addition, IBM intends to provide in a future z/VM release support for an alternate subchannel set to place PPRC secondary devices. This support is also applicable to GDPS/PPRC 3.8.

All statements regarding IBM's plans, directions, and intent are subject to change or withdrawal without notice.



## **z/VM V6.2 Content October 12, 2011**

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### **Question:**

What are the feature functions in z/VM 6.2?

### **Answer:**

With z/VM V6.2 IBM delivers on the promise of smarter computing with the next step in the evolution of mainframe virtualization. This release is designed to offer:

- Multi-system virtualization clustering technology allowing up to four z/VM instances to be clustered in a single system image (SSI) which offers clients:
    - Relief from the challenges associated with virtual machine sprawl on competitive systems
    - A more manageable infrastructure for cloud computing by providing a set of shared resources that can be managed as a single resource pool
    - Live Guest Relocation to move Linux virtual servers without disruption to the business, helping to avoid planned outages
    - Enhanced workload balancing with the added ability to move work to available system resources
  - Improved systems management to help manage the life cycle of the z/VM hypervisors and the virtual servers
  - IPv6 support for enhanced networking security, especially useful for doing business with the US Federal Government
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### **Question:**

What type of guest are supported for Live Guest Relocation in an SSI?

### **Answer:**

Linux Guests are supported.

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### **Question:**

Why isn't z/VM 6.2 a new version for z/VM rather than a new release of version 6?

### **Answer:**

z/VM V6.2 requires the same architectural level as V6.1. This level is available on all IBM System z10<sup>®</sup> Enterprise Class (z10 EC<sup>™</sup>), IBM System z10 Business Class<sup>™</sup> (z10 BC<sup>™</sup>) IBM zEnterprise 196 (z196) and IBM zEnterprise 114 (z114) servers as well as and future generations of System z servers.

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### **Question:**

What will be the effect of the new release have on support for z/VM 5.4?

### **Answer:**

Because z/VM 5.4 is the last release to support the IBM System z9, IBM eServer<sup>™</sup> zSeries<sup>®</sup> 990 (z990), 900 (z900), 890 (z890), and 800 (z800) servers, its Withdrawal from Marketing date has not been announced. IBM will provide at least three months notification prior to the planned withdrawal date.

IBM announced its intention to discontinue service support for z/VM V5.4 to be effective September 30, 2011, in Software Announcement 208-249, dated August 5, 2008. In IBM Software Announcement 209-207, dated July 7, 2009, IBM extended the new date for discontinuing service support for z/VM V5.4 to September 30, 2013.

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**Question:**

Can I still order z/VM V6.1?

**Answer:**

Currently z/VM 6.1 is also still available for ordering. IBM will discontinue marketing for z/VM V6.1 with the general availability of z/VM V6.2 in December 2011.

IBM will discontinue of service support for z/VM 6.1 has been previously been announced as April 30, 2013.

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**Question:**

As an overview, what other than z/VM Single System Image and Live Guest Relocation is in z/VM V6.2?

**Answer:**

z/VM 6.2 has a significant amount of content in addition to VMSSI and Live Guest Relocation. z/VM V6.2 is also includes:

Technology Exploitation enhancements

- Exploitation support of the IBM zEnterprise 196 (z196) and IBM zEnterprise 114 (z114). z/VM will recognize and report processing capability reduction due to customer-initiated power-saving mode or an autonomic response to environmental conditions and will reflect the change and its cause in monitor and accounting data streams. The operating system will now collect system topology information in CP Monitor data z/VM will provide support for two new System z channel path types (CHPIDs) to enable access to the networks that interconnect the components of the IBM zEnterprise System
- FICON Express8S and OSA-Express4S support
- XRC time stamping support in which z/VM exploits the Server Time Protocol (STP) facility to generate time stamps for guest and system DASD write I/O operations, allowing these I/O operations to be synchronized with those of other systems
- HyperSwap improvements to provide higher Reliability, Availability, and Serviceability (RAS).
- IBM Extended Address Volumes (EAV) support for the IBM DS8000<sup>®</sup> to support ECKD<sup>™</sup> volumes up to 262,668 cylinders
- IBM System Storage XIV<sup>®</sup> direct attachment support to z/VM for system use
- Dynamic emulated device path control ability to add and remove paths from an emulated device (representing a real SCSI device) while the device is online and possibly in use.
- IBM System Storage<sup>®</sup> TS1140 Tape Drive (3592 Model E07) for VM in either FICON<sup>®</sup> or ESCON<sup>®</sup> attachment.
- CPU-Measurement Counter Facility Host Support to have CP collect counter data generated by the CPU-Measurement Facility for MONDATA and MONSET reports and include the counter data in the CP MONITOR data stream.

## Systems Management enhancements

- Support for the IBM zEnterprise Unified Resource Manager. Augmenting the existing z/VM virtual server management functions available on System z10, this support now also permits virtual servers to be created and deleted, allows real and virtual networking resources to be created and deleted, and allows real and virtual networking resources to be managed by the Unified Resource Manager. Within a zEnterprise, a single z196 or z114 and an optional attached IBM zEnterprise BladeCenter® Extension (zBX) is called a node. A collection of one or more zEnterprise nodes that are managed as a single logical virtualized system by the Unified Resource Manager is called an ensemble. An ensemble can consist of a single z196 or z114 with no zBX attached, or two to eight CPCs where at least one of the z196 or z114 machines has a zBX attached.
- Dynamic discovery of FCP disks allowing z/VM to discover information about the DASD logical units (LUNS) accessible through virtual FCP devices available to the virtual machine.
- Enhanced Systems Management APIs to integrate the z/VM VMSSI clusters environment and other new functionality in z/VM 6.2
- Enhanced Directory Maintenance Facility to support z/VM VMSSI clusters
- Enhanced Performance Toolkit to support z/VM VMSSI clusters

## Network Virtualization

- Support for IBM zEnterprise System networks in z/VM for the (INMN) and intraensemble data network (IEDN) through its real and virtual networking capabilities. This allows the deployment and management of z/VM network topology is integrated into the zEnterprise environment and can be managed by the Unified Resource Manager.
- MPROUTE upgrade to the functional equivalency of z/OS® V1.12
- LDAP server upgrade to the functional equivalency of z/OS V1.12
- IPV6 support for z/VM TCP/IP FTP (client and server), z/VM TCP/IP SMTP (client and server), CMS NOTE and SENDFILE commands
- FTP Enhancements
- Multiple access ports per guest so a guest can have multiple unique access ports connected to the same virtual switch instance.
- OSA Address Table support so z/VM TCP/IP can display information such as IP addresses and MAC addresses from the OSA Address Table (OAT) for OSA devices including those managed by virtual switch controllers.

## Scalability

- Memory Scalability relief in the frame allocation management area.
- Disabling guest page reordering process capability of VM. With simple SET commands the system administrator can now decide if page reorder should be on or off for the system or a guest
- Improved page release serialization to reduce system overhead
- Improved contiguous frame coalescing to increase system throughput while finding adjacent free storage frames

- Alternate method for hard limiting of scheduled system resource that allows the system administrator the choice of how the algorithm for limiting guest should be used. This is done via CP command.

## Security

- z/VM SSL server upgrade and FIPS support to the z/OS V1.12 level. This also includes support for the federal Information Protection Standard (FIPS) 140-2.
- ESM access control for real devices via the CP ATTACH and GIVE commands. These commands now use the external security manager (ESM) to provide mandatory access control and discretionary access control for real devices.
- ESM access control for SET SECUSER and SET OBSERVER commands. These commands now operate under the authority checking of ESM mandatory access control (security label checking) if this feature is active.
- Enhanced RACF Security Server to the z/VM 6.2.0 level. This level provides the support for z/VM SSI clusters (When RACF is used in a z/VM SSI cluster, all member systems will share the RACF database, providing z/VM guests with a common and consistent security image.)
- Support for defining protected user IDs. Mandatory access control and discretionary access control for z/VM real devices (CP ATTACH and GIVE commands) and the Mandatory access control for the CP SET SECUSER and SET OBSERVER commands
- Crypto Express3 support that z/VM provides to guest virtual machines.
- Protected key CP Assist for Cryptographic Functions (CPACF) Guest support for high-performance bulk encryption using clear cryptographic keys, and also supports encrypted keys are enabled.
- EAL4+ certification for z/VM V6.1. z/VM V6.1 with the RACF Security Server optional feature, including labeled security, is being evaluated and certified for conformance to the Operating System Protection Profile (OSPP) of the Common Criteria standard for IT security, ISO/IEC 15408, at Evaluation Assurance Level 4+ (EAL4+). This satisfies the statement of direction made in the IBM Software Announcement dated July 22, 2010. All of the z/VM V6.1 service items that were included in the EAL4+ certification are included in the z/VM V6.2 base product.

## Application enablement

- z/Architecture<sup>®</sup> CMS, which was previously shipped as a sample program, is now a fully supported part of z/VM.
- Program Management Binder upgrade to the Binder level shipped with z/OS V1.12 level.
- Language Environment runtime libraries have been upgraded to z/OS V1.12 equivalency.
- Support for XL C/C++ Compiler for z/VM, V1.3. This is a z/VM-enabled version of the z/OS V1.12 XL C/C++ compiler. or further information on the IBM XL C/C++ For z/VM V1.3 product please refer to Software Announcement xxx-xx (RFA55579) dated October 12, 2011

More details on the overall release can be found at: <http://www.ibm.com/vm/zvm620/>

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**Question:**

Which servers are supported by z/VM V6?

**Answer:**

z/VM V6.2 supports the IBM System z10 EC, IBM System z10 BC servers IBM zEnterprise 196 (z196), IBM zEnterprise 114 (z114) and later.

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**Question:**

Is there any requirement for a Coupling Facility (CF) for an SSI Cluster?

**Answer:**

No. z/VM does not use a CF to implement the Single System Image. There is no relationship between the Single System Image feature and a parallel sysplex and the coupling facility it uses.

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**Question:**

Can z/VM instances in an SSI span long distances?

**Answer:**

The distance between the z/VM members of a Single System Image are based on the limitations of FICON and LAN communications which will limit the distance to a local metropolitan area.

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**Question:**

What is the maximum distance supported for SSI connectivity?

**Answer:**

The components of SSI connectivity have different restrictions:

- FICON CTCA's and Shared DASD over FICON must be within 100km unrepeated
  - For the SSI systems to be on the same LAN segment as they support Live Guest Relocation the systems must be within 10km unrepeated. This is the same limitation as the zBX internal Data Network (IEDN).
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**Question:**

Can you connect members of a VMSSI using channel extenders?

**Answer:**

No.

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**Question:**

What version of Linux is tested with z/VM in an SSI cluster?

**Answer:**

z/VM Development has tested with several levels of Linux which include but not limited to Novell SUSE SLES10, SLES11 and Red Hat REL6. Guidelines and or restrictions for specific releases and others will be identified prior to general availability of z/VM 6.2 at <http://www.ibm.com/vm/zvm62ssi>

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**Question:**

What is the additional support for Linux on System z guests using Dynamic Storage Reconfiguration (DSR)?

**Answer:**

Enhancements to z/VM storage management allow better cooperation with Linux on System z guests exploiting DSR.

z/VM support:

Allows operation when running second level on z/VM to be more compatible with operation when running directly on an LPAR Displays configured, standby, and reserved values for each virtual storage element via the QUERY VIRTUAL STORAGE command Improves z/VM handling of unexpected DSR conditions that may occur

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**Question:**

What is the purpose of the WWPN prediction tool?

**Answer:**

The WWPN prediction tool is available from IBM Resource Link™ to assist you with preplanning of your Storage Area Network (SAN) environment prior to the installation of your System z10 server. This standalone tool is designed to allow you to set up your SAN in advance, so that you can be up and running much faster once the server is installed. The tool assigns WWPNs to each virtual Fiber Channel Protocol (FCP) channel/port using the same WWPN assignment algorithms a system uses when assigning WWPNs for channels utilizing N\_Port Identifier Virtualization (NPIV).

The Hardware Configuration Definition (HCD) component of z/VM provides I/O device information from the input/output definition file (IODF) for the WWPN prediction tool.

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**Question:**

Where can I get more information on the WWPN prediction tool?

**Answer:**

For more information on setting up a SAN using the WWPN prediction tool, refer to the IBM Hardware Announcement 109-230 (US), dated April 28, 2009.

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**Question:**

Today I'm using Unified Resource Manager to manage z/VM and virtual servers running on z/VM. When I upgrade to z/VM 6.2 can I continue to use the Unified Resource Manager?

**Answer:**

Yes, you can continue to use the Unified Resource Manager to manage z/VM and its virtual servers. If you plan to use the z/VM Single System Image feature (VMSSI) then the suggested best practice is that you should no longer use Unified Resource Manager to manage z/VM virtual servers as some VMSSI functions, such as Live Guest Relocation, will not be exploited.

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**Question:**

So, if I am using VMSSI and am not managing my z/VM V6.2 virtual machines with Unified Resource Manager can I still use Unified Resource Manager to manage my POWER7<sup>®</sup> and IBM System x<sup>®</sup> blades?

**Answer:**

Yes.

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**Question:**

Can z/VM V6.2 virtual servers be part of a zEnterprise ensemble?

**Answer:**

Yes, like z/VM V6.1, z/VM V6.2 and its virtual servers can also be part of a zEnterprise ensemble and can be managed by the Unified Resource Manager. But, if you plan to use the VMSSI feature, especially if you plan to use virtual server mobility, then the best practice is that you should no longer use Unified Resource Manager to manage z/VM virtual servers.

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**Question:**

I plan to use Unified Resource Manager for management of my z/VM systems and I do not plan to use the VMSSI feature of z/VM Version 6 Release 2. Are there any differences in configuring z/VM to be ensemble managed between z/VM Version 6 Release 1 and z/VM Version 6 Release 2?

**Answer:**

Yes, the process is somewhat different between the two releases. The z/VM Version 6 Release 1 support for Unified Resource Manager delivered as service, while the z/VM 6.2 support is in the base of the product with some configuration already defined. As a result, most people find it easier to configure z/VM to be used in an ensemble environment on z/VM 6.2.

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**Question:**

I am interested in deploying z/VM V6.2 VMSSI. Are their resources to help me understand, plan and deploy a z/VM Single System Image?

**Answer:**

Yes, IBM STG Lab Services can assist with this. You can contact IBM STG Lab Based Services via the Internet at: <http://www.ibm.com/systems/services/labservices/> or send email to [systemz@us.ibm.com](mailto:systemz@us.ibm.com)

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**Question:**

Can I use the IBM Systems Director to manage z/VM V6.2?

**Answer:**

No, not at this time.

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**Question:**

Are there any planned installation changes in V6?

**Answer:**

Yes. IBM encourages all customers to review the installation process prior to trying to install the base z/VM system or new VMSSI feature as there are significant changes and even experienced customers will need to be familiar with the new process.

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**Question:**

With the installation changes affect the way z/VM 6.2 is installed?

Answer:

Yes. With the installation changes a number of things will change to facilitate the installation of a SSI cluster regardless if you are using SSI or not. These changes will be changes to both installation and that data gathered at installation. This was changed to further automate the installation process where possible and to use look and feel regardless if the installation was for an SSI cluster environment or a non-SSI environment.

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**Question:**

Is their migration path between a non-SSI environment and an SSI cluster environment?

**Answer:**

Yes, we do provide instructions but this does involve doing a fresh install for SSI.

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**Question:**

Where can I get more information on the installation changes?

**Answer:**

The information is located in the Installation manual and other documentation that can be referenced from the z/VM 6.2 web site at: <http://www.ibm.com/vm/zvm620>

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**Question:**

Are there any planned changes to the publications with V6.2?

**Answer:**

Yes, the entire z/VM library has been refreshed with new form numbers

One copy of the IBM *Online Library: z/VM Collection* on DVD is distributed with each z/VM V6.2 order.

The *IBM Online Library: z/VM Collection* on DVD is also available (for a fee) from the Publications Center Web site at: <http://www.ibm.com/e-business/linkweb/publications/servlet/pbi.wss>

z/VM product documentation published in BookManager<sup>®</sup> and Adobe PDF format is planned to be available at GA. The online locations are:

In the z/VM V6.2 VM Internet Library website at: <http://www.ibm.com/vm/library/>

or

In the z/VM V6.2 Information Center web site at:

<http://publib.boulder.ibm.com/infocenter/zvm/v6r2/index.jsp>



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**Question:**

What is an Information Center?

**Answer:**

IBM now publishes the z/VM documentation (information for the z/VM base and optional features) in an information center using the IBM Eclipse Help System framework. The content of the Information Center is identical to that in the traditional BookManager and Adobe PDF formats; however, the presentation might differ to some degree.

Advantages of information centers are:

- Content is indexed by Google and other Internet search engines to help locate information more easily.
- Custom searches can be created that include only the information you need for a particular task or job role.

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**Question:**

What features are optional for z/VM V6.2?

**Answer:**

The priced, optional features of the z/VM V6.2 base product are the VMSSI, Performance Toolkit for VM™, DirMaint™, RACF Security Server and Remote Spooling Communication Subsystem (RSCS) Networking.

## IBM System z server and IBM System Storage information

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**Question:**

Which servers are supported by z/VM V6.2?

**Answer:**

z/VM V6.2 supports the IBM System z10 EC, IBM System z10 BC servers IBM zEnterprise 196 (z196), IBM zEnterprise 114 (z114) and later.

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**Question:**

What supported versions and releases of z/VM support the z10 EC, z10 BC, z196 and z114 servers?

**Answer:**

z/VM releases V5.4 and V6.1, with applicable PTFs, and V6.2 or later.

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**Question:**

Where can I find out more information on the IBM System z servers?

**Answer:**

For additional information on System z Servers see: <http://www-03.ibm.com/systems/z/hardware/>

Also FAQs are also available for the System z servers at:

[ibm.com/systems/z/resources/faq/index.html](http://www.ibm.com/systems/z/resources/faq/index.html)

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**Question:**

Can I use the Hardware Management Console for installation?

**Answer:**

Yes. Using z/VM V5.4 or later and the Hardware Management Console (HMC) 2.10.0, or later, in conjunction with the Support Element (SE) 2.10.0, or later, on IBM System z10 servers, z/VM can be installed in an LPAR and both z/VM and Linux on System z can be installed in a virtual machine from the HMC DVD drive. This can eliminate requiring any external network setup and a physical connection between an LPAR and the HMC, instead using the existing communication path between the HMC and the SE and thus may make configuration easier and more secure because the HMC does not have to reside on the intranet.

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**Question:**

Are there any performance considerations when installing Linux from the HMC?

**Answer:**

Yes. This support is intended for customers who have no alternative, such as a LAN-based server, for serving the DVD contents for Linux installations. The elapsed time for installation using the HMC DVD drive can be an order of magnitude, or more, longer than the elapsed time for LAN-based alternatives.

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**Question:**

What cryptography support is provided by z/VM for the z10 EC, z10 BC, z196 & z114 servers?

**Answer:**

z/VM provides guest exploitation support for the CP Assist for Cryptographic Function (CPACF) and Crypto Express2 and Crypto Express3 features.

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**Question:**

What supported versions and releases of z/VM provide exploitation support for the z9 EC, z9 BC, z990, z900, z890, and z800 servers?

**Answer:**

z/VM release V5.4.

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**Question:**

Does z/VM V6.2 support FICON Express8S and OSA-Express4S?

**Answer:**

Yes. IBM has introduced a new I/O drawer and new form factor I/O cards for the z196 and z114 to support a direct Peripheral Component Interconnect Express Generation 2 (PCIe Gen2) infrastructure with increased capacity, granularity, and infrastructure bandwidth, as well as increased reliability, availability, and serviceability:

- FICON Express8S features for the storage area network (SAN) provide for single mode fiber (LX) and multimode fiber (SX) environments with two channels per feature, and two channel path identifiers (CHPIDs).
  - OSA-Express4S features for the local area network (LAN) provide for single mode fiber (LX, LR) and multimode fiber (SX, LR) environments. The 10 GbE features have one port per feature and one CHPID. The GbE features have two ports per feature and one CHPID shared by the two ports.
- 

**Question:**

Does z/VM provide support for the DS6000™ and DS8000?

**Answer:**

Yes. The DS6000 is designed to deliver enterprise-class storage capabilities in a space-efficient, modular design at a low price. The DS8000 series is designed to provide unmatched functionality, flexibility, and performance for enterprise disk storage systems at new levels of cost effectiveness. In addition, z/VM V6.2 supports approximately 1 TB CP SCSI disks as well as:

- Support to automatically switch between multiple channel paths to help improve overall performance on the DS6000. Preferred paths are used for I/O operations to devices attached to a 1750 control unit. z/VM V6.2 can also allow the DS6000 and DS8000 series to operate in their native control unit modes. That is, the DS6000 is supported as a 1750 control unit and the DS8000 as a 2107 control unit.

- Support for Parallel Access Volumes (PAVs) as minidisks for guest operating systems such as z/OS that exploit the PAV architecture. In addition, the potential benefit of PAVs for I/O issued to minidisks owned or shared by guests that do not support native exploitation of PAVs, such as CMS. PAVs enable a single System z server and applicable storage controller to simultaneously process multiple I/O operations to the same logical volume, which can help to significantly improve I/O response times by reducing device queuing delays.
- Support for the Hyper Parallel Access Volume (HyperPAV) function optionally provided by the IBM System Storage DS8000 disk storage systems. HyperPAV support complements the existing basic PAV support in z/VM V5.2, for applicable supporting disk storage systems.
- z/VM V6.2 supports the IBM FlashCopy® SE feature on the IBM DS8000 which provides a space-efficient snapshot capability that can greatly reduce the storage capacity needed for point-in-time copies.
- Guest support for the IBM Extended Address Volumes (EAV) function of the IBM DS8000, providing for volumes that can scale up to approximately 223 GB (262,668 cylinders).
- Support for Dynamic Volume Expansion simplifying disk management by allowing for the dynamic increase of a DS8000 volume size in order to accommodate application data growth

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**Question:**

What is the z/VM support for the IBM System Storage SAN Volume Controller (SVC) Storage Engine 2145?

**Answer:**

z/VM and its guest operating systems are designed to access SCSI FCP storage capacity from multiple vendors as a single reservoir of capacity that can be managed from a central point. z/VM supports the SVC through the z/VM generic SCSI device driver. The SVC handles the device-specific requirements for whatever collection of different storage devices a customer has attached to the SVC.

z/VM support for the SVC allows the z/VM control program (CP) and guest operating systems that use SCSI devices (such as Linux on System z and z/VSE, as well as z/VM itself) to access IBM disk subsystems, including the DS8000, DS6000, DS4000®, IBM XIV, as well as disk subsystems from other manufacturers that are supported by the SVC.

The SVC support adds “2145” as a parameter of the EDEVICE configuration statement, as well as the SET EDEVICE and QUERY EDEVICE commands.

The SVC can be used to provide SCSI devices as emulated FBA devices for use by CP and guest operating systems.

Use of SCSI devices accessed through the SVC by dedicated FCP subchannels is available to guest operating systems.

Supported hardware list, device driver and firmware levels for the SAN Volume Controller can be found at: <http://www.ibm.com/support/docview.wss?rs=591&uid=ssg1S1002864>

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**Question:**

Does z/VM provide support for the IBM XIV Storage System?

**Answer:**

Yes, XIV devices can be used for z/VM system volume usage when attached to a SAN Volume Controller (SVC). For additional information on the IBM XIV Storage System, refer to: <http://www.ibm.com/systems/storage/disk/xiv/index.html>

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**Question:**

Does z/VM V6.2 support the TS1140 Tape Drive (3592 Model E07)?

**Answer:**

Yes. z/VM V6.2 supports the IBM Total Storage<sup>®</sup> TS1140 Tape Drive (3592 Model E07) that can provide IBM System z customers with FICON or ESCON attachment of the highest capacity, highest performing tape drives offered by IBM.

In addition, tape library support for these drives is provided by DFSMS/VM FL221 with RMS APAR VM65005 and its prerequisite service.

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**Question:**

Does the prior supported releases of z/VM (V5.4 and V6.1) support the TS1140 Tape Drive (3592 Model E07)?

**Answer:**

Yes. z/VM 5.4 and 6.1 support for the 3592 Model E07 tape drive is provided with APAR VM64979.

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**Question:**

What version of Linux runs on IBM Servers?

**Answer:**

The minimum version IBM tested and supported Linux environments for IBM servers are documented in the IBM "Tested Environments" page for System z. See: <http://www-03.ibm.com/systems/z/os/linux/resources/testedplatforms.html>

## z/VM General

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**Question:**

What architecture mode is supported for guests operating on z/VM V6.2, running in 64-bit mode?

**Answer:**

z/VM V6.2 exploits and supports the z/Architecture, enabling you to run 64-bit capable operating systems (Linux on System z, z/OS, z/VSE<sup>®</sup> V4, and z/TPF) as guests of z/VM V5 when z/VM V5 is running on a System z platform in 64-bit mode. z/VM V6 also supports guest operating systems running in ESA/390 mode such as z/VSE V3, TPF, OS/390<sup>®</sup>, Linux on S/390<sup>®</sup>, or VM/ESA<sup>®</sup> when z/VM V6 is operating in 64-bit mode. In order for z/OS to operate as a guest of z/VM on the System z platform, both z/VM V6.2 and z/OS must be operating in 64-bit mode.

---

**Question:**

What operating systems can z/VM host?

**Answer:**

z/VM V6.2 is a System z operating system designed to host guest operating systems including Linux on System z, z/OS, OS/390, z/VSE, VSE/ESA, z/TPF, TPF, z/VM, and VM/ESA. When z/VM V6.2 is installed on Integrated Facility for Linux (IFL) processors, Linux, z/VM V5.4, and V6 can be hosted as guest operating systems.

---

**Question:**

Can z/VSE run as a guest of z/VM V6.2?

**Answer:**

Yes. z/VM V6.2 supports z/VSE V3 in ESA/390 (31-bit) mode only and z/VSE V4 in z/Architecture (64-bit) mode only.

---

**Question:**

What software is available for z/VM from other Independent Software Vendors (ISVs)?

**Answer:**

IBM maintains a list of software vendor products that can be found at the following link:  
<http://www.ibm.com/vm/vendor/>

Please note: This vendor product information is provided by the ISVs without independent evaluation or validation by IBM. IBM makes no claim as to the completeness of the information provided.

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**Question:**

What software is available for z/VM from IBM?

**Answer:**

A list of IBM Licensed Programs available for z/VM can be found at the following link:  
<http://www.ibm.com/vm/related/>

## **z/VM Marketing**

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### **Question:**

Who do I contact if I am interested in z/VM V6.2?

### **Answer:**

You may contact:

- IBM Marketing Representatives
  - IBM Business Partners (BPs)
- 

### **Question:**

What customers should be interested in z/VM V6.2?

### **Answer:**

The success of Linux on System z can be attributed in part to the business value that Linux-based solutions derived from the IBM mainframe virtualization technology provided by z/VM running on IBM System z servers. z/VM technology offers the ability to host a large number of Linux servers on a single mainframe while also providing a highly flexible, adaptable, and efficient operational environment that is well-suited for a dynamic infrastructure.

Today's announcement strengthens the z/VM offering by allowing you to manage, service, and administer up to four z/VM systems running in separate LPARs or separate servers as if they were one z/VM system. This cluster of z/VM systems is called a Single System Image. z/VM support for Live Guest Relocation allows running guests to be relocated to a different member within the Single System Image prior to a planned outage.

z/VM V6.2 operates only on IBM System z10, zEnterprise 196 and 114, and newer servers. Like z/VM V5, z/VM V6 requires z/Architecture (64 bit) for execution and can host 31-bit (ESA/390) guest operating systems and z/Architecture (64-bit) guest operating systems.

Clients can add capacity to IBM mainframe servers for hosting Linux on System z workloads by configuring their servers with Integrated Facility for Linux (IFL) processors.

z/VM V6.2 provides additional support and exploitation opportunities for many users who have built enterprise-wide automation and infrastructure enhancements on the VM platform in support of their applications, database systems, and on-demand business solutions.

## z/VM and Linux

### Question:

What IBM tools are available to help manage multiple images of Linux, analyze performance, and act upon results?

### Answer:

The following tools are designed to assist the system programmer with managing images, analyzing performance and adjusting the system for optimal resource utilization:

- Systems Management API – The Systems Management API provide a basic set of functions that may be called by applications to allocate and manage resources for guests running in z/VM virtual machines (virtual images). Use of the API through an application provided by a customer or solution provider are designed so that such applications can allow administrators who lack in-depth VM knowledge to manage large numbers of virtual images running in a single z/VM system.
- HMC and SE 2.10.1 for the z10 EC, z10 BC, z196 & z114 servers – Exploits the z/VM Systems Management APIs for z/VM V5.4, V6.1 and V6.2 to allow selected virtual resources to be defined and managed
- IBM Systems Director - Delivers a simplified platform management solution that streamlines the way physical and virtual systems are managed across a multisystem environment. Leveraging industry standards, IBM Systems Director supports multiple operating systems and virtualization technologies across IBM and non-IBM platforms. Through an easy-to-use, point-and-click, single user interface, IBM Systems Director provides consistent views for visualizing managed systems and determining how these systems relate to one another while identifying their individual status, thus helping to correlate technical resources with business needs. The z/VM Manageability Access Point (zMAP) Agent is provided for IBM Systems Director to communicate with z/VM. This Agent, now supplied with z/VM V6.1, allows IBM Systems Director to obtain information about guest virtual machines as well as take action on behalf of these virtual machines such as create, manage, and delete. This Agent runs in a Linux guest on z/VM.
- IBM Systems Director VMControl™ Image Manager for Linux on System z - IBM Systems Director VMControl Image Manager for Linux on System z, V2.1 is designed to simplify the management of virtual environments across multiple virtualization technologies and physical platforms to support the growing requirements of a dynamic infrastructure. IBM Systems Director VMControl Image Manager V2.1 is a plug-in to IBM Systems Director V6.1, providing support to manage and automate the deployment of virtual appliances (images) from a centralized location. For additional information on IBM Systems Director VMControl Image Manager for Linux on System z refer to IBM Software Announcement 209-095 (US), dated July 21, 2009.
- HCM/HCD – The HCM and HCD components are designed to reduce the amount of system administration input required to complete a z/VM installation and provide a comprehensive, easy-to-use I/O-configuration-management environment similar to that available with the z/OS operating system. The HCM and HCD programs work together to help you easily create and manage the hardware and software aspects of your z/VM system I/O configuration.



- Performance Toolkit for VM – The Performance Toolkit for VM provides enhanced capabilities for a z/VM systems programmer, operator or analyst to monitor and report performance data.
- Tivoli OMEGAMON XE on z/VM and Linux - Provides a wide range of information about the z/VM and Linux on System z operating systems, including information about your Linux instances running as z/VM guests and the Linux workloads, revealing how they are performing and affecting z/VM and each other.
- Virtual Machine Resource Manager (VMRM) – The Virtual Machine Resource Manager is a service that dynamically tunes the z/VM system. Virtual machines can be grouped into workloads by specifying workload and goal definitions and associations between them, and then adjusts virtual machine CPU and I/O and memory (Linux guests only) performance controls based on actual performance data to attempt to achieve the goals associated with each workload.
- Gigabit Ethernet OSA-Express2 and OSA-Express3 – Offer high-speed TCP/IP connections through Gigabit Ethernet (GbE) and 10 GbE (OSA-Express2 and OSA-Express3) adapters. This capability is a natural evolution of Ethernet and Fast Ethernet support that is needed to support data intensive TCP/IP applications and to help relieve traffic bottlenecks. z/VM enables guests, including z/OS and Linux, to use the OSA-Express2 and OSA-Express3 GbE adapter.
- Virtual IP Addressing (VIPA) – VIPA increases the reliability and stability of TCP/IP in the event of a network or interface failure. With VIPA, hardware link fault tolerance is supplied for both inbound and outbound TCP/IP communications on z/VM, which can provide automatic recovery of hard link failures and network traffic splitting.
- DirMaint – IBM Directory Maintenance (DirMaint) Facility provides efficient and security-rich interactive facilities for maintenance of your z/VM system directory.

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**Question:**

What features for z/VM enhance the Linux guest environment?

**Answer:**

The capability is provided to account for the use of system resources by virtual machines, including those running Linux. An accounting record is produced that tracks a virtual machine's use of virtual network resources, including virtual channel-to-channel adapters (CTCAs), inter-user communication vehicle (IUCV) or advanced program-to-program (APPC) connections, and virtual (Guest LAN) network interface cards (NICs).

z/VM Guest RSA-Assist Support for Linux, Fast Channel Command Word (CCW) Translation Extensions, Enhanced Page Fault Handling and Observer support.

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**Question:**

What function did z/VM Guest RSA-Assist Support for Linux provide?

**Answer:**

With corresponding RSA-Assist Support function available from Linux on System z, the VM Guest RSA-Assist support enables Linux guest virtual machines to exploit the IBM CryptoExpress2 and Crypto Express3. This support provides clear-key RSA support for a large number of Linux guests enabling hardware Secure Socket Layer (SSL) acceleration on the z10 EC and z10 BC servers.

---

**Question:**

What is the support for Linux on System z guests using DSR?

**Answer:**

z/VM storage management allows better cooperation with Linux on System z guests exploiting DSR. z/VM support:

- Allows operation when running second level on z/VM to be more compatible with operation when running directly on an LPAR
- Displays configured, standby, and reserved values for each virtual storage element via the QUERY VIRTUAL STORAGE command
- Improves z/VM handling of unexpected DSR conditions that may occur

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**Question:**

How do Fast Channel Command Word Translation Extensions benefit my Linux environment?

**Answer:**

Fast Channel Command Word (CCW) Translation Extensions help improve the performance of traditional I/O (Start Subchannel (SSCH)) to network and DASD devices. The z/VM Control Program (CP) provides a fast CCW translator to translate a wide range of channel programs that perform I/O to network adapters. This fast translator for network devices includes support for 64-bit indirect data address words (IDAWs), which allows guest machines to read and write data above the 2 GB limit using 64-bit I/O addressing. 64-bit IDAW support was further extended to the existing DASD fast CCW translator. This is also designed to include 64-bit IDAW support for DASD channel programs that are simulated via the minidisk cache (MDC). Although the fast CCW translation extensions are based on analysis of Linux guest channel programs, any VM guest that does qualifying I/Os can benefit from this new function.

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**Question:**

How is page fault handling enhanced in the z/VM?

**Answer:**

The current page fault handling support within CP is designed to allow Linux on System z guests to take full advantage of page fault notifications. With corresponding function available with Linux on System z, the Linux guest continues to process while the page fault is handled by CP

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**Question:**

What is the Integrated Facility for Linux (IFL)?

**Answer:**

The Integrated Facility for Linux is a dedicated Linux on System z processor. It is an optional feature, designed to add additional processing capacity, exclusively for Linux workload, with no effect on the existing model designation.

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**Question:**

What benefits does z/VM provide for my Linux guest environment?

**Answer:**

- z/VM enables you to run a large number of Linux server images on a single System z platform. It is ideal for integrating applications and data and consolidating select UNIX®, and Linux workloads deployed on multiple servers onto a single physical System z server, while maintaining the same number of distinct server images. These Linux images can be deployed on standard processor or IFL processors. Server consolidation may result in cost savings realized by managing large server farms deployed on virtual servers instead of multiple hardware servers.

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**Question:**

What are the specific value propositions of the IBM System z virtual Linux server environments for a dynamic infrastructure?

**Answer:**

A dynamic infrastructure helps allow for improved service, reduced costs, and reduced risk.

These aspects are very well supported by the IBM System z virtual Linux server environments:

- Improved service is not only provided by the high availability of the environment. Major elements are likewise the high flexibility, the dynamic access to resources and services, and the very fast provisioning.
- Cost reduction can be achieved through the outstanding virtualization capabilities, allowing for higher resource utilization, less energy consumption, and less management effort.
- Risk reduction can be provided through the manifold security and resiliency features, that address today's and new risks that may come with a more connected and collaborative world.

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**Question:**

What support is provided for Linux on System z running on z/VM?

**Answer:**

Support for Linux is provided by each distributor and through support providers such as your local System z IBM Business Partner and IBM Global Services. Please contact the distributors, your IBM Business Partner or IBM Global Services for specific support information.

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**Question:**

Can I buy a server that has IFL processors without including a standard processor?

**Answer:**

Yes. You can order/configure IFL-only processor models with the z10 EC, z10 BC, z196 & z114 servers.

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**Question:**

Can I run z/VM V6.2 in an LPAR which has a mix of standard and IFL processors?

**Answer:**

Yes. The IBM System z10 introduced and the IBM z196 & z114 continue to support z/VM-mode logical partitions (LPARs), which allow multiple types of System z processors to be defined in the same z/VM LPAR, including:

- Central Processors (CPs)
- Integrated Facility for Linux Processors (IFLs)
- IBM System z Integrated Information Processors (zIIPs)
- IBM System z Application Assist Processors (zAAPs)
- Internal Coupling Facility Processors (ICFs)

z/VM V6.2 exploits this capability by expanding its guest support for specialty processors to allow these processor types to be defined as virtual CPUs. This capability increases flexibility and simplifies systems management by allowing a single z/VM V6 system to:

- Operate z/TPF, z/VSE, and z/OS guests on CPs
- Operate Linux on System z as guests on IFLs and optionally on CPs
- Offload z/OS system software process requirements, such as DB2<sup>®</sup> workloads, on zIIPs
- Provide an economical Java execution environment under z/OS on zAAPs
- Operate coupling facility virtual machines in support of a Parallel Sysplex<sup>®</sup> test environment on ICFs and optionally on CPs

This support is exclusive to the IBM System z10, z196 & z114 servers.

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**Question:**

Can I control access to my Linux guests with RACF on z/VM?

**Answer:**

Yes. When the RACF Security Server feature is ordered, it is licensed under IPLA and is supported on both standard and IFL processors. It is supported on both standard and IFL processors. The RACF Security Server feature FL620 is designed to operate with z/VM V6.2.

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**Question:**

Can I run High Level Assembler (HLASM) to reassemble CP or CMS source modules?

**Answer:**

Yes. HLASM is available for licensing on standard processors. The High Level Assembler is required for z/VM to:

- Apply corrective service to RACF associated CP parts
- Change exit routines or perform local modifications for any IBM VM product or vendor product

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**Question:**

Can I license HLASM on IFL processors?

**Answer:**

No. The High Level Assembler is available for use with Linux on System z on IFL processors as a Programming Request for Price Quote (PRPQ). A PRPQ must be submitted to purchase the High Level Assembler for Linux on System z (5799-TCQ) and for its annual Subscription & Support (5799-TCR).

For pricing, terms and conditions, and special bid requests, contact your IBM representative or your IBM Business Partner.

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**Question:**

Can I license ISPF/VM on IFL processors?

**Answer:**

No. However, ISPF/VM is available on a special bid basis for licensing on IFL processors.

For pricing, terms and conditions, and special bid requests, contact your IBM representative or your IBM Business Partner.

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**Question:**

How does Linux perform under z/VM?

**Answer:**

System performance depends on the hardware resources allocated to z/VM V5 and V6 and on the level of activity within each Linux image. For assistance in understanding the performance implications for a particular situation, contact your IBM representative or your IBM Business Partner.

You can also refer to the z/VM Performance Reports on the z/VM Web site at:

<http://www.ibm.com/vm/perf/docs/>

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**Question:**

How many Linux servers can I consolidate to run under VM?

**Answer:**

Our experience with server consolidations show that the number of servers depends on the types of the workload, the technology level of consolidated servers, the utilization factor, and other implementation requirements. Therefore the answer varies by client and workloads.

IBM has a great experience with consolidation projects and customers can get sizings done through their IBM representative or an IBM Business Partner. Both channels have access to SIZE390 which is used for this purpose. More detailed performance information is available at:

<http://www.ibm.com/vm/perf/tips/linuxper.html>

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**Question:**

Will IBM maintain a list of Independent Software Vendor (ISV) products that are being offered for Linux?

**Answer:**

Yes. IBM maintains a list of Independent Software Developer products available for Linux on System z at: <http://www.ibm.com/systems/z/solutions/isv/linuxproduct.html>

You can also access a list of the IBM products available for Linux at the following URL:  
<http://www.ibm.com/software/os/linux/software>

\*Note: This information is provided by the ISVs without independent evaluation or validation by IBM. IBM makes no claim as to the completeness of the information provided.

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**Question:**

Where can I find more information about running Linux in a VM environment?

**Answer:**

You can visit z/VM and Linux on System z Resources at:  
<http://www.ibm.com/vm/linux>

or the Linux on System z Web page at:  
<http://www.ibm.com/systems/z/os/linux>

In addition, there is a wealth of information including white papers, Redbooks® and Redpapers and porting information, and as well as Linux customer stories located on the Linux on System z – Library and Technical support/documentation pages and at URL:  
[http://www.ibm.com/os/linux/support\\_resources.html](http://www.ibm.com/os/linux/support_resources.html)

## Pricing, Licensing, & Ordering

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**Question:**

What is IPLA?

**Answer:**

IPLA stands for IBM International Program License Agreement. There is a one-time license charge for use of the program, which includes defect support via e-mail, fax or postal service and no-charge upgrades for new releases and versions when a current S&S license is in effect. A separate Subscription and Support offering is available with an ongoing recurring charge (4-year OTC in AP - China) for enhanced support, which includes telephone support.

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**Question:**

Will z/VM V6.2 continue to be offered as an IPLA product?

**Answer:**

Yes. IPLA offerings enable pricing on IBM Integrated Facility for Linux (IFL) processors.

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**Question:**

Have any price changes been announced for z/VM V6.2?

**Answer:**

No. Pricing for z/VM V6.2 remain the same as V5 and V6.1 and continues to use the Engine-based Value Unit pricing metric. Pricing information is available at: <http://www.ibm.com/support/>  
Choose the option under "Purchase / upgrade tools" link under Electronic Services.

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**Question:**

How can z/VM be ordered?

**Answer:**

There is no change to the ordering process for z/VM V6.2. Refer to IBM Software Announcement 211-409 (US), dated October 12, 2011 for ordering information.

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**Question:**

How is the tiered Value Unit concept different than a flat price per processor?

**Answer:**

The engine-based value unit pricing metric for z/VM V6 offers a declining per-processor price, on a tiered basis. Tiered value unit pricing provides a lower price per processor, on a tiered basis, as the number of standard and IFL processors licensed are increased within the enterprise. Engine-based Value Unit pricing for z/VM V6 is different than MSU-based Value Unit pricing, which is available on other IBM software products.

Processors	Value Units Per Processor	Processors	Value Units Per Processor
1-3	10	13-16	6
4-6	9	17-20	5
7-9	8	21-25	4
10-12	7	26 or more	3

The current price per value unit is \$2,250\*. As such, the entry OTC price per processor will be \$22,500 for z/VM V6 base function. For example, if a customer were to license z/VM V6 for 10 processors, the total OTC price would be \$198,000:

$\{3*(2,250*10)\}+\{3*(2,250*9)\}+\{3*(2,250*8)\}+\{1*(2,250*7)\}$

\*Price quoted in US currency and is subject to change

### **Question:**

How can a customer benefit from enterprise aggregation with Engine-based Value Unit pricing?

### **Answer:**

Engine-based Value Unit pricing may give customers a price benefit as they grow their capacity across their businesses. Customers can aggregate the capacity for all the processors that the product is licensed on to achieve a more economical price. In other words, additional capacity will not be priced starting at the base with a higher price per unit, but on the capacity (processors) where z/VM V6 has already been installed. Enterprise aggregation is only available within the same country.

### **Question:**

z/VM V6.2 is priced per processor. Do I have to license it on each processor on the system, both standard and the IFL?

### **Answer:**

Yes. The following conditions apply:

- Your entitlement is for only the quantity of engine-based Value Units licensed. These engine-based Value Units can be for either standard or IFL processors.
- z/VM may run on IFL processors only if, on the IFL processors, z/VM is being used exclusively to run (1) Linux and, (2) if required, z/VM applications in support of those Linux workloads.
- When ordering z/VM V6 to operate on any of the standard processors (CPs), Licensee must specify Value Units equal to the Value Units to cover the number of standard processors (CPs) on your server.
- For a single server in an enterprise, the number of Value Units ordered for any optional feature to operate on standard processors must be equal to the number of Value Units ordered for the base z/VM V6 product operating on standard processors.
- When ordering z/VM V6 to operate on IFL processors, Licensee must specify Value Units equal to the Value Units to cover the number of IFL processors on your server.
- For a single server in an enterprise, the number of Value Units ordered for any optional feature to operate on IFL processors must be equal to the number of Value Units ordered for the base z/VM V6 product operating on IFL processors.



- If Licensee is running z/VM V6 in an LPAR specified as "z/VM-mode" that is configured with both IFL processors and standard processors (CPs) and Licensee intends to run software licensed under the IBM Customer Agreement (ICA) in a virtual machine in that LPAR, that virtual machine must be configured to execute only on standard processors (CPs).

Within the scope of an enterprise aggregation, the number of Value Units ordered for the S&S license must equal the number of Value Units ordered for the OTC license(s).

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**Question:**

What is the cost of migrating from z/VM V4, V5 or V6.1?

**Answer:**

There is no cost to migrate from z/VM V4, V5 or V6.1 to z/VM V6.2 if the customer has a current Subscription and Support (S&S) license for V4, V5 or V6.1 and is not increasing the number of processors licensed. Customers without current S&S licenses will pay the current price for the number of Value Units required per processor for the z/VM base and optional features.

Customers that wish to use the new z/VM Single System Image FL620 feature (VMSSI) will need to add this feature to their order at an additional cost just as all other features of the OS are.

\*Price quoted in US currency and is subject to change

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**Question:**

Do I get any credit for the MLC I have paid on prior VM or z/VM products?

**Answer:**

No. z/VM V5 is a new product, and charged as such.

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**Question:**

Will IBM continue with model group pricing for other IBM z/VM related products when running on standard processors or will they be offered under IPLA?

**Answer:**

IBM currently offers certain software products that enhance the Linux environment under the International Program License Agreement (IPLA) with one-time charge (OTC) pricing. In addition to z/VM V6, the products currently offered as priced, optional features of z/VM V6 under the IPLA are:

- IBM z/VM Single System Image Feature
- Directory Maintenance Facility (DirMaint)
- Performance Toolkit for VM
- RSCS Networking
- RACF Security Server

Additional systems management products available from IBM and offered under the IPLA using the same pricing model as z/VM for operating on IFL processors are:

- IBM Tivoli zSecure manager for z/VM RACF (5655-T13)
- IBM Tivoli OMEGAMON XE on z/VM and Linux (5698-A36)
- IBM Tape Manager for z/ VM (5697-J08)
- IBM Backup and Restore Manager for z/VM (5697-J06)

- IBM Operations Manager for z/VM (5697-J10)
- IBM Archive Manager for z/VM (5697-J05)

Tivoli provides a host of systems management products for managing Linux on System z. For specific products and releases, refer to the Tivoli platform support matrix at:  
[http://www.ibm.com/software/sysmgmt/products/support/Tivoli\\_Supported\\_Platforms.html](http://www.ibm.com/software/sysmgmt/products/support/Tivoli_Supported_Platforms.html)

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**Question:**

Can I transfer a z/VM V6.2 license?

**Answer:**

Yes, however with Software Announcement 205-274 (US), dated November 1, 2005 and effective with the availability of z/VM V5.2, the terms and conditions regarding program transfer have been revised. IBM introduced the Limited Transfer term which stated:

“You may only transfer z/VM V5.2 to another party, in connection with Your transfer of the machine on which You are entitled to operate z/VM V5.2 (referred to as a “Limited Transfer”), provided that any such Limited Transfer of z/VM V5.2 requires You to transfer Your rights and obligations under the Agreement to the transferee and therefore terminates Your authorization to continue to use z/VM V5.2. When the machine and z/VM V5.2 are transferred, You must either provide a printed copy of the Agreement or, if electronic licensing is used for z/VM V5.2, take the necessary actions that will require electronic acceptance of the Agreement by the transferee prior to the transferee’s first use of z/VM V5.2.”

These terms and conditions are also applicable to z/VM V5.3, V5.4, V6.1 and V6.2.

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**Question:**

Is a license required in order to use the Internet print features of the RSCS product?

**Answer:**

No. use of RSCS support for LPR, LPD, TN3270E and UFT protocols does not require a license. However, a license is required in order to use any other functions of the RSCS product. To receive the full function of RSCS, it is offered as an optional, priced IPLA feature.

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**Question:**

When ordering z/VM, do I get a money-back guarantee?

**Answer:**

Yes. Any new licenses generated for z/VM will have a 30-day money-back guarantee. This is for programs licensed under the IPLA and the IBM International License Agreement for Non-Warranted Programs. For the latest information please refer to the following agreements:

- IBM International Program License Agreement (z125-3301) — applies to warranted software
- IBM International License Agreement for Non-Warranted Programs (z125-5589) — applies to non-warranted (“as-is”) software
- IBM International License Agreement for Evaluation of Programs (z125-5543) — applies to evaluation (try and buy) software
- IBM International License Agreement for Early Release of Programs (z125-5544) — applies to early release (beta) software

The latest versions of these agreements can be found at the IPLA License Agreements and License Information (LI) Documents Repository Web site at: <http://www.ibm.com/software/sla>

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**Question:**

Can customers finance (or obtain financing for) their purchase of a z/VM software license?

**Answer:**

Yes, IBM Global Financing offers competitive financing to credit-qualified customers to assist them in acquiring IT solutions. Offerings include financing for IT acquisition, including hardware, software, and services, from both IBM and other manufacturers or vendors. Offerings (for all customer segments: small, medium, and large enterprise), rates, terms, and availability can vary by country. Contact your local IBM Global Financing organization or visit <http://www.ibm.com/financing>

IBM Global Financing offerings are provided through IBM Credit LLC in the United States, and other IBM subsidiaries and divisions worldwide to qualified commercial and government customers. Rates are based on a customer's credit rating, financing terms, offering type, equipment type, and options, and may vary by country. Other restrictions may apply. Rates and offerings are subject to change, extension, or withdrawal without notice.

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**Question:**

Is the education allowance available for z/VM V6.2?

**Answer:**

Yes. The 15% Education Allowance (EA) applies toward both the IPLA purchase price and the Software Subscription and Support license for z/VM V6.2.

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**Question:**

Does z/VM V6 have any software prerequisites?

**Answer:**

Yes. The prerequisite no-charge products EREP VM V3.5.0 (5654-260) and ICKDSF VM V1.17.0 (5684-042) are required. Both of these products are no-charge and are pre-installed on the base product System DDRs. If you are not already licensed for these products you will need to place a separate order for both products to establish a license.

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**Question:**

Can I order z/VM on ShopzSeries?

**Answer:**

Yes. You can use ShopzSeries to order the operating system and software products for z/VM operating environments. Using ShopzSeries, customers can quickly generate orders for the base operating system and software products with the z/VM SDO electronically. The z/VM base operating system can be ordered using Internet delivery of ShopzSeries. In the case of fully-entitled upgrades, it offers a fully-automated process so no IBM intervention required. Additionally, ShopzSeries will help to determine if your order is technically correct (i.e. to determine any co-req or pre-req or incompatibility conditions are resolved for timely order placement and processing). ShopzSeries is available in all countries.

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**Question:**

What additional information is available on generating and receiving software products for z/VM electronically?

**Answer:**

z/VM SDO Internet Delivery is available for generating and receiving software products.

- Customers can specify Internet as a delivery option for the program products contained in the z/VM SDO.
- Customers place orders via ShopzSeries specifying Internet as a delivery option.
- Customers can track the status of their orders in ShopzSeries
- Customers will receive an e-mail notification when their order is ready to download.
- Customers then download the order to their workstation.

z/VM customers can order preventive service by RSU and corrective service (by PTF number, APAR number or ESO) through ShopzSeries. z/VM Version 6 customers can also use the new installed inventory report generated by the VMFBTMAP command to tailor your ShopzSeries service order and avoid receiving service you already have installed. If Internet delivery is supported in your geography, ShopzSeries displays "Internet" as a delivery option.

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**Question:**

Are V5.1, V5.2, V5.3, V5.4 and V6.1 available for ordering?

**Answer:**

Currently only z/VM V5.4 and V6.1 are still available for ordering. V5.1 and V5.2 were withdrawn from marketing effective June 15, 2007. V5.3 was withdrawn from marketing effective September 8, 2008.

IBM will discontinue marketing for z/VM V6.1 with the general availability of z/VM V6.2.

z/VM V5.4 will continue to be marketed for operation on IBM zEnterprise 196 and 114, IBM System z10 EC, z10 BC z9 EC, z9 BC, z990, z890, z900, and z800 servers. IBM will provide at least three months notification prior to the planned withdrawal date.

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**Question:**

Is IBM planning to change the ordering process for z/VM V6.2?

**Answer:**

No. z/VM V6.2 can only be ordered using the System Delivery Offering (SDO) which includes a single deliverable containing z/VM V6.2 and a group of fully-serviced IBM Licensed Program Products. The z/VM SDO package contains:

- z/VM V6.2 System DDR (DASD Dump Restore) or a binary system image (DVD)
- z/VM SDO licensed products

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**Question:**

What benefits does the z/VM SDO provide me?

**Answer:**

The key benefit of the z/VM SDO is the ability to update dynamically the SDO with new program products (versions and releases), to apply service when available, or to delete withdrawn products. This capability makes the SDO a more effective solution for the z/VM customer.

For additional information on the z/VM SDO, refer to the z/VM SDO Web site at:  
<http://www.ibm.com/vm/sdo/>

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**Question:**

Is DFSMS/VM™ provided as standard with z/VM V6.2?

**Answer:**

No. DFSMS/VM, is orderable as a no-charge feature with z/VM System Delivery Option (SDO).

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**Question:**

Are there any plans to add additional products to the z/VM V6.2 SDO?

**Answer:**

No. However, IBM continues to evaluate additional products for inclusion into the z/VM SDO.

## Service and Support

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**Question:**

What type of support is planned to be provided for z/VM V6.2?

**Answer:**

IBM provides optional Subscription and Support (S&S) is available for z/VM V6.2. This optional support includes telephone assistance (voice support for defects during normal business hours) and access to updates, releases, and new versions of the program for as long as support is in effect. If the customer has not purchased the optional S&S support, defect support provided under the terms of the IPLA license is provided only via e-mail, fax or postal service. Please reference the IPLA Terms and Conditions for more information on the defect support provided with the basic license.

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**Question:**

Does the same type of support that applies to z/VM V6.2 also apply to the priced features?

**Answer:**

Yes. If you would like enhanced support for the priced optional features VMSSI, DirMaint, RSCS, RACF and Performance Toolkit for VM, you must purchase the S&S for each feature.

Please note: Within the scope of an enterprise aggregation, the number of Value Units ordered for the S&S license must equal the number of Value Units ordered for the OTC license(s).

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**Question:**

Is the S&S optional for z/VM and the priced optional features?

**Answer:**

Yes, however it is automatically added when you order z/VM V6.2 or any of the optional features of z/VM V6.2. If you do not desire S&S, you must decline this support when the order is placed.

Please note: S&S for z/VM not only provides defect support but also provides you with access to updates, releases and new versions of the program for as long as the support is in effect.

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**Question:**

If I have purchased S&S on a previous version of z/VM, will I be charged for ordering z/VM V6.2?

**Answer:**

No. If you have a current S&S for z/VM V4, z/VM V5 or z/VM V6, you are entitled to receive a no-charge upgrade to z/VM V6.2 and S&S for z/VM V6.2. This is also true for the priced, optional features of z/VM V6.2. If you have a current S&S for the any of the priced, optional features of z/VM V4, z/VM V5 or z/VM V6.2 you are entitled to receive a no-charge upgrade to that particular z/VM V6.2 priced, optional feature for which you have purchased and S&S license. .

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**Question:**

Is the z/VM S&S agreement separate from my Linux S&S agreement?

**Answer:**

Yes.

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**Question:**

What type of support will be provided for z/VM V6.2 if I don't order the S&S feature?

**Answer:**

Without ordering the S&S feature, you are limited to central service provided by e-mail, fax, or postal service. You also have access to IBM databases containing information for known program defects, defect corrections, restrictions, and bypasses at no additional charge.

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**Question:**

When I buy S&S, how will I be billed?

**Answer:**

You will be invoiced for one year (12 months) of support in advance. It will be automatically renewed at the end of the support period unless IBM is notified in writing to terminate the support charges.

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**Question:**

What will I be charged if I do not buy S&S when I originally license z/VM V5 or V6, but decide to purchase S&S later?

**Answer:**

You will be charged a payment equal to the total of all S&S charges that you would have paid during the lapsed interval had you not declined Support at the time it was offered to you, or terminated and subsequently resumed support, plus one year of support charges.

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**Question:**

Do I receive any credit if I terminate the S&S during the contract period?

**Answer:**

No.

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**Question:**

Where can I find the most up-to-date electronic version of this frequently asked questions list?

**Answer:**

Please visit: <http://www.ibm.com/systems/z/faq/> to view any updates to this FAQ list and any additional FAQ lists for other IBM system offerings.

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**Question:**

Whom can I contact for installation support?

**Answer:**

Installation and technical support is provided by your IBM System z Business Partner, local Field Technical Support Specialists (FTSS) and Advanced Technical Support (ATS) zSeries and S/390 Systems Support, Gaithersburg, Maryland. Support Line also provides installation support on a fee basis.

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**Question:**

What if I need additional services for z/VM?

**Answer:**

IBM Global Technology Services (GTS) and IBM System z Business Partners can provide additional on-site services and support. GTS offers a comprehensive selection of services to address your individual service and support requirements. For more information call the IBM Information Center at 1-800-IBM-4YOU (1-800-426-4968) or reference the Internet at the following URL:  
<http://www.ibm.com/services/>.

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**Question:**

What service offerings are available to assist me with the installation and implementation of Linux?

**Answer:**

For assistance with the planning, installation and implementation of Linux on your System z platforms contact either:

STG Lab Based Services via the Internet at:  
<http://www.ibm.com/systems/services/labservices/>

or

IBM Global Technology Services (GTS) via the Internet at:  
<http://www.ibm.com/services/>

Each provides a full range of services in support of Linux for System z and either can be reached via 1-800-IBM-4YOU (1-800-426-4968) or reference the Internet at: <http://www.ibm.com/services/>



## Education

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### Question

What public education courses does IBM provide for VM and Linux?

### Answer:

IBM IT Education Services currently offers the following courses:

The z/VM and Linux course catalog includes:

- ZV020 - z/VM Introduction and Concepts (3 days)
- ZV100 - z/VM and Linux Connectivity and Management (3.5 days)
- ZV060 - Installing, Configuring and Servicing z/VM for Linux Guests (5 days)
- MZ062 - Installing, Configuring and Servicing z/VM for Linux Guests (ILO -5 days)
- ZV200 - z/VM RACF and DirMaint Implementation (4.5 days)

The Linux course catalog includes:

- ZL120 - Linux Basics - A zSeries Perspective (2 days)
- ZL100 - Linux Implementation for zSeries (3 days)
- ZL150- Advanced Solutions for Linux on zSeries (4 days)
- ZL180 - Automated Deployment of Linux Images under z/VM (4.0 days)

Private offerings of these classes and customized education may also be requested from IBM. For more information on educational opportunities, contact your local IBM IT Education Services (ITES) or call IBM Training at 800-IBM-TEACH (426-8322) for catalogs, schedules, and enrollments or visit the IBM Training Web site at: <http://www.ibm.com/training/>.

Courses listed may not be available in all countries. Please check with your local office to learn about offerings for your country.

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### Question:

Do IBM technical conferences offer tracks for z/VM and Linux on System z?

### Answer:

Yes. IBM Training offers public and private z/VM classes and annual Technical Conferences in Europe (in the first half of the year) and in the United States (in the second half of the year).

For more information about IBM Technical Conferences, visit:

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

Additional z/VM Educational resources can be found on the z/VM Web site at:

<http://www.ibm.com/vm/education/>

## Related Information

### Question:

Where can I go for more detailed information about z/VM V5.4, V6.1 or V6.2 and Linux and System z technology?

### Answer:

See the following links for additional information:

General z/VM information:

- z/VM V5.4 resources: <http://www.ibm.com/vm/zvm540>
- z/VM V6.1 resources: <http://www.ibm.com/vm/zvm610>
- z/VM V6.2 resources: <http://www.ibm.com/vm/zvm620>

z/VM education:

- <http://www.ibm.com/vm/education>

z/VM publications:

Two basic z/VM publications are planned to be shipped in printed format automatically when you order the z/VM V6.2 base product including the License Information Document. Publications are also available as Adobe PDF or IBM BookManager® files and are provided in the IBM Information Center, on the IBM Online Library: z/VM Collection on DVD (supplied with z/VM V6.2 at no additional charge) and on the IBM z/VM Web site at:

- <http://www.ibm.com/vm/library>

or from the Publication Center at:

- <http://www.ibm.com/shop/publications/order>

FAQs:

- System z and z/VM  
<http://www.ibm.com/systems/z/resources/faq/index.html>

Programs and Products for z/VM:

- IBM Licensed Programs available for z/VM:  
<http://www.ibm.com/vm/related>
- Independent Software Vendor products available for z/VM:  
<http://www.ibm.com/vm/vendor/>

Programs and products for Linux:

Linux program requirements:

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

Independent Software Developer Products for Linux on System z:

- <http://www.ibm.com/os/linux/apps/all.html>

Redbook/Redpapers:

IBM Redbooks/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 technical professionals of IBM, Business Partners, and customers. For access to the latest Redbooks and Redpapers see the following URLs:

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

Linux Distributions:

Novell SUSE Linux: <http://www.suse.com/>

Red Hat: <http://www.redhat.com/>

IBM Global Services Solutions:

IGS Linux Solutions: <http://www.ibm.com/services/>



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