IBM z/VM V5.3 — Improving scalability, security, and virtualization technology

Key prerequisites ........................................ 2
Description .................................................. 2
Product positioning ....................................... 11
Statement of direction .................................... 12
Reference information .................................... 13
Education support ......................................... 14
Offering Information ...................................... 15
Publications .................................................. 15
Technical information .................................... 22
Ordering information ...................................... 31
Terms and conditions ..................................... 43
IBM Electronic Services ................................. 46
Prices ......................................................... 46
Order now ..................................................... 47

At a glance

z/VM V5.3 is designed to offer:

- Improved memory utilization to help relieve storage constraints
- Guest support enhancements, including a z/OS testing environment for the simulation of zAAP and zIIP specialty processors
- Comprehensive security with a new LDAP server and RACF feature, including support for password phrases
- Delivery of RSCS FL530 as a priced, optional IPLA feature
- Enhancements to help improve the ease-of-use of virtual networks
- Further exploitation of IBM System and Tape Storage devices
- Management enhancements for Linux and other virtual images

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Overview

With z/VM® V5.3, improvements to scalability, security, and virtualization technology can help support increased workloads on IBM System z9™ and zSeries® servers and enhance its security characteristics.

z/VM V5.3 provides support for larger logical partitions (LPARs) to improve scalability and to facilitate growth. A single z/VM partition can be configured with up to 256 GB of real storage (memory), twice the size supported by the previous release, and up to 32 Processor Units (PUs), a 33% increase over the previous release. The PUs may be:

- Central Processor (CP)
- System z™ Application Assist Processor (zAAP)
- System z9 Integrated Information Processor (zIIP)
- Integrated Facility for Linux™ (IFL)

z/VM V5.3 and Linux on System z collaborate to make more informed choices about how memory is managed. This level of cooperation can allow z/VM to run more virtual servers in the same amount of memory.

This new release provides an increased focus on security capabilities with the introduction of an LDAP server and client services for a more comprehensive security solution on z/VM. Security is also enhanced to support the use of password phrases in z/VM through a new RACF®
feature, more security-rich TCP/IP sessions, and enhanced data protection by exploiting drive-based data encryption of the IBM System Storage™ TS1120 Tape Drive.

z/VM V5.3 extends its world-class virtualization technology by providing guest support for zAAPs and zIIPs, the Modified Indirect Data Address Word (MIDAW) facility, and ASCII consoles. Manageability, reliability, and usability of virtual networks have also been improved.

The z/VM hypervisor is designed to help clients extend the business value of mainframe technology across the enterprise by integrating applications and data while providing exceptional levels of availability, security, and operational ease. z/VM virtualization technology is designed to allow the capability for clients to run hundreds to thousands of Linux servers on a single mainframe running with other System z operating systems, such as z/OS®, or as a large-scale Linux-only enterprise server solution. z/VM V5.3 can also help to improve productivity by hosting non-Linux workloads such as z/OS, z/VSE®, and z/TPF.

For the most current information on z/VM, refer to the z/VM Web site at http://www.ibm.com/servers/eserver/zseries/zvm/

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**Key prerequisites**

Refer to the Hardware requirements and Software requirements sections for details.

**Planned availability date**

June 29, 2007

**Description**

**Improved scalability and constraint relief**

**Support for up to 256 GB of real storage (memory)**

Changes to page table allocation in z/VM V5.3 allow z/VM to support significantly more real memory, up to 256 GB, twice the size supported by z/VM V5.2, with up to 8 terabytes (TB) of total virtual memory in use by guests. The actual amount of usable real and virtual memory is dependent on the amount of real memory in the z/VM logical partition, on the hardware server model, firmware level, and configuration, and on the number of guests and their workload characteristics. This can benefit customers with large amounts of real memory, and may help reduce or eliminate the need to spread large workloads across multiple z/VM LPARs. Enhancements to the management of contiguous frames may also reduce memory management overhead and improve performance. Better z/VM management of real memory can benefit most customers who experience memory constraints, regardless of the amount of central memory configured for z/VM use.

For specific information on the effect of these changes and on the new upper bound of real memory supported, refer to the z/VM V5.3 Performance Report, planned to be available on June 29, 2007.

**Up to 32 real processors in a single z/VM image**

z/VM V5.3 can support customer growth by allowing up to 32 real processors in a single z/VM image on an IBM System z server, an increase of 33% from the prior maximum of 24. The particular workload will influence the efficiency with which a z/VM system can use large numbers of processors. Generally, z/VM overhead is expected to be lower with fewer, more CPU-intensive guests than with many lightly loaded guests.

For further considerations on performance in a large-scale multiprocessing environment, refer to the z/VM V5.3: Migration Guide (GC24-6103) and the z/VM V5.3 Performance Report, both of which are planned to be available on June 29, 2007.

**Enhanced memory management for Linux guests**

z/VM V5.3 adds support for the Collaborative Memory Management Assist (CMMA) on the z9 EC and the z9 BC processors. This VM support, in conjunction with CMMA exploitation in guest operating systems such as Linux for System z, allows the z/VM V5.3 Control Program (CP) host and its guests to communicate attributes for specific 4K-byte blocks of guest memory. This exchange of information can allow both the z/VM host and its guests to optimize their use and
management of memory, in the following ways:

• CP knows when a Linux application releases storage and can select those pages for removal at a higher priority or reclaim the page frames without the overhead of paging-out their data content to expanded storage or disk.

• CP recognizes clean disk cache pages, the contents of which Linux is able to reconstruct, allowing CP to bypass paging-out the data contents when reclaiming the backing frames for these pages. If Linux or its application subsequently tries to refer to the discarded page, Linux is notified that the page has been discarded and can reread the contents from disk or otherwise reconstruct them.

• The guest further benefits from the Host Page-Management Assist (HPMA) announced in Hardware Announcement 105-241, dated July 27, 2005. In conjunction with CMMA, HPMA allows the machine to supply fresh backing page frames for guest memory when the guest reuses a previously discarded page, eliminating the need for the z/VM hypervisor to intercept and resolve these host page faults.

z/VM 5.3 is the delivery vehicle for providing enhanced memory management support on z/VM. This satisfies the statement of direction made in Software Announcement 205-168, dated July 27, 2005.

Refer to the Preventive Service Planning (PSP) bucket for your z9 EC or z9 BC server for required updates. To avoid system outages, required minimum MCL levels must be applied prior to IPLing z/VM V5.3 and exploiting new functions. The PSP buckets can be found on Resource Link™ at

https://techsupport.services.ibm.com/server/390.psp390

IBM is working with its Linux distribution partners to provide CMMA exploitation in future Linux for System z distributions or service updates.

Enhanced memory utilization using VMRM between z/VM and Linux guests

Virtual Machine Resource Manager (VMRM) assists in managing memory contention in the z/VM system. Based on CP monitor data, the z/VM V5.3 VMRM detects when memory is constrained and notifies the Linux guests. These guests can then take action to adjust their memory consumption to help relieve the memory constraint, such as by releasing pages containing the least recently referenced file cache data. The installation controls which guests are notified.

For additional information on VMRM memory management, including availability of the required Linux support, refer to the z/VM Web site at


HyperPAV support for IBM System Storage DS8000

z/VM V5.3 supports 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. The HyperPAV function potentially reduces the number of alias-device addresses needed for parallel I/O operations since HyperPAVs are dynamically bound to a base device for each I/O operation instead of being bound statically like basic PAVs. z/VM provides support of HyperPAV volumes as linkable minidisks for guest operating systems, such as z/OS, that exploit the HyperPAV architecture. This support is also designed to transparently provide the potential benefits of HyperPAV volumes for minidisks owned or shared by guests that do not specifically exploit HyperPAV volumes, such as Linux and CMS.

Enhanced FlashCopy® support

z/VM V5.3 support for the FlashCopy V2 feature of IBM System Storage disk storage devices has been enhanced to simplify the tasks required to automate backups. This includes the capabilities to:

• Specify multiple target minidisks
  The CP FLASHCOPY command can now accept up to 12 target minidisks to be copied.

• Determine the status of FlashCopy requests
  The new CP QUERY Virtual FLASHCOPY command allows the user to query the number of
FlashCopy relationships active for one or more of their virtual DASD.

- Exploit hardware asynchronous cache destage and discard

This is designed to eliminate delayed hardware response messages and provides quicker responses to the CP FLASHCOPY command. This makes the FlashCopy appear synchronous to the virtual machine and may simplify automating processes that exploit this technology.

In addition, z/VM has reduced the number of FlashCopy hardware-related error conditions that can be reflected to the guest for the z/VM FLASHCOPY command. z/VM will attempt to redrive the I/O on some error conditions before reflecting the command response back to the guest.

**Virtualization technology and Linux enablement**

**Support for IBM System z specialty engines (processors)**

Integrated Facility for Linux (IFL) processors are dedicated to Linux workloads. IFLs enable you to purchase additional processing capacity exclusively for Linux workloads, without affecting the MSU rating or the IBM System z model designation. This means that acquiring an IFL will not necessarily increase charges for IBM System z software running on general-purpose (standard) processors in the server. IFLs were first introduced in Software Announcement 201-163, dated May 29, 2001.

System z Application Assist Processors (zAAPs) are attractively priced specialized processors that provide an economical Java™ execution environment under z/OS and z/OS.e on the System z platform. zAAPs were announced in Hardware Announcement 104-118, dated April 7, 2004.

System z9 Integrated Information Processors (zIIPs) are the latest specialty processors, designed to help improve resource optimization and lower the cost for eligible workloads. z/OS and z/OS.e exploit zIIPs to offload software system overhead from standard Central Processors (CPs). This includes certain DB2® processing, enhancing the role of the mainframe as the data hub of the enterprise. zIIPs were announced in Hardware Announcements 106-287 and 106-293, dated April 27, 2006.

z/VM V5.3 is designed to provide new guest support for zAAPs and zIIPs and includes:

- Simulation support — z/VM simulates specialty processors for guest virtual machines by dispatching the virtual specialty processors on real CPs. Simulating specialty processors provides a test platform for z/VM guests to exploit mixed-processor configurations. This allows users to assess the operational and CPU utilization implications of configuring a z/OS system with zIIP or zAAP processors without requiring the real specialty processor hardware. This simulation also supports z/VM's continuing role as a disaster-recovery platform, since a virtual configuration can be defined to match the real hardware configuration even when real zIIP or zAAP processors are not available on the recovery system. z/VM simulates specialty processors using real CPs if the underlying hardware is capable of supporting the real specialty processor. zIIPs can be simulated only on System z9 (z9 EC and z9 BC) servers. zAAPs can be simulated only on z9 EC, z9 BC, z990, and z890 servers.

- Virtualization support — z/VM can create virtual specialty processors for virtual machines by dispatching the virtual processors on corresponding specialty processors of the same type in the real configuration. Guest support for zAAPs and zIIPs may help improve your total cost of ownership by allowing available zAAP and zIIP capacity not being used by z/OS LPARs to be allocated to a z/VM LPAR hosting z/OS guests running Java and DB2 workloads. zAAPs and zIIPs cost less than standard CPs, so this support might enable you to avoid purchasing additional CPs, thereby helping to reduce your costs both for additional hardware and for software licensing fees.

**Enhanced VSWITCH and guest LAN usability**

z/VM V5.3 provides usability enhancements for the virtual switch (VSWITCH) and guest-LAN environments including:

- Enhanced ease-of-use for Virtual LAN (VLAN) and promiscuous mode configuration changes

Changes to the authorized VLAN ID (VID) set and to promiscuous mode authorization are now effective immediately instead of requiring a revoke, a grant, and an uncouple/couple in order for the changes to take effect.
New capability to configure a native VLAN ID

This support provides the ability to specify a native VLAN identifier for untagged traffic and a default VLAN identifier for guest ports. The DEFINE VSWITCH command now supports the specification of a native VLAN identifier.

New virtual NIC monitor domain

Existing counts maintained for the virtual NIC, such as inbound packets, outbound bytes, and frame counts per MAC/VLAN, are now included in records in a new Virtual Network monitor domain. These new monitor records provide data for a virtual NIC that is coupled to any guest LAN or VSWITCH.

Modified Indirect Data Address Words (MIDAWs) for guests

z/VM V5.3 supports guest use of MIDAWs, which is a hardware feature available on the IBM System z9. MIDAWs can allow more flexibility and performance in certain channel programs as an alternative to data-chained channel-command words (CCWs). MIDAWs accommodate noncontiguous data areas that cannot be handled by the predecessor indirect-data-address words (IDAWs). z/VM support for guest use of MIDAWs can allow operating systems such as z/OS to use this new aspect of z/Architecture™ without regard to whether the operating systems are running in a logical partition or a virtual machine. This allows guest operating systems to exercise their code-paths just as they would on the real machine during, for example, preproduction testing of z/OS systems. Likewise, the provision of the function in a virtual machine allows guest operating systems to benefit from the real machine's added-value function just as though the guests were running directly on the machine.

Guest ASCII console support

The system ASCII console is a facility that comes with all System z models and is presented by the Hardware Management Console (HMC). z/VM V5.3 provides guest access to the system ASCII console. By dedicating the system ASCII console to a Linux guest, customers can facilitate recovery of the guest during an emergency situation, using an environment that provides tools (such as vi and emacs) that are familiar to Linux support staff. This can be particularly useful when normal network access to a guest operating system is not available. The system ASCII console (and hence the guest ASCII console) supports a VT220 data stream. This function can help lower system costs by helping to reduce the need to provide alternative facilities, such as duplicate network resources, to achieve desired guest-recoverability characteristics. Since this function provides guest access to the one system ASCII console by one guest at a time, use of the console can be transferred from guest to guest as required.

Enhanced SCSI support

z/VM V5.3 provides additional enhancements for Small Computer System Interface (SCSI) disk support for Linux users, including:

- Point-to-Point Fibre Channel links, which may provide a lower-cost installation than the current requirement for a Fibre Channel switched fabric
- Dynamically determined preferred paths for emulated FBA devices (EDEVICEs) on SCSI disks in an IBM System Storage DS6000, instead of the current need to specify which paths are preferred in a SET EDEVICE command or an EDEVICE configuration-file statement
- Faster formatting of emulated FBA devices (EDEVICEs) on SCSI disks in an IBM Enterprise Storage Server™ (ESS) or IBM System Storage DS8000
- Display of additional SCSI device characteristics when using the QUERY EDEVICE DETAILS command
- Checking for erroneous mapping of multiple emulated-device (EDEVICE) definitions onto the same SCSI disk when bringing emulated disks online

Network virtualization

Improved virtual network management

z/VM V5.3 helps network administrators manage virtual network performance, find and solve virtual network problems, and plan virtual network growth. z/VM V5.3 establishes a method for providing Simple Network Management Protocol (SNMP) data for virtual networking devices. Specifically, it provides a SNMP subagent that runs in a separate virtual machine from the SNMP agent and extends the functionality of the agent by supporting a specific set of Management...
Information Base (MIB) variables. A preconfigured subagent and exit routine are provided in z/VM V5.3 to supply bridge Management Information Base (BRIDGE-MIB) data, as documented in RFC 1493, for the z/VM Virtual Switch (VSWITCH). This subagent, through the use of a Network Management System client, can acquire BRIDGE-MIB data for the z/VM virtual switch. In addition, this support provides a programming interface to obtain information about virtual networks.

**Enhanced failover support for IPv4 and IPv6 devices**

Failover support for Internet Protocol version 4 (IPv4) and Internet Protocol version 6 (IPv6) devices has been improved in z/VM V5.3. When the z/VM TCP/IP stack has two (or more) Queued Direct Input/Output (QDIO) or LAN Channel Station (LCS) Ethernet devices on the same network and one device is stopped or fails, another device takes over responsibility for traffic destined for the failing device (or any devices the failing device had previously taken over). This failover support includes OSA-Express devices (in QDIO Ethernet or LCS Ethernet mode), Virtual IP Addresses (VIPAs), and addresses for which PROXYARP services are being provided through a takeover-eligible device. In addition to the basic failover support, one takeover-eligible device on that network will be responsible for informing other nodes on that network which hardware (MAC) address should be used to reach VIPA addresses on the TCP/IP stack, both when the stack initializes and when an IP takeover event occurs.

**Virtual IP Address (VIPA) support for IPv6**

Virtual IP address support in the TCP/IP stack has been extended in z/VM V5.3 to support IPv6 addresses. It is now possible to enable and configure a virtual device for IPv6, as well as to associate real IPv6-capable network adapters with a specific IPv6 virtual link for determining the source address used in outgoing packets. VIPA support is designed to improve the capability of the TCP/IP stack to maintain connections in the event that a real network device fails.

**Security**

**Delivery of LDAP server and client**

z/VM V5.3 introduces new user authentication, authorization, and auditing capabilities with the inclusion of an LDAP server and associated client utilities. The z/VM LDAP server has been adapted from the IBM Tivoli® Directory Server for z/OS, to be delivered in z/OS V1.8. Executing in a CMS virtual machine, LDAP is integrated in the base of z/VM V5.3 as a subcomponent of TCP/IP. The z/VM LDAP server provides:

- Multiple concurrent database instances (referred to as backends)
- Interoperability with LDAP V2 or V3 protocol-capable clients
- LDAP Version 2 and Version 3 protocol support
- Native authentication using Challenge-Response Authentication Method (CRAM-MD5), DIGEST-MD5 authentication, and Simple (unencrypted) authentication
- Root DSE information master/slave and peer-to-peer replication
- The ability to refer clients to additional directory servers
- The capability to create an alias entry in the directory to point to another entry in the directory
- Access controls on directory information
- Change logging
- Schema publication and update
- SSL communication (SSL V3 and TLS V1)
- Client and server authentication using SSL/TLS

The LDAP client utilities provide a way to add, modify, search, and delete entries in any server that accepts LDAP protocol requests.

For more details on what functions have been implemented in the initial version of the z/VM LDAP server, refer to the z/VM: TCP/IP LDAP Administration Guide (SC24-6140).

The new RACF Security Server for z/VM feature, available with z/VM V5.3, has also been updated to interoperate with the new z/VM LDAP server.

**Enhanced system security with longer passwords**

Working together, z/VM V5.3 and the RACF Security Server for z/VM FL530 feature support the
use of passwords that are longer than eight characters, called password phrases (also known as passphrases). A password phrase may contain mixed-case letters, numbers, blanks, and special characters, allowing for an exponentially greater number of possible combinations of characters than traditional passwords.

To utilize password phrases, an External Security Manager (ESM) that supports password phrases, such as RACF, is required. To ease migration from passwords to password phrases, the RACF Security Server for z/VM continues to support traditional 8-character passwords.

A new Callable Services Library (CSL) routine, DMSPASS, allows authorized CMS applications to authenticate passwords or password phrases. The z/VM LOGON command, the z/VM TCP/IP File Transfer Protocol (FTP), Systems Management API, Remote Execution Protocol (REXEC), and Internet Message Access Protocol (IMAP) servers, and the Performance Toolkit for VM have been updated to support password phrases.

For environments in which password phrases cannot be used, but where additional password complexity is required, the RACF Security Server for z/VM also provides support for mixed-case 8-character passwords.

Support for password phrases and mixed-case passwords enables a z/VM system to meet the enterprise password requirements imposed by many companies, governments, and institutions.

Conformance with industry standards

z/VM V5.3 adds Secure Sockets Layer/Transport Layer Security (SSL/TLS) support for industry-standard secure FTP (RFC 4217), Telnet (draft specification #6), and SMTP (RFC 3207) sessions. This support includes new socket APIs to permit a Pascal or Assembler client or server application to control the acceptance and establishment of TCP sessions that are encrypted with SSL/TLS. Data transmission on a connection can now begin in clear text and at some later point be made available in secure text, thus helping to reduce the need to dedicate a separate port for secure connections.

In order to enable enforcement of enterprise requirements for strong encryption on network connections (128 bits or higher), the z/VM SSL server has been enhanced to more easily allow weak cipher suites to be excluded.

SSL server enhancements

Previous releases of z/VM provided Red Hat Package Manager (RPM) packages for various Linux distributions. z/VM V5.3 supports:

- Novell SUSE Linux Enterprise Server (SLES) 9 Service Pack 3 (64-bit)
- Novell SUSE Linux Enterprise Server (SLES) 9 Service Pack 3 (31-bit)
- Red Hat Enterprise Linux (RHEL) AS 4 Update 4 (64-bit)
- Red Hat Enterprise Linux (RHEL) AS 4 Update 4 (31-bit)

The z/VM SSL server has been enhanced to allow the host Linux guest system to remain active after a critical error is encountered during server operations.

Also, the SSLADMIN command has been enhanced to:

- Allow the specification of the number of days that a self-signed certificate is to be valid
- Improve the management of the SSL server LOG files, by providing the ability to:
  - Maintain log information in a file named other than SSLADMIN LOG
  - Specify a maximum size to be established for the SSL server log
  - Purge log information accumulated by the SSL server

Tape data protection with support for encryption

z/VM now supports drive-based data encryption with the IBM System Storage TS1120 Tape Drive (machine type 3592, model E05). The TS1120’s encryption capability and its subsystem-integration support provide a flexible tape-data-encryption solution that provides data encryption and key management across a variety of environments with a single point of control for all encryption keys. Most importantly, this solution can help protect data on tape in a cost-effective way.

Encryption of tapes by z/VM itself requires that the IBM Encryption Key Manager be running on another operating system, using an out-of-band (such as TCP/IP) connection to the tape control
unit. z/VM native support includes encryption for DDR and SPXTAPE, as well as transparent support for guests that do not provide for their own encryption (for example, CMS and Linux for System z).

z/VM also enables encryption of tapes by guests (such as z/OS) that have the ability to control the tape-encryption facilities themselves and to optionally run the Encryption Key Manager. Key management for such guests can use either an out-of-band or an in-band (such as an ESCON® or FICON™ channel) connection between the Encryption Key Manager and the tape control unit. With the PTF for APAR VM64063 for z/VM V5.1 and V5.2, only the Encryption Key Manager's default keys are supported for use by z/VM and by guests that do not provide for their own encryption. z/VM V5.3 expands this support to allow any key label to be used, with key labels being accessible through a key alias that is defined to z/VM.

DFSMS/VM® FL221 with the PTF for APAR VM64062 supports locating encryption-capable 3592 tape drives in an Enterprise Automated Tape Library. This DFSMS/VM support provides tape-encryption capabilities for a z/VSE guest running on z/VM.

For additional information on the IBM System Storage TS1120 Tape Drive encryption support, refer to Hardware Announcement 106-655, dated August 29, 2006.

**Systems management**

**Enhanced management functions for Linux and other virtual images**

The z/VM Virtual Systems Management Application Programming Interface (API), first introduced in z/VM V4.4, is provided for System z platform provisioning applications (such as IBM Director and programs developed by non-IBM solution providers) for ease of use in creating and managing large numbers of Linux and other virtual images running on z/VM.

With z/VM V5.3, a new sockets-based server supports the z/VM Virtual Systems Management API. The sockets-based server is multitasking-capable and supports both AF_INET and AF_IUCV socket requests.

In addition to the new server, enhancements provided in z/VM V5.3 include:

- **New functions to:**
  - Create, delete, and query the IPL statement in a virtual image's directory entry
  - Create and delete virtual switches and guest LANs
  - Obtain processor, memory, and device information for active virtual images
  - Check the validity of a given user ID/password (or passphrase) combination

- **Enhancements to existing functions to:**
  - Provide values of specific attributes for selected query functions, rather than return a buffer containing QUERY command output
  - Exploit the new Asynchronous CP Command function available in z/VM V5.3
  - Accept passphrases and forward them to the external security manager to be set, changed, or deleted
  - Provide a list of active virtual images

The new and enhanced API functions for z/VM V5.3 have been implemented using the new sockets-based server. Functions provided in earlier releases of z/VM can also be invoked through the new server.

The sockets-based server replaces the Remote Procedure Call (RPC) server and CSL routines that were used to call the Virtual Systems Management API in previous releases of z/VM. The RPC server is still available in z/VM V5.3, with all of the functions that were available in z/VM V5.2. However, the enhancements provided in z/VM V5.3 are not available through the RPC server, for which no future enhancements are planned. Documentation on the use of the API with the RPC server and CSL routines will not be updated and will not be included in the V5.3 bookshelf. IBM intends to remove the RPC server from a future z/VM release.

**New function level for DirMaint™**

The priced, optional feature of the IBM Directory Maintenance Facility (DirMaint) has been upgraded to a new function level (FL530) in z/VM V5.3. In addition to all service being applied since FL510, Directory Maintenance Facility FL530 includes:

- Supporting new and changed directory statements in z/VM V5.3
• Eliminating indefinite wait times when a DATAMOVE machine cannot access all required resources for a DASD management function
• Providing more detailed information about the causes of errors returned from the Systems Management API

Enhancements to the Performance Toolkit

In addition to being upgraded to a new function level (FL530), the Performance Toolkit for VM feature has been enhanced for z/VM V5.3 to:

• Support passphrases when accessing the Performance Toolkit using the Web interface
• Change the service process for Performance Toolkit from a full-part replacement MODULE to service by individual object parts, reducing the size of the service deliverable
• Provide new or updated displays and reports to support the following new z/VM V5.3 functions:
  – Linux monitor data for virtual CPUs and steal time counters
  – Monitor data for virtual network devices and virtual switches
  – Monitor data for guest simulation of zAAPs, zIIPs, and IFLs
  – Monitor data for up to 32 processors in a z/VM image

Enhanced guest configuration

z/VM V5.3 helps improve the guest LOGON process by providing a new COMMAND statement in a virtual machine definition or profile to configure the virtual machine. Any form of a CP command may be invoked using this capability, including privileged class commands (such as SET RESERVED), on behalf of the virtual machine, eliminating the need to provide some other method to configure it.

Installation, service, and packaging changes

Additional DVD installation options

z/VM V5.3 provides some additional capabilities for installing z/VM from DVD. The second-level DVD installation process now supports moving the contents to an FTP server directory or a second-level CMS minidisk and then installing from the server or minidisk. This provides more options for customer environments and can facilitate electronic delivery of z/VM.

Enhanced status information

The automated service command, SERVICE, has been enhanced to display the service and production levels for preventive service (RSU) and displays an applied, built, and production status for corrective service. This can provide a quicker and easier way to determine service status.

RSCS repackaged as an optional feature

Remote Spooling Communications Subsystem (RSCS) V3.2.0 (5684-096) has been repackaged and is now available for licensing under International Program License Agreement (IPLA) terms and conditions. RSCS Function Level 530 (FL530) is available as a priced, optional, preinstalled feature of z/VM V5.3. Pricing is based on engine-based Value Units and is available for both IFL and standard processor configurations. RSCS FL530 provides dynamic command authorization support through a new server, RSCSAUTH, that runs as a disconnected z/VM server and is authorized for all RSCS commands. This can eliminate the need to recycle RSCS when changing system and link authorizations.

RSCS is a z/VM networking program. It provides data file transfer and print services to, from, and through the z/VM system on which it runs using both its own and TCP/IP networks. It extends the scope of a single system to an entire network of computers and devices. RSCS transfers data (as spool files) between its local system and remote devices and printers or other systems. It also acts as a print server for remote printers attached to other VM systems or a TCP/IP network. Through RSCS, users can send and receive messages, files, commands, and print and submit jobs within their network.

The stand-alone RSCS V3.2.0 (5684-096) product is planned to be withdrawn from marketing effective September 30, 2007.

New RACF Security Server for z/VM
With z/VM V5.3, the stand-alone RACF for VM V1.10.0 (5740-XXH) product has been repackaged with new function added and is now called the RACF Security Server for z/VM FL530 feature. It is a priced, optional feature and will operate only with z/VM V5.3.

The new RACF Security Server feature includes support for mixed-case passwords and password phrases. A password phrase is a string of up to 100 characters, including blanks, and can be used in addition to, or in place of, the traditional 8-character password. An installation exit is provided to help enable customers to define rules governing the length and content of password phrases.

Additional password management enhancements have been added, including:

- Validation of a password and password phrase using Diagnose X'88' and the new DMSPASS CSL routine
- Operation with the new industry-standard LDAP server included in z/VM V5.3 to enable remote management of passwords and selected user attributes, and to enable remote applications to perform authorization and auditing using RACF for z/VM
- Access by password phrase, allowing the removal of the 8-character password from a user ID
- Enhanced security of password reset operations, which now removes the password completely, rather than resetting the user password to the default group name, as in prior releases
- Adding the user's password to the password history list when the password is reset by an administrator
- Providing the capability for passwords to be set by administrators or authorized password management applications without the need for the user to immediately change the password on its first use, improving the auditing of password changes

To simplify analysis of the security audit trail, the RACF SMF Unload utility has been updated to store the unloaded data in industry-standard XML format, making it suitable to be examined by a variety of applications, including XML browsers and spreadsheets.

This new feature will be the base for all future RACF enhancements on z/VM and works with the existing functions and features of z/VM to provide improved discretionary and mandatory access controls, separation of duties, and auditability capabilities of z/VM.

IBM intends to withdraw the stand-alone RACF for VM V1.10.0 (5740-XXH) product from marketing on March 5, 2007, as announced in Withdrawal Announcement 906-254, dated December 5, 2006. IBM intends to discontinue service support for the stand-alone RACF for VM V1.10.0 (5740-XXH) product to be effective May 5, 2008, as announced in Withdrawal Announcement 907-023, dated February 6, 2007.

U.S. Daylight Saving Time effect on z/VM


New sample system configuration file statements will be shipped with z/VM V5.3. System programmers should change the dates that are specified on TIMEZONE_BOUNDARY statements in the existing system configuration files that their systems use.

For a complete description on the changes to Daylight Saving Time in 2007, refer to


The Language Environment® PTF for APAR VM64117 must be applied to z/VM V5.1 and V5.2 and provides required changes for C/C++ library functions. The PTF is integrated into z/VM V5.3.

If you observe DST, IBM recommends this PTF be installed and applications restarted before March 11, 2007. For more detailed information on how DST changes may affect your z/VM installation, refer to the z/VM Web site at

z/Architecture CMS shipped as a sample program

z/Architecture CMS is shipped as a sample program with z/VM V5.3 with no formal support available. This version of CMS runs in z/Architecture 31-bit addressing mode and enables the use of z/Architecture instructions, including those that operate on 64-bit registers, by CMS programs, while permitting most existing ESA/390-architecture CMS programs to continue to function without change. z/Architecture CMS does not exploit or explicitly support 64-bit addressing mode but it does not impose serious restrictions on programs that enter 64-bit addressing mode themselves. For additional z/Architecture CMS details and usage restrictions, refer to the z/VM Web site at


Withdrawal of the ROUTED and BOOTP servers

The ROUTED and BOOTP servers have been removed from z/VM V5.3. This satisfies the Statement of General Direction made in Software Announcement 205-168, dated July 27, 2005.

MPRoute is the only dynamic routing server supported by TCP/IP for z/VM FL530.

Accessibility by people with disabilities

The following features support use by people with disabilities:

- Operation by keyboard alone
- Optional font enlargement and high-contrast display settings
- Screen readers and screen magnifiers tested for use by people with visual impairment

Engine-based Value Unit pricing

Engine-based Value Unit pricing for z/VM V5.3 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 z/VM V5 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 z/VM V5.3 and the priced, optional features of DirMaint, RSCS, RACF Security Server, and the Performance Toolkit for VM are 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 is an annual charge and should be kept at an annual term.

Product positioning

The Information Technology industry has recognized the business value of exploiting virtualization technologies on any and all server platforms. IBM mainframe products have enjoyed high levels of server virtualization technology for many years. z/VM V5.3 is the latest offering of industry-acclaimed server virtualization support available for IBM System z. Building on a 40-year history of innovation, z/VM is becoming an ever more popular component of on demand System z computing solutions.

The success of Linux on System z can be largely attributed to the business value that Linux-based solutions derive from the IBM mainframe virtualization technology provided by z/VM and IBM System z servers. z/VM technology offers clients the ability to host a large number of Linux servers on a single mainframe while also providing an operational environment that is well-suited for on demand computing: highly flexible, adaptable, and efficient.

z/VM V5 offers new levels of price/performance, functional capabilities, and hardware exploitation that are expected to increase the attractiveness of deploying Linux solutions on the mainframe. Clients can add capacity to IBM mainframe servers for hosting Linux-on-z/VM
workloads by configuring their servers with Integrated Facility for Linux (IFL) processors.

The z/VM V5 pricing model can make it more feasible for clients to add z/VM virtualization technology to their standard-processor environment (compared to the pricing models of z/VM V3 and V4). This helps enable clients to use z/VM to host workloads that cannot run on IFL processors, such as z/OS, z/OS.e, VSE/ESA™, z/VSE, TPF, or z/TPF, to consolidate existing VM/ESA® or z/VM V3 and V4 workloads onto a single larger System z server.

z/VM V5 is the follow-on product for VM/ESA, z/VM V3, and z/VM V4. z/VM V5 requires z/Architecture (64-bit) for execution; therefore, it runs only on z9 EC, z9 BC, z990, z900, z890, and z800. z/VM V5 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 V5 is intended to address the following situations:

- Running more Linux server images on a single System z server. Considerably more images than are currently supported by the LPAR mode of operation (up to 60 on z9 EC, up to 30 on z9 BC, z990, and z890, and up to 15 on all other zSeries servers) can be achieved with z/VM guest support. These Linux on System z server images can be deployed on standard processors (CPs) or IFL processors with z/VM V5. Running multiple Linux images on an IFL-configured z/VM system may not increase the IBM software charges of your existing System z9 or zSeries environment. z/OS, z/OS.e, z/VM, TPF, z/TPF, VSE/ESA, z/VSE, or Linux clients can add z/VM V5 running on IFL processors to their environment without increasing IBM software costs on the standard processors (CPs).

- Moving selected Linux, Windows™, and UNIX® workloads to a single System z server while maintaining distinct server images and current LAN topology. This ability can help reduce systems-management complexity. Since the number of real hardware servers and associated physical LANs is reduced, cost savings may be realized by managing large server farms deployed on virtual servers instead of using multiple hardware servers. Deploying Linux workloads on z/VM V5 is particularly attractive if they interact with applications or data located on the same System z server.

- Enhancing virtual networking. z/VM virtual switch support provides external connectivity for guest LANs through an OSA-Express adapter without requiring a VM or Linux router virtual machine.

- Consolidating operating systems on the System z platform. z/VM V5.3 can provide more constraint relief than what was offered with z/VM V5.2. This constraint relief is provided for both ESA/390 and z/Architecture guest operating systems such as Linux for System z, TPF, z/TPF, z/OS, z/OS.e, VSE/ESA, or z/VSE. z/VM V5.3 offers enhanced scalability support for CPUs, memory, I/O, and networking, making it easier to consolidate workloads onto a single z/VM image.

- Migrating from VM/ESA to z/VM V5. This helps enable:
  - More memory to cache CMS minidisks by exploiting memory above 2 GB for minidisk cache
  - Connectivity (TCP/IP) enhancements and additional device support
  - Added security capabilities with SSL-protected TCP/IP network traffic, such as Telnet sessions and Web transactions

- Migrating to supported releases of z/OS or z/OS.e using z/VM V5. This can provide added flexibility for migration, production, and testing.

- Enhancing guest Parallel Sysplex® support in z/VM with the exploitation of the z/Architecture. This can enable addressability of larger amounts of real and virtual memory, allowing the development and testing of 64-bit Parallel Sysplex applications in a guest environment.

**Statement of direction**

- **Common Criteria Certification**: IBM intends to evaluate z/VM V5.3 with the RACF Security Server optional feature for conformance to the Controlled Access Protection Profile (CAPP) and Labeled Security Protection Profile (LSPP) of the Common Criteria standard for IT security, ISO/IEC 15408, at Evaluation Assurance Level 4 (EAL4).

This new SOD represents a modification to IBM's previously expressed Statement of Direction of July 27, 2005, which stated IBM's intent "to evaluate z/VM V5.2 with the RACF for z/VM
optional feature for conformance to the Controlled Access Protection Profile (CAPP) and Labeled Security Protection Profile (LSPP) of the Common Criteria standard for IT security, ISO/IEC 15408, at Evaluation Assurance Level 4 (EAL4)." Based on additional assessment of requirements, IBM no longer intends to evaluate z/VM V5.2.

- **OSA-Express2 link aggregation and failover support:** IBM intends to provide virtual switch (VSWITCH) support for IEEE Standard 802.3ad Link Aggregation in z/VM V5.3. This support is designed to allow all OSA-Express2 features that are associated with a virtual switch to be grouped and used as a single "fat pipe," helping to increase bandwidth and provide near-seamless failover in the event of a link failure. This z/VM support requires associated OSA-Express2 support that is planned to be available on IBM System z9 servers.

- **RPC server support for the Systems Management API:** IBM intends to withdraw support for the RPC/CSL interface from the Systems Management API server in a future z/VM release.

- **TCP/IP functions:** IBM intends to withdraw support for the Network Database (NDB) system, Trivial File Transfer Protocol (TFTP) server, X25 interface (including the X25IBI server), and SNALINK server in a future z/VM release.

- **3480 distribution medium:** IBM intends to withdraw 3480 tape as a distribution medium in a future z/VM release. IBM plans to continue distributing z/VM on 3590 tape and on DVD, and making it available for electronic delivery from ShopzSeries.

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

### Reference information

For information on the z9 EC, refer to:

- Hardware Announcement 106-715, dated October 10, 2006
- Hardware Announcement 106-293, dated April 27, 2006
- Hardware Announcement 105-241, dated July 27, 2005

For information on the z9 BC, refer to:

- Hardware Announcement 106-715, dated October 10, 2006
- Hardware Announcement 106-287, dated April 27, 2006

For information on the zSeries 990, refer to:

- Hardware Announcement 105-012, dated January 25, 2005
- Hardware Announcement 104-346, dated October 7, 2004
- Hardware Announcement 104-118, dated April 7, 2004
- Hardware Announcement 103-280, dated October 7, 2003
- Hardware Announcement 103-142, dated May 13, 2003

For information on the zSeries 890, refer to:

- Hardware Announcement 105-012, dated January 25, 2005
- Hardware Announcement 104-346, dated October 7, 2004
- Hardware Announcement 104-117, dated April 7, 2004

For information on the zSeries 900, refer to:

- Hardware Announcement 102-209, dated August 13, 2002
- Hardware Announcement 102-123, dated April 30, 2002
- Hardware Announcement 101-308, dated October 4, 2001
Hardware Announcement 100-323, dated October 3, 2000

For information on the zSeries 800, refer to:

Hardware Announcement 102-052, dated February 19, 2002

For information on the zSeries Offering for Linux, refer to:

Hardware Announcement 102-030, dated January 29, 2002

For z/VM capabilities, refer to:

• z/VM V5.2 Software Announcement 206-084, dated April 27, 2006
• z/VM V5.2 Software Announcement 205-168, dated July 27, 2005
• z/VM V5.1 Software Announcement 204-235, dated October 7, 2004
• Software Announcement 204-057, dated April 7, 2004

Availability of national languages:

To receive the translated help files for DFSMS/VM in Kanji, you must order the no-charge optional feature using the z/VM V5 System Delivery Option (SDO). You will also receive the base DFSMS/VM feature when ordering the DFSMS/VM Kanji feature.

Business Partner information

If you are a Direct Reseller - System Reseller acquiring products from IBM, you may link directly to Business Partner information for this announcement. A PartnerWorld ID and password are required (use IBM ID).

BP Attachment for Announcement Letter 207-019


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Education support

IBM Training offers classroom training, e-learning, conferences, certification, course roadmaps, and more. These publicly held or privately available courses are focused on z/VM® and Linux™ for System z™. IBM Training also provides on-site training with customized content and course materials for small or large groups.

The z/VM and Linux course catalog includes:

• ZV02 — z/VM Introduction and Concepts (3 days)
• ZV10 — z/VM and Linux Connectivity and Management (3.5 days)
• ZV06 — Installing, Configuring and Servicing z/VM for Linux Guests (5 days)
• ZV20 — z/VM RACF® and DirMaint™ Implementation (4.5 days)

The Linux course catalog includes:

• ZL12 — Linux Basics — A zSeries® Perspective (2 days)
• ZL10 — Linux Implementation for zSeries (3 days)
• ZL15 — Advanced Solutions for Linux on zSeries (4 days)

For additional VM education or additional information, contact your local IBM Education Services or call IBM Training at 800-IBM-TEACH (426-8322) for catalogs, schedules, and enrollments.

You may also visit the IBM Training Web site at

http://www.ibm.com/training/

For z/VM and Linux education, select "Training Finder — US," then under "Technology area," select "Mainframe servers," then under "Mainframe servers," select "z/VM and Linux."

For Linux education, select "Training Finder — US," then under "Technology area," select "Linux."

IBM IT Training offers various savings programs on IBM education. For more information on the savings programs available in your country, visit the IBM Training Web site at

http://www.ibm.com/training/

Select "Training in other countries," then select "IBM Education Pack — Save on Training," then select a country to view the various options.

Technical conferences

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).

The following System z technical conferences featuring z/OS®, z/VM, z/VSE® and Linux on System z are scheduled for 2007:

• IBM System z and System Storage™ Technical Conference, April 16-20, 2007, Munich, Germany. For more information, refer to
  http://www.ibm.com/training/conf/europe/systemz

• IBM System z Expo, September 17-21, San Antonio, Texas

For more information about IBM technical conferences, visit

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

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


Offering Information

Product information is available via the Offering Information Web site

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

Publications
Unlicensed documentation

Unlicensed documents within the z/VM V5 library are available as Adobe PDF files, IBM BookManager® files, or printed books.

Some publications identified as basic publications are automatically shipped in printed format, at no additional charge, when you order the z/VM V5 base product.

The other publications are supplied only in PDF or BookManager format with z/VM V5. All z/VM publications can also be obtained separately from z/VM (printed publications require payment of a fee) using the specific publication numbers through the IBM Publications Center at


The Publications Center is a worldwide central repository for IBM product publications and marketing material with a catalog of 70,000 items. Extensive search facilities are provided. Payment options for orders are via credit card (in the U.S.) or customer number for 50 countries. A large number of publications are available online in various file formats, and they can all be downloaded by all countries free of charge.

News of many publications may be subscribed to via Mysupport at


All publications updated for z/VM V5.3 are available as PDF files, which may be printed.

Adobe PDF files

Publications that are available in PDF format (except for the Guide for Automated Installation and Service and the License Information document) are provided on the IBM Online Library: z/VM Collection CD-ROM and the IBM Online Library: z/VM Collection on DVD (both of which are supplied with z/VM V5.3, at no additional charge) and are available from the Publications Center Web site at


Publications are also available from the IBM z/VM Internet Library at


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

http://www.adobe.com

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

IBM BookManager files

Publications that are available in BookManager format are provided on the IBM Online Library: z/VM Collection CD-ROM and the IBM Online Library: z/VM Collection on DVD (both of which are supplied with z/VM V5.3, at no additional charge) and are available from the Publications Center Web site at


Publications are also available from the IBM z/VM Internet Library at


The BookManager files can be read by either BookManager READ for VM (a separately orderable product) or IBM Softcopy Reader (supplied on the CD-ROM and DVD).

Printed books

All z/VM V5.3 basic publications are available as printed books and are orderable from the Publications Center.

One copy of the basic z/VM V5.3 printed publications, and two copies of the z/VM V5.3 online...
Publications (one on CD-ROM and one on DVD), are supplied automatically with the basic machine-readable material.

Publications changed for this announcement of enhancements for z/VM V5.3 are listed below. The z/VM: General Information publication is planned to be available on February 6, 2007. All other changed publications are planned to be available from the Publications Center and the z/VM Internet Library on June 29, 2007.

**Basic z/VM V5.3 — New editions**

**Unlicensed documentation**

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<th>Order number</th>
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<th>Print</th>
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<td>z/VM: Getting Started with Linux on System z</td>
<td>SC24-6096</td>
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<td>z/VM: Guide for Automated Installation and Service</td>
<td>GC24-6099</td>
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<td>z/VM: Summary for Automated Installation and Service (DVD Installation)</td>
<td>GA76-0406</td>
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<td>z/VM: Summary for Automated Installation and Service (Tape Installation)</td>
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<td>z/VM: CP Messages and Codes</td>
<td>SC24-6119</td>
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<td>z/VM: I/O Configuration</td>
<td>SC24-6100</td>
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<td>z/VM: TCP/IP Diagnosis Guide</td>
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<td>SC24-6126</td>
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<td>z/VM: VM Dump Tool</td>
<td>GC24-6129</td>
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<td>z/VM: VMSES/E Introduction and Reference</td>
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<td>X</td>
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<td>z/VM CMS Application Development Guide for Assembler</td>
<td>SC24-6070</td>
<td>X</td>
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<td>z/VM CMS Application Multitasking</td>
<td>SC24-6071</td>
<td>X</td>
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<tr>
<td>z/VM CMS File Pool Planning, Administration, and Operation</td>
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<td>SC24-6075</td>
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<td>z/VM CMS Planning and Administration</td>
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<td>z/VM CMS Primer</td>
<td>SC24-6137</td>
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<td>z/VM CP Exit Customization</td>
<td>SC24-6082</td>
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Optional RACF Security Server feature — New editions

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Other — New editions

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**Note**: An “X” in one of the columns indicates available formats.

**Note**: The updates in these new editions may not contain any new z/VM information.

Other — Not new editions

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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 technical professionals of IBM, Business Partners, and customers.

Refer to Software Announcement 205-168, dated July 27, 2005, and Software Announcement 206-084, dated April 27, 2006, for a list of applicable Redbooks and Redpapers. New Redbooks and Redpapers since the last z/VM announcement include:

- **Systems Administration**
  - z/VM and Linux on IBM System z: The Virtualization Cookbook for SLES9 (SG24-6695-01) describes how to set up your own Linux virtual servers on IBM zSeries and System z9 under z/VM. It adopts a cookbook format that provides a clearly documented set of procedures for installing and configuring z/VM in an LPAR and then installing and customizing Linux. You need a System z or zSeries logical partition (LPAR) with associated resources, z/VM 5.2 media, and a Linux distribution. This book is based on SUSE Linux Enterprise Server 9 (SLES9) for zSeries and we address both 31-bit and 64-bit distributions.
  - IBM z/VM and Linux on IBM System z: Virtualization Cookbook for Red Hat Enterprise Linux 4 (SG24-7272-00) describes how to set up your own Linux virtual servers on zSeries and IBM System z9 under z/VM. It adopts a cookbook format that provides a clearly documented set of procedures for installing and configuring z/VM in a logical partition (LPAR) and then installing and customizing Linux.

- **Networking**
  - IBM System z Connectivity Handbook (SG24-5444-06) discusses the connectivity options available for use within and beyond the data center for the IBM System z9 Enterprise Class (z9 EC), formerly System z9 109 (z9-109), System z9 Business Class (z9 BC), zSeries 990 (z990), zSeries 900 (z890), zSeries 900 (z900), and zSeries 800 (z800) servers.

- **Mainframe Servers**
  - IBM System z9 Enterprise Class Technical Guide (SG24-7124-01) discusses the IBM System z9 Enterprise Class (z9 EC), which offers a continuation of the IBM scalable mainframe server and provides an overview of the z9 EC and its functions, features, and associated software support.
  - IBM System z9 Business Class Technical Introduction (SG24-7241-00) provides basic information about new hardware functions and features, associated software support, and migration considerations.
  - IBM System z9 109 Configuration Setup (SG24-7203-00) assists you in planning and implementing a comprehensive configuration and implementation path for your IBM System z9 EC (formerly the z9 109), presents configuration setup examples, and discusses each implementation scenario in detail.
  - How does the MIDAW facility improve the performance of FICON™ channels using DB2® and other workloads? (REDP-4201-00) is intended for industry professionals who are interested in understanding IBM z/Architecture™, and for people who want to understand the types of workloads that will experience improved performance.
  - Introducing N_Port Identifier Virtualization for IBM System z9 (REDP-4125-00) describes the N_Port ID Virtualization (NPIV) feature in a Fibre Channel Protocol (FCP) fabric and focuses on NPIV concepts and implementation.
  - Using Cryptographic Adapters for Web Servers with Linux on IBM System z9 and zSeries (REDP-4131-00) describes how to configure Web servers (such as Apache2 and IBM HTTP server) to use hardware cryptographic devices in Linux running on IBM System z9 and zSeries platforms.
• **Storage**
  - IBM System Storage DS6000 Series: Architecture and Implementation (SG24-6781-02) describes the architecture, implementation, and setup of the IBM System Storage DS6000 series of storage servers.

• **Solutions**
  - IBM Communication Controller for Linux on System z V1.2.1 Implementation Guide (SG24-7223-01) helps you to install, tailor, and configure the IBM Communication Controller for Linux on System z (CCL) V1.2.1.
  - IBM Virtualization Engine™ V2.1 for System z (SG24-7276-00) guides you in installing, configuring, and using the suite of products available for the IBM System z mainframe. IBM Director 5.10, IBM Director z/VM Center extensions, Enterprise Workload Manager V2.1 (EWLM), Virtualization Engine Console, Resource Dependency Service V2.1, the Director and EWLM bridges to the Virtualization Engine Console are all installed on four separate Linux images (z/VM guests).

For the most current Redbooks or Redpapers, visit the IBM Redbooks Web site at

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

**Displayable softcopy publications**

All unlicensed online books are also available on CD-ROM (IBM Online Library: z/VM Collection, SK2T-2067) and DVD (IBM Online Library: z/VM Collection on DVD, SK5T-7054). The IBM Online Library: z/VM Collection CD-ROM and the IBM Online Library: z/VM Collection on DVD also contain libraries for approximately 60 products that run on z/VM V5.3. These will be available in the United States and Canada at the general availability of z/VM V5.3 and 30 days after general availability in other countries. For a list of kit contents, contact your IBM Business Partner or IBM representative.

One copy of the IBM Online Library: z/VM Collection CD-ROM and IBM Online Library: z/VM Collection on DVD will be shipped automatically with the product, at no additional charge. To order one additional copy, use the following features:

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To order additional quantities greater than one, for a fee, use SK2T-2067 or SK5T-7054 on the IBM Publications Center at


The online books can be used with the BookManager READ licensed programs in any of the READ-supported environments. The online books CD-ROM and DVD contain a program, Softcopy Receiver Tool, for transferring BookManager files to the workstation or host.

Terms and conditions for use of the machine-readable files are shipped with the files.

**Source file publications:** z/VM V5.3 manuals are not offered in source file form.

**Licensed publications:** z/VM V5.3 does not have any licensed publications.

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**Technical information**

**Specified operating environment**

**Hardware requirements:** z/VM V5.3 will operate on:

- System z9 Enterprise Class.

Refer to the Preventive Service Planning (PSP) bucket for the minimum MCL level and any required updates.
• System z9 Business Class.
  Refer to the Preventive Service Planning (PSP) bucket for the minimum MCL level and any required updates.

• IBM eServer zSeries 990.
  – At a minimum, MCL009 in the J13479 (SE-FCS 3X) stream must be installed.
  – At a minimum, MCL112 in the J13484 stream must be installed prior to IPLing z/VM V5.3 to avoid system outages.
  
  For additional information on this required update, refer to Resource Link™ at
  http://www.ibm.com/servers/resourcelink/

  You must have a Resource Link user ID and password. Select “Fixes,” then select “Hiper Alerts” under “Alerts,” then select “zSeries — z990,” then select “051205 HIPER MCL for 2084, 2086.”

• IBM eServer zSeries 890.
  – MCL009 in the J13479 (SE-FCS 3X) stream must be installed.
  – MCL112 in the J13484 stream must be installed prior to IPLing z/VM V5.3 to avoid system outages.
  
  For additional information on this required update, refer to Resource Link at
  http://www.ibm.com/servers/resourcelink/

  You must have a Resource Link user ID and password. Select “Fixes,” then select “Hiper Alerts” under “Alerts,” then select “zSeries — z890,” then select “051205 HIPER MCL for 2084, 2086.”

• IBM eServer zSeries 900.

• IBM eServer zSeries 800.

Refer to the Preventive Service Planning (PSP) bucket for your System z server for any additional updates. The PSP buckets can be found on Resource Link at

https://techsupport.services.ibm.com/server/390.psp390

• For the z9 EC, see the "Upgrade 2094DEVICE, Subset 2094/ZVM" bucket.
• For the z9 BC, see the "Upgrade 2096DEVICE, Subset 2096/ZVM" bucket.
• For the z900, see the "Upgrade 2084DEVICE, Subset 2084/ZVM" bucket.
• For the z890, see the "Upgrade 2086DEVICE, Subset 2086/ZVM" bucket.
• For the z900, see the "Upgrade 2064DEVICE, Subset 2064/ZVM" bucket.
• For the z800, see the "Upgrade 2066DEVICE, Subset 2066/ZVM" bucket.

Specific processor facilities required by z/VM V5.3 can be found on the z/VM Web site at

http://www.ibm.com/zseries/zvm

Refer to the appendix of the z/VM General Information manual for more information.

Installation requirements

• Installation requires a local non-SNA 3270 terminal, such as:
  – OSA — Integrated Communications Controller (ICC)
  – 3270 Integrated Console
  – 2074 Console Support Controller
  – 3174 Control Unit
  – Equivalent console
Installation from magnetic tape requires a tape drive capable of reading 3480 or 3590 tape cartridges.

Installation to ECKD™ DASD requires 3390 Model 3 or 9 DASDs, or DASD that is defined to emulate these specific models.

**Note:** For performance reasons, IBM does not recommend using the original IBM 3390 Model 9. This recommendation does not apply to 3390 Model 9 DASD defined on RAID technology subsystems such as IBM System Storage DASD.

Installation from DVD requires the Hardware Management Console (HMC) Level 1.8.

Installation to FCP-attached SCSI requires IBM System Storage SCSI disks or equivalent.

**TCP/IP for z/VM V5.3 hardware requirements:** TCP/IP for z/VM V5.3 requires one of the following:

- IBM 3172 Interconnect Controller with the Interconnect Controller Program (ICP) V3 (5621-425)
- IBM Open Systems Adapter 2 (OSA-2) Token Ring, Fast Ethernet, and 155 ATM
- IBM Open Systems Adapter Express (OSA-Express) Gigabit Ethernet, Fast Ethernet, 155 ATM, and Token Ring
- IBM Open Systems Adapter Express2 (OSA-Express2) GbE, 10 GbE, 1000BASE-T Ethernet, and Token Ring
- HYPERchannel A220 Processor Adapter 42990007

TCP/IP for z/VM V5.3 supports the HYPERchannel Series A devices (and HYPERchannel Series DX devices that are functioning as Series A devices). For additional information, refer to the appropriate Network Systems Corporation documentation.

- RS/6000® Channel Attachment using the Block Multiplexer Channel or ESCON® Adapter
- IBM 3088 Multisystem Channel Communication Unit

TCP/IP for z/VM V5.3 supports direct connection to another TCP/IP for VM, z/OS.e, or z/OS using the IBM 3088.

- IBM ESCON Channel-to-Channel Adapter

TCP/IP for z/VM V5.3 supports direct connection to another TCP/IP for VM or z/OS using the IBM ESCON Channel-to-Channel Adapter.

- IBM FICON Channel-to-Channel Adapter

TCP/IP for z/VM V5.3 supports direct connection to another TCP/IP for VM or z/OS using the IBM FICON Channel-to-Channel Adapter.

- IBM HiperSockets

VM programs using TCP/IP can communicate via HiperSockets with other VM programs using TCP/IP and with guest operating systems and other logical partitions using TCP/IP.

TCP/IP for z/VM V5.3 also requires a 3270-equivalent workstation for TCP/IP administration.

**VM Guest RSA-Assist Support for Linux hardware requirements:** In order for the VM Guest RSA-Assist Support for Linux to operate, corresponding function in Linux for System z and one of the following are required:

- IBM Crypto Express2 Coprocessor or Accelerator
- IBM PCIX Cryptographic Coprocessor (PCIXCC)
- IBM PCI Cryptographic Coprocessor (PCICC)
- IBM PCI Cryptographic Accelerator (PCICA)
Software requirements

Prerequisite requirements

- EREP VM (5654-260) V3.5.0.
  - The PTFs for APARs VM63743, VM63624, and VM63946 have been applied to the z/VM V5.3 system DDRs.
    - PTF for APAR VM63743 provides the necessary function to support the z9 EC.
    - PTF for APAR VM63624 provides the necessary function to support the DS6000 and DS8000.
    - PTF for APAR VM63946 provides the necessary function to support the z9 BC.

- Device Support Facilities — ICKDSF VM (5684-042) V1.17.0. Any fixes requested for ICKDSF should specify the PTF number of the VMSES/E formatted update. VMSES/E installable PTFs have the release number G14. 'G' indicates Release 17 of ICKDSF and '14' indicates VMSES/E format. The following PTFs have been applied to the z/VM V5.3 system DDRs:
  - The PTF for APAR PQ84848 provides the necessary function for ICKDSF to support large FBA devices.
  - The PTFs for APARs PQ96706 and PQ95319 provide the necessary function for ICKDSF to support the DS8000 and DS6000 storage devices, respectively.

The prerequisite no-charge products, EREP and ICKDSF, are preinstalled on the base product system DDRs.

When ordering z/VM V5.3, you must already be licensed for these products (5654-260 and 5684-042) or a separate order must be placed for each of these products to establish a license.

Refer to the Preinstalled products section for additional information on ordering EREP and ICKDSF.

Optional product/feature requirements

- DFSMS/VM requirements
  - ISPF V3.2.0 (5684-043) or a subsequent release for DFSMS/VM usage. ISPF is not required if you are using only the 3495 Tape Library Dataserver support of DFSMS.
  - DirMaint Facility optional feature of z/VM V5.3 if the minidisk management function is needed.
  - RACF Security Server for z/VM optional feature of z/VM V5.3 or its equivalent if a security product is needed for authorization.
  - Tivoli® Storage Manager Extended Edition for z/OS and z/VM V5.2 (5698-A11), Tivoli Storage Manager for z/OS and z/VM V5.2 (5698-A13), or Tivoli Storage Manager for VM (5697-TS9) and Language Environment component supplied with the base V5.2 system DDRs if Migration Level 2 (ML2) function of DFSMS/VM is used.

  **Note:** Program numbers 5698-A11 and 5698-A13 were withdrawn from marketing on January 21, 2005, and service support is planned to be discontinued on April 30, 2007.

  For current information regarding the discontinuance of service, refer to the z/VM Licensed Program (LP) Migration Matrix at

  **Note:** Program number 5697-TS9 was withdrawn from marketing on March 7, 2005, and service was discontinued on March 31, 2006.

  - TCP/IP for z/VM V5.3 to access the IBM 3495 Tape Library Dataserver for processors capable of 3490/3490E tape I/O, but incapable of 3495 Tape Library Data Server control.
  - RSCS FL530 feature for remote operations.
  - IBM Compiler for REXX/370 (5695-013) and IBM Library for REXX/370 (5695-014), if the compiled REXX installation-wide exit or a compiled ACS REXX exit is desired.
  - The PTF for APAR VM63746 allows DFSMS/VM RMS on z/VM V5.1, V5.2, and V5.3 to share tape drive devices using the multi-access tape feature of the CP ATTACH command. This allows, for example, z/VM 3480 install media to be inserted, and z/VM 5.3 to be installed from, an Automated Tape Library (ATL).

  The PTF for APAR VM64062 supports locating encryption-capable 3592 tape drives in an
Enterprise Automated Tape Library. The DFSMS/VM support provides tape-encryption capabilities for a z/VSE guest running on z/VM.

- Hardware Configuration Definition (HCD) and Hardware Configuration Manager (HCM) requirements

The following PTFs have been applied to the z/VM V5.3 system DDRs:
- PTF for APAR VM63960 provides the new function made available in z/OS V1.8.
- PTF for APAR VM63721 to support for 63.75K subchannels and CHPID type OSN on the z9 EC and z9 BC.
- PTF for APAR VM63869 provides the necessary function to support the z9 BC.

- IBM High Level Assembler (5696-234) requirements
  - High Level Assembler V1.5.0, or later, is required to:
    -- Create a new DMSTRT for system languages (NLS)
    -- Create image libraries for system printers (FCBs)
    -- Create GCS application segments (CONTENTS macro)
    -- Access major CMS application interfaces (CMSCALL)
    -- Access most CP application interfaces (DIAGNOSE)
    -- Use the AVS tuning control module (AGWTUN)
    -- Use RAS tools (such as MDCHECK, FS2SF6ER, AFTCHAIN, PRINTBLK, and PRINTFST)
    -- Use the API for data compression
    -- Use the CMS Pipelines Assemble macros interface
    -- Assemble exit routines for DirMaint and RSCS
    -- Customize Language Environment or compile assembler routines used in mixed-language user applications
    -- Assemble applications that exploit the IEEE Floating Point hardware facility
    -- Add devices that cannot be sensed (updating HCPRIO ASSEMBLE)
    -- Perform local modifications to modules written in assembler
    -- Assemble any CP modules
    -- Assemble exit routines for CP
    -- Reassemble CP replacement parts for the RACF Security Server optional feature

  **Note:** An equivalent product may be used in place of High Level Assembler.

- Language Environment

The following PTFs have been applied to the z/VM V5.3 system DDRs:
- The PTF for APAR VM64117 provides required changes for C/C++ library functions to support the changes for Daylight Savings Time. It must be applied to z/VM V5.1 and V5.2.
- The PTF for APAR VM64055 provides the necessary Language Environment support to:
  -- Run LDAP on z/VM V5.3
  -- Support new, increased sockets resolver domain search limits
  -- Add a delete interface to the C/C++ ioctl( ) function

- Online displayable publications requirements

  - BookManager files can be read by either BookManager READ for VM (a separately orderable product) or IBM Softcopy Reader (supplied on the CD-ROM and DVD). APAR GC05366 for BookManager/VM READ is required for READ/VM V1.3 Public Library to run in a non-370 mode. BookManager products also have prerequisite product requirements. Specific details are available in the BookManager announcement documentation.

- POSIX requirements
– Developing POSIX applications requires C/C++ for z/VM V1.1 (5654-A22).

• RSCS FL530 requirements
  – To communicate with users in an SNA network requires ACF/VTAM® for VM/ESA®, V4.2 (5654-010).
  – To communicate within an IP network requires TCP/IP for z/VM FL530.
  – Group Control Subsystem (GCS) must be configured and activated.

• Shared-DASD complex and CSE cluster program requirements
  In a shared-DASD complex, a single Directory Maintenance Facility (DirMaint) server with a single source directory can manage the object directory on up to 16 z/VM systems, if the DirMaint executable code disks and source directory disk are shared among all the systems. The following are required to support the shared-DASD complex:
  – DirMaint, Function Level 530 (FL530)
    Within the shared-DASD complex, all z/VM systems must be running the same DirMaint FL530 service level. Therefore, you must be licensed for the DirMaint FL530 feature on any z/VM V5.3 system in the complex.
  – The same DirMaint requirements as for the shared-DASD complex described above.
  – For shared spool and cross-system messaging:
    -- VM/Pass-Through Facility, V2.1.1, or later (5684-100)

OSA and Open Systems Adapter/Support Facility (OSA/SF) program requirements:
OSA/SF is provided with and supported on z/VM and can be accessed by a CMS user ID, a REXX EXEC, or a Java™-based Graphical User Interface (GUI). The GUI needs access to the Java 1.4 runtime and help on the workstation.

Access at the OSA/SF GUI requires the following communications protocols:

• For TCP/IP communication:
  – TCP/IP for z/VM on the host
  – TCP/IP on the workstation

OSA/SF 4.4.0 is also provided in the OSA/SF facility for z/VM V5.3.

• The PTF for APAR OA15170 provides the necessary function to display information for OSN features on the z9 EC and the z9 BC and support for Layer 2.
• To support an OSA in TCP/IP Passthru mode in a z/VM V5.3 environment, OSA/SF requires TCP/IP for z/VM V5.3. OSA/SF support is required in this mode only if access to one of the OSA’s ports is being shared by more than one host program or if an ATM OSA-2 is being used as a LAN Emulation Client (LEC).

For additional information on OSA/SF, refer to Hardware Announcement 103-142, dated May 13, 2003.

TCP/IP for z/VM V5.3 program requirements: TCP/IP for z/VM V5.3 has the following additional program requirements:

• If the SSL server is to be run, one of the following Linux distributions must be installed and configured for exclusive use by the SSL server:
  – Novell SUSE Linux Enterprise Server (SLES) 9 Service Pack 3 (64-bit)
  – Novell SUSE Linux Enterprise Server (SLES) 9 Service Pack 3 (31-bit)
  – Red Hat Enterprise Linux AS (Version 4 U4) (64-bit)
  – Red Hat Enterprise Linux AS (Version 4 U4) (31-bit)
• If a primary or secondary domain name server (not a caching-only name server) or the network database server is to be run:
– IBM DB2 Server for VSE & VM V7.1 (5697-F42), or later

• For SNAlink LU0 interface support:
  – ACF/VTAM® for VM/ESA V4 (5654-010)

• For X.25 interface support:
  – X.25 NCP Packet Switching Interface (NPSI) V3.4 (5688-035), or later, for 3745
  – Corresponding levels of ACF/VTAM and ACF/NCP that support NPSI

• If programs are developed in C:
  – IBM C for VM/ESA V3.1 (5654-033) or C/C++ for z/VM V1.1 (5654-A22)

• If programs are developed in Pascal:
  – IBM VS Pascal V1.2 (5668-767) Compiler and Library

Linux program requirements: Linux for System z is not provided with z/VM V5. In order to operate Linux as a guest of z/VM, Linux must be obtained from Linux distribution partners. For specific function and for the most current information on Linux distributions, refer to

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

Limitations

• z/VM V5 will operate only on hardware servers that support z/Architecture (64-bit), including z9 EC, z9 BC, z990, z890, z900, and z800.

• Linux is the only guest operating system z/VM will support on IFL processors (other than z/VM V4 or z/VM V5 itself).

• Use of IFL processors on z800 and z900 machines requires LPAR mode. Customers who choose to add IFL processors to a z800 or z900 machine running in basic mode will also have to run their operating system on the standard engine(s) in LPAR mode. This is not a consideration for z9 EC, z9 BC, z990, and z890 machines, which do not have basic mode.

• z/VM V5 does not provide support for V=R or V=F guest images. Customers running V=R and V=F guests should consider this when migrating to z/VM V5. The increase in processor requirements to run a V=V guest that was previously run as V=R, may be significant due to the loss of various hardware assists.

Performance considerations: System performance depends on the hardware resources allocated to z/VM V5.3 and on the level of activity within each Linux image. The results of the performance evaluation of z/VM V5.3 are planned to be available on June 29, 2007, in the z/VM Performance Report on the z/VM Web site at

http://www.ibm.com/servers/eserver/zseries/zvm/perf/docs/

Additional z/VM performance information is available on the z/VM Web site at


For assistance in understanding the performance implications for a particular situation, contact your IBM representative or your IBM Business Partner.

User group requirements: This announcement satisfies or partially satisfies requirements from one or more of the worldwide user group communities. Groups include zSeries Business Leaders’ Council (z/BLC), World Alliance of VSE and VM (WAVV), COMMON, COMMON Europe, GUIDE/SHARE EUROPE, Interaction (Australia/NZ, includes the former ASG and COMMON Australia), Japan GUIDE/SHARE (JGS), and SHARE Inc.

User group requirements satisfied with this announcement:

<table>
<thead>
<tr>
<th>Requirement number</th>
<th>Requirement description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MR126025746</td>
<td>Enable z/VM to generate &quot;gratuitous ARP&quot; when</td>
</tr>
</tbody>
</table>
ARP takeover occurs

MR1022036221 Allow use of the TRACERTE command without requiring special authorization

MR0628062936 Provide virtual switch support for Link Aggregation Control Protocol (LACP) of IEEE 802.3ad

MR1031036453 Allow deleting a device and link on TCP/IP

MR1024054319 Display PTF applied and put into production dates from the SERVICE EXEC

MR0426043744 Provide support for SMTP IPMAILERNAME statement

MR0725052955 Provide an option on SET OBSERVER COMMAND for no display

MR0209054947 Allow user identifiers to be used unambiguously as SMTP nicknames

MR00076228 Allow RSCS AUTH command to be dynamic

MR00074907 Allow RSCS AUTH command to be dynamic

MR112102599 Allow RSCS AUTH command to be dynamic

MR0924024650 Allow RSCS AUTH command to be dynamic

MR0531051830 Provide z/VM support of zAAP specialty processors

MR0329054435 Provide specification of COMM褲 ANY in TELNETPARMS

MR0512051655 Provide external interface to return server model and serial number

MR0504057612 Support multiple targets with z/VM CP FlashCopy® command

MR0204055238 Provide a query command to obtain FLASHCOPY status

MR061405463 Reduce time for hardware response messages and provide quicker responses to the CP FLASHCOPY command

MR0227042533 Provide improvements to the LOGON command

MR0406052249 Provide improvements to the LOGON command

MR00064226 Provide a CP SET RESERVE equivalent in the CP directory

Planning information

Customer responsibilities

z/VM V5.3 Subscription and Support (S&S): To order z/VM V5.3, you must use the SDO, program number 5741-A06. The z/VM base system, any ordered optional z/VM features, and any ordered SDO licensed products will be delivered as part of the z/VM SDO.

If you desire 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 z/VM S&S (5741-SNS). 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. z/VM S&S will be automatically added to your order. If you do not desire the S&S license for z/VM and/or the optional features of DirMaint, RSCS, RACF Security Server, or the Performance Toolkit for VM, you must take specific action to decline this support.

To host Linux guests of z/VM V5, you must also obtain a Linux for System z distribution. Information on those Linux distribution partners that have a marketing relationship with IBM can be found at

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

Licensed products packaged with z/VM V5.3: With the availability of z/VM V5, the following priced, optional products or features are automatically shipped and preinstalled on the z/VM V5 base product media:

- DirMaint FL530 feature
- RSCS FL530 feature
- RACF Security Server FL530 feature
- Performance Toolkit for VM FL530 feature

For more information on these products or features, refer to the Preinstalled products and features section.
These products or features must be enabled before using. If you choose to enable them, you must have a license for the product or the feature.

If you do not have a license for DirMaint, RSCS, RACF, or the Performance Toolkit for VM, you may establish one by placing an order for the optional features. You will receive the program directory for the optional feature or program product. The program directories include instructions for enabling use of the products.

For other IBM licensed products or products from Independent Software Vendors (ISVs), you should review the following support documents:

- Independent software vendor products available for z/VM can be found at http://www.ibm.com/servers/eserver/zseries/zvm/vendor/
- IBM licensed programs available for z/VM can be found at http://www.ibm.com/servers/eserver/zseries/zvm/related/

**Running 370-mode applications**: To simplify the migration of older applications and facilitate the running of 370-mode-only CMS applications in non-370-mode virtual machines, such as XA or XC mode, IBM provides the 370 Accommodation function. This function originally shipped with VM/ESA V1.2.1 (available July 1993) and has since been enhanced as the result of customer experience and input. 370 Accommodation handles the vast majority of inconsistencies between 370 mode and either XA or XC mode, eliminating the need to change these applications to exploit the new architectures.

z/VM V5 supports only XA-, ESA-, and XC-mode virtual machines. z/VM V5 does not support 370-mode virtual machines. 370-mode virtual machines are converted to XA mode during logon processing. The 370 Accommodation function is still supported for applications. If you find your applications cannot run under the current level of CMS, you should use the 370 Accommodation function or modify your applications, if possible. If problems persist, call IBM Service for assistance.

**Direct customer support**: Direct customer support is provided by IBM Operational Support Services — SoftwareXcel. This fee service enhances your productivity by providing voice and electronic access into the IBM support organization. IBM Operational Support Services — SoftwareXcel helps answer questions pertaining to usage and suspected software defects for eligible products.

Installation and technical support is provided by Global Services. For more information call 800-IBM-4YOU (426-4968).

For technical support or assistance, go to http://www.ibm.com/support

or contact your IBM representative for additional assistance.

**Packaging**

**z/VM V5.3**: The z/VM V5.3 product package is distributed with the following:

- International Program License Agreement (IPLA) (Z125-3301).
- License Information Document (LID) (GC24-6102).
- If ordering to install using 3480 tape:
  - Basic machine-readable material on 3480 tape cartridges for installation to a 3390 DASD
  - Stacked Recommended Service Update (RSU) 3480 tape cartridge(s) containing required service
  - Summary for Automated Installation and Service (Tape Installation), GA76-0407
- If ordering to install using 3590 tape:
  - Basic machine-readable material on a 3590 tape cartridge for installation to a 3390 DASD
  - Stacked RSU 3590 tape cartridge(s) containing required service
  - Summary for Automated Installation and Service (Tape Installation), GA76-0407
• If ordering to install using DVD:
  – Basic machine-readable material on one DVD for installation to a SCSI disk
  – Basic machine-readable material on one DVD for installation to a 3390 DASD
  – RSU DVD containing required service
  – Summary for Automated Installation and Service (DVD Installation), GA76-0406

  **Note:** The DVD format is a binary image, not in z/VM DDR format.

• One CD-ROM containing the IBM Online Library: z/VM Collection.

• One DVD containing the IBM Online Library: z/VM Collection on DVD.

• One tape containing the z/VM SDO Optional Products Enabling Aid labeled “z/VM Licensed Program Products.” If any SDO optional products are ordered, the Enabling Aid will be stacked on the tape labeled “z/VM Licensed Program Products.” Refer to the media report included with your shipment from IBM.

• Publications:
  – z/VM: Guide for Automated Installation and Service (GC24-6099)
  – z/VM: Getting Started with Linux on System z (SC24-6096)

• Program directories for z/VM V5.3, z/VM V5.3 SDO, and the preinstalled products.

• Program directories for DirMaint, RSCS, RACF, and the Performance Toolkit for VM if these optional features are ordered.

**3590 media:** Starting with the delivery of z/VM V4.3, z/VM was made available on 3590 media. With this capability, multiple physical tape images can now be delivered on consolidated (or stacked) tape(s) for z/VM. For example, the multiple tape volumes previously required to deliver the z/VM base system media on 3480 now require only a single 3590 tape. This is made possible by taking advantage of the larger storage capacity of the 3590 media. Additionally, optional products, offered in the z/VM SDO, may now be stacked on a physical tape, labeled “z/VM Licensed Program Products.” In order to determine the contents of these stacked tapes, you **MUST** refer back to the media report included with your shipment.

**Security, auditability, and control**

The announced program uses the security and auditability features inherent in the virtual machine and the System/370™, ESA/370, and ESA/390 architectures, and z/Architecture. The security and auditability of z/VM V5 are the same for ESA/390 and z/Architecture. The customer is responsible for evaluation, selection, and implementation of security features, administrative procedures, and appropriate controls in application systems and communication facilities.

**Software Services**

IBM Software Services has the breadth, depth, and reach to manage your services needs. You can leverage the deep technical skills of our lab-based, software services team and the business consulting, project management, and infrastructure expertise of our IBM Global Services team. Also, we extend our IBM Software Services reach through IBM Business Partners to provide an unmatched portfolio of capabilities. Together, we provide the global reach, intellectual capital, industry insight, and technology leadership to support any critical business need.

To learn more about IBM Software Services or to contact a Software Services sales specialist, visit


**Ordering information**

**Charge metric**

**Pricing metric description:** The products and features in this announcement have one pricing metric — Value Units based on the number of processors. Value Unit pricing with a decreasing
one-time charge (OTC) price per engine, subject to the tiers as documented in Value Unit Exhibit VUE021, is available for z/VM V5 for the optional features of DirMaint, RSCS, RACF, and the Performance Toolkit for VM, and for S&S entitlements at initial order of z/VM V5 or its features. Value Units of a given product cannot be exchanged, interchanged, or aggregated with Value Units of another product.

Engine-based Value Unit pricing of z/VM V5 is different than MSU-based Value Unit pricing, which is available on other IBM software products.

<table>
<thead>
<tr>
<th>Program name</th>
<th>Program number</th>
<th>Pricing metric description</th>
</tr>
</thead>
<tbody>
<tr>
<td>z/VM V5</td>
<td>5741-A05</td>
<td>Value Units</td>
</tr>
<tr>
<td>RSCS feature</td>
<td>5741-A05</td>
<td>Value Units</td>
</tr>
<tr>
<td>RACF Security Server feature</td>
<td>5741-A05</td>
<td>Value Units</td>
</tr>
<tr>
<td>DirMaint feature</td>
<td>5741-A05</td>
<td>Value Units</td>
</tr>
<tr>
<td>Performance Toolkit for VM feature</td>
<td>5741-A05</td>
<td>Value Units</td>
</tr>
</tbody>
</table>

Value Unit pricing for z/VM V5 provides a lower price per processor as more Value Units are licensed with z/VM V5. You may aggregate the capacity for all the processors running z/VM V5 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 z/VM V5 has already been installed, which may result in a lower unit price.

**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 z/VM V5 on all six processors, the applicable Value Units would be:

\[(3 \times 10) + (3 \times 9) = 57 \text{ Value Units}\]

The following z/VM V5 products and optional features and their associated Subscription and Support (S&S) are affected by the metric change from a “flat per-processor price” to "engine-based Value Units":

<table>
<thead>
<tr>
<th>Program number</th>
<th>Program number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>5741-A05</td>
<td>5741-SNS</td>
<td>z/VM V5</td>
</tr>
<tr>
<td>5741-A05</td>
<td>5741-SNS</td>
<td>RSCS feature</td>
</tr>
<tr>
<td>5741-A05</td>
<td>5741-SNS</td>
<td>RACF Security Server feature</td>
</tr>
<tr>
<td>5741-A05</td>
<td>5741-SNS</td>
<td>DirMaint feature</td>
</tr>
<tr>
<td>5741-A05</td>
<td>5741-SNS</td>
<td>Performance Toolkit for VM feature</td>
</tr>
</tbody>
</table>

The products in this announcement are 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 z/VM V5 on a processor per-day basis during your peak periods. For additional information on On/Off CoD, refer to Software Announcement 203-202, dated August 12, 2003, and Marketing Announcement 304-004, dated January 13, 2004.

**Performance Toolkit for VM**

The Performance Toolkit for VM feature provides a variety of reports on system performance to help manage your performance more efficiently.

The Performance Toolkit for VM feature was derived from the IBM FCON/ESA program (5788-LGA) and made available with z/VM V4.4. It was updated in z/VM V5.1 to provide functional equivalence to the Performance Reporting Facility (PRF) priced optional feature of z/VM V4.

The Performance Toolkit for VM feature is considered to be a program update for the RealTime Monitor (RTM) and/or the Performance Reporting Facility (PRF) features of z/VM V4 as defined in the IBM International Agreement for Acquisition of Support, Z125-6011. Therefore, any existing z/VM V4 customer who has purchased a Subscription & Support (S&S) license for the RTM or PRF feature is entitled to receive a no-charge upgrade for the Performance Toolkit for VM feature when ordering z/VM V5.3.

The priced, optional RTM and PRF features are not available with z/VM V5 nor can they be licensed on z/VM V5.

IBM strongly encourages customers to order S&S for the Performance Toolkit for VM feature.
S&S provides an easy and effective way for customers to access, during the coverage period, eligible new versions and releases of the Performance Toolkit for VM feature.

S&S also provides the same level of support that was available when customers paid a monthly license charge for products with the IBM Customer Agreement software license.

**High Level Assembler (5696-234)**

The High Level Assembler (5696-234) or an equivalent product is required for z/VM to:

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

For pricing, terms and conditions, or questions about licensing on IFL processors, customers should contact an IBM representative or Business Partner.

**Processor**

A processor (commonly called a CPU or core) is a functional unit within a computing device that interprets and executes instructions. A processor consists of at least an instruction control unit and one or more arithmetic or logic unit. With multicore technology each core is considered a processor. With full capacity licensing, a Proof of Entitlement (PoE) must be acquired for all activated processors available for use on the server.

The programs in this announcement have Value Unit-Based pricing.

<table>
<thead>
<tr>
<th>Program number</th>
<th>Program name</th>
<th>Value Unit</th>
<th>Exhibit</th>
</tr>
</thead>
<tbody>
<tr>
<td>5741-A05</td>
<td>z/VM V5</td>
<td>VUE021</td>
<td></td>
</tr>
</tbody>
</table>

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 processors are determined by the following table:

<table>
<thead>
<tr>
<th>Level</th>
<th>Processors minimum</th>
<th>Processors maximum</th>
<th>Value Units per processor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base</td>
<td>1</td>
<td>3</td>
<td>10</td>
</tr>
<tr>
<td>Tier A</td>
<td>4</td>
<td>6</td>
<td>9</td>
</tr>
<tr>
<td>Tier B</td>
<td>7</td>
<td>9</td>
<td>8</td>
</tr>
<tr>
<td>Tier C</td>
<td>10</td>
<td>12</td>
<td>7</td>
</tr>
<tr>
<td>Tier D</td>
<td>13</td>
<td>16</td>
<td>6</td>
</tr>
<tr>
<td>Tier E</td>
<td>17</td>
<td>20</td>
<td>5</td>
</tr>
<tr>
<td>Tier F</td>
<td>21</td>
<td>25</td>
<td>4</td>
</tr>
<tr>
<td>Tier G</td>
<td>26</td>
<td>+</td>
<td>3</td>
</tr>
</tbody>
</table>

**Order z/VM SDO through the Internet**

ShopzSeries provides an easy way to plan and order System z software upgrades, including z/VM. Using ShopzSeries, customers can quickly generate orders for z/VM SDOs. Additionally, ShopzSeries will ensure your order is technically correct (that is, ensures any corequisite or prerequisite or incompatibility conditions are resolved to ensure timely order placement and processing). ShopzSeries is available in the United States and several countries in Europe. In countries where ShopzSeries is not available yet, contact your IBM representative (or IBM Business Partner) to handle your order via the traditional IBM ordering process. For more details and availability, visit the ShopzSeries Web site at

http://www.ibm.com/software/ShopzSeries
The z/VM V5.3 SDO licensed products are eligible for Internet delivery using the ShopzSeries Web site and are planned to be available after the general availability of z/VM V5.3. The z/VM base operating system cannot be delivered using Internet delivery of ShopzSeries.

**Basic license**

**Licensing for z/VM V5.3:** The following z/VM V5 base and optional features and their associated Subscription and Support (S&S) are affected by the metric change from "flat price per engine" on z/VM V4 to "Value Units" based on the number of processors with z/VM V5:

<table>
<thead>
<tr>
<th>Program Number</th>
<th>SDO Program Number</th>
<th>S&amp;S Program Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>5741-A05</td>
<td>5741-A06</td>
<td>5741-SNS</td>
<td>z/VM V5</td>
</tr>
<tr>
<td>5741-A05</td>
<td>5741-A06</td>
<td>5741-SNS</td>
<td>RSCS feature</td>
</tr>
<tr>
<td>5741-A05</td>
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<td>5741-SNS</td>
<td>RACF Security Server feature</td>
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<td>5741-A06</td>
<td>5741-SNS</td>
<td>DirMaint feature</td>
</tr>
<tr>
<td>5741-A05</td>
<td>5741-A06</td>
<td>5741-SNS</td>
<td>Performance Toolkit for VM feature</td>
</tr>
</tbody>
</table>

The program number, 5741-A05, is used for licensing z/VM V5. You must specify the number of engine-based Value Units for the number of processors required as calculated by the Value Unit pricer.

Customers who purchased a Subscription & Support (S&S) contract for z/VM V4 will be entitled to a no-charge upgrade to z/VM V5.

When ordering z/VM V5 or the optional features to operate on standard processors (CPs) for a single server within the enterprise, you must specify Value Units equal to the Value Units to cover the number of standard processors (CPs) on your z9 EC, z9 BC, z990, z900, z890, or z800 server.

When ordering z/VM V5 or the optional features to operate on IFL processors for a single server within the enterprise, you must specify Value Units equal to the Value Units to cover the number of IFL processors on your z9 EC, z9 BC, z990, z900, z890, or z800 server.

When ordering z/VM V5 or the optional features to operate on standard processors (CPs) AND IFL processors for a single server within the enterprise, you must specify Value Units equal to the Value Units to cover the total number of processors (standard plus IFL) on your z9 EC, z9 BC, z990, z900, z890, or z800 server.

For a single server in an enterprise, the number of Value Units ordered for any optional features must be equal to the number of Value Units ordered for the base z/VM V5 product.

The quantity ordered cannot exceed the maximum number of processors per server. The number of processors for a single server to be used to calculate Value Units should not be more than:

<table>
<thead>
<tr>
<th>Quantity</th>
<th>IFL processors</th>
<th>Standard processors</th>
<th>Maximum processors</th>
<th>For each server</th>
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</thead>
<tbody>
<tr>
<td>54</td>
<td>54</td>
<td>54</td>
<td>Syst em z9 EC (2094)</td>
<td></td>
</tr>
<tr>
<td>6</td>
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<td>zSeries 990 (2084)</td>
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<td>15</td>
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<td>zSeries 900 (2064)</td>
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<td>4</td>
<td>4</td>
<td>zSeries 800 (2066)</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>0</td>
<td>4</td>
<td>zSeries Offering for Linux (2066-0FL)</td>
<td></td>
</tr>
</tbody>
</table>

The optional features DirMaint, RSCS, RACF, and the Performance Toolkit for VM are preinstalled on the base system media. Ordering these features establishes a license for entitlement purposes and you will also receive a program directory for the optional features ordered. If you intend to use DirMaint, RSCS, RACF, or the Performance Toolkit for VM, now or at a later date, you must establish a license for billing and shipment of publications.

The Performance Toolkit for VM feature is considered a program update for the RTM and PRF features as defined in the IBM International Agreement for Acquisition of Support, Z125-6011. Therefore, any existing z/VM V4 customers, with licenses for the RTM or PRF features, who have also purchased S&S for either the RTM or PRF feature, are entitled to receive a no-charge
Availability of Common Criteria Certification feature: On October 26, 2005, the German Federal Office of Information Security (Bundesamt für Sicherheit in der Informationstechnik [BSI]) issued its certification that z/VM V5.1 with the RACF for z/VM feature conforms to the requirements of the Controlled Access Protection Profile (CAPP) and the Labeled Security Protection Profile (LSPP), both at Evaluation Assurance Level 3+. Therefore, z/VM V5.1 and its priced, optional features, DirMaint, RACF, and the Performance Toolkit for VM, known as Common Criteria Certification feature, can be ordered if you require a certified level of z/VM. The Recommended Service Update (RSU) Level 5103RSU (PTF UM97510) plus the RACF for z/VM PTF for APAR VM63613 is required to maintain certification.

In Software Announcement 206-084, dated April 27, 2006, IBM announced plans to withdraw the Common Criteria Certification feature from marketing on September 30, 2007. This withdrawal date has changed and IBM now intends to withdraw the Common Criteria Certification feature from marketing on June 15, 2007. IBM plans to support the Common Criteria Certification feature until September 30, 2007.

IBM intends to evaluate z/VM V5.3 with the RACF Security Server optional feature for conformance to the Controlled Access Protection Profile (CAPP) and Labeled Security Protection Profile (LSPP) of the Common Criteria standard for IT security, ISO/IEC 15408, at Evaluation Assurance Level 4 (EAL4).

This new SOD represents a modification to IBM's previously expressed Statement of Direction of July 27, 2005, which stated IBM's intent "to evaluate z/VM V5.2 with the RACF for z/VM optional feature for conformance to the Controlled Access Protection Profile (CAPP) and Labeled Security Protection Profile (LSPP) of the Common Criteria standard for IT security, ISO/IEC 15408, at Evaluation Assurance Level 4 (EAL4)." Based on additional evaluation of requirements, IBM no longer intends to evaluate z/VM V5.2.

z/VM V5.3 (5741-A05) basic license

<table>
<thead>
<tr>
<th>Entitlement Identifier</th>
<th>Description</th>
<th>License Option/Pricing Metric</th>
</tr>
</thead>
<tbody>
<tr>
<td>S0111PP</td>
<td>z/VM V5</td>
<td>Use-based OTC, Per Value Unit</td>
</tr>
<tr>
<td>S0111PH</td>
<td>DirMaint feature</td>
<td>Use-based OTC, Per Value Unit</td>
</tr>
<tr>
<td>S013T68</td>
<td>RSCS feature</td>
<td>Use-based OTC, Per Value Unit</td>
</tr>
<tr>
<td>S0111PL</td>
<td>RACF feature</td>
<td>Use-based OTC, Per Value Unit</td>
</tr>
<tr>
<td>S0111PT</td>
<td>Performance Toolkit for VM feature</td>
<td>Use-based OTC, Per Value Unit</td>
</tr>
</tbody>
</table>

Ordering z/VM V5.3 Using the SDO: Orders for z/VM V5.3 will be accepted beginning June 15, 2007. When placing an order, if you wish to have that order fulfilled with z/VM V5.3, you will need to specify a customer requested arrival date (CRAD) of June 29, 2007, or later. Production of z/VM V5.3 orders is planned to begin on June 29, 2007.

z/VM V5.2 and its priced, optional features of DirMaint, RACF, and the Performance Toolkit for VM will be withdrawn from marketing on June 15, 2007, and will be supported until April 30, 2009.

The Common Criteria Certification feature and its priced, optional features of DirMaint, RACF, and the Performance Toolkit for VM will be withdrawn from marketing on June 15, 2007, and will be supported until September 30, 2007.

z/VM V4.4 has been withdrawn from marketing effective March 31, 2006, as announced in Withdrawal Announcement 905-261, dated December 6, 2005. Service support for z/VM V4.4 has been withdrawn effective September 30, 2006, as announced in Software Announcement 205-168, dated July 27, 2005.

z/VM V3.1 has been withdrawn from marketing as of August 27, 2004. Service support for z/VM V3.1 has been withdrawn effective December 31, 2005, as previously announced in Withdrawal Announcement 904-151, dated August 3, 2004.

Orders for z/VM V5.3 and the optional features must use the z/VM V5.3 SDO packaged offering, program number 5741-A06. The z/VM base system, any ordered optional z/VM features, and any ordered SDO licensed products will be delivered as part of the z/VM SDO.

You must specify the disk type to which you will install and the desired distribution medium.

With the ordering of z/VM V5.3, you will receive a system DDR tape or DVD containing the program code for z/VM V5.3, an IPLA for 5741-A05, a LID, program directories, the SDO Enabling Aid, and one copy of each publication available for z/VM V5.3 as listed in the Planning.
Examples

- **Example 1** — You currently do not have z/VM V5 licensed on any processors on any System z9 or zSeries server within your enterprise. Your engine-based Value Unit for licensing (5741-A05) is 0.

  If you will be licensing z/VM V5 and designating two IFL processors on a single System z9 or zSeries server within your enterprise as running z/VM V5, you will specify the disk type to which you will install and the desired distribution medium. When licensing using 5741-A05, capacity to be specified in engine-based Value Units would be (2 * 10) or **20** resulting in a total of **20** Value Units.

- **Example 2** — You currently are not running z/VM V5 on standard processors (CPs) but you are running z/VM V5 on one IFL processor (probably running Linux on System z) on a single System z9 or zSeries server within your enterprise. Your engine-based Value Unit for licensing (5741-A05) is 10.

  If you will be licensing z/VM V5 and designating two additional IFL processors on a single System z9 or zSeries server within your enterprise as running z/VM V5, you will specify the disk type to which you will install and the desired distribution medium. When licensing using 5741-A05, additional capacity to be specified in engine-based Value Units would be (2 * 10) or **20** resulting in a total of **30** Value Units.

- **Example 3** — You currently are running z/VM V5 on two standard processors (CPs) on a single System z9 or zSeries server within your enterprise. Your engine-based Value Unit for 5741-A05 is 20.

  If you will be licensing z/VM V5 and designating two additional standard processors (CPs) on a single System z9 or zSeries server within your enterprise as running z/VM V5, you will specify the disk type to which you will install and the desired distribution medium. When licensing using 5741-A05, additional capacity to be specified in engine-based Value Units would be (1 * 10) + (1 * 9) or **19** resulting in a total of **39** Value Units.

- **Example 4** — You currently are running z/VM V5 on two standard processors and on one IFL processor (probably running Linux for System z) on a single System z9 or zSeries server within your enterprise. Your engine-based Value Unit for 5741-A05 is 30.

  If you will be licensing z/VM V5 for four additional processors and designating one as a standard processor and the remaining three as IFL processors on a single System z9 or zSeries server within your enterprise as running z/VM V5, you will specify the disk type to which you will install and the desired distribution medium. When licensing using 5741-A05, additional capacity to be specified in engine-based Value Units would be (3 * 9) + (1 * 8) or **35** resulting in a total of **65** Value Units.

- **Example 5** — You currently do not have z/VM V5 licensed on any processors on any System z9 or zSeries server within your enterprise. Your engine-based Value Unit is 0.

  If you will be licensing z/VM V5 and designating two standard processors on one System z9 or zSeries server and on an additional System z9 or zSeries server within your enterprise, you will license z/VM V5 on one standard processor and on two IFL processors, you will specify the disk type to which you will install and the desired distribution medium. When licensing using 5741-A05, additional capacity to be specified in engine-based Value Units would be (3 * 10) + (2 * 9) or **48** resulting in a total of 48 Value Units because of aggregating the licenses within the enterprise.

---

**z/VM V5.3 Base SDO (5741-A06) — S0111J2**

<table>
<thead>
<tr>
<th>Orderable supply ID</th>
<th>Language</th>
<th>Distribution medium</th>
</tr>
</thead>
<tbody>
<tr>
<td>S0111RS</td>
<td>US English</td>
<td>3480 Tape</td>
</tr>
<tr>
<td>S0111X6</td>
<td>US English</td>
<td>3590 Tape</td>
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**z/VM V5.3 Base SDO (5741-A06) — S0111HM**

<table>
<thead>
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<th>Language</th>
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</thead>
<tbody>
<tr>
<td>S0111RT</td>
<td>US English</td>
<td>DVD</td>
</tr>
</tbody>
</table>

**Optional features of z/VM V5.3 SDO (5741-A06)**

**DirMaint feature (5741-A06) — S0111HV**
RSCS (5741-A06) — S013T66

<table>
<thead>
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<th>Orderable supply ID</th>
<th>Language</th>
<th>Distribution medium</th>
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<tr>
<td>S013TCM</td>
<td>US English</td>
<td>3590 Tape</td>
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<td>S013TCK</td>
<td>US English</td>
<td>DVD</td>
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RACF Security Server feature (5741-A06) — S0111J0

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<th>Language</th>
<th>Distribution medium</th>
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<td>S0111X4</td>
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Performance Toolkit for VM feature (5741-A06) — S0111HX

<table>
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<th>Language</th>
<th>Distribution medium</th>
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<td>S0111RK</td>
<td>US English</td>
<td>3480 Tape</td>
</tr>
<tr>
<td>S0111X2</td>
<td>US English</td>
<td>3590 Tape</td>
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<tr>
<td>S0111X1</td>
<td>US English</td>
<td>DVD</td>
</tr>
</tbody>
</table>

The features are for stand-alone product and not for ordering.

z/VM V5.3 Base (5741-A05) — S0111J2

<table>
<thead>
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<th>Orderable supply ID</th>
<th>Language</th>
<th>Distribution medium</th>
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<tbody>
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<td>S0111J3</td>
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<td>3480 Tape (Not for Supply)</td>
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</tbody>
</table>

z/VM V5.3 Base (5741-A05) — S0111HM

<table>
<thead>
<tr>
<th>Orderable supply ID</th>
<th>Language</th>
<th>Distribution medium</th>
</tr>
</thead>
<tbody>
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<td>S0111HN</td>
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<td>DVD SystemImage (Not for Supply)</td>
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DirMaint feature (5741-A05) — S0111HV

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<td>S0111HW</td>
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<td>3480 Tape (Not for Supply)</td>
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</tbody>
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RSCS feature (5741-A05) — S013T66

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<th>Orderable supply ID</th>
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</tr>
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<tbody>
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<td>S013T67</td>
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<td>3480 Tape (Not for Supply)</td>
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RACF Security Server feature (5741-A05) — S0111J0

<table>
<thead>
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Performance Toolkit for VM feature (5741-A05) — S0111HX

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<td>S0111HZ</td>
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</table>

Support for z/VM V5.3

Program name: z/VM Subscription & Support

Program number: 5741-SNS

Support for z/VM V5 is provided and licensed under the IBM International Agreement for

IBM United States Announcement 207-019
Acquisition of Support (Z125-6011).

This 5741-SNS order establishes entitlement records as well as support for z/VM V5.3 or the optional features. If an 5741-SNS order is declined, you will only be entitled to support under the basic warranty for z/VM V5.3 (5741-A05).

z/VM has adopted the support lifecycle extensions as announced in Software Announcement 203-204, dated August 12, 2003, which provide for 3 years of technical support after general availability. Therefore:

- Central service for z/VM V5.3 (5741-A05) is planned to be available by IBM until September 30, 2010.
- Central service for z/VM V5.2 (5741-A05) is planned to be available by IBM until April 30, 2009.
- Central service for the Common Criteria Certification feature (5741-A05) is planned to be available by IBM until September 30, 2007.
- Central service for z/VM V4.4 (5739-A03) was discontinued on September 30, 2006.

The z/VM S&S provides:

- Corrections that fix substantial deviations of unmodified products from the then-current code, publications, and informal documentation (that is, release notes and memos).
- Software product updates that are improvements, extensions, and other changes IBM, at its discretion, deems to be reasonable.
- Recommended Service Updates (RSUs), new versions, and new releases at no additional charge.
- Technical support:
  - A reasonable amount of remote assistance via telephone, mail, facsimile (fax), or e-mail to address suspected IBM program defects, where available, during normal IBM business hours from Monday through Friday, except local holidays. Exceptions from normal IBM business hours are Severity 1 (high impact) problems. Support for high impact suspected IBM defects is available 24 hours a day, 7 days a week.
  - Temporary fixes for problems (where known), where they exist.

On-site (local) support, although available, is provided as part of the IBM portfolio of fee-based services.

z/VM S&S annual support charges, based on the number of Value Units specified, will be automatically added to your order. If you do not desire the S&S license for z/VM and/or the optional features of DirMaint, RSCS, RACF, or the Performance Toolkit for VM, you must take specific action to decline this support.

A no-charge S&S registration record will be established on each designated machine where z/VM V5 and the priced, optional features of DirMaint, RSCS, RACF, and the Performance Toolkit for VM are running. These no-charge S&S registration records will be linked to the billable S&S and all billable S&S within the scope of the engine-based Value Units aggregation will be linked together.

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

The quantity ordered cannot exceed the maximum number of processors per server. The number of processors for a single server to be used to calculate Value Units should not be more than:

<table>
<thead>
<tr>
<th>Quantity</th>
<th>IFL Standard Maximum</th>
<th>processors</th>
<th>processors</th>
<th>processors</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td>54</td>
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</table>

IBM United States Announcement 207-019

IBM is a registered trademark of International Business Machines Corporation
**z/VM Subscription and Support (5741-SNS)**

<table>
<thead>
<tr>
<th>Entitlement identifier</th>
<th>Description</th>
<th>License option/Pricing metric</th>
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</thead>
<tbody>
<tr>
<td>S0111PX</td>
<td>z/VM V5 SW Subscription and Support ASC</td>
<td>Decline SW S&amp;S No-charge</td>
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<tr>
<td></td>
<td></td>
<td>SW S&amp;S Registration No-charge</td>
</tr>
<tr>
<td>S0111R1</td>
<td>DirMaint feature</td>
<td>SW Subscription and Support ASC</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Decline SW S&amp;S No-charge</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SW S&amp;S Registration No-charge</td>
</tr>
<tr>
<td>S013T6B</td>
<td>RSCS feature</td>
<td>SW Subscription and Support ASC</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Decline SW S&amp;S No-charge</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SW S&amp;S Registration No-charge</td>
</tr>
<tr>
<td>S0111R0</td>
<td>RACF feature</td>
<td>SW Subscription and Support ASC</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Decline SW S&amp;S No-charge</td>
</tr>
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<td></td>
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<td>SW S&amp;S Registration No-charge</td>
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<td>S0111PZ</td>
<td>Performance Toolkit for VM feature</td>
<td>SW Subscription and Support ASC</td>
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<td>Decline SW S&amp;S No-charge</td>
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<tr>
<td></td>
<td></td>
<td>SW S&amp;S Registration No-charge</td>
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</table>

The features are for stand-alone product and not for ordering.

**z/VM V5.3 Base S&S (5741-SNS) — S0111HH**

Orderable supply ID Language Description

S0111HJ US English z/VM V5.3 3390 Sys DDR (Support for 5741-A05)

**z/VM V5.3 Base S&S (5741-SNS) — S0111HK**

Orderable supply ID Language Description

S0111HL US English z/VM V5.3 DVD Sys Image (Support for 5741-A05)

**z/VM V5.3 Base S&S (5741-SNS) — S0111H7**

Orderable supply ID Language Description

S0111HB US English DirMaint feature (Support for 5741-A05)

**z/VM V5.3 Base S&S (5741-SNS) — S013T6C**

Orderable supply ID Language Description

S013T6D US English RSCS feature (Support for 5741-A05)

**z/VM V5.3 Base S&S (5741-SNS) — S0111HC**

Orderable supply ID Language Description

S0111HD US English RACF Security Server feature (Support for 5741-A05)

**z/VM V5.3 Base S&S (5741-SNS) — S0111HF**

Orderable supply ID Language Description

S0111HG US English Performance Toolkit for VM feature (Support for 5741-A05)

**National Language Translation**

When you order z/VM V5.3, the National Language Translation files for message repositories, help files, and other panels or files are included with the system.
The following components or features are supported by z/VM V5.3 in the following languages:

- German — CP, CMS (including CMS Utilities), REXX
- Japanese Kanji — CP, CMS (including CMS Utilities), REXX, PIPES

The DirMaint feature provides National Language translation for DirMaint messages in Kanji and is automatically included with this feature.

To receive the translated help files for DFSMS/VM in Kanji, you must order the no-charge optional DFSMS/VM feature using the z/VM V5 System Delivery Option (SDO).

**z/VM V5.3 SDO optional licensed products**

**Program name:** z/VM V5.3 SDO  
**Program number:** 5741-A06

The following table provides the orderable supply features for the optional licensed products with z/VM V5.3.

### Orderable supply feature numbers for 5741-A06

<table>
<thead>
<tr>
<th>Orderable supply</th>
<th>Language</th>
<th>Medium</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>S0111RS</td>
<td>US English</td>
<td>3480 Tape</td>
<td>5741-A05 3480 3390 Sys DDR</td>
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<tr>
<td>S0111X6</td>
<td>US English</td>
<td>3590 Tape</td>
<td>5741-A05 3590 3390 Sys DDR</td>
</tr>
<tr>
<td>S0111RT</td>
<td>US English</td>
<td>DVD</td>
<td>5741-A05 DVD System Image</td>
</tr>
<tr>
<td>S0111X7</td>
<td>US English</td>
<td>3480 Tape</td>
<td>5741-A05 3480 SDO Opt Prod Aid</td>
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Preinstalled products and features

• EREP and ICKDSF.

The prerequisite no-charge products, EREP (5654-260) and ICKDSF (5684-042) are preinstalled on the base product system DDRs. If you intend to use EREP or ICKDSF now or at a later date, you must establish a license for billing and shipment of publications by placing an order for each of these products. Because the product code is already preinstalled, your order should indicate that shipment of media should be suppressed for these products. This can be accomplished by including the Delivery Option feature number 3471 (Ship Documentation Only) which designates the shipment of:

• Language Environment.

Language Environment is integrated into the base of z/VM V5.3.

• HCD and HCM.

HCD and HCM provides a comprehensive I/O configuration management environment, similar to that available with the z/OS operating system. HCD and HCM is delivered preinstalled into the base of z/VM V5.3, enabled for use, and is available at no additional charge.

• OpenExtensions Shell and Utilities.

OpenExtensions Shell and Utilities is included in z/VM V5.3 with no licensing or billing requirements.

• CMS Utilities.

CMS Utilities is included in z/VM V5.3 at no additional charge.

• Open Systems Adapter Support Facility (OSA/SF).

OSA/SF (V4.4.0) is a host-based tool supporting OSA-2 and OSA-Express features and is included in z/VM V5.3 later, with no licensing or billing requirements.

• TCP/IP for z/VM and NFS.

The TCP/IP base and the Network File System (NFS) feature of TCP/IP are delivered preinstalled, enabled for use, and are available at no additional charge.
• RSCS feature.

RSCS V3.2.0 (5684-096) has been repackaged and is now available for licensing under International Program License Agreement (IPLA) terms and conditions. RSCS Function Level 530 (FL530) is available as an priced, optional feature. Pricing is based on engine-based Value Units, and can be licensed on IFL and standard processor processors. RSCS FL530 is preinstalled with z/VM V5.3, in a disabled state. If you intend to use RSCS for more than operating network-attached printers now or at a later date, you must establish a license for billing and shipment of publications. A license is established for RSCS FL530 by placing an order for the feature. Because the product code is already preinstalled, you will not receive any additional code.

• DirMaint, RACF Security Server, and the Performance Toolkit for VM optional features for z/VM V5.

DirMaint, RACF Security Server, and the Performance Toolkit for VM optional features for z/VM V5.3 are preinstalled in a disabled state. If you intend to use any one of these features, now or at a later date, you must establish a license for billing and shipment of publications. Enablement instructions are provided in the program directory for each feature to enable the feature for use on your system. A license is established by placing an order for the feature.

z/VM V5.3 (5741-A05) Temporary Use Charge

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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 (LI) 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 maintenance and does not require customer signatures:

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

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

System z, IBM eServer zSeries, and S/390 IBM Operational Support Services — SoftwareXcel is an option for those customers who desire added services.

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. Consult the IBM
Software Support Guide for further information at

http://www.ibm.com/software/support

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 (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. 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.

Authorization for Use on Home/Portable Computer: You may not copy and use this program
on another computer without paying additional license fees.

Volume orders (IVO): No

Passport Advantage applies: No

Usage restriction: Yes

- z/VM V5 supports z9 EC, z9 BC, z990, z900, z890, and z800. For information about specific
  z/VM machine requirements and programming requirements, refer to the z/VM: General
  Information (GC24-6095)

- 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.

- Only Linux workloads in an LPAR or Linux guests of z/VM V5 can operate on the IFL
  processors and they cannot run other IBM operating systems except z/VM V4 or z/VM V5.

- When ordering z/VM V5 or the optional features to operate on any of the standard processors
  (CPs), you must order Value Units equal to the number of Value Units for the total number of
  standard processors (CPs) on your z9 EC, z9 BC, z990, z900, z890, and z800.

- When ordering z/VM V5 or the optional features to operate on IFL processors, you must order
  Value Units equal to the number of Value Units for the total number of IFL processors on your
  z9 EC, z9 BC, z990, z900, z890, and z800.

- When ordering z/VM V5 or the optional features to operate on standard processors (CPs) and
  IFL processors, you must order Value Units equal to the total number of Value Units for the
  total number of processors (standard plus IFL) on your z9 EC, z9 BC, z990, z900, z890, and
  z800.

- z/VM V5.3 operates on the z9 EC, z9 BC, z990, z890, z900, and z800.

The program requires hardware that implements the IBM 64-bit z/Architecture in order to
execute properly and therefore you are not authorized to install or use this program on any
machine that does not properly implement 64-bit z/Architecture. For information about specific
z/VM machine requirements and programming requirements, see the z/VM: General
Information manual, GC24-6095.

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

**Software Maintenance applies:** No

For operating system software, the revised IBM Operational Support Services — SoftwareXcel offering will provide support for those operating systems and associated products that are not available with the newly announced Software Maintenance offering. This will ensure total support coverage for your enterprise needs, including IBM and selected non-IBM products. For complete lists of products supported under both the current and revised SoftwareXcel offering, visit

http://www.ibm.com/services/sl/products

For additional information on the revised IBM Operational Support Services, refer to Services Announcement 601-023, dated July 10, 2001.

**IBM Operational Support Services — SoftwareXcel:** Yes

**System i™ Software Maintenance applies:** No

**Variable charges apply:** No

**Educational allowance available:** Yes. A 15% education allowance applies to qualified education institution customers.

SVC is only applicable when running on standard processors and the maximum time for which it applies is for 12 months.

The SVC offering is valid only while both the predecessor product and the replacement product are:

- Both running on the same CPU
- Licensed under the same IBM customer number
- In the process of being migrated from the older product to the newer one by the customer
- Providing the same function

**Note:** When the SVC offering meets these requirements, you must order the appropriate number of Value Units for z/VM V5.3 to be eligible.

**Products eligible for Single Version Charging (SVC)**

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On/Off Capacity on Demand

To be eligible for On/Off Capacity on Demand pricing, you must be enabled for temporary capacity on the corresponding hardware, and the required contract, Attachment for Customer Initiated Upgrade and IBM eServer On/Off Capacity on Demand — Software (Z125-6611) must be signed prior to use.

IBM Electronic Services

IBM has transformed its delivery of hardware and software support services to put you on the road to higher system availability. Electronic Services is a Web-enabled solution that offers an exclusive, no-additional-charge enhancement to the service and support available for IBM servers. These services provide the opportunity for greater system availability with faster problem resolution and preemptive monitoring. Electronic Services comprises two separate, but complementary, elements: Electronic Services news page and Electronic Services Agent.

The Electronic Services news page is a single Internet entry point that replaces the multiple entry points traditionally used to access IBM Internet services and support. The news page enables you to gain easier access to IBM resources for assistance in resolving technical problems.

The Electronic Service Agent™ is no-additional-charge software that resides on your server. It monitors events and transmits system inventory information to IBM on a periodic, client-defined timetable. The Electronic Service Agent automatically reports hardware problems to IBM. Early knowledge about potential problems enables IBM to deliver proactive service that may result in higher system availability and performance. In addition, information collected through the Service Agent is made available to IBM service support representatives when they help answer your questions or diagnose problems.

To learn how Electronic Services can work for you, visit

http://www.ibm.com/support/electronic

Prices

Information on charges is available at

http://www.ibm.com/support

Choose the option entitled "Purchase / upgrade tools."

The products and features in this announcement have one pricing metric — Value Units based on the number of processors. The change applies only to the z/VM V5.3 base and the priced, optional features of DirMaint, RSCS RACF, and the Performance Toolkit for VM and the S&S entitlements at the initial order.

**Program name:** z/VM Version 5 Release 3

**Program number:** 5741-A05

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### On/Off Capacity on Demand — Temporary Use Charge (TUC)

#### z/VM V5.3 (5741-A05) Temporary Use Charge

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### IBM Global Financing

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](http://www.ibm.com/financing)

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