

VIRTUAL MACHINE/EXTENDED ARCHITECTURE SYSTEM PRODUCT (VM/XA SP) RELEASE 1

Contents

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Brief Description of Announcement, Charges, and Availability

The VM/XA System Product (VM/XA SP) is IBM's premier VM operating system for IBM 370-XA capable processors. VM/XA System Product Release 1 supersedes all releases of VM/XA Systems Facility (VM/XA SF) while providing a migration path for VM/XA Systems Facility customers. All VM/XA Systems Facility functions are supported including single-image N-way, vector processors, partitionable expanded storage, and block paging. In addition to offering new function and additional device support to VM/XA Systems Facility customers, it offers, for the first time in the XA environment, an interactive environment capable of supporting large numbers of users. It also provides a bimodal CMS which will operate in either System/370 mode with 24-bit addressing or 370-XA mode with 24- or 31-bit addressing capability. Additionally, program interfaces have been defined to allow the development of applications which are portable between System/370 and 370-XA CMS virtual machines. Virtual Machine/System Product High Performance Option (VM/SP HPO) customers will find that VM/XA System Product Release 1 offers an attractive growth path to IBM's larger processors running in single-image mode and relief to user growth constraints.

Group	Graduated Charge	Monthly One-Time License Charge
---	---	\$4,500
30	\$112,500	

Customer Letter Section

HIGHLIGHTS

- o Functional improvements in VM/XA to support high capacity CMS environments along with support for additional key CMS (System/370 and/or 370/XA) licensed programs
- o Bimodal CMS providing 31-bit addressing capability
- o Performance monitoring facility
- o VM/XA Real Time Monitor support
- o Logged-on user limit enhancements
- o Resource Access Control Facility (RACF) Support
- o Additional device support
- o Ease-of-use improvements in object code maintenance
- o National Language Support for CMS

DESCRIPTION

VM/XA System Product Release 1 licensed program incorporates all the functions of VM/XA Systems Facility and offers enhanced function and additional device support.

SUPPORT OF HIGH CAPACITY CMS WORKLOADS

Support is provided for selected licensed programs new to the VM/XA environment such as PROFS (TM) and enhancements have been made to increase the number of interactive users that can be supported in the VM/XA environment. VM/XA System Product Release 1 provides additional capacity for CMS environments over what is provided by VM/SP HPO.

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BIMODAL CMS

The VM/XA System Product Release 1 CMS, which is an extension of the VM/System Product (VM/SP) Release 5 CMS, has been enhanced to take advantage of the capabilities of 370-XA architecture including 31-bit addressability for both programs and data.

This single CMS can execute on either System/370 or 370-XA virtual machines.

When CMS is invoked in 370-XA mode, applications may benefit from 370-XA capabilities including 370-XA input/output (I/O) capabilities and storage addressing for both programs and data above the previous 16-megabyte addressing limit. Engineering and

scientific users will benefit by the 31-bit capability of VS Fortran Version 2 and the Engineering and Scientific Subroutine Library. Applications that have not been enhanced to fully utilize the 31-bit capability may execute and reference data below the 16-megabyte addressing limit and still benefit from 370-XA I/O advantages. Applications that cannot execute above the 16-megabyte limit may co-exist with 370-XA capable applications.

Programs running on CMS will now be able to take advantage of 370-XA virtual machine sizes that are greater than 16-megabyte.

The enhancements to the CMS programming interfaces enable an application to be coded so that it can be independent of whether it is running in a System/370 virtual machine or a 370-XA virtual machine. In addition, programs running in a 370-XA virtual machine can choose to execute with either 24-bit addressing, 31-bit addressing, or dynamically switch between the two.

Some modifications may be required to migrate an application to VM/XA System Product Release 1 due to the differences between System/370 and 370-Extended Architecture.

PERFORMANCE MONITORING FACILITY

A native VM monitoring facility, including significant enhancements over prior VM/370 monitors, is provided in the VM/XA System Product environment. The monitor facility provides the necessary data which will enable the user to analyze the utilization of, and contention, for the major system resources such as processors, storage, I/O devices and the paging subsystem. Monitor externals have been substantially revised, in order to permit future system growth and meet user requirements.

VM/XA REAL TIME MONITOR SUPPORT

VM/XA System Product Release 1 will provide support for VM/XA Real Time Monitor/Systems Facility (RTM/SF). All support as provided for RTM/SF on VM/XA Systems Facility Release 2 has been upgraded to support VM/XA System Product Release 1.

LOGGED-ON USER LIMIT ENHANCEMENTS

Function is provided to allow installations to limit the maximum number of users logged onto the system.

RACF SUPPORT

VM/XA System Product Release 1 provides customers with the data security functions as provided in VM/SP (with or without VM/SP HPO) ensuring compatibility to those customers who have implemented RACF data security procedures on their current VM/SP systems.

ADDITIONAL DEVICE SUPPORT

Refer to the VM/XA System Product General Information manual

(GC23-0362), which will be available third quarter, 1987, for a complete list of supported devices.

EASE-OF-USE IMPROVEMENTS FOR OBJECT CODE MAINTENANCE

Some modules in VM/XA System Product Release 1 are shipped in object code only. New EXECs are provided to enhance the maintenance of these modules.

NATIONAL LANGUAGE SUPPORT FOR CMS

National language support provides the capabilities for end users to receive messages and HELP in their language.

PUBLICATIONS

The following publications are planned to be available as shown. To order, contact your IBM marketing representative.

Available now:

- o Bimodal CMS for VM/XA Systems (GG24-3174)

Available June 1987:

- o VM/XA System Product Guide (GG24-3173)

Available third quarter, 1987:

- o VM/XA System Product General Information (GC23-0362)

Available fourth quarter, 1987:

- o VM/XA System Product Conversion Notebook

Available December 1987:

- o VM/XA System Product Application Development Guide for CMS
- o VM/XA System Product Application Conversion Guide for CMS
- o VM/XA System Product Application Development Reference for CMS

Available March 1988:

- o VM/XA System Product Administration
- o VM/XA System Product Installation Tips
- o VM/XA System Product Overview Presentation Guide

EDUCATION SUPPORT

The VM education curriculum will be updated to reflect the new facilities offered by VM/XA System Product Release 1.

SCHEDULE

General availability of VM/XA System Product Release 1 is planned for March 1988. General availability of the National Language Support feature is planned for June 1988.

TECHNICAL INFORMATION

SPECIFIED OPERATING ENVIRONMENT

MACHINE REQUIREMENTS: VM/XA System Product Release 1 is supported on all IBM 370-XA capable processors.

Consult the VM/XA Systems Product General Information manual for minimum required engineering change levels. The latest minimum required engineering change levels will be available 60 days prior to

general availability. Contact your IBM marketing representative for details.

A tape drive is required to service VM/XA System Product. Refer to the Minimum Hardware Configuration section of the VM/XA System Product General Information manual for details.

PROGRAMMING REQUIREMENTS:

- o Assembler H Version 2 (or equivalent)
- o The current version of EREP (5654-260) must be ordered and installed.

PROGRAM INTERFACES: VM/XA System Product Release 1 is designed to support the following operating systems as virtual machines, either in a V=V or a V=R preferred machine:

- o MVS/SP Version 1 Release 3.5 and later (MVS/370)
- o MVS/SP Version 2 Release 1.3 and later (Multiple Virtual Storage/Extended Architecture (MVS/XA))
- o VM/SP Release 4 and later
- o VM/SP HPO Release 4.2 and later
- o OS/VS1 Release 7 with BPE Release 4 and later
- o VSE/Advanced Function Version 2
- o VSE/System Product Version 2, all releases, and Version 3 Release 1
- o VM/XA Systems Facility, all releases (V=V only)
- o VM/XA System Product Release 1 (V=V only)

LICENSED PROGRAMS SUPPORTED: The following licensed programs are supported by the VM/XA Release 1. Later versions, releases and modifications of the listed licensed programs are supported unless noted otherwise.

Licensed programs supported in System/370 mode Virtual Machines: (System/370 mode means that the virtual machine (server or user) must be IPLed in System/370 mode.)

- o VM/XA Real Time Monitor/Systems Facility
- o VM/XA Migration Aid Remote 3270 Display Option (5664-183)
- o RSCS Networking Version 1 Release 3 (5748-XP1)

Note: Version 2 is not supported.

- o VM/Pass-Through Facility Release 2 or later (5748-RC1)
- o VSE/VSAM Release 3 (5746-AM2)
- o Resource Access Control Facility (RACF) Version 1 Release 8 (5740-XXH)
- o IBM FORTRAN Language Conversion Program (5668-864) (support planned for second quarter, 1988)
- o 3090 Vector Facility Simulator (5798-DWF) (support planned for

- second quarter, 1988)
- o Elementary Math Library (5799-BTB) (support planned for second quarter, 1988)
- o VM/Data Collector (5798-DZF)
- o Graphical Data Display Manager (GDDM) Release 4 (5748-XXH)
- o Graphical Data Display Manager Version 2 which includes:
 - GDDM/VM - Version 2 Release 1.1 (5664-200)
 - GDDM Presentation Graphics Facility (GDDM-PGF) - Version 2 Release 1 (5668-812)
 - GDDM Interactive Map Definition (GDDM-IMD) Version 2 Release 1 (5668-801)
 - GDDM Image View Utility (GDMM-IVU) (5668-723)
 - GDDM Graphical Kernel System (GDDM-GKS) (5668-802)
 - GDDM Restructured Extended Executor (GDDM-REXX) (5664-336)
- o IBM Professional Office System (PROFS) Version 2 Release 2 (5664-309) including support for the PROFS Application Support Feature and the PROFS Personal Computer Support Feature at the required service level. Support is planned for second quarter, 1988. Application System and DisplayWrite/370, corequisite products of PROFS, are not supported.
- o SQL/DS Version 2 Release 1 (5688-004) Note: VM/XA System Product Release 1 will not support the database switching functions, that require TSAF, recently announced by SQL/DS Version 2, for either local or remote data bases.
- o Query Management Facility (QMF) (5668-AAA) Version 2 Release 2 (support planned for second quarter, 1988)
- o IBM 3270-PC File Transfer Program (5664-281)
- o High-Accuracy Arithmetic (ACRITH) Subroutine Library Release 3 for VM/System Product (5664-185) (support planned for second quarter, 1988)
- o Graphics Access Method/SP (GAM/System Product) Release 2 (5668-978)
- o Graphical Data Display Manager/graPHIGS (TM) (GDDM/graPHIGS) (5668-792) at the then current release
- o SCientific ENgineering Application Director (SCENAD) (5668-882) (support planned for second quarter, 1988) Note: VM/Interactive Productivity Facility (VM/IPF) Version 2 Release 2 (5668-MS1) is a prerequisite for SCENAD in the VM environment. Only the BROWSE and SADT (stacks information from the access device table) functions are supported in VM/XA System Product Release 1 and are the only IPF functions required by SCENAD.
- o Advanced Communication Function/System Support Program Version 3

- Release 2 for VM (5664-289) at the required service level
 - o Emulation Program Release 4 for the IBM Communications Controllers for use on 3720/3725 (5735-XXB)
 - o Emulation Program for the IBM 3705 Communication Controller (5735-XXB)
 - o VM Batch Facility (5664-364) (support planned for second quarter, 1988)
 - o OS PL/I Release 5.1
 - Optimizing Compiler and Libraries (5734-PL3)
 - Optimizing Compiler (5734-PL1)
 - Resident Library (5734-LM4)
 - Transient Library (5734-LM5)
 - o IBM Transmission Control Protocol/Internet Protocol (TCP/IP) for VM (5798-FAL)
 - o Document Composition Facility (DCF) Release 3.1 (5748-XX9)
Licensed Programs Supported in System/370 and 370-XA Mode
- Virtual Machines:
- o Assembler H Version 2 (5668-962)
 - o Engineering and Scientific Subroutine Library (ESSL) Release 1 (5668-863) (support planned for second quarter, 1988)
 - o Interactive System Productivity Facility (ISPF) with a planned availability of second quarter, 1988
 - o ISPF/Program Development Facility (PDF) with a planned availability of second quarter, 1988
 - o VS FORTRAN Version 2 at the then current release. Planned support is second quarter, 1988.
 - Compiler, Library and Interactive Debug (5668-806)
 - Library (5668-805)
 - o OS PL/I Version 2 (planned for support second quarter, 1988)
 - Compiler/Library/Interactive Test Facility (5668-909)
 - Compiler/Library (5668-910)
 - Library (5668-911)
 - o IBM Virtual Storage COBOL II at the then current release (support planned for fourth quarter, 1988)
 - Compiler and Library (5668-958)
 - Library (5668-940)

COMPATIBILITY:

Compatibility Statement for VM/XA SF Release 2:

In general, VM/XA System Product Release 1 is upward compatible from VM/XA Systems Facility Release 2.

Application programs that currently execute on VM/XA Systems Facility should execute without change unless dependent on those

functions listed under exceptions, below.

Programs written in higher level languages are source and object level compatible on CMS (i.e., CMS supports the same languages for both systems).

Programs using 24-bit virtual storage addresses continue to execute in virtual storage below 16 megabytes without change.

Exceptions: Programs or EXECs that depend on one or more of the following will need to be examined for compatibility:

- o Internal control program and CMS structure of control blocks
- o External
 - Applications that use undocumented interfaces
 - Programs that depend on the syntax or output format of control program commands. The syntax of most command invocations remains upward compatible. The format of many command responses has changed, particularly for Query and SPOOLing commands.
 - Programs that operate on SPOOL files owned by another user must now refer to SPOOL files by userid and spoolid. Control program SPOOLing commands are enhanced for this support.
- o Messages - There are a small percentage of messages where the text has been improved for clarity and consistency.

Approximately half of the 370-XA messages have changed message numbers. Return codes have also experienced extensive changes. Additionally, VM/XA SP has many four-digit message numbers; therefore, some command invocations will now result in four-digit return codes. Applications that depend on 10-character message header lengths and/or three-digit control program command return codes should be examined. Systems using programmed operator facilities must examine their routing tables for any changes necessary.

Compatibility Statement for VM/SP HPO:

While one of the primary objectives of VM/XA System Product Release 1 is to provide a growth path for VM/SP HPO customers with maximum compatibility to ease migrations, due to factors such as architectural differences, full compatibility is not possible. VM/XA System Product Release 1 has made every effort to fulfill the migration objective by keeping, where possible, command syntax, responses and message text the same.

The bimodal CMS component of VM/XA System Product Release 1 is generally compatible with the CMS component of VM/SP Release 5.

Details of incompatibilities and conversion considerations may be found in the VM/XA System Product Application Conversion Guide

(SC23-0403) and the VM/XA System Product Conversion Notebook (SC23-0357).

PERFORMANCE CONSIDERATIONS: The performance of VM/XA System Product Release 1 can be viewed from three major environmental perspectives:

1. High capacity CMS environments, which include interactive as well as CMS-based production applications

VM/XA SP Release 1 offers new opportunities to those VM/SP HPO installations experiencing growth constraints due to System/370 limitations. VM/XA SP can support significantly more users than VM/SP HPO through access to the larger single-image capabilities of IBM 308X Model 3084 or IBM 3090 processors Models 200E, 300E, 400, 400E, and 600E, larger real memory, addressing capabilities above the 16-megabyte line and the XA I/O subsystem.

VM/XA SP Release 1 performance will approach that of VM/SP HPO Release 5 operating in an unconstrained System/370 environment.

Relative to VM/XA SF, additional CMS interactive users can be supported as a result of enhancements to control program logic including scheduler enhancements.

2. Guest performance where VM/XA SP Release 1 is used primarily to support guest production or test and maintenance of guest operating systems such as MVS/XA

Guest performance will be at least equivalent to that experienced under VM/XA SF Release 2.

3. Numerically Intensive Computing environments

Numerically Intensive Computing performance will be equivalent to that experienced under VM/XA SF Release 2 or VM/SP HPO Release 5.

Specific performance information will be provided by general availability.

PLANNING INFORMATION

STORAGE ESTIMATES: The resident nucleus for VM/XA System Product Release 1 will be approximately one megabyte and the minimum supported storage size will be four megabytes.

PACKAGING: VM/XA System Product will be shipped with the combined components of:

- o VM/XA System Product Control Program
- o VM/XA System Product CMS (VM/SP Release 5 CMS with 370-XA extensions)

SYSTEM INTEGRITY

System integrity is an important characteristic of VM/XA

System Product. This announcement extends IBM's previous statements on system integrity to the VM/XA System Product environment. For VM/XA System Product Release 1, IBM will now accept APARs that describe exposures to system integrity or that describe problems encountered when a program running in a virtual machine not authorized by a mechanism under the customer's control introduces an exposure to system integrity.

IBM has implemented specific design and coding guidelines for maintaining system integrity in the development of VM/XA System Product. Procedures have also been established to make the application of these design and coding guidelines a formal part of the design/development process.

However, since it is not possible to certify that any system has perfect integrity, IBM will accept APARs that describe exposures to the system integrity of VM/XA System Product or that describe problems encountered when a program running in a virtual machine not authorized by a mechanism under the customer's control introduces an exposure to the system integrity of VM/XA System Product, as defined below.

IBM will continue its efforts to enhance the integrity of VM/XA System Product and to respond promptly when exposures are identified in VM/XA System Product and any subsequent releases. VM/XA SYSTEM PRODUCT SYSTEM INTEGRITY DEFINITION: VM/XA System Product control program system integrity is defined as the inability of any program running in a virtual machine not authorized by a VM/XA System Product control program mechanism under the customer's control and/or a guest operating system mechanism under the customer's control to:

- o Circumvent or disable the control program main or secondary storage protection.
- o Access a resource protected by the Resource Access Control Facility (RACF). Resources protected by RACF include virtual machines, mini-disks, and terminals.
- o Access a control program password-protected resource.
- o Obtain control in real supervisor state or with privilege class authority or directory capabilities greater than those it was assigned.
- o Circumvent the system integrity of any guest system which itself has system integrity as the result of an operation by any VM/XA System Product control program facility. Specifically, this includes MVS/370, MVS/XA, VM/SP, and VM/SP HPO Release 3 and subsequent releases, VM/XA Systems Facility Release 2 and VM/XA

System Product and subsequent releases.

Main storage protection refers to the isolation of one virtual machine from another. The control program accomplishes this by the use of hardware dynamic address translation, SIE guest storage extent limitation, and the Set Address Limit facility.

Secondary storage protection refers to the disk extent isolation implemented for minidisks/virtual disks through channel program translation.

Password-protected resource refers to resources protected by control program logon passwords and minidisk passwords.

Guest operating system refers to a control program that operates under the VM/XA System Product control program.

Directory capabilities refer to those directory options which control the use of functions intended to be restricted by specific assignment, such as those which permit system integrity controls to be bypassed or those not intended to be generally granted to users. CUSTOMER RESPONSIBILITIES: While protection of the customer's data remains the customer's responsibility, data security continues to be an area of vital importance to IBM. IBM's commitment to the system integrity of the VM/XA System Product environment, as described in this announcement, represents a further significant step to help customers protect their data.

Product documentation, subject to change, will describe what action must be taken and which facilities must be restricted to complement the system integrity support provided by VM/XA System Product. Such actions and restrictions may vary depending on the system, configuration, or environment. The customer is responsible for the selection, application, adequacy, and implementation of these actions and restrictions, and for appropriate application controls.

SECURITY, AUDITABILITY, AND CONTROL

VM/XA System Product includes several facilities to ensure the security and integrity of the system. Each guest and CMS user runs in a unique virtual machine definition which, in combination with IBM 370-XA architecture features, prohibits one user from accessing another's data in storage (unless specifically allowed through shared segments). Additionally, VM/XA System Product and IBM 370-XA channel facilities provide protection against channel programs accessing another user's virtual addresses. Minidisk security is provided by a password facility to control both read-only and read-write access. Both logon ID and password checking are provided to minimize unauthorized system access. User class restructure provides customers with a more granular ability to control access to commands and

DIAGNOSE codes through customer definition of classes. The VM/SP HPO Release 5 journaling function is not supported. RACF provides customers with many of these functions as well as other security considerations.

User management is responsible for evaluation, selection and implementation of these features, for administrative procedures, and for appropriate controls in application systems and communications facilities.

RELIABILITY, AVAILABILITY, AND SERVICEABILITY

VM/XA RAS has been enhanced with the following facilities:

- o IDs are provided in key system control blocks to aid systems programmers in analyzing storage dumps.
- o VM/XA System Product Release 1 introduces a redesign of the CCW translation function which improves product RAS characteristics through an improved functional organization and structure. This will result in easier diagnosis and quicker, more reliable fixes when a problem is encountered.
- o A protected end-user facility function as provided by VM/SP and VM/SP HPO has been introduced to VM/XA System Product Release 1 which improves the availability of customer application environments by reducing the exposure to errors involving forced user interaction with the control program component of VM. This may be of particular interest to installations with users inexperienced with control program interactions (i.e., users who typically only interact with a CMS application).
- o Terminal enhancements are provided which can improve the availability of a system. Installations can add or move displays

without necessarily having to reassemble the control data set (HCPRIO) or re-IPLing.

ORDERING INFORMATION

Ordering information will be provided at availability.

TERMS AND CONDITIONS

LICENSING: This program is licensed under the terms and conditions of the Agreement for IBM Licensed Programs.

GRADUATED CHARGES AMENDMENT APPLIES: Yes, for licenses acquired for a graduated one-time charge.

INSTALLATION OR LOCATION LICENSE APPLIES: No. A separate license is required for each designated machine on which the licensed program materials will be used, except as otherwise provided by IBM.

USAGE LICENSE: No.

EDUCATIONAL ALLOWANCE: A 15% educational allowance toward eligible

license charges is available to qualifying institutions in accordance with the Educational Allowance Amendment. The educational allowance is not additive to any other discount or allowance.

VOLUME DISCOUNT: This program is eligible for volume discounts. Additional information will be available prior to general availability.

WARRANTED:

Basic License - Yes.

DSLO - Not applicable.

LICENSED PROGRAM MATERIALS AVAILABILITY: Restricted Materials - Yes.

This licensed program will be available with source licensed program material for some modules designated as RESTRICTED MATERIALS OF IBM. In addition, some modules will be available without source licensed program material. These modules will be available in object code.

TESTING PERIOD:

Basic License - Two months.

DSLO - Not applicable.

PROGRAM SERVICES: Central service, including the IBM Support Center, for the basic license will be available until discontinued by IBM upon six months' written notice. Central service, including the IBM Support Center, for DSLO licenses will only be provided through the customer location designated for the basic license.

CHARGES

		Graduated		Monthly	
		One-Time		License	
		Charge		Charge	
Program	Processor				
Number	Group	Basic	DSLO	Basic	DSLO
5664-308	---	---	\$4,500	\$3,375	
30	\$112,500	\$84,375	--	--	
40	216,000	162,000	--	--	

ONE-TIME CHARGE UPGRADES:

	Basic	DSLO
30 to 40	\$103,500	\$77,625

GRADUATED CHARGES: The applicable graduated one-time charges will be based on the processor group of the designated machine on which the licensed program is licensed for use. The charge for processor group upgrades will be the difference in the current charges between the two groups. There will be no adjustment or refund for processor group downgrades. Licenses for which a customer has paid a one-time-charge may be redesignated to a processor in that group or any lower group.

PROGRAM UPGRADE CHARGES: Program upgrade charges apply for upgrades from VM/SP (5664-167) and/or VM/SP HPO (5664-173) to VM/XA System Product (5664-308). The program upgrade applies to orders for VM/XA System Product when it replaces either a VM/SP and/or a VM/SP HPO license that was obtained for a one-time charge and is discontinued upon installation of the new product. If the product (VM/SP and/or VM/SP HPO) is not discontinued, the full one-time charge applies to the new product (VM/XA System Product). These upgrade charges are effective through December 31, 1988.

Upgrade Price From: Group 30 Group 40

VM/SP (5664-167)

Basic	\$102,830	\$200,530
DSLO	77,120	150,390

VM/SP HPO (5664-173)

Basic	83,670	169,870
DSLO	62,750	127,400

VM/SP and VM/SP HPO

Basic	73,990	154,390
DSLO	55,500	115,800

ONE-TIME CHARGE: Customers who pay a graduated or non-graduated one-time charge for a licensed program receive enhancements and future releases, if any, at no additional charge. Significant new function may be offered as an optional feature and charged for separately. If a new version is announced and the customer elects to license the new version for a one-time charge and replace the prior version, an upgrade charge may apply.
