

File No. S370-99  
Order No. GC20-1813-1

**Systems**

# IBM Virtual Machine Facility / 370: Glossary and Master Index

## I Release 2 PLC 1

This publication consolidates the indexes of publications in the IBM Systems Library for the IBM Virtual Machine Facility/370. It also provides a reading plan and a glossary for these publications.

The master index lists topics alphabetically, and refers to publications where these topics are discussed. The indexes of these publications list the same topics and refer to specific pages.

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Second Edition (March 1974)

This a major revision of GC20-1813-0 and makes that edition obsolete. This edition applies to Release 2 PLC 1 (Program Level Change) of IBM Virtual Machine Facility/370 and to all subsequent releases unless otherwise indicated in new editions or Technical Newsletters.

Extensive changes have been made to this manual, and a new section has been added; therefore, the user should read it in its entirety.

Changes are periodically made to the specifications herein; before using this publication in connection with the operation of IBM systems, consult the latest IBM System/360 and System/370 Bibliography, Order No. GA22-6822, for the editions that are applicable and current.

Requests for copies of IEM publications should be made to your IBM representative or to the IBM branch office serving your locality.

A form for readers' comments is provided at the back of this publication. If the form has been removed, comments may be addressed to IBM Corporation, VM/370 Publications, 24 New England Executive Park, Burlington, Massachusetts 01803. Comments become the property of IBM.

This publication contains a consolidated and expanded Glossary of VM/370 terms and replaces glossaries in all VM/370 publications, except for that which appears in VM/370: Introduction.

This publication is also intended to direct VM/370 users seeking specific information to those publications that contain the needed information. The master index section consolidates the indexes from the following publications:

IBM Virtual Machine Facility/370:

Introduction, Order No. GC20-1800.

Planning and System Generation Guide, Order No. GC20-1801.

BASIC Language Reference Manual, Order No. GC20-1803.

Command Language Guide for General Users, Order No. GC20-1804.

EDIT Guide, Order No. GC20-1805.

Operator's Guide, Order No. GC20-1806.

System Programmer's Guide, Order No. GC20-1807.

OLTSEP and Error Recording Guide, Order No. GC20-1809.

Terminal User's Guide, Order No. GC20-1810.

EXEC User's Guide, Order No. GC20-1812.

The index entries are listed alphabetically, and refer to the publications where the topics are discussed. Indexes in these publications list the same topics and refer the reader to the specific pages containing the information sought.

Figure 1 illustrates a reading plan for the VM/370 library, with the publications grouped according to their probable users.

Virtual Machine Facility/370 (VM/370) Library  
 (Release 2 PLC 1)

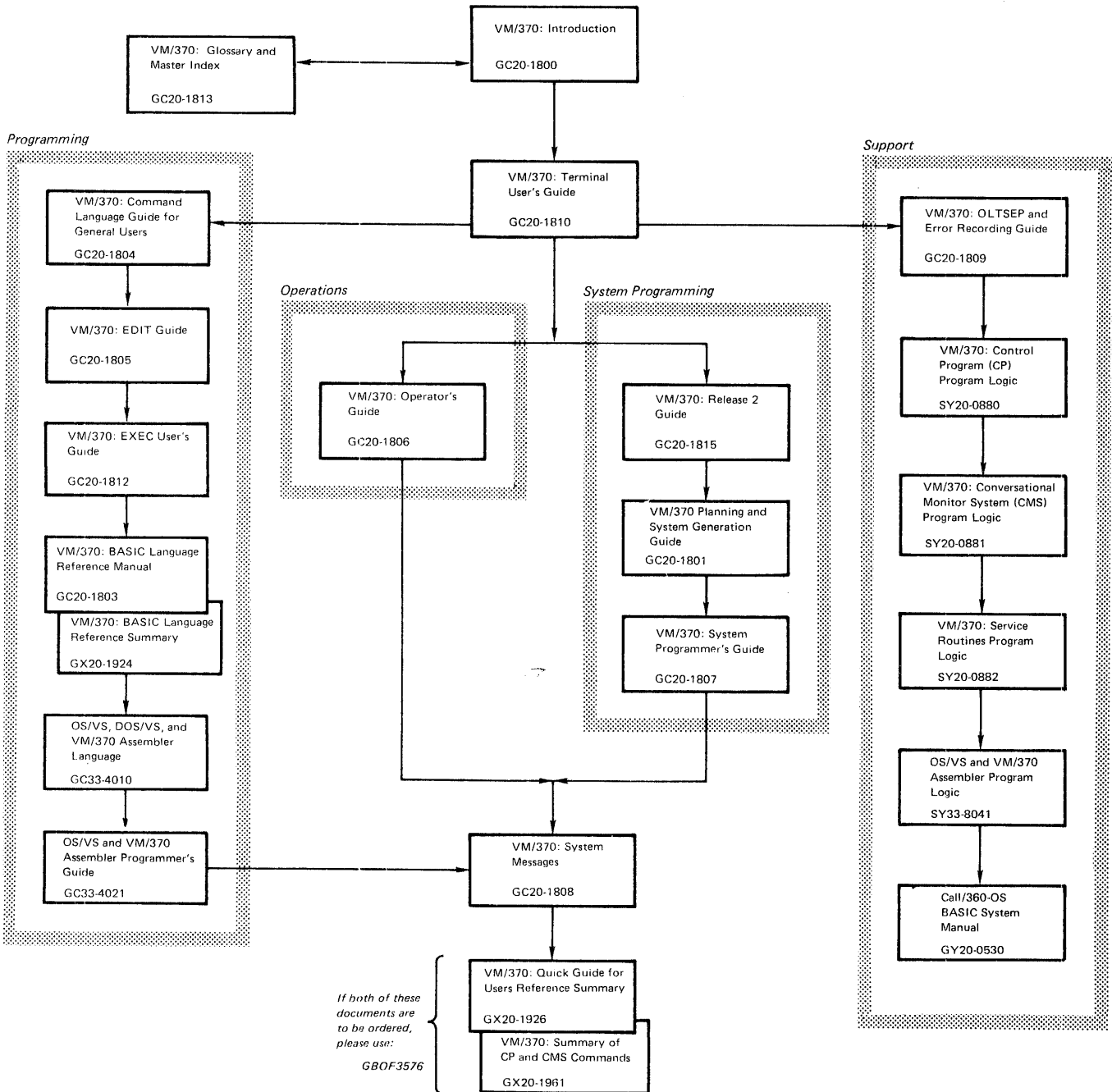


Figure 1. Virtual Machine Facility/370 Library

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This consolidated glossary defines terms that have special meaning in VM/370 publications. All other glossaries have been deleted from the VM/370 library, except for the glossary in the VM/370: Introduction.

For a more complete list of data processing terms, see the publication Data Processing Glossary, GC20-1699. Where a term has an asterisk (\*) preceding the listed meaning, it is an American National Standard definition.

abbreviations, command: Certain short forms of command names, options, and operands that are not truncations. For example, MSG instead of MESSAGE, and RDR instead of READER. Contrast with minimum truncation.

access mode: See filemode. See also disk extension.

active disk table (ADT): A table residing in the user's copy of the CMS nucleus that contains an entry for each valid filemode letter, that is, for each disk that has been accepted.

active file table (AFT): A table residing in the user's copy of the CMS nucleus that contains an entry for each disk file that is currently open.

active page: A page in real storage that has been referenced within a specified period of time.

address stop: An address that can be specified at the real or virtual console which, when addressed or fetched, causes a halt in processing. See also breakpoint, instruction address stop.

address translation: The process of changing the address of an item of data or an instruction from its virtual storage address to its real storage address. See also dynamic address translation.

alphameric characters: The characters A through Z, a through z, digits 0 through 9, and the special characters #, \$, and @.

attention interruption: An input/output interruption caused by a terminal user pressing the Attention key (or equivalent). See also signaling attention, Attention key.

Attention key: A key on some terminals that, when pressed, causes an I/O interruption in the central processing unit. Also referred to as the ATTN key. See also signaling attention.

ATTN key: See Attention key.

available frame count: A count of storage frames ready for reassignment.

available page queue: A list of the pages whose real storage is currently available for allocation to any task.

automatic logon: A process by which the primary VM/370 system operator's virtual machine is activated automatically during VM/370 initialization.

auxiliary directory: In CMS, an extension of the CMS file directory, which contains the names and locations of certain CMS modules that are not included in the CMS file directory.

A-disk: Same as primary user disk.

batch facility: See CMS Batch Facility.

BLIP facility, CMS: Provides a means of indicating to the user at a terminal, via a tilt/rotate of the Selectric type ball or the displaying of some specified character, every two seconds of real or virtual execution time that has elapsed for his CMS virtual machine.

breakpoint: A place in a routine specified by an instruction, instruction digit, or other condition, where the routine may be interrupted by external intervention or by a monitor routine. In VM/370, an instruction address stop that can be established via a CP or CMS command. See instruction address stop.

broadcast message: Information which can be sent by the system operator to all terminal users enabled to receive messages. The three major classes of messages are: (1) logon messages that are automatically displayed at the user's terminal when he logs on; (2) additional optional lower priority logon messages; (3) warning messages that alert users to some significant event or action that is imminent.

built-in functions: Same as EXEC built-in functions.

channel program translation: In a channel program, replacement by software of virtual cylinder, storage, and I/O device addresses with real addresses.

character-deletion character: Same as logical character delete character.

Class A user: See primary system operator.

Class Any user: Any user, regardless of class, who is allowed to use a subset of CP commands to log onto VM/370, have his terminal logically connected to a multiple-access virtual machine, or send messages to the operator or other users.

Class B user: See system resource operator privilege class.

Class C user: See system programmer privilege class.

Class D user: See spooling operator privilege class.

Class F user: See system analyst privilege class.

Class F user: See service representative privilege class.

Class G user: See general user privilege class.

clock, time-of-day (TOD): See time-of-day (TOD) clock.

clock comparator: A System/370 hardware feature required by VM/370 which provides a means of causing an interruption when the time-of-day clock has equaled or exceeded the value specified by a program or virtual machine.

CMS: Conversational Monitor System.

CMS Batch Facility: A facility that allows a user to run time-consuming or noninteractive CMS jobs in batch mode in another virtual machine dedicated to that purpose, thus freeing his own terminal and virtual machine for other work.

CMS file directory: A directory on each disk maintained by CMS that contains the name, format, size, and location of all the CMS files on the disk. When a disk is accessed via the ACCESS command, the directory is read into virtual storage and

identified with one of the ten disk mode letters -- A, B, C, D, E, F, G, S, Y, or Z.

CMS nucleus: The portion of CMS that is resident in the user's virtual storage whenever CMS is executing. Each CMS user receives a copy of the CMS nucleus when he performs an IPL of CMS. See also saved system, shared segment.

CMS primary disk: Same as primary user disk.

CMS system disk: One or more virtual disks that contain a copy of the CMS nucleus and/or the disk-resident CMS commands.

CMS system file: Any file residing on the CMS system disk instead of on a user's disk.

CMS user disk: One or more virtual disks containing CMS or read-only OS files that may be accessed by the user. If the user has read/write access to a disk, he may create and store programs and data files on the disk. Files are retained until the user deletes them. The user may also link to and access other users' disks, usually on a read-only basis.

cold start: A system restart that ignores previously maintained data areas and accounting information in main storage, and the contents of paging and spool files on CP-owned disks. Contrast with warm start.

command: A request from a user at a terminal for the execution of a particular function. The command may be the name of a CMS file with a filetype of EXEC or MODULE, or it may be a CP or CMS command. See also subcommand, user-written CMS commands.

command abbreviations: See abbreviations.

command privilege class: See privilege class.

command scan: In CMS, a routine that scans the command line entered and converts it to a standard CMS parameter list. See also parameter list.

console input buffer: Same as console stack.

console function: That subset of CP commands that allows the user to simulate almost all of the functions available to an operator at a real system console.

console spooling: See virtual console spooling.

console stack: A CMS facility that allows a user to set up one or more CMS command



and/or data lines (via appropriate EXEC or EDIT subcommands) that will be passed, one at a time, to CMS when CMS issues a read to the user's terminal. Synonymous with console input buffer, or terminal input buffer.

context editing: A method of editing a file without using line numbers. To refer to or change a particular line or a group of lines, all or part of the contents of that line are specified.

control terminal: Any terminal currently being used by the primary system operator (privilege class A), the resource operator (class B) or the spooling operator (class D) to control system resources.

Conversational Monitor System (CMS): A virtual machine operating system that provides general interactive time sharing, problem solving, and program development capabilities, and operates only under the control of the VM/370 control program.

CP: The VM/370 control program which manages the resources of a single computer such that multiple computing systems appear to exist. Each virtual machine is the functional equivalent of an IBM System/370.

CP command: A facility that allows the terminal user to control his virtual machine. The command facilities of the VM/370 control program (excluding its subsystem CMS) are referred to collectively as CP commands and the subset which performs console simulation are referred to as console functions.

CP-owned disk: Any disk that has been formatted by the CP FORMAT program; for example, the CP system residence volume, or any disk that contains CP paging, spooling, or temporary disk space.

CP privilege class: See privilege class.

CP trace table: A table used for debugging the VM/370 system that can record, in a wrap-around fashion, the chronological occurrences of events that take place in the real machine.

CPU timer: A System/370 hardware feature that provides a means of measuring elapsed CPU time and causes an interruption when a previously specified amount of time has elapsed. The CPU timer is decremented when the CPU is executing instructions, is in a wait state, and is executing program loading instructions, but not when the CPU is in a stopped state.

current line pointer: A pointer that indicates the line of a CMS file at which the Editor is currently working.

DAT: dynamic address translation.

dedicated channel: A channel that is attached to a virtual machine for its sole use, so that CP can bypass the address translation of virtual devices and CP's normal channel scheduling.

dedicated device: An I/O device or line that cannot be shared among users. The facility may be permanently assigned to a particular virtual machine via a VM/370 directory entry, or temporarily attached by the resource operator to the user's virtual machine.

default file attributes: In CMS, certain reserved filetype names that cause the CMS Editor to assume certain values for record length, tab settings, upper/lowercase setting, record sequence numbering, verification mode, record type, fixed or variable length record type, truncation column, and other related record characteristics.

default operand: An operand that has a preset value if omitted in the CP or CMS command line. Such an operand is indicated with an underscore, which shows the preset value.

delimiter: (1) A flag that separates and organizes items of data. Synonymous with separator. (2) A character that groups or separates words or values in a line of input. In VM/370, normally one or more blank characters are used to separate the command name and each operand or option in the command line. In certain cases, a tab, left parenthesis, or backspace character can also act as a delimiter.

demand paging: Transfer of a page from external storage to real storage only after that page is referenced during execution of the virtual machine. See also page-in.

Diagnose Interface: A means by which any virtual machine, including CMS, can communicate directly with CP via the System/370 DIAGNOSE instruction. Specific codes have been defined that allow efficient use of CP services by a virtual machine.

directory: See either CMS file directory or VM/370 directory.

disabled page fault: A page fault that occurs when input/output and external interruptions are disallowed by the CPU.

disconnect mode: An environment where a virtual machine is executing, but where it does not have a physical line or terminal connected as an operator console. Any attempt to issue a read to the console

causes the virtual machine to be logged off after 15 minutes have elapsed, unless the user logs on again within the 15-minute interval.

dispatching: The starting of virtual machine execution.

display paging: A technique, used by the CMS Editor for 3270 display devices, for scanning through a CMS file 10 or 20 lines at a time.

dormant state: A state in which the active pages of a virtual machine have been paged-out.

draining unit record devices: Stopping the spooling operations on a real unit record device or devices after the current spool file has completed.

dynamic address translation (DAT): (1) The change of a virtual storage address to a real storage address during execution of an instruction. See also address translation. (2) A hardware feature that performs the translation.

dynamically modified channel program: A channel program that is altered by the computer or by data being read in from a channel during the interval between the execution of the START I/O (SIO) instruction and the channel end interrupt.

EDIT macro: A special CMS EXEC file that allows you to invoke complex sequences of EXEC control statements and EDIT subcommands via a single command.

EDIT mode: The environment that allows the user to issue EDIT subcommands to insert, change, delete, or rearrange records in a CMS file.

enabled page fault: A page fault that occurs when input/output and external interruptions are allowed by the CPU.

escape character: Same as logical escape character.

EXEC built-in functions: Special EXEC keyword functions that can be invoked to provide specific types of information to a user's EXEC procedure.

EXEC control statements: Special statements that determine what is to be done within an EXEC procedure. The statements can be used: to control logic flow; to communicate with a terminal, a user program, or the VM/370 system; or to

create output files via the user's virtual punch.

EXEC user-defined variable: A special EXEC keyword variable that can be defined by a user and manipulated in an EXEC procedure.

EXEC procedure: A CMS function that allows users to create new commands by setting up frequently used sequences of CP and/or CMS commands, together with conditional branching facilities, into special procedures to eliminate the repetitious re-keying of those command sequences.

external page address: An address that identifies the location of a page in external page storage. The address consists of a cylinder number, a device number, and a page number.

external page storage: The portion of auxiliary storage that is used to contain 4K byte pages.

external page storage management: A set of routines in the paging supervisor that control external page storage.

favorable execution performance option: A virtual machine performance option that provides up to a specified portion of CPU time to a particular virtual machine.

fetch protection: A storage protection feature that determines right-of-access to main storage by matching the protection key associated with a main storage fetch reference with the storage keys associated with those frames of main storage.

file access mode: Designates whether the file can be used as read-only or read/write by a user.

fileid: A CMS file identifier consisting of a filename, filetype, and a filemode which is associated with a particular file when the file is created, defined, or renamed under CMS. See also filename, filetype, filemode.

filemode: A two-character field that is part of the CMS file identifier. The first character must be one of the ten disk mode letters A, B, C, D, E, F, G, S, Y and Z, and indicates the CMS file directory on which the file resides and whether the disk is a user virtual disk or a CMS system disk. The second character must be a number and indicates the file access mode of the disk. See also file access mode.

filename: A one- to eight-character alphameric field which is part of the CMS file identifier and serves to identify the file for the user.

filetype: A one- to eight-character alphameric field that is used as a descriptor or as a qualifier of the filename field in the CMS file identifier. See also reserved filetype.

frame number: The part of a real storage address needed to refer to a frame. See also page number, segment number.

full recording mode: See recording mode, full.

general user privilege class: The subset of CP commands that allow the Class G programmer or problem solver to manipulate and control his virtual machine.

IBCDASDI program: See virtual disk initialization function.

IBM Virtual Machine Facility/370 (VM/370): A time-sharing System Control Program that consists of: (1) a control program (CP) that manages the resources of an IBM System/370 computing system in such a way that multiple terminal users each have a functional simulation of an IBM System/370 (a virtual machine) at their disposal, and (2) the Conversational Monitor System (CMS), which provides general time sharing, program development, and problem solving facilities.

immediate command (CMS): A CMS command which, when issued after an Attention interrupt signal (such as pressing the ATTN key), causes any program execution currently in progress to be suspended until the immediate command is processed. The immediate commands are HO (halt SVC tracing), HT (halt typing or displaying), RT (resume typing or displaying), and HX (halt execution).

inactive page: A page in real storage that has not been referenced during a predetermined period of time.

input line: For typewriter terminals, information keyed in by a user between the time the typing element of his terminal comes to rest following a carriage return until another carriage return is typed. For display terminals, the data keyed into the user input area of the screen. See also user input area.

Installation Verification Procedure (IVP): A procedure distributed with the VM/370 system that exercises the newly generated VM/370 system to verify that the basic facilities of VM/370 are functioning correctly.

instruction address stop: An instruction address specified via a CP or CMS command, which, when fetched, causes the virtual machine to stop.

intensive recording mode: See recording mode, intensive.

interaction: A basic unit used to record system activity, consisting of acceptance of a line of terminal input, processing of the line, and a response, if any. An interaction is recorded when a user task starts its wait for a line of terminal input.

interactive user: A user who is designated by CP as conversational if the virtual machine uses a relatively small amount of CPU time between terminal input/output operations.

internal trace table: See CP trace table.

invalid page: A page that cannot be directly addressed by the dynamic address translation feature of the CPU.

IVP: Installation Verification Procedure.

line-deletion or line delete character: Same as logical line delete character.

line end character: Same as logical line end character.

line number: A number located at either the beginning or the end of a record that can be used in editing to refer to that line. See also prompting.

line number editing: A mode of operation under the EDIT command in which lines or records to be keyed in or modified are prompted for or referred to by specific line or record numbers. See also prompting.

load map: A map containing the storage locations of control sections and entry points of a program loaded into storage.

locally attached terminal: A terminal such as a 3277 Display Station whose control unit is directly connected to a computer's data channel. No telecommunications line or control unit is used.

local update procedure: The process by which a customer can add his own modifications or enhancements to VM/370 modules or source code during the generation of the CP and/or CMS systems.

locked page: A page that is not to be paged out.

logical editing characters: Characters which allow the user to correct keying errors, combine multiple lines of input on one physical line, and key in logical editing characters as data. The logical editing characters may be defined, reassigned or unassigned by the customer and/or the user. See also logical character delete character, logical escape character, logical line delete character, logical line end character.

logical character delete character: A special editing character, normally the AT (@) sign, that causes CP to delete it and the immediately preceding character from the input line. If a number of delete characters are keyed in consecutively, that same number of preceding characters are deleted from the input line. The value may be redefined or unassigned by the installation or the user.

logical escape character: A special editing character, normally the double quote (") character, that causes CP to consider the immediately following character as a data character instead of as a logical editing character.

logical line: A command or data line that can be separated from one or more additional command or data lines on the same input line by a logical line end character.

logical line delete character: A special editing character, normally the cent (¢) sign, that causes CP to delete the previous logical line in the input line back to (and including) the previous logical line end character. See also logical line.

logical line end character: A special editing character, normally the pound (#) sign, that allows the user to key in several command and/or data lines in the same physical line; that is, each logical line except the last line is terminated with the logical line end character.

logically connected terminal: Refers to a leased or switched line terminal or a locally attached terminal that is connected to a multiple-access virtual machine via the CP DIAL command. See also multiple-access virtual machine.

macro: Same as macro instruction.

macro instruction: A statement in a source language that is equivalent to a specified sequence of machine instructions.

main storage: (1) \* The general purpose storage of a computer. Usually, main storage can be accessed directly by the operating registers. Contrasts with auxiliary storage. (2) All program-addressable storage from which instructions may be executed and from which data can be loaded directly into registers. See also real storage and virtual storage.

master file directory block: Same as CMS file directory.

MINIDASD function: Same as virtual disk initialization function.

minidisk: Same as virtual disk.

minidisk directory: Same as CMS file directory.

minimum truncation: A shortened form of certain CP and CMS command names, operands and options that can be keyed in to reduce key strokes. For example, the ACCESS command has a minimum allowable truncation of two, so AC, ACC, ACCE, ACCES, and ACCESS would all be recognized by CMS as the ACCESS command. Contrast with abbreviations.

multiple-access virtual machine: A virtual machine running under VM/370 that supports teleprocessing terminals.

named system: See saved system.

native mode: Refers to running an operating system standalone on the real machine instead of under VM/370.

null line: A logical line with a length of zero; usually used to signal the Editor to terminate INPUT mode and enter EDIT mode. In VM/370, for typewriter terminals, a terminal input line consisting of a return as the first and only information or a logical line end character as the last character in the data line. For display devices, the cursor positioned at the beginning of the user input area or contains data that ends with a logical line end character.

operating system: Software which controls the execution of computer programs and which may provide scheduling, debugging, input/output control, accounting, compilation, storage assignment, virtual storage management, data management, and related services.

ordered seek queuing: A technique used by the CP I/O supervisor to schedule DASD I/O operations for non-dedicated disks in an orderly progression from lower to higher cylinder numbers so that I/O operations for cylinders that are located at or near the present cylinder are handled before attempting to handle DASD accesses located at more distant higher cylinders. When the highest cylinder is reached, the progression is reversed from high to low. This tends to minimize average seek times and to allow a greater level of I/O activity compared to initiating DASD seeks on an arbitrary "first come, first served" basis.

output display area: For display devices, the upper portion of the display screen that contains a historical log of the most recent lines of console input to and output from the virtual machine and CP. On the 3270, this area is protected, that is, the user is unable to key information into it. This display format is not used by the CMS Editor.

page: (1) A fixed-length block of instructions, data, or both, that can be transferred between real storage and external page storage. VM/370 and VS2 support 4K pages. DOS/VS and VS1 use 2K pages. (2) To transfer instructions, data, or both between real storage and external page storage.

pageable nucleus: Less frequently used portions of the CP nucleus that are not normally resident in real main storage.

page fault: A program interruption that occurs when a page that is marked "not in real storage." See also page translation exception.

page fixing: Same as page locking.

page frame: A block of real storage that contains a page. See also storage block.

page frame table: A table (called the CORTABLE) that contains an entry for each frame. Each frame table entry describes how the frame is being used.

page-in: The process of transferring a page from external page storage to real storage.

page locking: Marking a page as nonpageable so that it remains in real storage until released.

page number: The part of a virtual storage address needed to refer to a page. See also frame number, segment number.

page-out: The process of transferring a page from real storage to external page storage.

page reclamation: The process of making available and addressable the contents of a page in real storage that is waiting to be (or already has been) paged out. Page reclamation can occur after a page fault or after a request to fix or load a page, as long as no page-in operation has been scheduled for that particular page frame.

page table: A table (labeled PAGTABLE) that indicates whether or not a page is in real storage and that correlates virtual addresses with real storage addresses.

page translation exception: A program interruption that occurs when a virtual address cannot be translated by the hardware because the invalid bit is set in the page table entry for that address. See also page fault, segment translation exception, translation specification exception.

page wait: A condition in which a task or virtual machine is placed in a wait state while a requested page is brought into real storage. When any partition or region of a virtual machine operating system is in a page wait situation, the CP dispatcher selects another virtual machine for execution regardless of whether other partitions or regions of the first virtual machine are ready for execution. Therefore, the highest priority partition in a virtual machine uses up a greater percentage of the time slice allocated to that virtual machine than if the operating system were running standalone on the real System/370.

page zero: Storage locations zero to 4095.

paging: The process of transferring pages between real storage and external page storage.

paging activity indexes: Values that affect the algorithm used by CP in controlling the dispatching and scheduling of all active logged-on virtual machines.

paging area: An area of direct access storage that is used by CP for the

temporary storage of pages when paging occurs.

paging device: A direct access storage device on which pages are stored.

paging rates: The average number of page-ins and page-outs per unit of time.

paging supervisor: A part of the CP nucleus that allocates and releases real storage page frames for pages, selects the appropriate paging device, and initiates page-in and page-out operations based on ordered seek queuing and slot sorting techniques. See also ordered seek queuing, slot sorting.

parent directory: The directory for a CMS disk that has a disk extension defined for it via the ACCESS command.

parameter list: In CMS, a string of eight-byte arguments pointed to by general register 1, which is used to call a CMS command or function. The first argument must be the name of the command or function to be called.

password: In VM/370, a one- to eight-character symbol that the user is required to supply at the time he logs on to identify himself to VM/370. The password is normally protected from inadvertent disclosure to unauthorized personnel by not displaying or by masking the password as it is keyed in. A password may also be assigned to a virtual disk to control or limit access to that disk.

performance option: One or more functions that can be assigned to a virtual machine to improve its performance, response time (if terminal-oriented) and/or throughput under VM/370.

PER: program event recording.

PFnn keys: Same as Program Function (PFnn) keys.

PLC: Program Level Change tape.

preferred virtual machine: Refers to a particular virtual machine to which one or more of the performance options have been assigned.

primary paging device: The direct access storage device with the highest effective data rate available for use by CP. CP will always attempt to store pages on this paging device instead of on slower paging devices as long as space is available.

primary system operator: The first CP privilege class A user that is logged on to VM/370 after system initialization. This

operator has primary control over the VM/370 system, and can enable and disable teleprocessing lines, lock and unlock pages, force users off the VM/370 system, issue warning messages, query, set (and reset) performance options for selected virtual machines, and invoke VM/370 accounting. If the current primary operator logs off, the next class A user to log on becomes the primary system operator.

primary user disk: A virtual disk allocated to a CMS user that is accessed as his A-disk on which he can create or store files. Such files are retained until he requests that they be deleted. See also virtual disk.

print inhibit: A hardware feature available on some typewriter terminals, such as the 2741, which permits the user to key in information via the keyboard without causing the data to be typed out on the terminal's typewriter.

priority performance option: A virtual machine parameter that influences the internal scheduling algorithm of the VM/370 control program. The lower the priority value specified, the higher the priority of the virtual machine.

privilege class: One or more classes assigned to a via a VM/370 user directory entry that allows him access to a logical subset of all the CP commands.

privileged instruction: An instruction that can be executed only when the central processing unit is in the supervisor state.

privileged instruction simulation: The CP-incurred overhead to handle privileged instructions for virtual machine operating systems that think they are in supervisor state but which are executing in problem state under VM/370.

problem state: A state during which the central processing unit cannot execute input/output and other privileged instructions. Contrast with supervisor state. VM/370 runs all virtual machines in problem state. See also privileged instruction simulation.

processor storage: General purpose storage that is part of a central processing unit. Synonymous with real storage.

Product and Support Requirements Request: A mechanism by which customers and IBM personnel can provide feedback to the developers of a program, system, or System Control Program (SCP) indicating deficiencies that need correction, or major new functional and/or device support that should be added.

PROFILE EXEC: A special EXEC procedure with a filename of PROFILE which can be created by a user. The procedure is normally executed immediately after CMS is loaded into his virtual machine.

Program Function (PFnn) keys: Special keys available on 3270 terminals which can be defined as elementary cataloged procedures equivalent to one or more CP or CMS command lines, or input data for a virtual machine. A Program Function key may also be defined to provide a function equivalent to tabbing for 3270 terminals. When the PFnn key is pressed, the function or functions are performed, and the full command line can be displayed on the screen.

program event recording (PER): A hardware feature used to assist in debugging programs by detecting program events.

Program Level Change (PLC) tape: The VM/370 PLC is a system update service that can include new functions as well as cumulative system changes. The latest PLC tape periodically made available at PID contains all new updates, as well as all previous updates since the last VM/370 release base.

prompting: An interactive technique that makes it easier for a user to supply information to a program. The program types out or displays a request, question, message, or number, and the user keys in the desired response. The process is repeated until all necessary information has been supplied.

protected field: For 3270 display terminals, a field that cannot be keyed into by the user. Any attempt by the user to key data into this area results in the keyboard being locked.

PSRR: Product and Support Requirements Request.

queue 1: The dispatching queue of interactive users. The number of users that can be contained in queue 1 is determined by the dispatcher from the amount of real storage available to the VM/370 control program. The time slice given to an interactive user is much shorter than for a non-interactive user, but his virtual machine is dispatched much more frequently.

queue 2: The dispatching queue of non-interactive users. The queue is ordered by priority and limited in size by the availability of system page frames and the user's paging activity.

quiet recording mode: See recording mode, quiet.

read-only access: An access mode associated with a virtual disk which allows a user to read but not write any file on the disk.

read-only system residence disks: See shared read-only system residence disks.

read/write access: An access mode associated with a virtual disk which allows a user to read and write any file on the disk.

real address: (1) The address of a location in real storage. (2) The address of a real I/O device.

real storage: (1) In System/370 virtual storage systems, the storage of a System/370 computing system from which the central processing unit can directly obtain instructions and data, and to which it can directly return results. (2) Same as processor storage.

recording mode, full: The mode of operation where transient CPU and/or main storage errors that are corrected or circumvented by hardware retry or error correction code logic are recorded on the VM/370 error recording cylinders.

recording mode, intensive: A special error recording mode that can be invoked by a Customer Engineer (CE) for only one I/O device at a time. On the first through tenth unit check or other error condition specified by the CE, an I/O error record is constructed, formatted, and written out onto the VM/370 I/O error recording cylinder, after which no further errors are recorded.

recording mode, quiet: The mode of operation where transient CPU and/or main storage errors that are corrected or circumvented by hardware retry or error correction code logic are not recorded on the VM/370 error recording cylinders. This mode is entered via the SET MODE RETRY QUIET command or after 12 transient machine checks have occurred while in full recording mode.

Recovery Management Support (RMS): The facilities that gather information about hardware reliability and allow retry of operations that fail because of CPU, main storage, I/O device, or channel errors.

relocate hardware: Same as dynamic address translation.

reserved filetypes: A special group of filetypes which have specific default attributes such as record size, tab settings, truncation column, and upper/lowercase characters associated with that particular filetype. The Editor will create a file according to those attributes, and certain CMS commands will search for and only act on or execute CMS files that have specific filetypes.

reserved page frame performance option: A virtual machine option that reserves an essentially private set of page frames for use by one virtual machine and allows the most recently active pages of a virtual machine's storage to remain allocated in real storage.

response time: (1) The time between the submission of an item of work to a computing system and the return of results. (2) In systems with time sharing, the time between the end of a block or line-character of terminal input and the display of the first character of system response at the terminal.

RMS: Recovery Management Support.

saved system: A special nonrelocatable copy of a virtual machine's virtual storage and associated registers that is kept on a CP-owned disk and that can be loaded by name instead of by I/O device address to substantially reduce the time it takes to IPL the system in a virtual machine. In addition, a saved system such as CMS can also share one or more 64K segments of reenterable code in real storage between virtual machines. This reduces the cumulative real main storage requirements and paging demands of such virtual machines.

screen attribute byte: A byte that takes up a character position on the 3270 screen that defines the characteristics of the following field on the screen; such as protected, not protected, displayable or nondisplayable. The user is not allowed to set or change screen attribute bytes if the 3270 is used as the virtual console of a virtual machine.

scrolling: In the CMS Editor, a technique used with the 3270 display terminal to scan quickly in a forward or backward direction a fixed number of records (normally 20) at a time.

S-disk: See CMS system disk.

secondary paging device: An auxiliary storage device that is not used for paging

operations until the available space on primary paging devices falls below a specified minimum. Portions of a secondary paging device can be used for purposes other than paging operations.

segment: (1) A contiguous 64K or 1024K area of virtual storage (not necessarily contiguous in real storage) that is allocated to a job or system task. (2) VM/370 does not use 1024K segments, but will support any virtual machine operating system that uses 1024K segments.

segment number: The part of a virtual storage address needed to refer to a segment. See also frame number, page number.

segment table: A table used in dynamic address translation to control user access to virtual storage segments. Each entry indicates the length, location, and availability of a corresponding page table.

segment table entry: An entry in the segment table that indicates the length, location, and availability of a corresponding page table.

segment translation exception: A program interruption that occurs when a virtual address cannot be translated by the hardware because the invalid bit in the segment table entry for that address is set. See also page translation exception, translation specification exception.

separator: See delimiter.

service representative privilege class: The CP privilege class F user, normally an IBM Field Engineer, is permitted to set or change the level of detail of I/O device error recording to the level desired. See also recording mode (full, intensive, and quiet).

service routines: CP or CMS routines used for addressing and updating directories, formatting or initializing disks, or performing disk, tape, or terminal input/output functions.

shadow page table: A page table created and used by CP to control the virtual storage of a virtual machine operating system such as DOS/VS and OS/VS that itself can perform paging on a real machine.

shared read-only system residence disk: A system residence disk that has been modified so that most of the system residence information is read-only and accessible to all relevant virtual machines, leaving only a relatively smaller private read/write system disk that must be dedicated to each virtual machine. This



technique can substantially reduce the disk requirements of an installation by avoiding needless duplication of disk packs by virtual machines which use the same operating system. See also saved system.

shared segment: A feature of a saved system that allows one or more segments of reentrant code in real storage to be shared among many virtual machines. For example, if a saved CMS system was generated, segment 1 of the CMS nucleus is shared in real storage among all CMS virtual machines loaded by name, that is, every CMS machine's segment of virtual storage maps to the same 64K of real storage. See also saved system.

shared system: See saved system, shared read-only system residence disk.

signaling attention: Indicates that a user has pressed a key or keyed in a CP command to present an attention interrupt to CP or to his virtual machine.

sleep mode: An environment where the virtual machine is in a dormant state, that is, the virtual machine is not running, but connect time still accumulates, and messages may be displayed at the terminal. The virtual machine is reactivated when the user signals attention to CP. See also signaling attention.

slot sorting: A technique used by the CP paging supervisor to reduce the number of separate channel programs needed to read from or write pages on a paging device. This is accomplished by grouping, in the same channel program, the reading or writing of pages which occur in different relative record positions on the same track or within the same cylinder. See also ordered seek queuing.

soft error: See transient error.

spool file class: A one-character class associated with each virtual unit record device that allows the user to control which input spool files are read next, and allows the spooling operator to better control or reorder the printing or punching of spool files having similar characteristics or priorities. The spool file class value can be A-Z, 0-9, or \*.

spoolid: A CP-assigned number from 0001 to 9999 unique to that spool file that is automatically assigned when the file is closed. To identify a given spool file, it is necessary to specify the owner's userid and virtual device type as well as the spoolid.

spooling: The reading and writing of unit record input and output data on auxiliary

storage devices concurrently with job execution, in a format convenient for later processing or output operations.

spooling area: Any direct access storage area temporarily used by VM/370 to store input for a virtual card reader, output for a virtual printer or punch, or a console log of input/output for a virtual console.

spooling operator privilege class: The CP privilege class D user who controls the real unit record equipment and all closed spool files.

spooling unit record I/O: See virtual spooling devices, spooling.

stack: See console stack.

static CP area: Those portions of storage that are allocated to CP during system generation and IPL.

subcommand: The commands of processors such as EDIT and EXEC that run under CMS.

storage block: A 2K block of real storage to which a storage key can be assigned.

supervisor state: A state during which the central processing unit can execute input/output and other privileged instructions. Contrast with problem state.

SVC 76 Error Recording Interface: A means for VM/370 to record the error incidents encountered by certain operating systems running in a virtual machine under VM/370. When the virtual operating system issues SVC 76, VM/370 translates the virtual storage and I/O device addresses to the real ones, records the information on the VM/370 error recording cylinder, and returns control to the virtual machine, bypassing the virtual machine's own error recording routine, thus avoiding duplicate recording of the same errors.

synonym: In CMS, an alternative command name defined by the user and/or the installation as equivalent to an existing CMS command name and created in a CMS file with a filetype of SYNONYM. Issuing the SYNONYM command allows use of those synonyms for that terminal session or until use of synonyms is revoked by issuing the SYNONYM command with no operands.

system analyst privilege class: The CP privilege class E user, normally the VM/370 system analyst, who can query, examine, and print or display, but not modify, certain areas of the CP nucleus, and can create saved systems. See also saved systems.

system programmer privilege class: The CP privilege class C user, normally the VM/370

system programmer, who can modify any real storage locations in the machine.

system resource operator privilege class: The CP privilege class B user, who controls all the other real resources of the machine, such as main storage, disk and tape drives, not controlled by the primary system or spooling operators.

system restart: The restart that allows reuse of previously initialized areas. System restart usually requires less time than IPL. See also warm start.

temporary disk: An area on a direct access storage device allocated to the user at logon time or allocated via the CP DEFINE command on which his newly created or stored files are retained until he logs off, at which time the area is released.

terminal I/O wait: The condition of a task that cannot continue processing until a message is received from a terminal.

terminal input buffer: Same as console stack.

terminal session: The period of time from logon to final logoff when a user and his virtual machine can utilize the facilities of CP, CMS, and/or his operating system. This includes any time that the virtual machine is running in disconnect mode. See also disconnect mode.

terminal user: Anyone who is eligible to log on.

text library: A CMS file that contains relocatable object modules and a directory that indicates the location of each of these modules within the library.

thrashing: A condition in which the system cannot do much useful work because of excessive paging.

time-of-day (TOD) clock: A System/370 hardware feature required by VM/370 which is incremented at least once every microsecond, and provides a consistent measure of elapsed time suitable for the indication of date and time. The TOD clock runs regardless of whether the CPU is in running, wait, or stopped states.

timeout, LOGON: For a terminal that is attempting to log onto VM/370 via a switched line, the Line Timeout hardware feature of a telecommunications control

unit that logs off the user if he does not key in any character for a specified period of time, normally 28 seconds. If logged off, the user must dial the VM/370 computer again.

time share: To use a device or system for two or more interleaved purposes.

time sharing: A method of using a computing system that allows a number of users to execute programs concurrently and to interact with the programs during execution.

time slice: (1) A uniform interval of time on the central processing unit allocated for use in performing a task. Once the interval has expired, CPU time is allocated to another task; thus, a task cannot monopolize CPU time beyond a fixed limit.

(2) In systems with time sharing, a segment of time allocated to a terminal job. In VM/370, interactive users get much shorter time slices than non-interactive users, but are normally dispatched more frequently.

time slicing: (1) A feature that can be used to prevent a task from monopolizing the central processing unit and thereby delaying the assignment of CPU time to other tasks. (2) In systems with time sharing, the allocation of time slices to terminal jobs.

token: An eight-character symbol created by the CMS EXEC interpreter when it scans an EXEC statement line. Words longer than eight characters are truncated to eight characters

trace table: See CP trace table.

transient error: For System/370, any CPU or main storage condition that is detected and corrected or circumvented by retry or error correction code logic.

translate mode: When virtual addresses are converted to real addresses via segment and page tables.

translation specification exception: A program interruption that occurs when a page table entry, segment table entry, or certain control registers contain information in an invalid format. See also page translation exception, segment translation exception.

translation table: See page table and segment table.

truncation, minimum: See minimum truncation.

universal class card reader: A virtual card reader with a spool file class of \* (asterisk) that can read any class of reader, printer, or punch files that have been spooled or transferred to it.

user directory: Same as VM/370 directory.

user disk: Same as CMS user disk.

user identification: A one- to eight-character alphanumeric symbol identifying each terminal user. Abbreviated userid.

userid: See user identification.

user profile table: A table of user attributes (called the VMBLOCK) built for each active user from information gathered during logon.

user-defined CMS command: See user-written CMS command.

user input area: For display devices, the bottom two lines of the screen where the user is required to key in command or data lines. This screen format is not used with the CMS Editor.

user-written CMS command: Any user's CMS file that has a filetype of MODULE or EXEC that may be executed as if it were a CMS command by issuing the filename followed by any operands or options expected by the program.

verification mode: A mode of operation under the EDIT command in which all EDIT subcommands are acknowledged and any textual changes are typed or displayed as they are made.

virtual address: An address that refers to virtual storage or a virtual I/O device address, and must, therefore, be translated into a real storage or I/O device address when it is used.

virtual card reader: A simulation on disk by CP of a real card reader, but having the ability to read card, punch, or printer records of up to 151 characters in length. The default spool file class is asterisk (\*). The virtual device type and I/O device address are normally defined in the VM/370 user directory. See also spool file class, universal card reader.

virtual computing system: Same as virtual machine.

virtual console function: A CP command that is executed via the Diagnose Interface.

virtual console spooling: The process of creating a spooled copy of his console input/output on disk instead of, or in addition to, having it typed or displayed at his terminal. The console data includes messages, responses, commands, or data from or to CP and the virtual machine operating system. The user can invoke or terminate console spooling at any time and as often as he likes. When the console spool file is closed, it becomes a printer spool file.

virtual CPU time: The time required to execute the instructions of the virtual machine.

virtual disk: A logical subdivision (or all) of a physical disk pack that has its own virtual device address, consecutive virtual cylinders (starting with cylinder zero), and a VTOC or disk label identifier. Each user virtual disk is preallocated and is defined via VM/370 directory entries as belonging to some user. Synonymous with minidisk.

virtual disk initialization function: The IBCDASDI program, which now has the ability to initialize virtual as well as real disks for use by DOS, DOS/VS, OS, and OS/VS virtual machines running under VM/370.

virtual machine: A functional simulation of an IBM System/370 computing system. Each virtual machine is controlled by a suitable operating system. VM/370 controls the concurrent execution of multiple virtual machines on a single real System/370.

Virtual Machine Assist feature: A hardware feature available on the System/370 Models 135, 145, and 158, which causes a significant reduction in the real supervisor state time used by VM/370 to control the operation of virtual storage systems such as DOS/VS and OS/VS and, to a lesser extent, CMS, DOS, and OS when running under VM/370. This reduction in VM/370 supervisor state time is accomplished by having the Virtual Machine Assist feature instead of VM/370 handle page invalid situations and certain privileged instructions, including some SVC interrupt handling, for virtual machines.

virtual printer (or punch): A printer (or card punch) simulated on disk by CP for a virtual machine. The machine type and virtual I/O address is normally defined in the VM/370 directory entry for that user's virtual machine.

virtual spooling device: Unit record devices simulated on disk by CP, with the machine type and virtual I/O device addresses defined in the VM/370 user directory or via the CP DEFINE command. CP's spooling facilities allow multiple

virtual machines to share more efficiently the real unit record devices. In addition, VM/370 has extended the concept of spooling to include the logging of all I/O to and from the virtual console. See also virtual card reader, virtual printer (or punch), virtual console spooling.

virtual storage: Addressable space that appears to the user as real storage from which instructions and data are mapped into real storage locations. The size of virtual storage is limited by the addressing scheme of the computing system or virtual machine and by the amount of paging disk space available, rather than by the actual number of real storage locations.

virtual=real performance option: A virtual machine option that permits storage of a virtual machine to have the same range of addresses as real storage, except page zero which must be relocated. It is used for programs that dynamically modify channel programs and for improved performance under VM/370.

VM/370: See IBM Virtual Machine Facility/370.

VM/370 directory: A CP disk file that defines each virtual machine's normal configuration; the user's userid, password, normal and maximum allowable virtual storage, CP command privilege class or classes allowed, dispatching priority, logical editing characters to be used, account number, and CP options desired.

VM/370 user directory: See VM/370 directory.

warm start: (1) Same as system restart. (2) The automatic reinitialization of the VM/370 control program that occurs if the control program cannot continue processing. Closed spool files and VM/370 accounting information are not lost and still contain valid data. (3) The result of an IPL during which previous system data is not destroyed.

working set: The working set size of a virtual machine is the estimated main storage that the virtual machine will need in order to run without causing a thrashing condition.

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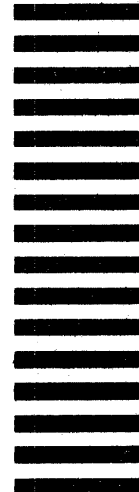
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Printed in U.S.A. GC20-1813-1



**International Business Machines Corporation  
Data Processing Division  
1133 Westchester Avenue, White Plains, New York 10604  
(U.S.A. only)**

**IBM World Trade Corporation  
821 United Nations Plaza, New York, New York 10017  
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