



# z/VM V3R1 Enabled for 64-bit Architecture

## Overview

### Exploiting New Technology

Building upon the solid VM/ESA® base, z/VM delivers enhancements for new hardware technologies such as: 64-bit addressing, FICON™ channels, high-speed communication adapters, and advanced storage solutions.

The z/VM product offers a new base for customers looking to exploit IBM Virtual Machine technology on the industry's best-of-breed server platform, the IBM @server zSeries. For additional information on the zSeries 900 family of servers, refer to Hardware Announcement 100-323, dated October 3, 2000.

z/VM provides a highly flexible test and production environment for enterprises deploying the latest e-business solutions. Increasingly, enterprises need to build multisystem server solutions to meet the demands of their enterprises and IT infrastructures. z/VM helps enterprises meet those demands with a broad range of support for operating system environments such as z/OS, OS/390®, TPF, VSE/ESA™, CMS, LINUX® for S/390®, or Linux for zSeries. For additional information on z/OS, refer to Software Announcement 200-352, October 3, 2000.

In addition to exploiting zSeries, z/VM supports a wide variety of S/390 servers and offers today's VM/ESA customer the ability to support their existing VM environment on the latest S/390 technology, while positioning themselves for growth into the zSeries 900 family of servers.

### Consolidating LINUX Workloads

z/VM offers an ideal platform for consolidating Linux workloads on a single S/390 or zSeries 900. Running Linux as a guest of z/VM enables you to run tens to hundreds of Linux images while benefiting from the reliability, availability, and serviceability characteristics of S/390 or zSeries 900 servers in addition to allowing you to exploit the exceptional capabilities of z/VM.

### Related Products Enhanced

The VM performance related products have been enhanced to support the z/Architecture. Realtime Monitor VM/ESA (RTM) will provide performance data for z/VM and VM Performance Reporting Facility (VMPRF) will be able to analyze new and changed monitor records in z/VM, including those produced as part of 64-bit architecture support.

RTM simplifies performance analysis and the installation management of VM environments. VMPRF uses system monitor data to analyze system performance and to detect and diagnose performance problems. For additional information on RTM and VMPRF, refer to Software Announcement 200-359, dated October 3, 2000.

### Key Prerequisites

Refer to the **Hardware Requirements** and **Software Requirements** sections for details.

### Planned Availability Date

February 23, 2001

## At a Glance

z/VM is a follow-on product to VM/ESA and includes these key features:

- New architecture exploitation enabling 64-bit guest operating systems
- Real storage constraint relief by eliminating the 2 GB central storage limitation
- Native FlashCopy support for Enterprise Storage Server (ESS) for high-speed data copy
- Guest support enhancements for 3494 VTS and FICON-attached 3590 A60 Tape Controller
- Connectivity enhancements for TCP/IP:
  - Improved security with the inclusion of a Secure Socket Layer (SSL) server
  - Transparent data access to remote systems data with an NFS Client
  - Capability and useability improvements to FTP server for Web browsers
  - Reduced load on hosts with support for IP Multicasting
  - Improved data transfer performance with QDIO supporting Gigabit Ethernet, Fast Ethernet, and 155 ATM (Ethernet LAN Emulation)
- Support for the DFSMS/MVS® to enhance OS/390 application affinity
- The GUI Facility workstation agents, help files, and modules will be available from the VM Download Library

### For ordering, contact:

Your IBM representative, an IBM Business Partner, or IBM Americas Call Centers at

800-IBM-CALL

Reference: LE001

*This announcement is provided for your information only. For additional information, contact your IBM representative, call 800-IBM-4YOU, or visit the IBM home page at: <http://www.ibm.com>.*

---

## Description

---

### *z/VM Version 3 Release 1*

#### **Enhanced Architecture and Device Support**

**zSeries 900 Family of Servers:** z/VM exploits the z/Architecture enabling you to run 64-bit capable operating systems such as OS/390 Release 10, z/OS, or Linux for zSeries as guests of z/VM when z/VM is running on a zSeries server. Additionally, 31-bit guest operating systems such as OS/390, VSE/ESA, TPF, and Linux for S/390 can run on z/VM and realize memory constraint relief because of the z/VM support of large real memory. This support simplifies the migration and testing of 64-bit operating systems and applications. z/VM Version 3 Release 1 supports 64-bit virtual coupling facilities as well as continuing to support them in ESA/390™ (32-bit) mode. For additional information on z/OS, refer to Software Announcement 200-352, dated October 3, 2000. For additional information on the zSeries 900 Family of Servers, refer to Hardware Announcement 100-323, dated October 3, 2000.

**Enterprise Storage Server (ESS) Support:** Guest support for the Parallel Access Volumes feature has been integrated into z/VM Version 3 Release 1. This feature allows the configuration of logical volumes (known as alias Parallel Access Volumes), where each logical volume (alias) has its own unique device address but is actually an exposure of the existing real device (known as the base Parallel Access Volume). This allows the host to issue concurrent I/O requests to one real device, the base volume, through the different alias volumes.

z/VM allows a native CP user to initiate a Flash Copy (an instant copy of a disk volume or minidisk) of a source device to a target device on an IBM ESS. Customers will find this feature especially beneficial for large databases which normally require a long time to copy.

**Tape Support Enhancements:** z/VM will provide additional guest support for the 3494 Virtual Tape Server (VTS):

- Peer-to-Peer VTS provides flexible component placement to meet 7 x 24 processing requirements and a solution for remote backup and recovery.
- Import/Export allows physical tapes to be removed and inserted into the VTS logical tape library.

3590 A60 tape controllers attached with FICON channels will be supported for use by guests of z/VM when such guests themselves support the 3590 A60 on native-FICON channels.

#### **Connectivity Enhancements for TCP/IP**

**FTP Server Improvements:** The FTP server has been enhanced to better accommodate Web browser and graphical FTP clients. The changes and new function include:

- The ability to provide UNIX-format list information in response to client DIR subcommand requests.
- The ability to perform automatic EBCDIC-ASCII data translation for transferred files, based on file types (or file extensions).
- New subcommands.
- A server-specific configuration file is now used by the FTP server for its startup information, making

configuration more consistent with other TCP/IP servers.

**IP Multicast Support:** This support provides the ability to send an IP datagram to a group of hosts that are members of a single multicast group, and the ability for members of a multicast group to receive multicast datagrams. Membership in multicast groups is dynamic and may be spread across separate physical networks. Hosts may join or leave a multicast group at any time. They are not required to belong to a multicast group to send datagrams to its members. TCP/IP will maintain a list of host group memberships associated with each network interface. IP Multicast is exploited by ROUTED.

**Queued Direct I/O (QDIO) Support:** TCP/IP now supports Queued Direct I/O providing greater performance utilizing this highly efficient data transfer architecture. The QDIO facility allows a program to directly exchange data with an I/O device without performing traditional S/390 I/O instructions. QDIO enables the TCP/IP stack to support the OSA Express adapter for connection to a Gigabit Ethernet, Fast Ethernet, or 155 ATM (Ethernet LAN Emulation) network.

**Secure Socket Layer (SSL) Support:** SSL is a TCP/IP protocol providing privacy between two communicating applications (a client and a server). Under SSL protocol, the server is authenticated and must provide a certificate to prove its identity. In addition to authentication, both the client and the server participate in a handshake protocol that produces the cryptographic parameters for the session.

The processing required for SSL is provided by a new SSL server. An installation identifies the ports that are secure and specifies the certificates to be used. Any VM server listening on a secure port can participate in an SSL connection with any external client that supports SSL according to RFC 2246. No changes to the VM server are required to use the SSL support.

**VM NFS Client Support:** This enhancement allows CMS users and applications transparent access to data on remote systems that run NFS servers supporting Sun NFS V2 or V3 protocols, or both.

The remote data accessed by an NFS client is mounted on the CMS BFS structure in a single virtual machine. Once mounted, the remote file system is accessible using BFS interfaces

#### **Additional z/VM Enhancements**

**Binder/Loader Support:** CMS hosts the DFSMS/MVS Program Management Binder and provides a native implementation of the corresponding program object loader functions. Included with this support is a new CMS command, BIND, to invoke the services of the binder to bind and store an executable file containing a program object on DASD (minidisk, SFS, or BFS). An executable file produced by the binder may be used on a CMS system containing the program object loader in exactly the same way as a conventional MODULE file generated by the CMS GENMOD command. Also provided is an enhancement to the C89 command to use the new BIND command in place of the combination of the LE prelinker and the old LOAD, INCLUDE, and GENMOD commands. Furthermore, the complete binder API is available to application programs that need to invoke the services of the binder dynamically. The CMS binder/loader support allows ready transportability of executable files between z/VM and OS/390 or z/OS systems and provides the infrastructure to permit CMS to exploit new and emerging programming language technology being developed for

z/OS, thus significantly enhancing CMS's OS application affinity.

**VM Dump Tool:** With this support, the VM Dump Tool is introduced as the supported vehicle for reading abend, stand-alone or virtual machine dumps of CP system. The Dump Viewing Facility continues to be the supported vehicle for reading non-CP (CMS, and so on) dumps. The VM Dump Tool assists in analyzing dump data from a dump file created by the DUMpload utility.

### **Graphical User Interface (GUI) Facility**

The following changes have been made to the GUI Facility in z/VM:

- The GUI workstation agents, along with their Help files, will not be shipped with the z/VM product. They will be available with limited support from the VM Download Library at:

<http://www.ibm.com/s390/vm/download>

- The CMSDESK application modules and message repository will also be available as part of the GUI package from the download library.
- The Distributed Graphical User Interface Toolkit and the Graphical User Interface Facility publications will not be part of the z/VM product library. You can obtain copies of these books from the IBM Publication Ordering System.

<http://www.elink.ibm.com/pbl/pbl>

- The CMSDESK command and nucleus routines will remain in CMS. Documentation will be available from the GUI download package. To use these functions, you will need to download the workstation agents and GUI modules and put them on a CMS minidisk or SFS directory of your choice.

### **Product Restructuring and Packaging Changes**

Numerous changes have been made to the packaging of z/VM Version 3 Release 1 which include:

- The **OpenEdition® Shell and Utilities**, which was a priced, optional feature of VM/ESA, has been integrated into the CMS component of z/VM Version 3 Release 1. It has been renamed to OpenExtensions™ Shell and Utilities and is now available at no additional charge.
- The **NFS Client**, new with z/VM is integrated into CMS and the priced, optional TCP/IP Feature of z/VM.
- The **TCP/IP Kerberos Data Encryption Standard (DES) Feature of z/VM** has been integrated into the TCP/IP feature of z/VM. This provides 48-bit encryption/decryption services for the Kerberos authentication server as well as APIs for application programs.
- The **LAN File Services/ESA (LFS/ESA)** feature of VM/ESA has been withdrawn from marketing and is not available in z/VM. Refer to Withdrawal Announcement 999-387, dated December 7, 1999.
- **OSA/SF Version 2 Release 1**, which supports the OSA Express, is included in the OSA/SF feature for z/VM. For additional information about OSA/SF V2R1, refer to Software Announcement 299-041, dated February 22, 1999.
- The **6250 tape** medium is no longer supported as a distribution medium for z/VM.

### **Realtime Monitor VM/ESA (RTM) Version 1 Release 5.3**

RTM is designed as a real-time monitor and diagnostic tool for monitoring, analysis, and problem solving for z/VM Version 3 Release 1. For additional information on RTM, refer to Software Announcement 200-359, dated October 3, 2000.

### **VM Performance Reporting Facility (VMPRF) Version 1 Release 2.2**

VMPRF provides performance management capabilities for VM systems. VMPRF analyzes new and changed monitor records in z/VM, including those produced as part of 64-bit architecture support. For additional information on VMPRF, refer to Software Announcement 200-359, dated October 3, 2000.

### **Year 2000**

This product is Year 2000 ready. When used in accordance with its associated documentation, it is capable of correctly processing, providing, and/or receiving date data within and between the twentieth and twenty-first centuries, provided that all products (for example, hardware, software, and firmware) used with the product properly exchange accurate date data with it.

### **Euro Currency**

This program is EuroReady.

For more information on the implications of the euro, visit the IBM euro Web site at:

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

### **EuroReady Products**

IBM considers an IBM product to be EuroReady if the product, when used in accordance with its associated documentation, is capable of correctly processing monetary data in the euro denomination and of respecting the euro currency formatting conventions (including the euro sign). This assumes that all other products (for example, hardware, software, and firmware) that are used with this product are also EuroReady. IBM hardware products that are EuroReady may or may not have an engraved euro sign key on their keyboards.

Currently, EuroReady status applies primarily to IBM products specific to the EMU countries. Products that are not specific to these countries are deemed to be "not ready" for euro unless otherwise stated in the product's country-specific specifications.

### **IBM Hardware Ready**

IBM supplies certain IBM products which include third party software (pre-loaded or not) and/or third party attached hardware. In these instances IBM is not in a position to assert that these third party products are, in themselves, EuroReady.

Therefore, such IBM products will be designated as Hardware ready.

### **EuroReady Solutions**

IBM considers a solution to be EuroReady when the solution providers have:

- Analyzed the euro requirements, including the need to comply with relevant EC rules

- Built in appropriate function and can clearly demonstrate this by:
  - Detailing euro related requirements
  - Describing how these will be implemented in the solution
  - Declaring when the implementation will be generally available

The euro capabilities of a EuroReady solution will be clearly identified as features of the Solution specification as described in the contracts document.

---

## Product Positioning

---

z/VM is intended to address the following customer situations:

- OS/390 customers migrating to OS/390 Release 10 or z/OS will find z/VM gives them added flexibility for their test and migration work. z/VM supports the execution of 64-bit operating systems running on the new zSeries 900 family of servers.
- Customers with real memory constraints will experience relief by running z/VM in 64-bit mode on a zSeries 900. This constraint relief is provided for 31-bit guest operating systems such as TPF. It is not uncommon for TPF customers who run tens of guest systems for testing to encounter paging constraints imposed by a 31-bit capable VM/ESA. Customers running a large number of MVS™, OS/390, VSE/ESA, or Linux images may also benefit from this support.
- Customers with multiple servers supporting their business environment can take advantage of larger memory capacity and consolidate more workload on a zSeries 900.
- VM/ESA customers requiring more memory to cache CMS minidisks can exploit memory above 2 GB for minidisk cache with z/VM.

- VM/ESA customers will benefit from the enhanced support in z/VM for connectivity (TCP/IP) and device support.
- VM/ESA customers requiring SSL-secure TCP/IP network traffic, such as Telnet sessions and Web transactions, will be able to do so with z/VM.
- Guest Parallel Sysplex® support is enhanced in z/VM with the exploitation of the 64-bit architecture providing the ability to address larger amounts of real and virtual memory. This will allow customers to develop and test their 64-bit applications in a guest environment.

z/VM is the follow-on product for VM/ESA customers. It provides additional support and exploitation opportunities for the thousands of customers that have built enterprise-wide automation and infrastructure enhancements on the VM platform in support of their applications, database systems, network computing, and e-business solutions.

---

## Statement of Direction

---

The following actions are planned by IBM. We highly recommend that you consider these plans when planning for system upgrades.

- LANRES support in z/VM is planned to be functionally stabilized at the z/VM Version 3 Release 1 level. It is IBM's intent to remove LANRES from a future release of z/VM.

---

## Hardware and Software Support Services

---

### *SmoothStart™ /Installation Services*

IBM SmoothStart and Installation Services are not provided.

---

## Reference Information

---

Below is a list of IBM licensed products for VM that have been announced or made available since May, 1999.

For additional information on products from IBM, visit the IBM Announcement Web site, available from the IBM News Web site at:

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

### IBM Licensed Products

Program Name	Release Level	Program Number	Availability Date
ACF/NCP for MVS, VM and VSE	7.8.0	5648-063	9/24/99
ACF/SSP for MVS, VM and VSE	4.8.0	5654-009	9/24/99
DITTO/ESA	1.3.0	5654-029	6/25/99
High Level Assembler	1.4.0	5696-234	9/29/00
NTuneMON	3.1.0	5648-D72	8/25/00
DB2® Server for VSE & VM	7.1.0	5697-F42	9/29/00
COBOL for OS/390 & VM	2.2.0	5648-A25	10/27/00
Tivoli® Storage Manager for VM	4.1.0	5697-TS9	7/28/00
Tivoli Storage Manager for VM	4.1.0	5698-TSM	7/28/00
Tivoli Space Manager for VM	4.1.0	5698-SPM	7/28/00

ISVs have also announced new products available for VM. For the most current information on products from ISVs, refer to the VM Web site at:

<http://www.ibm.com/s390/vm/vendor/>

**Trademarks**

z/VM, z/OS, z/Architecture, zSeries, zSeries 900, e(logo)server, FICON, VSE/ESA, ESA/390, OpenExtensions, MVS, and SmoothStart are trademarks of International Business Machines Corporation in the United States or other countries or both.

VM/ESA, OS/390, S/390, DFSMS/MVS, OpenEdition, Parallel Sysplex, DFSMS/VM, and DB2 are registered trademarks of International Business Machines Corporation in the United States or other countries or both.

Tivoli is a registered trademark of International Business Machines Corporation or Tivoli Systems Inc. in the United States or other countries or both.

LINUX is a registered trademark of Linus Torvalds.

Other company, product, and service names may be trademarks or service marks of others.



# IBM US Announcement Supplemental Information

October 3, 2000

## Education Support

For VM education, call IBM Learning Services at 800-IBM-TEACH (426-8322) for catalogs, schedules and enrollments. To request information via fax, call 800-IBM 4FAX (426-4329) and request document #0007. You may also visit the IBM Learning Services Web site at:

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

Click-on Curricula Spotlights, S/390® and Printing, then VM/ESA® and VSE/ESA™.

You may also visit the VM Web site at:

<http://www.ibm.com/s390/vm/education/>

for educational resources available for z/VM or VM/ESA.

## Technical Information

### Specified Operating Environment

**Hardware Requirements:** z/VM Version 3 Release 1 will operate on:

- IBM @server zSeries 900 family of servers
- All models of the S/390 Parallel Enterprise Servers Generation 3, 4, 5, and 6
- All models of the Parallel Enterprise Server R2 and R3
- All models of the S/390 Multiprise® 3000 or Multiprise 2000
- All S/390 Integrated Servers
- PC Server System/390® or RS/6000® with System/390 Server-on-Board

Refer to the General Information Manual for more information.

### TCP/IP Feature for z/VM Hardware Requirements

The TCP/IP Feature for z/VM requires one of the following:

- IBM 3172 Interconnect Controller with the Interconnect Controller Program (ICP) Version 3 (5621-425)
- IBM Open Systems Adapter 2 (OSA-2) Token Ring, Fast Ethernet, 155 ATM
- IBM Open Systems Adapter Express (OSA-Express) Gigabit Ethernet, Fast Ethernet, and 155 ATM
- IBM 37xx communications controller using X.25 or SNA connections.

Native attachment of the IBM 3745 to TCP/IP and associated dynamic IP routing within the 3745 is not supported.

- IBM 8232 LAN Channel Station Model 1 or 2

*This announcement is provided for your information only. For additional information, contact your IBM representative, call 800-IBM-4YOU, or visit the IBM home page at: <http://www.ibm.com>.*

- HYPERchannel A220 Processor Adapter 42990007

TCP/IP Feature for z/VM 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 Feature for z/VM supports direct connection to another TCP/IP for VM, MVS™, OS/390®, or z/OS using the IBM 3088.

- IBM ESCON Channel-to-Channel Adapter

TCP/IP Feature for z/VM supports direct connection to another TCP/IP for VM, MVS, OS/390, or z/OS using the IBM ESCON Channel-to-Channel Adapter.

### Software Requirements: z/VM Version 3 Release 1 Prerequisite Requirements

- EREP VM (5654-260) V3.R5.0 — APAR VM62260 is required to correctly process changes for IEEE Floating Point.
- Device Support Facilities — ICKDSF VM (5684-042) V1 R16.0; both the CMS version of ICKDSF and an IPLable standalone version of ICKDSF (5747-DS1) V1 R16.0 are supplied with z/VM Version 3 Release 1. 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 16 of ICKDSF and "14" indicates VMSES/E format.

The prerequisite products, EREP and ICKDSF are pre-installed. Therefore, when ordering the z/VM Version 3 Release 1 System DDR, you must already be licensed for these products or a separate order must be placed for each of these products to establish a license.

### Optional Product/Feature Requirements

- IBM High Level Assembler (5696-234): Due to customer requests, the High Level Assembler was removed as a hard prerequisite product as of VM/ESA Version 2 Release 2.0.
  - The High Level Assembler Release 2.0 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 AVS tuning control module (AGWTUN)
  - Use RAS tools (such as MDCHECK, FS2SFSE, AFTCHAIN, PRINTBLK, PRINTFST)
  - Use the new API for data compression
  - Use the new CMS Pipelines Assemble macros interface
  - Use the Assemble interface to GUI
  - Assemble exit routines for DirMaint, and RSCS
  - Customize Language Environment® or compile assembler routines used in mixed-language user applications
  - High Level Assembler Release 3.0 or later is required to:
    - Assemble applications that exploit the IEEE Floating Point hardware facility
  - High Level Assembler Release 4.0 or later is required to:
    - Add devices that cannot be sensed (updating HCPRI0 ASSEMBLE).
    - Perform local modifications to modules written in assembler.
    - Service the CP Loader (HCPLDR).
    - Create the Stand-Alone Dump Utility (HCPSADMP EXEC).
    - Assemble any CP modules.
    - Assemble exit routines for CP.
    - High Level Assembler Release 4.0 or later is required to install and service RTM Version 1 Release 5.3. This release is the only supported release of RTM for z/VM Version 3 Release 1.
  - RACF® Requirements
    - RACF Version 1 (5740-XXH) Release 10.0 with APAR VM62958 to run in 64-bit mode on a zSeries 900 or equivalent if a security product is needed
  - POSIX Requirements
    - Developing POSIX applications requires IBM C for VM/ESA Version 3 Release 1.0 (5654-033)
  - Distributed Computing Environment (DCE) for z/VM Requirements
    - TCP/IP feature for z/VM
    - DCE application development requires IBM C for VM/ESA Version 3 Release 1.0 (5654-033)
  - DFSMS/VM® Function Level 221 Requirements
    - ISPF Version 3 (5684-043) Release 2.0 or subsequent release for installation and during DFSMS/VM usage. ISPF is not required if the customer is using only the 3495 Tape Library Dataserver support of FL221.
    - IBM Directory Maintenance Version 1 (DirMaint) Release 5.0 (5748-XE4) if the minidisk management function is needed.
  - RACF Version 1 (5740-XXH) Release 10.0 (or its equivalent) if a security product is needed.
  - If Migration Level 2 (ML2) function of DFSMS/VM is used, ADSTAR® Distributed Storage Manager (5648-020), Tivoli® ADSM for VM (5697-VM3), Tivoli Storage Manager for VM (5697-TSM), or Tivoli Storage Manager for VM (5697-TS9 or 5698-TSM) is required.
  - TCP/IP Feature for z/VM 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.
  - Program Development Facility (PDF) Version 3 (5684-123) Release 2.0 or CMS Utilities feature to use the BROWSE and EDIT functions.
  - Remote Spooling Communications Subsystem Networking (RSCS) (5684-096) Version 3 Release 2.0 or later 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.
  - CD-ROM Installation Requirements
    - Optical Media Attach/2 Program (5621-264) or a S/390 Integrated Server, PC Server System/390, or RS/6000 with System/390 Server-On-Board using an AWSOMA emulated tape drive
  - Online Displayable Publications Requirements
    - z/VM publications received via the IBM Online Library Omnibus Edition: VM Collection CD-ROM require a BookManager® READ licensed program to view. Online books shipped on CD-ROM may also be viewed by the IBM Library Reader™ licensed programs for Windows™ DOS and OS/2®, which are shipped, at no additional charge, on the publications CD-ROM. APAR GCO5366 for BookManager/VM READ is required for READ/VM 1.3 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.
- OSA and OSA/SF Program Requirements:** Open Systems Adapter/Support Facility (OSA/SF) for z/VM is provided with and supported on z/VM. OSA/SF for z/VM can be accessed by a CMS user ID, by a REXX call to OSA/SF API, and at the OSA/SF Windows 95, Windows NT™, or OS/2 GUI.
- To use the OSA/SF GUI one of the following is required:
- Microsoft™ Windows 95 4.00.950B (OSR2)
  - Microsoft Windows NT 4.0 with Service Pack 3
  - OS/2 Warp Version 4.0 Fixpack 6
- Access at the OSA/SF GUI requires one of the following communications protocols:
- EHLLAPI (3270), which requires:
    - Personal Communications/3270 Version 4 Release 2 (5871-AAA)
    - ACF/VTAM®
  - APPC (CPI-C), which requires ACF/VTAM® OS/2 on the workstation
  - TCP/IP, which requires TCP/IP on the workstation and TCP/IP running at the host

OSA/SF Version 2 Release 1 is included in the OSA/SF feature for z/VM Version 3 Release 1. To support an OSA in its TCP/IP Passthru mode in a z/VM Version 3 Release 1 environment, OSA/SF requires the TCP/IP Feature for z/VM. 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 Software Announcement 299-041, dated February 22, 1999.

**Software Requirements for TCP/IP Feature for z/VM:** The TCP/IP Feature for z/VM has the following additional program requirements:

- If a primary or secondary domain name server is to be run (not a caching-only name server), or the Network Data Base server is to be run:
  - DB2® Server for VSE & VM Version 5 Release 1 (5648-158), DB2 Server for VSE & VM Version 6 Release 1 (5648-A70), or DB2 Server for VSE & VM Version 7 Release 1 (5697-F42).
- For SNAlink LU0 interface support:
  - ACF/VTAM for VM/ESA Version 3 (5684-095) or Version 4 (5654-010)
- For X.25 interface support:
  - X.25 NCP Packet Switching Interface (NPSI) Version 3 (5688-035) Release 4 or later for 3745 or 3720
  - X.25 NPSI Version 2 (5668-719) Release 1 for 3725
  - Corresponding levels of ACF/VTAM and ACF/NCP that support NPSI
- If programs are developed in C:
  - IBM C for VM/ESA Version 3 (5654-033) Release 1
- If programs are developed in Pascal:
  - IBM VS Pascal Version 1 (5668-767) Release 2 Compiler and Library
- To use the SNMP (monitor) client support with NetView®:
  - NetView for VM/ESA Version 2 (5756-051) Release 3

**Other VM-Related Information:** The following VM-related products require the PTFs for the APARs listed below to run on z/VM Version 3 Release 1:

- DirMaint V1 R5.0 (5748-XE4) — #VM62609
- Pass Through Facility V2 R1.1 (5684-100) — #VM61373
- Host Management Facility V1 R1.1 (5684-157) — #VM62632
- CMS Utilities Feature V1 R1.1 — #VM62639

**System Delivery Offering (SDO):** The z/VM System Delivery Offering Version 3 Release 1 (5654-A20) is an entitled offering and will be available concurrently with the general availability of z/VM Version 3 Release 1 on February 23, 2001. The VM/ESA SDO (5654-026), which is at the VM/ESA Version 2 Release 4 level, will continue to be available for ordering after the availability of the z/VM Version 3 Release 1 SDO.

The SDO content offered in each version of the SDO is dynamically updated as new program products, versions, and releases, as well as service, become available.

Progress in increasing the number of products exploiting VMSES/E make the VM SDO a more integrated and dynamic IBM software package. Key benefits of this SDO are:

- An increase in the number of products available in VMSES/E format. This, coupled with delivery of the majority of non-VMSES/E format products in semi-VMSES/E format, allows VMSES/E to be the single installation vehicle for most products. Only a few products remain completely non-VMSES/E installable and INSTFPP will still be used to install these products.
- The ability to dynamically update the content of the SDO at any time. This includes service updating a product, adding new products or new versions or releases of already provided products, or deleting products. This capability will make the SDO a more effective solution for the z/VM customer.

For additional information on the SDO, refer to the VM Web site at:

<http://www.ibm.com/s390/vm/sdo/>

**New Licensed Products in VMSES/E Format**

Product	Program Number	VRM
High Level Assembler	5696-234	1.4.0
DB2 Server for VSE & VM	5697-F42	7.1.0
— Query Management Facility Feature	5697-F42	7.1.0
COBOL for OS/390 & VM	5648-A25	2.2.0
VM Performance Reporting Facility (VMPRF)	5684-073	1.2.2
Realtime Monitor VM/ESA (RTM)	5798-DWD	1.5.3

VRM = Version Release Modification Level

**Limitations:** z/VM Version 3 Release 1 will operate on:

- zSeries 900 family of servers
- All models of the S/390 Parallel Enterprise Servers Generation 3, 4, 5, and 6
- All models of the Parallel Enterprise Server R2 and R3
- All models of the S/390 Multiprise 3000 or Multiprise 2000
- All S/390 Integrated Servers
- PC Server System/390 or RS/6000 with System/390 Server-on-Board

**Performance Considerations:** Additional information on z/VM performance will be available at general availability. You should consult your marketing representative at or after general availability.



**User Group Requirements:** Customer user requirements satisfied in this release:

REQ00060114 — NFS Client for CMS  
REQ00070399 — Display Command with % Option  
REQ00074964 — FTP and NFS respect POSIXGLIST group names  
REQ00072831 — RDRLIST displays date and time stamps differently than FILELIST  
REQ00073197 — CP SET IOCD5\_ACTIVE nn /RESET Activation profile HMC/SE  
REQ00073194 — Porting Sun RPC  
REQ00072800 — SENDFILE EXEC does not put real name in 'To:' line for SMTP mail  
REQ00074906 — VM TCP/IP should provide SSL support for Telnet  
MR00074370 — Need Virtual ESCON CTCA Support  
MR00074967 — Need Virtual ESCON CTCA Support  
MR00074968 — Need Virtual ESCON CTCA Support  
MR00026628 — Display Command With % Option  
MR00070399 — Display Command With % Option  
MR00026628 — Symbolic Real Volser Definitions on the MDISK Directory  
MR0905004136 — VM FTPSERVE Does not Supply Timestamps in Console Messages

**S/390 Service Update Facility (SUF) Version 3:** IBM announces Version 3 of SUF. SUF Version 3 will be available for download starting in the first quarter, 2001.

SUF is an Internet-based method for ordering and receipt of S/390 software service. SUF supports VM, VSE, and OS/390 systems.

SUF Version 3 enhancements include:

- Simplification of the prerequisites required to run SUF by elimination of the need for WebSphere™ Application Server
- Improved usability through a re-designed User Interface.

Take advantage of the Internet to simplify the ordering and receipt of S/390 service, and reduce the time and effort required to maintain S/390 systems.

Advantages include:

- Faster and easier service
- Increased system stability, fewer outages, less down time
- Less service research required
- Elimination of tape handling, processing, and storage

For additional information, and to obtain SUF, refer to the S/390 SUF Web site at:

<http://ibm.com/s390/suf>

## Planning Information

### Customer Responsibilities

#### Products and Features Packaged with z/VM

With the availability of z/VM Version 3 Release 1, TCP/IP, Remote Spooling Communication System (RSCS), Language Environment (LE) for VM, and Tivoli Storage Manager (TSM) for VM Version 4.1 (previously Tivoli ADSM for VM Version 3.1) will be automatically shipped and pre-installed in z/VM Version 3 Release 1 base product DDRs.

TCP/IP is a priced, optional feature. RSCS and TSM are priced optional products pre-installed on the z/VM system DDRs. The feature or products must be enabled to use. If you choose to enable them, you must have a license for the product. For TCP/IP, a license is established for the Base feature (Level 3A0) and the Network File System (NFS) feature of TCP/IP by ordering the appropriate charge feature numbers under z/VM Version 3 Release 1, product number 5654-A17. If a license does not already exist for RSCS and TSM, you may establish one by placing an order for the product and using the delivery option "ship publications only" (feature 3471). This delivery option will prevent unnecessary shipment of the media while allowing for shipment of the basic publications for the products, including the program directories. The program directories include instructions for enabling use of the products.

Additional information concerning this new packaging method can be found in the **Ordering** section under New Licensees.

### Running 370-Mode Applications

CMS does not run in 370 mode virtual machines. 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 was originally shipped with VM/ESA 1.2.1 (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.

The IBM S/390 Generation 4, 5, and 6 servers as well as the zSeries 900, do not support S/370™-mode operations. Therefore, the following VM systems or functions will not function on these systems:

- Any unsupported release of VM
- 370-mode CMS virtual machines
- 370-mode guests

The CMS Migration Utility Feature, provided with VM/ESA Version 2 Release 3, is not available with z/VM Version 3 Release 1. Customers who find their applications cannot run under the current level of CMS should use the 370 Accommodation function or modify their applications if possible. If problems persist, customers should call IBM Service for assistance.

**Direct Customer Support:** Direct customer support is provided by Support Line for S/390 Software. This fee service can enhance your productivity by providing voice and electronic access into the IBM support organization. Support Line for S/390 Software will help answer questions pertaining to usage, how to, and suspected software defects for eligible products.

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

### Security, Auditability, and Control

The announced programs uses the security and auditability features inherent in the virtual machine and the System/370™, ESA/370, ESA/390™, and z/Architecture. The security and auditability of z/VM is 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.

---

## Customer Financing

---

IBM Global Financing offers attractive financing to credit-qualified commercial and government customers, and Business Partners in more than 40 countries around the world. IBM Global Financing is provided by the IBM Credit Corporation in the United States. Offerings, rates, terms, and availability may vary by country. Contact your local IBM Global Financing organization. Country organizations are listed on the Web at:

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

---

## Ordering Information

---

The following advance publication is available now in PDF and BookManager formats and can be ordered separately using the specific publication number through the IBM Publication Ordering System at:

<http://www.elink.IBMLink.ibm.com/pbl/pbl>

Title	Order Number	Availability Date
z/VM: General Information	GC24-5944	October 3, 2000

This publication is also available in PDF format from the VM Web site at:

<http://www.ibm.com/s390/vm/pubs/>

### New Licensees

Orders for new licenses can be placed after November 21, 2000.

Shipment will not occur before availability date.

Unless a later date is specified, orders entered before the planned availability date will be assigned a schedule date of one week following availability.

New users of z/VM Version 3 Release 1 should specify:

Type	Model
5654	A17

With z/VM, several products are automatically pre-installed on the base product DDRs. **EREP** and **ICKDSF** are not priced products however, they do require a license for service purposes.

**Language Environment (LE) Version 1 Release 8** is included and enabled for use with no licensing or billing requirements.

**OpenExtensions™ Shell and Utilities**, previously a priced, optional feature of VM/ESA, is included in z/VM with no licensing or billing requirements.

**Open Systems Adapter Support Facility (OSA/SF V2R1)** is a host-based tool supporting OSA-2 and OSA-Express features and has been included in z/VM with no licensing or billing requirements.

**RSCS Version 3 Release 2.0** is pre-installed with z/VM, in a disabled state. If you intend to use RSCS, now or at a later date, you must establish a license for billing and

shipment of publications. If you already have a license for the product, you may follow the enablement instructions in the program directory for the product to enable the product for use on your system. A license is established for RSCS 3.2.0 by placing an order for the product. Because the product code is already pre-installed, 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 publications only. The product number is:

Description	Product Number
RSCS 3.2.0	5684-096

**Tivoli Storage Manager for VM Version 4.1** (originally named Tivoli ADSM for VM/ESA, Version 3.1) is pre-installed on the z/VM system DDRs. It is a priced product that may be selected during the z/VM installation process. If you intend to use Tivoli Storage Manager, now or at a later date, you must establish a license for billing and shipment of publications by placing an order for the product. Because the product code is already packaged with z/VM, 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 publications only. The product number is:

Description	Product Number
Tivoli Storage Manager for VM 4.1.0	5697-TS9
Tivoli Storage Manager for VM 4.1.0	5698-TSM (Value-Based Pricing)

For additional information, including terms and conditions for Tivoli Storage Manager for VM Version 4.1, program number 5698-TSM, refer to Software Announcement 200-245, dated July 25, 2000, and for program number 5697-TS9, refer to Software Announcement 200-244, dated July 25, 2000.

Refer to Software Announcement 299-126, dated May 24, 1999, for information on Tivoli ADSM for VM/ESA Version 3.1.

The **TCP/IP Base Feature (Level 3A0)** and the **Network File System (NFS) feature of TCP/IP** are also delivered pre-installed in a disabled state. If you intend to use either of these features, now or at a later date, you must establish a license for billing. A license is established for the TCP/IP Base feature Level 3A0 and the NFS feature of TCP/IP by ordering the appropriate FWLC, MLC, DSLO, MOSP, GOLC, and/or ELC charge feature numbers under z/VM Version 3 Release 1 product number 5654-A17. Existing TCP/IP Version 2 (5735-FAL) customers moving to z/VM are eligible for Single Version Charging as appropriate.

Optionally available for the TCP/IP Base feature Level 3A0 is the Source which is not pre-installed but may be ordered as an optional feature of z/VM.

**Flat Workload License Charge:** IBM has announced a new pricing structure for VM and VSE software, Flat Workload License Charge (FWLC) for operating systems and licensed products operating on the zSeries 900 or equivalent. The FWLC is a monthly charge and is independent of the size of the zSeries 900 for which the product is licensed. To be eligible for a FWLC license, you must also have z/OS running in 64-bit mode on a zSeries 900 or equivalent. If you do not qualify for FWLC, then

ELC or Model Group 80 charges apply. For additional information on FWLC pricing, refer to Software Announcement 200-354, dated October 3, 2000.

**Basic License**

**Pricing Options Available for z/VM**

There are various pricing options available for ordering z/VM and is dependent on which IBM server you select. These options are:

- FWLC when ordering z/VM and/or features for a zSeries 900 or equivalent. This option requires z/OS running in 64-bit mode on the zSeries 900 or equivalent. If you do not qualify for FWLC, then ELC or Model Group 80 charges apply.
- Graduated Monthly License Charge (MLC) when ordering z/VM and/or features for S/390 servers as listed under **Hardware Requirements** section, including DSLO, MOSP, DSLO/MOSP, and ELC.
- Growth Opportunity License Charge (GOLC) when ordering z/VM and/or features for an S/390 Multiprise 3000.
- Entry Support License (ESL) One-Time Charge (OTC) when ordering z/VM and/or features for ESL machines.

ESL machines can be determined by referring to the IBM Entry End User/390 Attachment (Z125-4379).

To order a basic license, specify the program number and feature number 9001 for asset registration. Specify either the feature number for a FWLC or for a graduated MLC or OTC, specify the feature numbers below that correspond to the processor group that contains the designated machine; or for a GOLC, specify the feature numbers below that correspond to the processor group that contains the designated machine.

Also, specify the feature number of the desired distribution medium.

**z/VM Base**

**Flat Workload License Charge for a zSeries 900 or equivalent**

Description	Flat Workload Monthly License Charge Feature Number
z/VM Version 3 Release 1	4180

**Basic Graduated License Charges**

Group	Basic Graduated Monthly License Charge Feature Number
25	4202
28	4203
29	4204
30	4205
31	4206
32	4207
35	4208
38	4209
40	3860
50	3861
60	3862
70	3863
80	3864

**MOSP Basic Graduated License Charges**

**Multiple Operating System — PR/SM™ (MOSP):** For a graduated license charge, specify the following feature numbers, corresponding to the group that contains the designated machine.

Group	MOSP Basic Graduated Monthly License Charge Feature Number
25	4212
28	4213
29	4214
30	4215
31	4216
32	4217
35	4218
38	4219
40	3910
50	3911
60	3912
70	3913
80	3914

**CMS Utilities Feature:** To order the CMS Utilities feature, specify optional material feature number.

Specify one of the following feature numbers as applicable or corresponding to the group that contains the designated machine.

**Flat Workload License Charge for a zSeries 900 or equivalent**

Description	Flat Workload Monthly License Charge Feature Number
CMS Utilities Feature	4181

**Basic Graduated License Charges**

Group	Basic Graduated Monthly License Charge Feature Number
25	4242
28	4243
29	4244
30	4245
31	4246
32	4247
35	4248
38	4249
40	3870
50	3871
60	3872
70	3873
80	3874

**MOSP Basic Graduated License Charges**

**MOSP:** For a graduated license charge, specify the following feature numbers, corresponding to the group that contains the designated machine.

Group	MOSP Basic Graduated Monthly License Charge Feature Number
25	4252
28	4253
29	4254
30	4255
31	4256
32	4257
35	4258
38	4259
40	3920
50	3921
60	3922
70	3923
80	3924

**TCP/IP Base Feature for z/VM:** TCP/IP Base is automatically shipped and pre-installed in a disabled state on the z/VM Version 3 Release 1 base product DDR. Specify one of the following feature numbers as applicable or corresponding to the group that contains the designated machine.

**Flat Workload License Charge for a zSeries 900 or equivalent**

Description	Flat Workload Monthly License Charge Feature Number
TCP/IP Base Feature	4182

**Basic Graduated License Charges**

Group	Basic Graduated Monthly License Charge Feature Number
25	4282
28	4283
29	4284
30	4285
31	4286
32	4287
35	4288
38	4289
40	3885
50	3886
60	3887
70	3888
80	3889

**MOSP Basic Graduated License Charges**

**MOSP:** For a graduated license charge, specify the following feature numbers, corresponding to the group that contains the designated machine.

Group	MOSP Basic Graduated Monthly License Charge Feature Number
25	4292
28	4293
29	4294
30	4295
31	4296
32	4297
35	4298
38	4299
40	3935
50	3936
60	3937
70	3938
80	3939

**TCP/IP NFS Feature:** The TCP/IP NFS Base is automatically shipped and pre-installed in a disabled state on the z/VM Version 3 Release 1 base product DDR. Specify one of the following feature numbers as applicable or corresponding to the group that contains the designated machine.

**Flat Workload License Charge for a zSeries 900 or equivalent**

Description	Flat Workload Monthly License Charge Feature Number
TCP/IP NFS Feature	4183

**Basic Graduated License Charges**

Group	Basic Graduated Monthly License Charge Feature Number
25	4322
28	4323
29	4324
30	4325
31	4326
32	4327
35	4328
38	4329
40	3890
50	3891
60	3892
70	3893
80	3894

**MOSP Basic Graduated License Charges**

**MOSP:** For a graduated license charge, specify the following feature numbers, corresponding to the group that contains the designated machine.

Group	MOSP Basic Graduated Monthly License Charge Feature Number
25	4332
28	4333
29	4334
30	4335
31	4336
32	4337
35	4338
38	4339
40	3940
50	3941
60	3942
70	3943
80	3944

When selecting the following TCP/IP options, specify the appropriate basic OTC feature number:

	TCP/IP Basic OTC Feature Number
TCP/IP Source Code	3859

**Note:** The group or MSUs can be determined by referring to the Exhibit for IBM System/390 Machines (Z125-3901) associated with the IBM Customer Agreement (Z125-4575).

**Entry Support License (ESL):** To order an ESL license, specify the program number, feature number 9001 for asset registration, and the applicable ESL OTC feature number. Also specify the feature number of the desired distribution medium.

Program Number/Description	ESL OTC Feature Number
z/VM Version 3 Release 1	4103
CMS Utilities Feature	4117
TCP/IP Base Feature for z/VM	4138
TCP/IP NFS Feature	4145

ESL machines can be determined by referring to the IBM Entry End User/390 Attachment (Z125-4379).

**Growth Opportunity License Charge (GOLC):** To order a GOLC software, specify the program number and feature number 9001 for asset registration, from the table below. Also, specify the feature number for the desired distribution medium.

**z/VM Version 3 Release 1**

**z/VM Base**

GOLC Category	GOLC Feature Number
H30	4104
H50	4105
H70	4106

**CMS Utilities Feature**

H30	4118
H50	4119
H70	4120

**TCP/IP Base Feature for z/VM**

H30	4139
H50	4140
H70	4141

**TCP/IP NFS Feature for z/VM**

H30	4146
H50	4147
H70	4148

**Single Version Charging:** To elect single version charging, the customer must notify and identify to IBM the prior program and replacement program and the designated machine the programs are operating on.

**Basic Machine-Readable Material:** z/VM Version 3 Release 1 is installed via the z/VM System DDR and is available on either 3480 cartridge, 4-mm DAT cartridge, or CD-ROM. This can be ordered through the z/VM base product (5654-A17) or via the VM/System Delivery Offering (SDO). (For more information regarding SDO, refer to the Software Delivery Offering section in the **Technical Information** section.) The z/VM Version 3 Release 1 deliverable is the z/VM System DDR. It is refreshed as needed.

For all z/VM Version 3 Release 1 orders, the following no-charge prerequisite products are pre-installed on the System DDRs:

- EREP (5654-260)
- ICKDSF (5684-042)

Therefore, when ordering z/VM Version 3 Release 1, the customer must be licensed for these products or a separate order must be placed for these products.

**Note:** The High Level Assembler (HLASM) is no longer shipped on the DDR. If you would like HLASM, it must be ordered separately. Refer to the **Software Requirements** section for information on when HLASM is required.

To order the z/VM Version 3 Release 1 System DDR, select the feature number of the desired distribution medium:

Feature Number	Distribution Medium
3404	3480 tape cartridge
3410	CD-ROM
3431	4-mm tape cartridge

Also, select the feature number of the desired pre-built System DDR tapes or CD-ROM:

Environment	Feature Number
3380 System DDR	6460
3390 System DDR	6461
9345 System DDR	6462
FBA System DDR	6463
CD-ROM System DDR	6464

**Note:**

- The 3800 Image Library is shipped in the System DDR and does not have to be ordered separately.
- The following optional tapes are included with the base DDR:
  - ESA Migration Tool
  - PLX Source Code
  - DFSMS/VM
  - Stacked RSU
- The CD-ROM System DDR contains all four system DDRs, all non-priced features (excluding DCE feature) for z/VM, and the stacked RSU. With the CD-ROM System DDR, you will also receive an additional CDs containing:
  - ESA Migration Tool
  - PLX Source Code
  - DFSMS/VM
  - DFSMS/VM Kanji
  - LANRES/VM Feature
  - Restricted Source
  - z/VM BookManager Library

Installation via CD-ROM requires the IBM Optical Media Attach/2 Program (5621-264) or a S/390 Integrated Server, PC Server System/390, or RS/6000 with System/390 Server-On-Board using an AWSOMA emulated tape drive. CD-ROM is the preferred media choice over tape for the S/390 Integrated Server, PC Server S/390, and RS/6000 with System/390 Server-On-Board.

**National Language Translation:** When you order z/VM Version 3 Release 1, the National Language Translation files for message repositories, HELP files, and other panels or files are included with the system.

The following components/features are the ones supported by z/VM in the following languages:

- German —CP, CMS, REXX, Pipes, CMS Utilities feature
- Japanese Kanji —CP, CMS, REXX, Pipes, CMS Utilities feature

If you would like DFSMS/VM translated in Kanji, order feature number:

Feature	Description
6472	DFSMS/VM Kanji

**Customization Options:** Select the appropriate feature numbers to customize your order to specify the delivery options desired. These features can be specified on the initial or MES orders.

*Example:* If publications are not desired for the initial order, specify feature number 3470 to ship media only. For future updates, specify feature number 3480 to ship media updates only. If, in the future, publication updates are required, order an MES to remove feature number 3480; then, the publications will ship with the next release of the program.

Description	Feature Number
<b>Initial Shipments</b>	
Serial Number Only (suppresses shipment of media and documentation)	3444
Ship Media Only (suppresses initial shipment of documentation)	3470
Ship Documentation Only (suppresses initial shipment of media)	3471
<b>Update Shipments</b>	
Ship Media Updates Only (suppresses update shipment of documentation)	3480
Ship Documentation Only (suppresses update shipment of media)	3481
Suppress Updates (suppresses update shipment of media and documentation)	3482
<b>Expedite Shipments</b>	
Local IBM Office Expedite (for IBM use only)	3445
Customer Expedite Process Charge (\$30 charge for each product)	3446

Expedite shipments will be processed to receive 72-hour delivery from the time IBM Software Delivery and Fulfillment (SDF) receives the order. SDF will then ship the order via overnight air transportation.

**Optional Machine-Readable Material:** To order, select the feature number for the desired distribution medium and the optional material feature number:

Feature Number	Distribution Medium
3404	3480 tape cartridge
3410	CD-ROM
3431	4-mm tape cartridge

Optional Material	Tape or Cartridge Feature Number	CD-ROM Feature Number	Group	MOSP DSLO Graduated Monthly License Charge Feature Number
CMS Utilities Feature	6465	6465	25	4232
DCE Base Services Feature	6466	6466	28	4233
LANRES/VM feat w/Disk	6468	6464	29	4234
includes Workstation 3-1/2-inch Diskette			30	4235
			31	4236
Restricted Source*	6469	6464	32	4237
P/390 Preconfigured System		6474	35	4238
TCP/IP Source Feature	6470	6470	38	4239
CD-ROM Collection Kit	7221	7221	40	4020
z/VM BookManager Library	6473	6464	50	4021
			60	4022
			70	4023
			80	4024

\* Contains *RESTRICTED MATERIAL OF IBM*

The DCE User Data Privacy feature (#6467) requires the OpenExtensions DCE Base Services feature (#6466) to be installed first. The OpenEdition DCE User Data Privacy feature is a no-charge feature used for controlling the export of the DES algorithm. When installed, this feature enables data encryption using the DES algorithm. Because this feature contains data encryption, it is therefore subject to special export licensing requirements by the Bureau of Export Administration of the U.S. Department of Commerce.

**CMS Utilities Feature:** Specify one of the following feature numbers as applicable or corresponding to the group that contains the designated machine.

**DSLO Graduated Monthly License Charge**

Optional Material	Tape or Cartridge Feature Number	CD-ROM Feature Number	Group	DSLO Graduated Monthly License Charge Feature Number
DCE User Data Privacy Feature	6467	6467	25	4262
			28	4263
			29	4264
			30	4265
			31	4266
			32	4267
			35	4268
			38	4269
			40	3970
			50	3971
			60	3972
			70	3973
			80	3974

**DSLO License:** To order a DSLO license, specify the program number, feature number 9901 for asset registration, and the feature number below for the graduated MLC that corresponds to the group containing the designated machine.

**z/VM Base: DSLO Graduated Monthly License Charge**

Group	DSLO Graduated Monthly License Charge Feature Number
25	4222
28	4223
29	4224
30	4225
31	4226
32	4227
35	4228
38	4229
40	3960
50	3961
60	3962
70	3963
80	3964

**MOSP DSLO Basic Graduated Monthly License Charge**

**MOSP:** For a graduated monthly license charge, specify the following feature numbers, corresponding to the group that contains the designated machine.

**MOSP DSLO Graduated Monthly License Charge**

**MOSP:** For a graduated monthly license charge, specify the following feature numbers, corresponding to the group that contains the designated machine.

Group	MOSP DSLO Graduated Monthly License Charge Feature Number
25	4272
28	4273
29	4274
30	4275
31	4276
32	4277
35	4278
38	4279
40	4030
50	4031
60	4032
70	4033
80	4034

**TCP/IP Base Feature for z/VM:** TCP/IP Base is automatically shipped and pre-installed in a disabled state on the z/VM Version 3 Release 1 base product DDR. Specify one of the following feature numbers as applicable or corresponding to the group that contains the designated machine.

**DSLO Graduated Monthly License Charge**

Group	DSLO Graduated Monthly License Charge Feature Number
25	4302
28	4303
29	4304
30	4305
31	4306
32	4307
35	4308
38	4309
40	3985
50	3986
60	3987
70	3988
80	3989

**MOSP DSLO Graduated Monthly License Charge Feature Number**

Group	Feature Number
25	4352
28	4353
29	4354
30	4355
31	4356
32	4357
35	4358
38	4359
40	4050
50	4051
60	4052
70	4053
80	4054

**MOSP DSLO Graduated Monthly License Charge**

**MOSP:** For a graduated monthly license charge, specify the following feature numbers, corresponding to the group that contains the designated machine.

Group	MOSP DSLO Graduated Monthly License Charge Feature Number
25	4312
28	4313
29	4314
30	4315
31	4316
32	4317
35	4318
38	4319
40	4045
50	4046
60	4047
70	4048
80	4049

Ordering a DSLO feature will result in IBM maintaining a record of this customer location as a DSLO user only. All material for the DSLO license will be provided through the basic license location. If a user selects DSLO, no other feature numbers are valid for this order and no program materials or updates will be shipped.

**Extended License Charge (ELC)**

**ELC Basic License:** To order a basic license, specify the appropriate program and feature number, if required, for asset registration. Specify the applicable ELC features. Also, specify the feature number of the desired distribution medium.

Processors with assigned capacity above 80 MSUs will have VM and VSE software prices, including zSeries 900 servers (or equivalent) that do not qualify for FWLC charges, based on the CPU service unit capacity of the processor. The ELC price structure will have a Base Charge for 80 MSU capacity and an incremental per MSU charge for all additional MSUs above the 80 MSU base.

ELC charges are Monthly License Charges.

**TCP/IP NFS Feature: DSLO Graduated Monthly License Charge**

Group	DSLO Graduated Monthly License Charge Feature Number
25	4342
28	4343
29	4344
30	4345
31	4346
32	4347
35	4348
38	4349
40	3990
50	3991
60	3992
70	3993
80	3994

Description	ELC Feature Number
ELC Base, 80 MSUs	4100
ELC 1 MSU	4101
ELC 50 MSUs	4102

**CMS Utilities Feature**

ELC Base, 80 MSUs	4114
ELC 1 MSU	4115
ELC 50 MSUs	4116

**TCP/IP Base Feature for z/VM**

ELC Base, 80 MSUs	4135
ELC 1 MSU	4136
ELC 50 MSUs	4137

**MOSP DSLO Graduated Monthly License Charge**

**MOSP:** For a graduated monthly license charge, specify the following feature numbers, corresponding to the group that contains the designated machine.

**TCP/IP NFS Feature**

ELC Base, 80 MSUs	4142
ELC 1 MSU	4143
ELC 50 MSUs	4144



**Licensing:** The following apply to products ordered with ELC:

- (1) Z125-6018 ICA Attachment for Extended License Charges, which should be signed by the customer
- (2) Z125-6019 ICA Exhibit for Extended License Charges

**Unlicensed Documentation:** Unlicensed Documentation within the z/VM library are available in Adobe PDF files, BookManager files, or printed books. They have been defined as either "Basic" or "Optional."

- Basic Publications

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

- Optional Publications

Optional (not basic) publications are supplied only in PDF or BookManager format with z/VM. Some of these publications have printed versions. They can be ordered separately for a fee using the specific publication numbers through the IBM Publications Ordering System (POS) at:

<http://www.elink.ibm.link.ibm.com/pbl/pbl>

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

**Adobe PDF Files:** Publications that are available in PDF format are provided on the *IBM Online Library Omnibus Edition: VM Collection CD-ROM* (supplied with z/VM at no additional charge) and on the IBM VM Web site at:

<http://www.ibm.com/s390/vm/pubs>

or from POS at:

<http://www.elink.ibm.link.ibm.com/pbl/pbl>

### Basic z/VM — New Editions

#### Unlicensed Documentation

Title	Order Number	PDF	Format BKM	Print
z/VM: Installation Guide	GC24-5945	X		X
z/VM: Planning and Administration	SC24-5948	X	X	X
z/VM: Service Guide	GC24-5946	X	X	X
z/VM: System Messages and Codes	GC24-5974	X	X	X
z/VM: TCP/IP Level 3A0 Planning and Customization	SC24-5981	X	X	X
z/VM: Licensed Program Specifications	GC24-5943	X	X	

**Note:** An "X" in one of the columns indicates available formats

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.

**BookManager Files:** Publications that are available in BookManager format are provided on the *IBM Online Library Omnibus Edition: VM Collection CD-ROM* (supplied with z/VM at no additional charge). BookManager files are also provided on the IBM VM Web site at:

<http://www.ibm.com/s390/vm/pubs>

and on the z/VM BookManager Library feature tape. The BookManager files can be read by either BookManager READ for VM or the IBM Library Reader for Windows, OS/2, or DOS. The IBM Library Reader programs that are included on the CD-ROM have been updated. If you intend to read the files on the z/VM CD-ROM using one of the Library Reader programs, you must either use the programs as supplied by IBM on the CD-ROM or download the Library Reader programs at no-charge from the IBM Web site at:

<http://booksrv1.raleigh.ibm.com/homepage/ilrsvr.html>

**Printed Books:** All z/VM basic publications and **some** of the other publications are available as printed books and are orderable from the Publications Ordering System (POS).

A program directory for z/VM and one for each product or feature, one copy of the Basic z/VM printed publications, and one copy of z/VM Online publications on CD-ROM are supplied automatically with the basic machine-readable material.

**Optional z/VM Base — New Editions**

**Unlicensed Documentation**

Updated for z/VM.

<b>Title</b>	<b>Order Number</b>	<b>PDF</b>	<b>Format BKM</b>	<b>Print</b>
z/VM: CMS Application Development Guide	SC24-5957	X	X	
z/VM: CMS Application Development Guide for Assembler	SC24-5958	X	X	
z/VM: CMS Application Multitasking	SC24-5961	X	X	
z/VM: CMS Callable Services Reference	SC24-5959	X	X	
z/VM: CMS Command Reference	SC24-5969	X	X	
z/VM: CMS File Pool Planning, Administration, and Operation	SC24-5949	X	X	
z/VM: CMS Macros and Functions Reference	SC24-5960	X	X	
z/VM: CMS Pipelines Reference	SC24-5971	X	X	
z/VM: CMS Pipelines User's Guide	SC24-5970	X	X	
z/VM: CMS User's Guide	SC24-5968	X	X	
z/VM: CP Command and Utility Reference	SC24-5967	X	X	
z/VM: CP Exit Customization	SC24-5953	X	X	
z/VM: CP Programming Services	SC24-5956	X	X	
z/VM: Diagnosis Guide	GC24-5975	X	X	
z/VM: Dump Viewing Facility	GC24-5966	X	X	
z/VM: Enterprise Systems Architecture/Extended Configuration Principles of Operation	SC24-5965	X	X	
z/VM: General Information	GC24-5944	X	X	
z/VM: Group Control System	SC24-5951	X	X	
z/VM: Migration Guide	GC24-5928	X	X	
z/VM: OpenExtensions Advanced Application Programming Tools	SC24-5979	X	X	
z/VM: OpenExtensions Callable Services Reference	SC24-5980	X	X	
z/VM: OpenExtensions Command Reference	SC24-5978	X	X	
z/VM: OpenExtensions POSIX Conformance Document	GC24-5976	X	X	
z/VM: OpenExtensions User's Guide	SC24-5977	X	X	
z/VM: Performance	SC24-5952	X	X	
z/VM: Program Management Binder and Loader for CMS	SC24-5934	X	X	
z/VM: Quick Reference	SC24-5986	X	X	
z/VM: Reusable Server Kernel Programmer's Guide and Reference	SC24-5964	X	X	
z/VM: REXX/VM Reference	SC24-5963	X	X	
z/VM: REXX/VM User's Guide	SC24-5962	X	X	
z/VM: Running Guest Operating Systems	SC24-5950	X	X	
z/VM: System Operation	SC24-5954	X	X	
z/VM: Virtual Machine Operation	SC24-5955	X	X	
z/VM: VM Dump Tool	SC24-5887	X	X	
z/VM: VMSES/E Introduction and Reference	GC24-5947	X	X	
z/VM: XEDIT Command and Macro Reference	SC24-5973	X	X	
z/VM: XEDIT User's Guide	SC24-5972	X	X	
C for VM/ESA: Library Reference	SC23-3908	X	X	
Debug Tool User's Guide and Reference	SC09-2137	X	X	
DFSMS/MVS®: Program Management Language Environment for OS/390 & VM: Concepts Guide	SC26-4916	X	X	X
Language Environment for OS/390 & VM: Debugging Guide and Run-Time Messages	GC28-1945	X	X	X
Language Environment for OS/390 & VM: Migration Guide	SC28-1942	X	X	X
Language Environment for OS/390 & VM: Programming Guide	SC28-1944	X	X	X
Language Environment for OS/390 & VM: Programming Reference	SC28-1939	X	X	X
Language Environment for OS/390 & VM: Writing Interlanguage Communication Applications	SC28-1940	X	X	X
Language Environment for OS/390 & VM: Writing Interlanguage Communication Applications	SC28-1943	X	X	X

**Note:** An "X" in one of the columns indicates available formats

**Optional z/VM Base — Not New Editions****Unlicensed Documentation**

Not updated for z/VM.

Title	Order Number	PDF	Format BKM	Print
CMS/TSO Pipelines: Author's Edition	SL26-0018		X	X
VM/ESA: CMS Primer	SC24-5458		X	X
VM/ESA: Connectivity Planning, Administration, and Operation	SC24-5756		X	X
VM/ESA: CPI Communications User's Guide	SC24-5595		X	X
VM/ESA: DFSMS/VM Function Level 221 Installation and Customization	SC26-4704		X	X
VM/ESA: DFSMS/VM Function Level 221 Messages and Codes	SC26-4707		X	X
VM/ESA: DFSMS/VM Function Level 221 Planning Guide	GC35-0121		X	X
VM/ESA: DFSMS/VM Function Level 221 Removable Media Services User's Guide and Reference	SC35-0141		X	X
VM/ESA: DFSMS/VM Function Level 221 Storage Administration Guide and Reference	SH35-0111		X	X
VM/ESA: Open Systems Adapter Support Facility User's Guide	SC28-1992		X	X
VM/ESA: Programmer's Guide to the Server-Requester Programming Interface for VM	SC24-5455		X	X
VM/ESA: REXX/EXEC Migration Tool for VM/ESA	GC24-5752		X	X
VM/ESA: REXX/VM Primer	SC24-5598		X	X
Common Programming Interface Communications Reference	SC26-4399	X		X
Common Programming Interface Resource Recovery Reference	SC31-6821		X	X
External Security Interface (RACROUTE) Macro Reference for MVS and VM	GC28-1366		X	X
Planning for the System/390 Open Systems Adapter Feature	GC23-3870	X	X	X

**Note:** An "X" in one of the columns indicates available formats**Optional CMS Utilities Feature — Not New Editions****Unlicensed Documentation**

Not updated for z/VM.

Title	Order Number	PDF	Format BKM	Print
VM/ESA: CMS Utilities Feature	SC24-5535		X	X

**Note:** An "X" in one of the columns indicates available formats**Optional TCP/IP Feature — New Editions****Unlicensed Documentation**

Updated for z/VM.

Title	Order Number	PDF	Format BKM	Print
z/VM: TCP/IP Level 3A0 Diagnosis Guide	GC24-5985	X	X	
z/VM: TCP/IP Level 3A0 Messages and Codes	GC24-5984	X	X	
z/VM: TCP/IP Level 3A0 Programmer's Reference	SC24-5983	X	X	
z/VM: TCP/IP Level 3A0 User's Guide	SC24-5982	X	X	

**Note:** An "X" in one of the columns indicates available formats

**Optional OpenEdition® DCE Feature — Not New Editions**

**Unlicensed Documentation**

Not updated for z/VM.

<b>Title</b>	<b>Order Number</b>	<b>PDF</b>	<b>Format BKM</b>	<b>Print</b>
OpenEdition for DCE VM/ESA: Administration Guide	SC24-5730		X	X
OpenEdition for DCE VM/ESA: Administration Reference	SC24-5731		X	X
OpenEdition for DCE VM/ESA: Application Development Guide	SC24-5732		X	X
OpenEdition for DCE VM/ESA: Application Development Reference	SC24-5733		X	X
OpenEdition for DCE VM/ESA: Configuring and Getting Started	SC24-5734		X	X
OpenEdition for DCE VM/ESA: Introducing OpenEdition Distributed Computing Environment	SC24-5735		X	X
OpenEdition for DCE VM/ESA: Messages and Codes	SC24-5736		X	X
OpenEdition for DCE VM/ESA: Planning	SC24-5737		X	X
OpenEdition for DCE VM/ESA: User's Guide	SC24-5738		X	X

**Note:** An "X" in one of the columns indicates available formats

**Optional LANRES/VM Feature — Not New Editions**

**Unlicensed Documentation**

Not updated for z/VM.

<b>Title</b>	<b>Order Number</b>	<b>PDF</b>	<b>Format BKM</b>	<b>Print</b>
LAN Resource Extension and Services/VM: General Information	GC24-5618		X	X
LAN Resource Extension and Services/VM: Guide and Reference	SC24-5622		X	X
LAN Resource Extension and Services/VM: Licensed Program Specifications	GC24-5617		X	X

**Note:** An "X" in one of the columns indicates available formats

**Optional Licensed — Not New Editions**

**Unlicensed Documentation**

Not updated for z/VM.

<b>Title</b>	<b>Order Number</b>	<b>PDF</b>	<b>Format BKM</b>	<b>Print</b>
VM/ESA: DFSMS/VM Function Level 221 Diagnosis Guide	LY27-9589			X

**Note:** An "X" in one of the columns indicates available formats

**NLS Publications:** The following translated publications will be available after the general availability of z/VM Version 3 Release 1:

<b>Order Title</b>	<b>Number</b>	<b>Language</b>
z/VM: General Information	GC24-5944	German
z/VM: Installation Guide	GC24-5945	Japanese
z/VM: Service Guide	GC24-5946	Japanese
z/VM: System Messages and Codes	GC24-5974	Japanese
z/VM: OpenExtensions Command Reference	SC24-5978	Japanese
z/VM: Planning and Administration	SC24-5948	Japanese
z/VM: REXX/VM Reference	SC24-5963	Japanese
z/VM: CP Command and Utility Reference	SC24-5967	Japanese
z/VM: CMS Command Reference	SC24-5969	Japanese
z/VM: TCP/IP Planning and Customization	SC24-5981	Japanese
z/VM: TCP/IP User's Guide	SC24-5982	Japanese
z/VM: Quick Reference	SC24-5986	Japanese

**Displayable Softcopy Publications:** The z/VM books (licensed and unlicensed) are offered in online displayable book format on the product media and shipped automatically, on tape only.

All unlicensed online books are also available on CD-ROM SK2T-2067, the *IBM Online Library Omnibus Edition: VM Collection*. The VM Collection also contains libraries for approximately 60 products that run on z/VM. This will be available in the United States at general availability of the z/VM Version 3 Release 1 product and 30 days after general availability in the other world trade countries. For a list of kit contents, see your IBM Business Partner or IBM representative.

One copy of the CD-ROM Collection Kit will be shipped automatically with the product at no additional charge. To order additional copies, order feature number 7221.

	<b>Feature Number</b>	<b>Order Number</b>
CD-ROM Collection Kit	7221	SK2T-2067

The online books can be used with the BookManager READ licensed programs in any of the Read-supported environments. They can also be used with the IBM Library Readers in DOS and OS/2 environments. The IBM Library Readers have the same functions as the BookManager READ/DOS and READ/2 licensed programs except the Library Readers can only be used to view IBM-produced online books. Both IBM Library Readers are supplied at no additional charge with online books on CD-ROM.

Online books CD-ROMs also contain programs that allow you to upload the displayable books to a VM or MVS host for viewing with IBM BookManager READ/VM or READ/MVS (the VM and MVS READ programs are not included on online books CD-ROMs but can be licensed from IBM).

Terms and conditions for use of the displayable book files and the IBM Library Readers are described in a document included with all online documentation.

**Source File Publications:** z/VM manuals are not offered in source file form.

**Licensed Documentation:** The only licensed documentation available for z/VM is the DFSMS/VM Function Level 221 Diagnosis Guide (LY27-9589). This publication has not been updated for z/VM and is only available in printed format. It is not available on the IBM Online Library Omnibus Edition: VM Collection CD-ROM and must be ordered separately for a fee from the IBM Publication Ordering System at:

<http://www.elink.ibm.com/pbl/pbl>

Subsequent updates (technical newsletters or revisions between releases) to the publications shipped with the product will be distributed to the user of record for as long as a license for this software remains in effect. A separate publication order or subscription is not needed.

---

## Terms and Conditions

---

**Licensing:** IBM Customer Agreement

**Variable Charges Apply:** Yes

**Indexed Monthly License Charge (IMLC) Applies:** No

**Installation License or Location License Applies:** No

**Usage Restriction Applies:** No

**Educational Allowance:** Yes, 15% education allowance applies to qualified education institution customers.

**Volume Discount:** Not applicable.

---

### Products Eligible for Single Version Charging

---

Replaced Programs		Replacement Programs	
Program Number	Program Name	Program Number	Program Name
5654-030	VM/ESA Version 2	5654-A17	z/VM Version 3 Release 1
5684-112	VM/ESA Version 1	5654-A17	z/VM Version 3 Release 1
5664-167	VM/SP™	5654-A17	z/VM Version 3 Release 1
5664-173	VM/SP HPO	5654-A17	z/VM Version 3 Release 1
5664-301	VM/IS Base (Core)	5654-A17	z/VM Version 3 Release 1
5664-308	VM/XA SP	5654-A17	z/VM Version 3 Release 1
5735-FAL	TCP/IP Version 2	5654-A17	TCP/IP Feature for z/VM
5798-FAL	TCP/IP Version 1	5654-A17	TCP/IP Feature for z/VM
5684-142	LANRES/VM	5654-A17	z/VM Version 3 Release 1
5688-198	Language Environment/370	5654-A17	z/VM Version 3 Release 1
5706-116	DFSMS/VM	5654-A17	z/VM Version 3 Release 1
5668-911	OS/PL/I V2 Library	5654-A17	z/VM Version 3 Release 1
5734-LM4	OS PL/I Resident Library	5654-A17	z/VM Version 3 Release 1
5734-LM5	OS PL/I Transient Library	5654-A17	z/VM Version 3 Release 1
5688-022	VS COBOL II Library Only	5654-A17	z/VM Version 3 Release 1
5668-940	VS COBOL II Library Only	5654-A17	z/VM Version 3 Release 1
5740-LM1	OS/VS COBOL Library Only	5654-A17	z/VM Version 3 Release 1
5688-039	C/370™ Library	5654-A17	z/VM Version 3 Release 1

**Warranted:** Yes

#### Licensed Program Materials Availability

- Restricted Materials of IBM: Some
- Non-Restricted Source Materials: Some
- Object Code Only (OCO): Some
- Publication that identifies
  - OCO components: GC24-5944
  - Availability Date: October 3, 2000

**Testing Period:** Two months (Basic license only)

#### Program Services

Support Center applies: Yes  
Access available through the IBM Support Center

Available until discontinued: 12-months' written notice

APAR Mailing Address: IBM Corporation  
Dept C7NG  
c/o z/VM Service  
1701 North Street  
Endicott, NY 13760

Services for DSLO licenses: Provided through basic license location

**Support Line:** Yes

---

## Prices

---

Contact your IBM representative for prices information for this announcement.

---

## Order Now

---

Use Priority/Reference Code: LE001

Phone: 800-IBM-CALL  
Fax: 800-2IBM-FAX  
Internet: ibm\_direct@us.ibm.com  
Mail: IBM Atlanta Sales Center  
Dept. LE001  
P.O. Box 2690  
Atlanta, GA 30301-2690

You can also contact your local IBM Business Partner or IBM representative. To identify them, call 800-IBM-4YOU.

**Note:** Shipments will begin after the planned availability date.

### **Trademarks**

z/VM, z/OS, z/Architecture, zSeries, zSeries 900, e(logo)server, VSE/ESA, MVS, Library Reader, WebSphere, S/370, System/370, ESA/390, IBMLink, OpenExtensions, PR/SM, SP, and C/370 are trademarks of International Business Machines Corporation in the United States or other countries or both.

S/390, VM/ESA, Multiprise, System/390, RS/6000, ESCON, OS/390, Language Environment, RACF, DFSMS/VM, ADSTAR, BookManager, OS/2, ACF/VTAM, VTAM, DB2, NetView, DFSMS/MVS, and OpenEdition are registered trademarks of International Business Machines Corporation in the United States or other countries or both.

Windows, Windows NT, and Microsoft are trademarks of Microsoft Corporation.

Tivoli is a registered trademark of International Business Machines Corporation or Tivoli Systems Inc. in the United States or other countries or both.

Other company, product, and service names may be trademarks or service marks of others.

---

### **Year 2000 Readiness Disclosure**

*Statements made in this announcement regarding Year 2000 are "Year 2000 Readiness Disclosures" under the Year 2000 Information and Readiness Disclosure Act of 1998, a U.S. statute enacted on October 19, 1998.*