OpenVMS Glossary

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This document contains definitions for commonly used terms in documentation of the OpenVMS operating system.

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Preface

Intended Audience

This document is intended for all users of OpenVMS documentation.

Document Structure

The terms are presented in alphabetical order. They have not been grouped into categories.

Conventions

In this manual, every use of OpenVMS AXP means the OpenVMS AXP operating system, every use of OpenVMS VAX means the OpenVMS VAX operating system, and every use of OpenVMS means both the OpenVMS AXP operating system and the OpenVMS VAX operating system.

_____ **Note** _____

In this document, discussions that refer to VMScluster environments apply to both VAXcluster systems that include only VAX nodes and VMScluster systems that include at least one AXP node unless indicated otherwise.

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Glossary

$allocation-class$

Part of a naming convention for physical devices. This convention is described in the *OpenVMS Cluster Systems* manual.

"a" character

The subset of ASCII characters that are allowed in the labels of ANSI-labeled magnetic tape.

abort

An exception occurring in the middle of an instruction that sometimes leaves the registers and memory in an indeterminate state such that the instruction cannot necessarily be restarted.

absolute time

A value expressing a specific date (month, day, and year) and time of day. Absolute time values are always expressed in the system as positive numbers.

access control

(1) Restrictions on the ability of a subject (user or process) to use the system or an object in the computing system. Authentication of the user name and password controls access to the system, while protection codes and access control lists regulate access to protected objects in that system.

(2) In DECnet for OpenVMS, the process of screening inbound connect requests and verifying them against a local system account file.

access control entry (ACE)

An entry in an access control list. ACEs may specify identifiers and the access rights to be granted or denied the holders of the identifiers, default protection for directories, or security alarm details. ACLs for each object can hold numerous entries, limited only by overall space and performance considerations.

access control list (ACL)

A list that defines the kinds of access to be granted or denied to users of an object. Access control lists can be created for objects such as files, devices, and mailboxes. Each ACL consists of one or more entries known as access control list entries.

access control string

A series of 0 to 42 characters that contains login information to be sent to a remote node. An access control string usually consists of a username, spaces or tabs, and a password.

access mode

A processing mode that determines which instructions a processor can execute and which locations in memory it can read and write. The four processor access modes (in order from most to least privileged and protected) are: kernel (mode 0), executive (mode 1), supervisor (mode 2), and user (mode 3). When the processor is in kernel mode, the executing software has complete control of, and responsibility for, the system. The processor status longword contains the current access mode field. The operating system uses access modes to define protection levels for software executing in the context of a process. For example, the executive service and most system services run in kernel mode and are most protected. OpenVMS Record Management Services (RMS) and some system services run in executive mode. The command interpreter is less protected and runs in supervisor mode. The debugger runs in user mode with the same privileges and protection as normal user programs. See *record access mode*.

access type

(1) The way a procedure accesses its arguments. See *record access type*

(2) The right to perform an operation on a protected object. A security policy can require multiple access rights to complete an operation. A file, the most commonly accessed object, can require read, write, execute, delete, or control access.

access violation

An exception that takes place on an attempt to reference an address that is either not mapped into virtual memory or not accessible by the current access mode.

account

Every user must have an account to use the system. The account is identified by the user's username. Different accounts allow different levels of service from the system (for example, the privileges users hold, the times during which they can log in, and so on).

accounting file

A file that contains information about system resource use. The information is stored in binary format: you cannot print it with the PRINT command or type it with the TYPE command. To process the accounting file, use the Accounting utility. See *current accounting file*.

account name

The string in the account field of the user authorization file (UAF) that shows the name of the user's accounting group.

ACE

See *access control list entry*.

ACL

See *access control list*.

ACP

See *ancillary control process*.

active component

A network component whose operational state is other than OFF. The ACTIVE keyword can be used with the Network Control Program (NCP) commands SHOW or LIST to display information about active lines, circuits, nodes, and logging.

active member

A shadow set member that is fully consistent with all other active members of the shadow set.

active set

In a symmetric multiprocessing system, those processors that have been bootstrapped into the system, have undergone initialization, and are capable of scheduling and executing processes. Together, the primary processor and all secondary processors make up a system's active set. See *available set*.

adapter control block (ADP)

A structure in the I/O database that describes an adapter or device controller and the I/O interconnect to which it is attached.

address

A number used by the operating system and user software to identify a storage location in memory. See *virtual address* and *physical address*.

address access type

A type of access in which the specified operand of an instruction is not accessed directly by the instruction. The address of the specified operand is the actual instruction operand, and the context of the address calculation is determined by the data type of the operand.

address space

The set of all possible addresses available to a process. Virtual address space refers to the set of all possible virtual addresses. Physical address space refers to the set of all possible physical addresses transmitted on the processor-to-memory interconnect.

adjacent node

A network node connected to the local node by a single physical line.

ADP

See *adapter control block*.

affinity

In a symmetric multiprocessing system, a close association of a device or a process with a specific processor or set of processors in the system. See *device affinity* and *process affinity*.

alarm

See *security alarm*.

alert

A mechanism by which a thread informs either itself or another thread to terminate as soon as possible. *Alert* and *cancel* have the same meaning.

alertable

A routine in which synchronous alert delivery can occur only at specific, well-defined points. These points are DECthreads routines that determine if an alert is pending and, if so, deliver the alert.

alertsafe

A routine that can be called without risk of triggering an alert while asynchronous delivery of alerts is enabled.

alignment

Placement of a data item at an address in memory that is an even multiple of some machine-dependent unit, such as a longword or quadword. See *natural alignment*.

allocating

Reserving a particular device unit for exclusive use. A user process can allocate a device only when that device is not allocated by any other process.

allocation class

A unique number between 0 and 255 that the system manager assigns to a pair of hosts and to the dual-pathed devices that the hosts make available to other nodes in the VMScluster configuration. (Allocation class 0 is used to denote that the node is not a member of any allocation class.) The allocation class provides a way for users to access dual-pathed devices through either of the hosts. In this way, if one host of an allocation class set is not available, the user can gain access to a device specified by that allocation class through the other host of the allocation class.

Alpha Primary Bootstrap (APB)

The primary bootstrap program that initializes an AXP system with OpenVMS AXP. The program is located in the boot block of physical memory and is the first program read by the CPU when a processor is booted after it has been halted.

alphanumeric character

An uppercase or lowercase letter, a dollar sign, an underscore, or a decimal digit.

alphanumeric UIC

A format of user identification code (UIC) that specifies the user's group (optional) and member in alphanumeric form rather than numeric form.

alternate key

An optional key within the data records in an indexed file; used by OpenVMS Record Management Services (RMS) to build an alternate index. See *key indexed files* and *primary key*.

American Standard Code for Information Interchange (ASCII)

A set of 8-bit binary numbers representing the alphabet, punctuation, numerals, and other special symbols used in text representation and communications protocol.

ancillary control process (ACP)

A process that acts as an interface between user software and an I/O driver. An ACP provides functions supplemental to those performed in the driver, such as file and directory management. Two examples of ACPs are the magnetic tape ACP and the network ACP.

AP

See *argument pointer*.

APB

See *Alpha Primary Bootstrap*.

application

A set of tasks related by the business activity they support and controlled as a single unit. See *transaction processing*.

area

(1) A region of an indexed file maintained by OpenVMS Record Management Services (RMS) that allows a user to specify placement or specific bucket sizes or both for particular portions of a file. An area consists of any number of buckets; there may be from 1 to 255 areas in a file.

(2) A group of nodes in a network that can run independently as a subnetwork.

area router

See *level 2 router*.

area routing

A technique for grouping the nodes in a network into areas for routing purposes. Routing in a multiple-area network is on two levels, with one level of routing within an area (called level 1 routing) and a second, higher level of routing between areas (called level 2 routing). Area routing permits a DECnet for OpenVMS network to support the configuration of very large networks.

argument information register

On AXP systems, integer register 25 (R25). In a standard call this register describes the argument list.

argument list

A vector of entries (longwords on VAX systems and quadwords on AXP systems) that represent a procedure parameter list and possibly a function value.

argument pointer (AP)

General register 12 on VAX systems. By convention, AP contains the address of the base of the argument list for procedures initiated using CALL instructions.

ASCII

See *American Standard Code for Information Interchange*.

ASMP

See *asymmetric multiprocessing*.

assembler

A language processor that translates a source program containing assembly language directives and machine instructions into an object module.

assembly language

A machine-oriented programming language. VAX MACRO is the assembly language for the VAX computer. MACRO–64 for OpenVMS AXP systems is the assembly language for the Alpha AXP computer. See *binary machine code*.

assigning a channel

Establishing the necessary software link between a user process and a device unit that allows a user process to communicate with the device.

assignment statement

In DIGITAL Command Language (DCL), the association of a symbol name to use with a character string or numeric value. Symbols can define synonyms for system commands or can be used for variables in command procedures.

AST

See *asynchronous system trap*.

ASTLVL

See *asynchronous system trap level*.

ASTSR

See *asynchronous system trap summary register*.

asymmetric multiprocessing (ASMP)

A multiprocessing configuration in which the processors are not equal in their ability to execute operating system code. In general, a single processor is designated as the primary, or master, processor; other processors are the slaves. The slave processors are limited to performing certain tasks, whereas the master processor can perform all system tasks. See *symmetric multiprocessing*.

asynchronous record operation

A mode of record processing in which a user program can continue to execute after issuing a record retrieval or storage request without having to wait for the request to be fulfilled.

asynchronous software interrupt

An asynchronous interruption of normal code flow caused by some software event. This interruption shares many of the properties of hardware exceptions that include forcing some out-of-line code to execute.

asynchronous system trap (AST)

A software-simulated interrupt to a user-defined service routine. ASTs enable a user process to be notified asynchronously, with respect to that process, of the occurrence of a specific event. If a user process has defined an AST routine for an event, the system interrupts the process and executes the AST routine when that event occurs. When the AST routine exits, the system resumes execution of the process at the point where it was interrupted.

asynchronous system trap level (ASTLVL)

On VAX systems, a value kept in an internal processor register that is the most privileged access mode for which an AST is pending. The AST does not occur until the current access mode drops in privilege (rises in numeric value) to a value greater than or equal to ASTLVL. Thus, an AST for an access mode is not serviced while the processor is executing in a more privileged access mode.

asynchronous system trap summary register (ASTSR)

On AXP systems, the register that contains a bitmask of the access modes for which an asynchronous system trap, or AST, is pending. An AST for a given access mode represented by a bit set in this register does not occur while the current access mode is more privileged than the access mode of the AST.

atomic instruction

An instruction that consists of one or more discrete operations that are handled by the hardware as a single operation, without interruption.

atomicity

A requirement that either all operations of a transaction are made permanent or none of them are made permanent.

atomic operation

An operation that cannot be interrupted by other system events, such as an asynchronous system trap (AST) service routine. An atomic operation appears to other processes to be a single operation. Once an atomic operation starts, it always completes without interruption.

Read-modify-write operations are typically not atomic at an instruction level on a RISC machine.

attached processor

See *secondary processor*.

attribute

(1) In the security context, a characteristic of an identifier or the holder of an identifier. Attributes can enhance or limit the rights granted with an identifier. For example, a user holding an identifier with the resource attribute can charge disk space to the identifier.

(2) In threads, the individual components of the attributes object. Attributes specify detailed properties about the objects to be created.

attributes object

An object that holds the individual attribute values to be used when creating threads, mutexes, or condition variables. An attributes object is analogous to a type definition in a programming language. It describes details of the objects to be created.

audit

See *security audit*.

auditing

To record the occurrence of events with security implications as they occur on the system and, later, to examine system activity for possible security violations or improper use of the system. Security-relevant events include activities such as logins, breakins, changes to the authorization database, and access to protected objects. Event messages can be sent as alarms to an operator terminal or written as audit records to a log file.

authentication

The act of establishing the identity of users when they start to use the system. OpenVMS (and most other commercial operating systems) uses passwords as the primary authentication mechanism.

authorization file

See *user authorization file.*

automatic record locking

A OpenVMS Record Management Services (RMS) capability that allows a user to lock only one record in a specific shared file at any given time. The lock occurs on every execution of a $FIND or $GET macroinstruction (unless the NLK bit is set in the record processing field). The lock is released when the next record is accessed, when the current record is updated or deleted, when the record stream is disconnected, or when the file is closed. OpenVMS Record Management Services (RMS) maintains locks on modified records during a recovery unit.

availability

The percentage or amount of scheduled time that a computing system provides application service.

available set

In a symmetric multiprocessing system, those processors that have passed the system's power-on hardware diagnostics and may or may not be actively involved in the system. The available set includes the active set. See *active set.*

backplane interconnect

On VAX systems, an internal processor bus that allows I/O device controllers to communicate with main memory and the central processor. These I/O controllers may reside on the same bus as memory and the central processor (for instance, in VAX 8200, VAX 8250, VAX 8300, VAX 8350 systems), or they may be on a separate bus entirely (for instance, in a VAX–11/780 or VAX 8600/8650 system). In the latter case, an I/O adapter enables and controls the communications between the I/O bus and the processor and memory.

The backplane interconnect is called the synchronous backplane interconnect, or SBI, in the VAX–11/780 and VAX 8600 family of systems; the CPU-to-memory interconnect, or CMI, on the VAX–11/750 processor; and the VAXBI in the VAX 8500 family of systems, the VAX 8700, the VAX 8800, the VAX 8200 family of systems, the VAX 8300 family of systems, the VAX 6200 family of systems, and the VAX 6300 family of systems. The MicroVAX 3000 series and MicroVAX II processors use the Q22–bus as a backplane. See *processor-memory interconnect.*

backup switching

When a second computing system or component picks up processing in the event that the primary computing system or component fails.

balance set

The collection of all process working sets currently resident in physical memory. The balance set is maintained by the system's swapper process.

bandwidth

The range of frequencies assigned to a channel or system; that is, the difference expressed in Hertz between the highest and lowest frequencies of a band.

base priority

The priority that the system assigns to a process when it is created. A base priority generally comes from the authorization file. The scheduler never schedules a process below its base priority. The base priority can be modified only by the system manager or the process itself. The base priority of a running process can be altered by any user with ALTPRI privilege.

batch job

A program that is scheduled and executed under the control of the batch processing subsystem. Control input for a batch job comes from a command procedure stored on disk, and output is directed to a disk file.

batch processing

A mode of processing in which all commands to be executed by the operating system (and, optionally, data to be used as input to the commands) are placed in a file or punched onto cards and submitted to the system for execution as a single unit. See *command procedure*.

baud rate

The speed at which a terminal transmits or receives characters.

BCUG

See *bilateral closed user group*.

bilateral closed user group (BCUG)

An optional packet switching data network facility that restricts pairs of data terminal equipment (DTE) on communicating with each other.

binary machine code

The internal instruction format used by the computer. It is called binary because only two characters—0 and 1—are used in this code. Programmers use languages, compilers, and the assembler to generate the binary code.

binding

See *linking*.

bits per inch (bpi or bits/in)

The recording density of a magnetic tape; indicating how much data can fit on 1 inch of the recording surface. See *density*.

bit string

See *variable-length bit field*.

block

(1) The smallest logically addressable unit of data that a specified device can transfer in an I/O operation (512 contiguous bytes for most disk devices).

(2) An arbitrary number of contiguous bytes used to store logically related status, control, or other processing information.

(3) To prevent a thread from executing.

blocking AST

An AST that can be requested by a process using the lock management system services. A blocking AST is delivered to the requesting process when it is preventing another process from accessing a resource.

block I/O

A data-accessing technique in which the program manipulates the blocks (physical records) that make up a file, instead of its logical records; allows for the direct access to the blocks in a file without regard for the file organization or record format.

boot

Short for bootstrap. A bootstrap is a technique or device by which the system brings itself into a desired state by means of its own action, such as a routine whose first few instructions are sufficient to bring the rest of the routine into memory from an input device. Bringing a fresh operating system into memory is called booting.

boot name

The abbreviated name of the device being used to boot software. For example, DU0 is the boot name for device DU0.

boot server

The management center for a VMScluster system and its major source provider. The boot server provides disk access and downline loads satellite nodes.

bootstrap block

A block in the index file of a system disk. It can contain a program that loads the operating system into memory.

bound procedure

A type of procedure that requires knowledge (at run-time) of a dynamically determined larger enclosing scope to function correctly.

bpi or bpi/in

See *bits per inch*.

breach

A break in the system security that results in admitting a person or program to an object.

break-in attempt

An effort made by an unauthorized source to gain access to the system. Since the first system access is achieved through logging in, break-in attempts primarily refer to attempts to log in illegally. These attempts focus on supplying passwords for users known to have accounts on the system through informed guesses or other trial-and-error methods.

broadcast

In threads, a mechanism to wake all threads waiting on a condition variable. See *signal*.

broadcast addressing

In an Ethernet network, a special type of multicast addressing in which all nodes are to receive a message.

broadcast circuit

A circuit having multiple nodes connected to it and having a method for transmitting a message that will be received by multiple receivers.

bucket

A storage structure of 1 to 32 blocks used for building and processing files of relative and indexed organization. A bucket contains one or more records or record cells. Buckets are the unit of contiguous transfer between OpenVMS Record Management Services (RMS) buffers and the disk.

bucket locking

A facility that prevents access to any record in a bucket by more than one user until that user releases the bucket.

bucket split

The result of inserting records into a full bucket. To minimize bucket splits, OpenVMS Record Management Services (RMS) attempts to keep half of the records in the original bucket and transfers the remaining records to a newly created bucket.

buffer

An internal memory area used for temporary storage of data records during input or output operations.

buffered data path

A UNIBUS adapter data path that transfers 32 or 64 bits of data in a single synchronous backplane interconnect, or SBI, transfer.

buffered I/O

An I/O operation, such as terminal or mailbox I/O, in which an intermediate buffer from the system buffer pool is used instead of a process-specified buffer. See *direct I/O*.

bugcheck

An internal inconsistency that the operating system cannot resolve. If a nonfatal bugcheck is declared, an error log entry is made. If the system cannot continue to run, a fatal bugcheck is declared and the system produces a crash dump.

busywait

See *spin wait*.

byte

Eight contiguous bits starting on any addressable boundary. Bits are numbered 0 to 7 from right to left. Bit 0 is the low-order bit. When interpreted arithmetically, a byte is a two's complement integer with significance increasing from bits 0 through 6. Bit 7 is the sign bit. The value of the signed integer is in the range −128 to +127 decimal. When interpreted as an unsigned integer, significance increases from bits 0 through 7 and the value of the unsigned integer is in the range 0 to 255 decimal. A byte can be used to store one ASCII character.

byte granularity

A property of memory systems in which adjacent bytes can be written concurrently and independently by different processes or processors.

cache memory

A small, high-speed memory placed between slower main memory and the processor. A cache increases effective memory transfer rates and processor speed. It contains copies of data recently used by the processor and fetches several bytes of data from memory in anticipation that the processor will access the next sequential series of bytes.

call

To transfer control to a specified routine.

call frame

The body of information that a procedure must save to allow it to properly return to its caller. A call frame may exist on the stack or in registers. A *call frame* may optionally contain additional information required by the called procedure. See *stack frame*.

call instructions

The VAX processor instructions CALLG (call procedure with general argument list) and CALLS (call procedure with stack argument list).

call stack

The stack and the conventional stack structure used during a procedure call. Each access mode of each process context (user, supervisor, executive, and kernel) has one call stack and, on VAX systems, the interrupt service context has one call stack.

cancel

A mechanism by which a thread informs either itself or another thread to terminate as soon as possible. *Cancel* and *alert* have the same meaning.

capability

In a symmetric multiprocessing environment, an attribute of a single processor or set of processors. The capabilities required by a given process determine the set of processors on which it can be scheduled. For instance, the routine that maintains the system time can execute only on the processor that has the timekeeper capability.

captive account

A type of account that limits the activities of the user. Typically, the user is restricted to using certain command procedures and commands. For example, the user may not be allowed to use the Ctrl/Y key. This type of account is synonymous with a turnkey or tied account.

carrier sense

A signal provided by the Physical layer of the DECnet for OpenVMS architecture to indicate that one or more stations (nodes) are currently transmitting on the Ethernet channel.

Carrier Sense, Multiple Access with Collision Detect (CSMA/CD)

A link management procedure used by the Ethernet. Allows multiple stations to access the broadcast channel at will, avoids contention by means of carrier sense and deference, and resolves contention by means of collision detection and retransmission.

CCB

See *channel control block*.

CCITT

Comité Consultatif International Télégraphique et Téléphonique (International Telegraph and Telephone Consultative Committee). An international consultative committee that sets international communications usage standards.

central processing unit (CPU)

The hardware that handles all calculating and routing of input and output as well as executing programs. In short, the CPU is the part of the computer that actually computes.

channel

(1) A logical path connecting a user process to a physical device unit. A user process requests the operating system to assign a channel to a device so the process can communicate with that device. See *controller data channel*.

(2) A means of transmission over a packet switching data network. For the VAX Packetnet System Interface (PSI), a logical path between data terminal equipment (DTE) and data circuit-terminating equipment (DCE) over which data is transmitted. Each channel is identified by a unique reference number called a logical channel number (LCN).

channel control block (CCB)

A structure in the I/O database created by the Assign I/O Channel system service to describe the device unit to which a channel is assigned.

channel request block (CRB)

A structure in the I/O database that describes the activity on a particular controller. The channel request block for a controller contains pointers to the wait queue of drivers ready to access a device through the controller.

character

A symbol represented by an ASCII code. See *alphanumeric character*.

character buffer

A temporary storage area used to store the last character deleted by an EDT delete character operation.

characteristics

A display type for the Network Control Program (NCP) commands SHOW and LIST. It refers to static information about a component that is kept in either the volatile or permanent database. Such information may include parameters defined for that component by either the SET or DEFINE command.

character string

A contiguous set of bytes. A character string is identified by two attributes: an address and a length. Its address is the address of the byte containing the first character of the string. Subsequent characters are stored in bytes of increasing addresses. The length is the number of characters in the string.

character string descriptor

A quadword data structure used for passing character data (strings). The first word of the quadword contains the length of the character string. The second word can contain type information. The remaining longword contains the address of the string.

CI

See *computer interconnect*.

CI only VMScluster configuration

A type of VMScluster configuration in which the computer interconnect, or CI, device is used for most interprocessor communication. In these configurations, a node may be a VAX processor or a hierarchical storage controller, or HSC.

circuit

Virtual communication paths between nodes or data terminal equipment (DTE). Circuits operate over physical lines and are the media on which all I/O occurs. X.25 circuits are virtual circuits.

CISC

See *Complex Instruction Set Computer*.

client

A computing system entity that uses the services of other system entities called *servers.*

client/server

A style of computing in which a server system provides common database access, performs computations, and assumes system management tasks for its clients.

close

To terminate all operations on a file.

closed user group (CUG)

An optional packet switching data network facility that restricts two or more
DTEs in the same group to communicating with each other. The basic CUG also
prevents these DTEs from accessing or being accessed by other DTEs outside the
group. Additions to the basic CUG facility allow one or more DTEs to access or
be accessed by DTEs outside the group.

cluster

(1) A set of contiguous blocks that is the basic unit of space allocation on a
Files–11 disk volume.

(2) A set of pages brought into memory in one paging operation (page fault
cluster).

(3) An event flag cluster.

CMI

See *computer memory interconnect.*

CMP

See *compatibility mode bit.*

collating sequence

An order assigned to the characters of a character set (for example, ASCII,
multinational, or EBCDIC) used for sequencing purposes.

collision

Multiple network transmissions overlapping in the physical channel, resulting in
garbled data and necessitating retransmission.

collision detect

A signal provided by the Physical layer of the DECnet for OpenVMS architecture
to its Data Link layer to indicate that one or more stations (nodes) are contending
with the local station's transmission.

command

In DIGITAL Command Language (DCL), an instruction, generally an English
word, entered by the user at a terminal or included in a command procedure. A
command requests the software monitoring a terminal or reading a command
procedure to perform some well-defined activity. For example, entering the COPY
command requests the system to copy the contents of one file into another file.

command file

See *command procedure.*

command image

A program associated with and invoked by a DCL command.

command interpreter

A procedure-based system code that executes in supervisor mode in the context of
a process to receive, to check the syntax of, and to parse commands entered by
the user at a terminal or submitted in a command file.

command language interpreter

See *command interpreter*.

command level

Input stream for the command interpreter. The initial input stream is always command level 0. An interactive command procedure begins executing at command level 1. A batch job command procedure begins executing at command level 0. You can use the execute procedure (@) command or the CALL command in a command procedure to create up to 32 nested command levels.

command node

The node from which a Network Control Program (NCP) command is issued.

command parameter

The positional operand of a command delimited by spaces, such as a file specification, option, or constant.

command procedure

A file containing commands and data that the command interpreter can accept in lieu of the user's entering the commands individually on a terminal. Thus, command procedures provide a means of automatically passing commands to the operating system. In addition, they permit users to employ such programming techniques as loops, counters, labels, and symbol substitution to set up elaborate command sequences that can be altered through user interaction. Command procedures can also be submitted to the system for processing as batch jobs.

command string

A line (or set of continued lines) containing a command and, optionally, information modifying the command. A complete command string consists of a command, its qualifiers, if any, and its parameters (file specifications, for example), if any, and their qualifiers, if any. A command string is normally terminated by pressing the Return key.

common

A VAX FORTRAN term for a program section that contains only data.

common event flag cluster

A set of 32 event flags that enables cooperating processes to post event notification to each other. Common event flag clusters are created as they are needed. A process can associate with up to two common event flag clusters.

compatibility

The ability of programs written for one type of computer system (such as VAX) to execute on another type of system (such as AXP).

compatibility mode

A mode of execution that enables the central processor to execute nonprivileged PDP–11 instructions. The operating system supports compatibility mode execution by providing an RSX–11M execution environment for an RSX–11M task image. The operating system compatibility mode procedures intercept calls to the RSX–11M executive and convert them to the appropriate operating system functions. Note that a layered product, VAX–11 RSX, is required for the RSX–11M environment.

compatibility mode bit (CMP)

The compatibility mode bit in the VAX processor status longword.

compiler

A system component that translates a program written in a high-level language into an object module in binary machine code.

complete crash dump

A crash dump that contains the complete contents of all of physical memory.

Complex Instruction Set Computer (CISC)

A computer that has individual instructions that perform complex operations, including complex operations performed directly on locations in memory. Examples of such operations include instructions that do multibyte data moves or substring searches. CISC computers are typically contrasted with Reduced Instruction Set Computer (RISC) computers.

component

An element in a network that can be controlled and monitored. Components include lines, circuits, nodes, modules, logging, and objects. Components form part of the Network Control Program (NCP) command syntax.

computer interconnect, CI

A high-speed, fault-tolerant, dual-path bus, which has a bandwidth of 70 megabits per second. With the CI, any combination of processor nodes and intelligent I/O subsystem nodes — up to 16 in number — can be loosely coupled in a computer-room environment.

computer memory interconnect, CMI

The part of the VAX–11/750 hardware that connects the processor, memory controllers, MASSBUS adapters, and the UNIBUS interconnect.

computing component

Part of the total computing system around which an arbitrary boundary has been defined. The boundary can be defined at any level.

concatenate

To link together in a series.

concealed device

An I/O device that has a logical name associated with it; users thus see the logical name, rather than the device name, displayed in most system responses.

concurrency

Simultaneous operations by multiple agents on a shared object.

condition

An error state that exists when an exception occurs. See *exception* and *condition handler*.

condition codes

The 4 bits in the VAX processor status word that indicate the results of previously executed instructions.

condition handler

A procedure that the system executes when a process exception occurs. When an exception occurs, the operating system searches for a condition handler and, if found, initiates the handler immediately. The condition handler may perform some action to change the situation that caused the exception and continue execution for the process that incurred the exception. Condition handlers execute in the context of the process at the access mode of the code that incurred the exception.

condition value

A 32-bit value (sign-extended to a 64-bit value on AXP systems) used to uniquely identify an exception condition. A condition value can be returned to a calling program as a function value or signaled using the signaling mechanism.

condition variable

A synchronization object used in conjunction with a mutex. A condition variable allows a thread to be blocked until some event happens.

configuration database

A database containing files that provide information about network components. Specifically, the files contain information about the local node, and all nodes, modules, circuits, lines, logging, and objects in the network. See *permanent database* and *volatile database*.

configuration register

A control and status register (CSR) for an adapter; for example, a UNIBUS adapter. It resides in the adapter's I/O space.

congestion loss

A condition in which data packets transmitted over a network are lost when the DECnet for OpenVMS Routing layer is unable to buffer them.

connection

The logical path in system communications architecture by which two processes communicate.

connector node

A node that serves as an X.25 gateway to permit host nodes to access a packet switching data network.

connect-to-interrupt

A function by which a process connects to a device interrupt vector. To perform a connect-to-interrupt, the process must map to the program I/O space containing the vector. See *page frame number mapping*.

consistent

A shadow set is consistent when every logical block on a member unit contains exactly the same data as the same logical block on the other members.

console

The manual control unit integrated into the central processor. The console enables the operator to start and stop the system, monitor system operation, and run diagnostics.

console terminal

The video or hardcopy terminal connected to the central processor console.

context

See *process context*.

context indexing

The ability to index through a data structure automatically because the size of the data type is known and used to determine the offset factor.

context switching

On VAX systems, interrupting the activity in progress and switching to another activity. Context switching occurs as one process after another is scheduled for execution. The operating system saves the hardware context of the interrupted process in its hardware process control block (PCB) using the Save Process Context instruction, and loads the hardware PCB of another process into the hardware context using the Load Process Context instruction, thus scheduling that process for execution.

On AXP systems, the operating system saves the hardware context of the interrupted process in its hardware privileged context block (HWPCB) using the swap privileged context instruction, and loads the HWPCB in the same operation.

contiguous area

A group of physically adjacent blocks on a device or in memory.

continuation character

A hyphen placed at the end of a command line, which allows the user to continue the command string on the next line after the Return key is pressed.

control and status register (CSR)

A device or controller register residing in the processor's I/O space. The CSR initiates device activity and records its status.

control key

The keyboard character that causes a control action. A control key is usually the combination of the Ctrl key and an alphabetic key, for example, Ctrl/Y.

controller

The part of a mass storage subsystem responsible for interfacing between drives and computers. Controllers usually multiplex the services of one or more drives among the demands of one or more host computers.

controller data channel

A logical path to which a driver for a device on a multidevice controller must be granted access before it can activate a device.

control region

The highest-addressed half of per-process space (the P1 region). Control region virtual addresses refer to the process-related information used by the system to control the process, such as the kernel, executive, and supervisor stacks; the permanent I/O channels; exception vectors; and dynamically used system procedures (such as the command interpreter). The user stack is also normally found in the control region.

control region base register (P1BR)

On VAX systems, the processor register, or its equivalent in a hardware process control block, that contains the base virtual address of a process control region page table.

control region length register (P1LR)

On VAX systems, the processor register, or its equivalent in a hardware process control block, that contains the number of nonexistent page table entries for virtual pages in a process control region.

control region page table (P1PT)

The page table that maps the control region of virtual address space.

control station

The network node at the controlling end of a multipoint circuit. The control station controls the tributaries for that circuit.

cooperating tasks

Two tasks that communicate with each other in a task-to-task communication environment. In particular, cooperating tasks must agree on optional user data to be passed, how they will send and receive messages to ensure that there is one transmit for each receive, and which task will disconnect the link.

copy-on-reference

A method used in memory management for sharing data until a process accesses it, in which case it is copied and made private before the access. Copy-on-reference allows sharing of the initial values of a global section whose pages have read/write access but contain preinitialized data available to many processes.

copy thread

In terms of volume shadowing, a copy thread is a single stream of I/O that is part of a full copy or merge operation.

cost

An numeric value assigned to a circuit that exists between two adjacent nodes. In the DECnet for OpenVMS network, data packets are routed on paths with the lowest cost.

counted string

A character-string data structure consisting of a byte-sized length followed by the string. Although a counted string is not used as a procedure argument, it is a convenient representation in memory.

counters

Performance and error statistics kept for a network component, such as lines or nodes.

CPU

See *central processing unit.*

crash

The system's response to an unstable condition, particularly if the system is corrupted. Rather than continuing to operate and possibly damaging itself, the system stops functioning. If the system has crashed, users will be unable to use their terminals. See *hanging*.

crash dump

The action the operating system takes, when it crashes, to preserve information for future analysis. See *complete crash dump* and *selective crash dump*.

CRB

See *channel request block*.

CRC

See *cyclic redundancy check*.

CRT

Cathode-ray tube. See *terminal*.

cross development

The process of creating software using tools running on one system, but targeted for another type of system. For example: creating AXP code using tools running on a VAX VMS system.

CSMA/CD

See *Carrier Sense, Multiple Access with Collision Detect*.

CSR

See *control and status register*.

CUG

See *closed user group*.

current access mode

The processor access mode of the currently executing software indicated in the current mode field of the processor status.

current accounting file

The accounting file in which the local node is currently storing information about resource use. By default, it is SYS$MANAGER:ACCOUNTNG.DAT. See *accounting file*.

cursor

An indicator used on a video terminal to point to the screen position where the next character will appear.

cyclic redundancy check (CRC)

An error detection scheme in which the receiver checks each block of data for errors. The check character is generated by taking the remainder after dividing all the serialized bits in a block of data by a predetermined binary number. The check character is compared with the transmitter-generated check character. If the check characters do not match, retransmission of the block of data is requested.

cylinder

The tracks at the same radius on all recording surfaces of a disk.

data

A general term referring to any representation of facts, concepts, or instructions in a form suitable for communication, interpretation, or processing.

database

(1) All the occurrences of data described by a database management system.

(2) A collection of related data structures.

data check

An operation that consists of first performing the derived physical, logical, or mutual read or write function successfully and then comparing the data in memory with the data on disk to make sure they match.

data circuit-terminating equipment (DCE)

A CCITT X.25 term referring to the network equipment that establishes, maintains, and terminates a connection and handles the signal conversion and coding between the data terminal equipment and the network. The switching exchange of the network to which data terminal equipment (DTEs) are connected. In non-X.25 usage, the term is synonymous with "modem."

datagram

A unit of data sent over the network that is handled independently of all other units of data so far as the network is concerned. When a route header is added, a datagram becomes a packet.

data integrity

The ability of a system to maintain its information in a consistent state.

data link mapping (DLM)

Capability of using an X.25 virtual circuit as a DECnet for OpenVMS data link.

data terminal equipment (DTE)

An X.25 term referring to the user's equipment (computer or terminal) connected to a data circuit-terminating equipment (DCE) on a packet switching data network (PSDN) for the purpose of sending and receiving data.

data structure

Any table, list, array, queue, or tree whose format and access conventions are well defined for reference by one or more images.

data type

In general, the way in which bits are grouped and interpreted. In reference to the processor instructions, the data type of an operand identifies the size of the operand and the significance of the bits in the operand. Operand data types include byte, word, longword, and quadword integer; floating and double-floating character string; packed decimal string; and variable-length bit field.

DCE

See *data circuit-terminating equipment*.

DCL

See *DIGITAL Command Language*.

DDB

See *device data block*.

DDT

See *driver dispatch table*.

debugger

A program that aids a programmer in finding errors in other programs.

debug symbol table

The portion of the symbol table that is created by the compiler or assembler.

decryption

The process that restores encrypted information to its original unencoded form.

dedicated resource

A system resource—an I/O device, image, or the entire system—that is assigned to a single application or purpose.

default

A value or operation that is automatically included in a command, unless the user specifies otherwise. In most cases, default settings will be what is "normal" or "expected".

default directory

The directory that the operating system assumes when a directory specification has not been supplied by the user.

default disk

The disk from which the system reads and to which the system writes; by default, all files that you create. The default disk is used whenever a file specification in a command does not explicitly name a device.

deferred echo

Refers to the fact that terminal echoing does not occur until a process is ready to accept input entered by type-ahead.

degraded performance

Performance in which service continues, but response time is extended or the number of users that can be served is reduced, or both.

delimiter

A character that separates, terminates, or organizes elements of a character string, statement, or program.

delta time

A time value expressing an offset from the current date and time. Delta times are always expressed in the system as negative numbers whose absolute value is used as an offset from the current time.

demand-zero page

A page, typically of an image stack or buffer area, that is initialized to contain all zeros when dynamically created in memory as a result of a page fault. This feature eliminates the waste of disk space that would otherwise be required to store blocks (pages) that contain only zeros.

density

The number of bits per inch (bpi or bpi/in) of magnetic tape. Typical values are 800 bpi and 1600 bpi. See *bits per inch*.

dependable computing system

One that can be counted on to provide services to its users when those services are needed, and with sufficient performance. The computing components are created and combined in the manner necessary to provide a required level of dependability.

descriptor

A data structure used in calling sequences for passing argument types, addresses, and other optional information. See *character string descriptor*.

designated router

A routing node on the Ethernet selected to perform routing services on behalf of end nodes.

destructor

A user-supplied routine that finalizes and then deallocates a per-thread context value.

detached process

A process that has no owner. The job controller creates a detached process when a user logs in to the system. It also creates a detached process each time it initiates a batch job or services a request for a logical link connect. Because the job controller does not own the processes it creates, these processes are referred to as detached. The DCL command RUN/UIC and the Create Process system service (specifying a UIC) allow a suitably privileged process to request creation of a detached process.

device

The general name for any peripheral connected to the processor that is capable of receiving, storing, or transmitting data. Card readers, line printers, and terminals are examples of record-oriented devices. Magnetic tape devices and disk devices are examples of mass storage devices. Terminal line interfaces and interprocessor links are examples of communications devices. Devices are not necessarily hardware (see *pseudodevice*).

device affinity

In a symmetric multiprocessing system, a close association of a device with a specific processor or set of processors in the system. There are three dimensions to device affinity in the operating system. First, physical connectivity describes those devices that are directly accessible only to the primary processor or to all processors. Secondly, affinity is a software mechanism that defines those processors that can initiate an I/O operation on the device. Finally, interruptibility describes the set of processors that can receive interrupts from a device.

device allocation

See *allocating*.

device controller

The electronic circuits associated with each physical device in the system that serve as the interface between the processor and the device hardware.

device data block (DDB)

A structure in the I/O database that identifies the generic device or controller name and driver name for a set of devices attached to the same controller.

device driver

The software associated with each physical device in the system that serves as the interface between the operating system and the device controller.

Device driver code is divided into two sections: device-dependent logic that drives a particular kind of device unit, and device-independent support routines that perform functions common to all devices. Each unit of a particular type has a driver process, but there is only one set of driver code.

device interrupt

An interrupt received on interrupt priority levels (IPLs) 20 through 23. Device interrupts can be requested only by devices, controllers, and memories.

device lock

In a symmetric multiprocessing system, a dynamic spin lock, the ownership of which synchronizes device-specific code that executes at device interrupt priority level (IPL). A device lock is associated with each adapter or controller in the system. See *spin lock*.

device name

The field in a file specification that identifies the device unit on which a file is stored. Device names also include the mnemonics that identify an I/O peripheral device in a data transfer request. A device name consists of a mnemonic followed by a controller identification letter (if applicable), followed by a unit number (if applicable), and ends with a colon.

device queue

See *spool queue*.

device register

A location in device controller logic used to request device functions (such as I/O transfers) or report status.

device unit

An I/O device and its controlling logic; for example, a disk drive or terminal. Some controllers can have several device units connected to a single controller; for example, mass storage controllers.

D_floating point data

See *double floating data*.

diagnostic

A program that tests hardware, firmware, peripheral operation, logic, or memory and reports any faults it detects.

DIGITAL Command Language (DCL)

A command interpreter in the operating system. It provides a means of communication between the user and the operating system. See *monitor console routine*.

DIGITAL Network Architecture, DNA

A set of protocols (rules) governing the format, control, and sequencing of message-exchange for all Digital network implementations. The protocols are layered, and they define rules for data exchange from the physical link level up through the user interface level. DNA controls all data that travels throughout a Digital network. DNA also defines standard network management and network generation procedures.

Digital Storage Architecture (DSA)

The specifications from Digital governing the design of and interface to mass storage products. DSA defines the functions to be performed by host computers, controllers, and drives, and specifies how they interact to manage mass storage.

Digital Storage Systems Interconnect (DSSI)

A data bus that uses the System Communication Architecture (SCA) protocols for direct host-to-storage communications. The DSSI cable can extend to 6 meters and has a peak bandwidth of 4 megabytes.

direct data path

A UNIBUS adapter data path that transfers 16 bits of data in a single synchronous backplane interconnect (SBI) transfer.

direct I/O

An I/O operation in which the system locks the pages containing the associated buffer in physical memory for the duration of the I/O operation. The I/O transfer takes place directly from the process buffer. See *buffered I/O.*

direct mapping cache

A cache organization in which only one address comparison is needed to locate any data in the cache because any block of main memory data can be placed in only one possible position in the cache. See *fully associative cache.*

direct memory access (DMA)

The method by which a device driver transfers a large amount of data without requesting an interrupt after transferring each of the smaller amounts.

directory

A file that briefly catalogs a set of files stored on disk or tape. The directory includes the name, type, and version number of each file in the set, as well as a unique number that identifies the file's actual location and points to a list of its attributes. See *master file directory* and *subdirectory.*

directory name

The field in a file specification that identifies the directory in which a file is listed. The directory name begins with a left bracket ([or <) and ends with a right bracket (] or >).

disconnect abort

A form of disconnection by which nontransparent tasks can deaccess a logical link without deassigning the channel. A disconnect abort indicates that not all messages sent have necessarily been received.

discretionary controls

Security controls that are applied at the user's option; that is, they are not required. Access control lists are typical of such optional security features.

disk

High-speed, random-access devices. There are several kinds of disks. Floppy disks are small, flexible disks. Hard disks are either fixed in place or removable. Removable disk types include a single hard disk enclosed in a protective case and a stacked set of disks enclosed in a protective case.

disk scavenging

Any method of obtaining information from a disk that the owner intended to discard. The information, although no longer accessible by normal means, retains a sufficient amount of its original magnetic encoding so that it can be retrieved and used by one of the scavenging methods.

distributed transaction processing

The processing of transactions on remote nodes. A user logged in to a transaction processing system on one node can select tasks in an application on a transaction processing system on another node.

DLM

See *data link mapping*.

DMA

See *direct memory access*.

DNA

See *DIGITAL Network Architecture*.

double floating data

A double precision floating-point number, eight bytes long, having a range of $\pm 2.9 * 10^{-37}$ to $\pm 1.7 * 10^{38}$ and a precision of approximately 16 decimal digits. See *G_floating data*.

downline system load

A DECnet for OpenVMS function that allows an unattended target node to receive an operating system file image or terminal server image from another node.

downline task load

A DECnet for OpenVMS function that allows a remote target node to receive an RSX–11S task from another node.

down time

The percentage or amount of time a computing system does not provide application service as scheduled.

DPT

See *driver prolog table*.

drive

The electromechanical unit of a mass storage device system on which a recording media (disk cartridge, disk pack, or magnetic tape reel) is mounted.

driver

See *device driver*.

driver code

See *device driver*.

driver dispatch table (DDT)

A table in a driver that lists the entry point addresses of standard driver routines and the sizes or diagnostic and error logging buffers for the device type.

driver fork level

The interrupt priority levels (IPLs) at which a driver fork processes executes, that is, IPLs 8 through 11. Every unit control block indicates the address of a fork lock that synchronizes driver resources. The fork lock structure indicates the fork level or driver.

driver prolog table (DPT)

A table in the driver that describes the driver and the device type to the procedure that loads drivers into the system.

driver start I/O routine

See *start I/O routine*.

DSA

See *Digital Storage Architecture*.

DSSI

See *Digital Storage Systems Interconnect*.

DST

See *debug symbol table*.

DTE

See *data terminal equipment*.

DV

The bit in the processor status word that indicates that decimal overflow traps are enabled.

dynamic access

A technique in which a program switches from one record access mode to another while processing a file.

dynamic load balancing

A method of work distribution in which the operating system ensures that the system work load is evenly distributed among the processors. Dynamic load balancing in a symmetric multiprocessing system is a direct effect of the implementation of the scheduler. In a multiprocessing system, processors independently and continually look for processes to execute from a common pool of processes.

EBCDIC

See *Extended Binary Coded Decimal Interchange Code*.

ECB

See *exit control block*.

ECC

See *error correction code*.

echo

A terminal handling characteristic in which the characters typed by the user on the terminal keyboard are also displayed on the screen or printer.

editor

A system image used for creating and altering text files.

effective address

The address obtained after deferred or indexing modifications are calculated.

encryption

A process of encoding information so that its content is no longer immediately obvious to anyone who obtains a copy of it.

end node

A node that can receive packets addressed to it and send packets to other nodes, but cannot route packets through from other nodes. Also called a nonrouting node.

entry mask

On VAX systems, a word whose bits represent the registers to be saved when a procedure is called with a CALLS or CALLG instruction, and restored when the procedure executes a RET instruction.

entry point

A location that can be specified as the object of a call.

environmental identifier

One of four classes of identifiers. Environmental identifiers are provided by the system to identify groups of users according to their usage of the system. For example, all users who access the system by dialing up receive the Dialup identifier. See *identifier*.

equivalence name

The string associated with a logical name in a logical name table. An equivalence name can be, for example, a device name, another logical name, or a logical name concatenated with a portion of a file specification. See *search list*.

erase-on-allocate

A technique that applies an erasure pattern whenever a new area is allocated for a file's extent. The new area is erased with the erasure pattern so that subsequent attempts to read the area can only yield the erasure pattern and not some valuable remaining data. This technique is used to discourage disk scavenging.

erase-on-delete

A technique that applies an erasure pattern whenever a file is deleted or purged. This technique is used to discourage disk scavenging.

erasure pattern

A character string that can be used to overwrite magnetic media for the purpose of erasing the information that was previously stored in that area.

error

An event during the operation of a computing component that produces incorrect results due to one or more faults. Errors are observed as incorrect responses within a specific computing component.

error correction

The action necessary to isolate the effects of faults to a specific computing component. The goal is to contain the impact of the problem.

error correction code (ECC)

Code that carries out automatic error correction by performing an exclusive OR operation on the transferred data and applying a correction mask.

error logger

A system process that empties the error log buffers and writes the error messages into the error file. Errors logged by the system include memory system errors, device errors and timeouts, and interrupts with invalid vector addresses.

error message

Sent by the system when some action you have requested fails. Each error message identifies the particular part that detected the error. Most error messages result from typing mistakes or syntax mistakes. Often, you can correct the error by retyping the command.

escape sequence

An escape is a transition from the normal mode of operation to a mode outside the normal mode. An ASCII escape character is the code that indicates the transition from normal to escape mode. An escape sequence refers to the set of character combinations starting with an escape character that the terminal transmits without interpretation to the software set up to handle escape sequences.

ESP

See *executive-mode stack pointer*.

ESR

See *exception service routine*.

Ethernet

A communications concept for local communication networks that employs coaxial cable as a passive communications media to interconnect different kinds of computers, information processing products, and office equipment at a local business site. Ethernet does not require switching logic or control by a central computer.

evasive action

A responsive behavior by the system to discourage break-in attempts whenever they seem to be in progress. The system has a set of criteria it uses to detect the fact that break-in attempts may be underway. Typically, once the system suspects that an unauthorized user is attempting to log in, the evasive action consists of locking out all login attempts by the offender for a limited period of time.

event

(1) A change in process status or an indication of the occurrence of some activity that concerns an individual process or cooperating processes; an incident reported to the scheduler that affects a process's ability to execute. Events can be synchronous with the process's execution (a wait request), or they can be asynchronous (I/O completion). Some other events include swapping, wake request, and page fault.

(2) A network or system-specific occurrence for which the logging component maintains a record.

(3) An exception or interrupt.

event class

A particular classification of events. Generally, this classification follows the DIGITAL Network Architecture, or DNA architectural layers; some layers may contain more than one class. Class also includes the identification of system-specific events.

event flag

A bit in an event-flag cluster that can be set or cleared to indicate the occurrence of the event associated with that flag. Event flags are used to synchronize activities in a process or among many processes.

event-flag cluster

A set of 32 event flags used for event posting. Four clusters are defined for each process: two process-local clusters and two common event flag clusters. Of the process-local flags, eight are reserved for system use.

event type

A particular form of event that is unique within an event class.

exception

An event detected by the hardware or software (other than an interrupt or jump, branch, case, or call instruction) that changes the normal flow of instruction execution. An exception is always caused by the execution of an instruction or set of instructions (whereas an interrupt is caused by an activity in the system independent of the current instruction). There are three types of hardware exceptions: traps, faults, and aborts. Examples are attempts to execute a privileged or reserved instruction, trace traps, compatibility mode faults, breakpoint instruction execution, and arithmetic traps such as overflow, underflow, and division by zero.

exception dispatcher

An operating system procedure that searches for a condition handler when an exception condition occurs. If no exception handler is found for the exception or condition, the image that incurred the exception is terminated.

exception enables

See *trap enables*.

exception service routine (ESR)

The routine by which VAX and AXP hardware initially pass control to service an exception. An exception service routine passes control to a general exception dispatcher that attempts to locate a condition handler to further service the exception.

exception vector

See *vector*.

executable image

An image that can be run in a process. When run, an executable image is read from a file for execution in a process.

executive

The generic name for the collection of procedures included in the operating system software that provides the operating system's basic control and monitoring functions.

executive mode

The second most privileged processor access mode (mode 1). The OpenVMS Record Management Services (RMS) and many of the operating system's system service procedures execute in executive mode.

executive-mode stack pointer (ESP)

The process context stack pointer for executive mode.

executor node

The node at which a Network Control Program (NCP) command actually executes.

exit

An image rundown activity that occurs when image execution terminates either normally or abnormally. Image rundown activities include deassigning I/O channels and disassociating common event flag clusters. Any user- or system-specified exit handlers are called.

exit control block (ECB)

A data structure that describes an exit handling routine declared by the Declare Exit Handler system service, $DCLEXH.

exit handler

A procedure executed when an image exits. An exit handler enables a procedure that is not on the call stack to gain control and clean up procedure-owned databases before the actual image exit occurs.

expression

Any combination of variables and/or constants with operators that the computer can evaluate to produce a result.

extended attribute block (XAB)

A OpenVMS Record Management Services (RMS) user data structure that contains additional file attributes beyond those expressed in the file access block (FAB), such as boundary types (aligned on cylinder, logical block number, and virtual block number) and file protection information.

Extended Binary Coded Decimal Interchange Code (EBCDIC)

A set of 8-bit characters used for representing data. See *ASCII*.

extended QIO processor (XQP)

A facility that supplements the QIO driver's functions when performing virtual I/O operations on file-structured devices (Files–11 On-Disk Structure Level 2). The XQP executes in kernel mode in the context of the process of its caller.

extension

The amount of space allocated at the end of a file each time a sequential write exceeds the allocated length of the file.

extent

The contiguous area on a disk containing a file or a portion of a file. An extent consists of one or more clusters.

F11ACP

See *Files–11 ancillary control process*.

FAB

See *file access block*.

failover

(1) The process of reconfiguration after a hard fault or for planned maintenance.

(2) The ability of a system or component to reconfigure itself.

failure

The inability of a computing component to perform its function correctly due to one or more internal faults whose effects cannot be contained. Failures are observed as incorrect behavior by the consumers of the computing component's services.

failure exception mode

A mode of execution selected by a process that instructs the system to declare an exception condition if an error occurs as the result of a system service call. The normal mode is for the system service to return a status code for which the process must test.

failure recovery

The action necessary to restore the failed computing component to a correctly functioning condition. The goal is prompt return to zero defects.

fallback

A function that the Terminal Fallback Facility (TFF) performs when an application program sends a character that a terminal cannot display. In this case, TFF replaces the character with the closest possible visual character that the terminal can display.

fault

(1) A hardware exception condition that occurs in the middle of an instruction and leaves the registers and memory in a consistent state so that eliminating the fault and restarting the instruction gives correct results.

(2) A defect in some component of a computing system.

fault management

The discipline used to engineer systems with a cost-effective balance of fault prevention qualities, error correction capabilities, and failure recovery facilities. Fault management is realized in the implementation of a dependable computing system. It is also a philosophy that is followed during the implementation.

fault prevention

The process of designing and constructing computing components to be free from faults. The goal is zero defects.

fault tolerance

(1) The ability of a computing system to sustain a single operational fault while it continues to provide service without user intervention, with no significant delay in service, without loss of work in progress, and with complete data integrity.

(2) The ability of a computing system to withstand faults and errors while continuing to provide the required services. See *hardware-based fault tolerance* and *software-based fault tolerance*.

FCB

See *file control block*.

FCS

See *file control system*.

FDL

See *file definition language.*

FDT

See *function decision table.*

FDT routine

A driver routine called by the Queue I/O Request system service to perform device-dependent preprocessing of an I/O request.

F_floating-point data

See *floating (point) data*.

FID

See *file identifier*.

field

A set of contiguous bytes in a logical record. See *variable-length bit field*.

FIFO

First-in/first-out; the order in which processing is performed. For example, processing on a FIFO queue would be on a first-come, first-served basis. See *LIFO*.

file

A set of data elements arranged in a structure significant to the user. A file is any named, stored program or data, or both, to which the system has access. Access can be of two types: read-only, meaning the file is not to be altered, and read-write, meaning the contents of the file can be altered. See *volume*.

OpenVMS security policy protects files from improper access. An operation can require read, write, execute, delete, or control access.

file access block (FAB)

A OpenVMS Record Management Services (RMS) user data structure that describes a particular file and contains file-related information needed for data operations, such as OPEN, CLOSE, or CREATE.

file control block (FCB)

A memory-resident structure used by the operating system to coordinate access to a file that is opened by an active task.

file control system (FCS)

A generic term for the file control services that control the file services for disks and tapes. These services include adding, opening, closing, and renaming files.

file definition language (FDL)

A special-purpose language used to write specifications for data files. These specifications are written in text files called FDL files; they are then used by OpenVMS Record Management Services (RMS) utilities and library routines to create the actual data files.

file header

A block in the index file describing a file on a Files–11 disk structure. The file header contains information needed by the file system to find and use the file. Some of this information is displayed when the DCL command DIRECTORY is entered. There is at least one file header for every file on the disk.

file identifier (FID)

A 6-byte value used to uniquely identify a file on a Files–11 disk volume. The file number, file sequence number, and relative volume number are contained in the file identifier.

file name

The field containing a 1- to 39-character name for a file that precedes a file type in a file specification.

file name extension

See *file type*.

file organization

The particular file structure used as the physical arrangement of the data comprising a file on a mass storage media. The OpenVMS Record Management Services (RMS) file organizations are sequential, relative, and indexed.

Files–11

The name of the disk structure used by the RSX–11, IAS, and OpenVMS operating systems. See *Files–11 On-Disk Structure Level 1* and *Files–11 On-Disk Structure Level 2.*

Files–11 ancillary control process (F11ACP)

The interface process that is the files manager for the Files–11 on-disk structure.

Files–11 On-Disk Structure Level 1

The original Files–11 structure used by IAS, RSX–11M, and RSX–11S for disk volumes. VAX systems support structure level 1 to ensure compatibility among systems. AXP systems do not support structure level 1.

Files–11 On-Disk Structure Level 2

The second-generation disk file structure supported by The operating system. The Files–11 data structure prepares a volume to receive and store data in a way recognized by the operating system.

file section

The part of a file that contains the user data and that is delimited by the header and trailer labels. Only one section of a given file can be written on any one volume. Multiple sections of a file or other file sections cannot be interspersed within a file section.

file sharing

The capability of a particular relative or indexed file to allow access to more than one process.

file specification

A unique name for a file on mass storage media. It identifies the node, the device, the directory name, the file name, the file type, and the version number under which a file is stored.

file structure

The way in which the blocks forming a file are distributed on a disk or magnetic tape.

file system

A method of recording, cataloging, and accessing files on a volume.

file type

The field in a file specification that consists of a period followed by a 0- to 39-character identification. By convention, this field identifies a generic class of files that have the same use or characteristics, such as compiler and assembler listing files, binary object files, and so on.

first part of an instruction done (FPD)

On VAX systems, a bit in the processor status longword. If the FPD is set, when the processor returns from an exception or interrupt, it resumes the interrupted operation where it left off, rather than restarting the instruction.

fixed-length control area

An area, prefixed to a variable-length record, containing additional information about the record that may have no bearing on the other contents of the record. The fixed-length control area may be used, for example, to contain line numbering or carriage control information.

fixed-length record format

A file format in which all records have the same length.

fixed line number

A number fixed to a line of text in a file. The EDT text editor maintains a record of line numbers during the editing sessions in which the files are used; they are copied to the file when the editing session ends.

flag

A bit that can be set to invoke the execution of a particular sequence of instructions; frequently, an indicator used to tell some later part of a program that a certain condition occurred earlier.

floating (point) data

A single precision floating-point number, 4 bytes long, having a range of $\pm 2.9 * 10^{-37}$ to $\pm 1.7 * 10^{38}$ and a precision of approximately seven decimal digits.

floating point register

On AXP systems, any of the 32 32-bit registers used to manipulate a floating-point operand, to pass a floating-point argument, or to return a floating-point function value.

floating underflow (FU)

On VAX systems, a trap enable bit in the processor status word (PSW).

folder

A subdivision of a file in which you can store mail messages.

foreign command

A symbol that executes an image whose name is not recognized by the command interpreter as a DCL command.

foreign file specification

A file whose specification does not conform to the OpenVMS oerating system syntax.

foreign volume

Any volume other than a Files–11 formatted volume. A foreign volume may or may not be file-structured.

fork block

The portion of a unit control block that contains a driver's context while the driver is waiting for a resource, or the portion of another structure used as a fork block to enable the driver to synchronize events at a lower interrupt priority level (IPL). A driver awaiting a processor or adapter resource has its fork block linked into a fork queue.

fork dispatcher

An interrupt service routine that is activated by a software interrupt at a fork interrupt priority level (IPL). Once activated, it dispatches driver fork processes from a processor-specific fork queue until no processes remain in the queue for that IPL.

fork lock

In a OpenVMS symmetric multiprocessing system, a static spin lock, the ownership of which synchronizes the right of a driver's fork process to execute at its associated fork interrupt priority level (IPL). See *spin lock*.

fork process

A minimal context process that executes code under a series of constraints: it executes at raised interrupt priority levels; it uses R0 through R5 only (other registers must be saved and restored); it executes in system virtual address space; it is only allowed to refer to and modify static storage that is never modified by higher interrupt priority level code. The operating system uses software interrupts and fork processes to synchronize executive operations.

fork queue

A processor-specific queue of driver fork blocks that is awaiting activation, at a particular interrupt priority level, by the fork dispatcher.

form feed

The movement of the cursor position to the start of a new page.

FP

See *frame pointer and stack frame base register*.

FPD

See *first part of an instruction done*.

frame

A unit, which is delimited by flags and includes a header, used by the link level to exchange data packets as well as control and error information between data terminal equipment (DTE) and data circuit-terminating equipment (DCE) on a packet switching data network. See *stack frame*.

frame pointer (FP)

On VAX systems, general register 13 (R13); on AXP systems, integer register (R29). By convention, it contains the base address of the most recent call frame on the stack.

front-end

The part of a computing system that typically handles data capture, terminal displays, communications, and validation functions.

FU

See *floating underflow*.

full copy assist

Optimizes performance during a volume shadowing full copy operation. The full copy assist decreases the impact on the system, the I/O bandwidth consumption, and the time required for full copy operations by allowing the host node to control a direct disk-to-disk transfer of data.

full copy member

A device that is not yet a member of the shadow set, but that is being added to the shadow set and requires a full copy operation because it is completely inconsistent with respect to the other members in the shadow set.

full copy operation

Copies data from an active shadow set member to a new, specified volume in order to make the new device consistent and bring it into full shadow set membership. The specified volume should be a blank volume or a former shadow set member that is not consistent with the other shadow set members.

fully associative cache

A cache organization in which any block of data from main memory can be placed anywhere in the cache. Address comparison must take place against each block in the cache to find any particular block. See *direct mapping cache*.

function code

See *I/O function code*.

function decision table (FDT)

A table in a device driver that lists all valid function codes for the device and the addresses of I/O preprocessing routines associated with each valid function.

function keys

Keyboard keys that send special signals to the operating system. Function keys are referred to as Fx, where x is the number associated with that key. For example, when you enter a DCL command and press F12, you are telling the system to move the cursor to the beginning of the line.

function modifier

See *I/O function modifier*.

general identifier

One of three possible types of identifiers that specify one or more groups of users. The general identifier is alphanumeric and typically is a convenient term that symbolizes the nature of the group of users. For example, a typical general identifier might be PAYROLL for all users allowed to run payroll applications.

general purpose register

Any of the registers designated by the processor architecture to be used as the primary operands of native-mode instructions. The general registers include general-purpose registers, which can be used as accumulators, as counters, and as pointers to locations in main memory.

The VAX architecture provides 16 32-bit general purpose registers, R0 through R12, including the frame pointer, argument pointer, stack pointer, and program counter.

The 32 32-bit AXP integer registers, R0 through R31, include registers with designated special purposes like the stack pointer, frame pointer, argument info register, return address register, and procedure value register.

generic device name

A device name that identifies the type of device but not a particular unit; a device name in which the specific controller or unit number is omitted.

G_floating data

An extended-range floating-point number, 8 bytes long, having a range of $\pm0.56 * 10^{-308}$ to $\pm0.9 * 10^{308}$ and a precision of approximately 15 decimal digits.

global

Affecting the entire file, the entire system, or the entire image, depending on context. A global substitution in a text file would be the changing of all instances of a particular string to something else, for example, changing "dog" to "cat."

global page table

The page table containing the master page table entries for global sections.

global section

A shared memory area (for example, FORTRAN global common) potentially available to all processes in the system. Access is protected by standard access control mechanisms.

global symbol

(1) A symbol defined in a module of a program that is potentially available for reference by another module. The linker resolves (matches references with definitions) global symbols. See *local symbol*.

(2) A command language symbol accessible at all command levels.

global symbol table (GST)

In a library, an index of strongly defined global symbols used to access the modules defining the global symbols. The linker also puts global symbol tables into an image. For example, the linker appends a global symbol table to executable images that are intended to run under the symbolic debugger, and it appends a global symbol table to all shareable images.

Gold key

The upper-left key on the VT100 series terminal keypad, which enables alternate keypad functions.

granularity

A characteristic of storage systems that defines the amount of data that can be read or written with a single instruction, or read or written independently. VAX systems have byte or multibyte granularities while disk systems typically have 512-byte or greater granularities. AXP systems have longword and quadword granularities.

group

(1) A set of users in a system. The group name appears as the first field of a user identification code (UIC): [group,member]. The access rights accorded the group member appear in the third field of an object's protection code: (System:access,Owner:access,Group:access,World:access).

(2) A set of jobs (processes and their subprocesses) with access to a group's common event flags and logical name tables.

group number

The number or its alphanumeric equivalent in the first field of a user identification code (UIC).

GST

See *global symbol table*.

handshaking sequence

The exchange of logical link connection information between two tasks. This exchange takes place to enable the successful completion of a logical link connection.

hanging

The extremely slow response of the system. During an interactive session, when the terminal fails to respond, it is said to be hanging. When the system hangs, users might think that it has crashed.

hardcopy terminal

Terminals that print output on paper. See *terminal*.

hardware

The physical computer equipment, including such mechanical devices as the line printer, the terminals, the mass-storage devices, and so forth.

hardware address

For an Ethernet device, the unique Ethernet physical address associated with a particular Ethernet communications controller (usually in read-only memory) by the manufacturer.

hardware-based fault tolerance

The ability to detect, isolate, and bypass a fault that has been engineered into and executed through hardware.

hardware context

The values contained in the processor registers while a process is executing. When a process is executing, its hardware context is continually being updated by the processor. When a process is not executing, its hardware context is stored in its hardware process control block (PCB) on the VAX system, and the hardware privileged context block (HWPCB) and other software data structures on AXP systems.

hardware exception

A particular category of exceptions that directly reflect an exceptional condition in the current hardware state that should be noted or fixed by the software. Hardware exceptions may occur synchronously or asynchronously with respect to the normal program flow.

hardware privileged context block (HWPCB)

On AXP systems, a data structure known to the processor that contains the saved privileged context when a process is not executing. A process's HWPCB resides in its process header.

hardware process control block (hardware PCB)

On VAX systems, a data structure known to the processor that contains the saved hardware context when a process is not executing. A process's hardware PCB resides in its process header.

header page

Printed page at the beginning of a listing that identifies the printed file.

help file

A text file in a format suitable for use with the HELP command. Help files can provide up to nine levels of search.

H_floating data

An extended range floating-point number, 16 bytes long, having a range of $\pm 0.84 * 10^{-4932}$ to $\pm 0.59 * 10^{4932}$ and a precision of approximately 33 decimal digits.

hibernation

A state in which a process is inactive, but known to the system. A hibernating process becomes active again when a wake request is issued. It can schedule a wake request before hibernating, or another process can issue its wake request. A hibernating process can also become active long enough to service any AST it may receive while it is hibernating. See *suspension*.

hierarchical directory structure

A structure of directories that has several levels arranged in a tree-like structure, based on a one-to-many relationship.

hierarchical storage controller, HSC

A self-contained, intelligent, mass-storage controller that communicates with VAX processors and implements volume shadowing on Digital Storage Architecture (DSA) disks.

high-level language

A language for specifying computing procedures or organization of data within a digital computer. High-level languages are distinguished from assembly and machine languages by the omission of machine-specific details required for direct execution on a given computer.

highwater marking

A technique for discouraging disk scavenging. The system tracks the furthest extent that the owner of a file has written into the file's allocated area. It then prohibits any attempts at reading beyond the written area on the premise that any information that exists beyond the currently written limit is information some user had intended to discard. The operating system accomplishes the goals of highwater marking with its erase-on-allocate strategy.

holder

A user who possesses a particular identifier. Users and the identifiers they hold are recorded in the rights database. Whenever an object requires an accessor to hold an identifier, the system checks the process rights list (which is built from the rights database) in processing the access request.

home block

A block in the index file that contains the volume identification, such as volume label and protection.

hop

The logical distance between two nodes. One hop is the distance from one node to an adjacent node.

host node

(1) For a DECnet for OpenVMS network, a node that provides services for another node (for example, the host node supplies program image files for a downline load). For the VAX Packetnet System Interface (PSI), a node that accesses a packet switching data network by means of an X.25 multihost connector node.

(2) The node that makes a device available to other nodes in a VMScluster configuration. A host node can be either a processor that adds the device to the mass storage control protocol (MSCP) server database or a hierarchical storage controller (HSC) server.

hot standby

A second running computing system that is ready to pick up application processing in the event the primary computing system fails.

HSC

See *hierarchical storage controller*.

HWPCB

See *hardware privileged context block*.

IDB

See *interrupt dispatch block*.

identifier

An alphanumeric string representing a user or group of users that is stored in the rights database and used by the system in checking access requests. There are four types of identifiers: user identification code (UIC) identifiers, environmental identifiers, general identifiers, and facility identifiers.

image

Procedures and data bound together by the linker to form an executable program. This executable program is executed by the process. There are three types of images: executable, shareable, and system.

image activator

A set of system procedures that prepares an image for execution. The image activator establishes the memory management data structures required both to map the image's virtual pages to physical pages and to perform paging.

image exit

See *exit*.

image information file (IIF)

An ASCII file that contains information about the interface between VAX system images. VAX Environment Software Translator (VEST) uses IIFs to resolve references to other images and to generate the appropriate linkages. VEST is part of the DECmigrate tool set.

image I/O segment

That portion of the control region that contains the OpenVMS Record Management Services (RMS) internal file access blocks (IFAB) and I/O buffers for the image currently being executed by a process.

image name

The name of the file in which an image is stored.

image privileges

The privileges assigned to an image when it is installed. See *process privileges*.

image section

A group of program sections with the same attributes (such as read-only access, read/write access, absolute, relocatable, and so on) that is the unit of virtual memory allocation for an image.

immediate value

A mechanism for passing input parameters where the actual value is provided in the argument list entry by the calling program.

inbound connection

Logical link connection requests that a task receives.

increment

(1) To add one quantity to another.

(2) The quantity added.

index

The structure that allows retrieval of records in an indexed file by key value. See *key (indexed files)*.

indexed file organization

A file organization in which a file contains records and a primary key index (and optionally one or more alternate key indexes) used to process the records sequentially by index or randomly by index.

indexed sequential file

A record file in which each record has one or more data keys embedded in it. Records in the file are individually accessible by specifying a key associated with the record.

index file

The file on a Files–11 volume that contains the access information for all files on the volume and enables the operating system to identify and access the volume.

index file bitmap

A table in the index file of a Files–11 volume that indicates which file headers are in use.

indirect command file

See *command procedure*.

input file

File containing data to be transferred into the computer.

Often input and output files are confused. DCL usually prompts for these files, but most system utilities require you to identify your input and output files by position in a command line. Be sure of the syntax for the command you are using.

input stream

The source of commands and data—the user's terminal, the batch stream, or a command procedure.

integer register

See *general purpose register*.

integrated storage element (ISE)

A disk or tape device that contains a dedicated controller for the device in a combined package. The ISE contains fully functional MSCP/TMSCP server components, SCS, and port interface logic. ISEs are intelligent multi-host controllers, and work in parallel with other ISEs on the interconnect.

interactive

Mode of communication with the operating system in which you enter a command, and the system executes it and responds. One command has to finish executing before you can enter another.

interactive system

A computer system in which the user and the operating system communicate directly by means of a terminal. The operating system immediately acknowledges and acts upon requests entered by the user at the terminal.

interactive utility

A computer program, invoked with a DCL command, that provides a special environment from which you can perform a specific set of tasks. You work interactively with these utilities by entering subcommands and other information in response to the utility's prompt.

interleaving

Assigning consecutive physical memory addresses alternately between two memory controllers.

interlocked instruction

A VAX instruction that performs some action in a way that guarantees the complete result as a single, uninterruptible operation in a multiprocessing environment. Since other potentially conflicting operations can be blocked while the interlocked instruction completes, interlocked instructions can have a negative performance impact.

interprocess communication facility

A common event flag cluster, mailbox, or global section used to pass information between two or more processes.

interrecord gap (IRG)

A blank space deliberately placed between data records on the recording surface of a magnetic tape.

interrupt

(1) An event other than an exception or a branch, jump, case, or call instruction that changes the normal flow of instruction execution. Interrupts are generally external to the process executing when the interrupt occurs. See *device interrupt*, *software interrupt*, and *urgent interrupt*.

(2) A packet, sent through a packet switching data network, that bypasses normal flow control procedures used by data packets.

interrupt dispatch block (IDB)

A structure in the I/O database that describes the characteristics of a particular controller and points to devices attached to that controller.

interrupt message

A user-generated message sent outside the normal exchange of data messages during nontransparent DECnet for OpenVMS task-to-task communication. This use of the term interrupt is contrary to the normal usage, which means to designate a software or hardware interrupt mechanism.

interrupt priority level (IPL)

The interrupt level at which a software or hardware interrupt is generated. There are 31 possible interrupt priority levels: IPL 1 is lowest, 31 is highest. The levels arbitrate contention for processor service. For example, a device cannot interrupt a processor if the processor is currently executing at an interrupt priority level equal to or greater than the interrupt priority level of the device's interrupt service routine.

interrupt service routine (ISR)

The routine executed when an interrupt occurs.

interrupt stack (IS)

On VAX systems, the processor-specific stack used when executing in interrupt service context. At any time, the processor is either in a process context executing in user, supervisor, executive, or kernel mode, or in interrupt service context operating in kernel mode, as indicated by the interrupt stack and current mode bits in the processor status longword. The context of the interrupt stack is not switched.

interrupt stack pointer (ISP)

On VAX systems, the stack pointer for the systemwide interrupt stack.

interrupt vector

See *vector*.

I/O database

A collection of data structures that describes I/O requests, controllers, device units, volumes, and device drivers in a system. Examples are the driver dispatch table, driver prolog table, device data table, unit control block, channel request block, I/O request packet, and interrupt dispatch block.

I/O driver

See *device driver*.

I/O function

An I/O operation interpreted by the operating system and typically resulting in one or more physical I/O operations.

I/O function code

A 6-bit value specified in a Queue I/O Request system service that describes the particular I/O operation to be performed (for example, read, write, rewind).

I/O function modifier

A 10-bit value specified in a Queue I/O Request system service that modifies an I/O function code (for example, read terminal input no echo).

I/O lockdown

The state of a page when it cannot be paged or swapped out of memory.

I/O request packet (IRP)

A structure in the I/O database that describes an individual I/O request. The Queue I/O Request system service creates an I/O request packet for each I/O request. The operating system and the driver of the target device use information in the I/O request packet to process the request.

I/O rundown

An operating system function in which the system cleans up any I/O in progress when an image exits.

I/O space

The region of physical address space that contains the configuration registers, and device control and status and data registers. These regions are not physically contiguous.

I/O status block (IOSB)

A data structure associated with the Queue I/O Request system service. This service optionally returns a status code, number of bytes transferred, and device- and function-dependent information in an IOSB. An IOSB is not returned from the service call, but filled in when the I/O request completes.

IPL

See *interrupt priority level*.

IRG

See *interrecord gap*.

IRP

See *I/O request packet*.

IS

See *interrupt stack*.

ISE

See *integrated storage element*.

ISECT

See *image section*.

ISP

See *interrupt stack pointer*.

ISR

See *interrupt service routine*.

iterative translation

Repetitive translation of a logical name that occurs when a logical name's definition includes another logical name.

IV

Integer overflow trap enable bit in the processor status word.

jacket routine

A procedure that converts procedure calls from one calling standard to another, for example, calls between translated OpenVMS VAX images, which use the VAX calling semantics, and native AXP images, which use the AXP calling semantics.

JIB

See *job information block*.

job

The accounting unit equivalent to a process and its subprocesses, if any, and all subprocesses that they create. Jobs are classified as batch and interactive. For example, the job controller creates an interactive job to handle a user's requests when the user logs in to the system, and it creates a batch job when the symbiont manager passes a command input file to it.

job controller

The system process that establishes a job's process context, starts a process running the LOGIN image for the job, maintains the accounting record for the job, manages symbionts, and terminates a process and its subprocesses.

job information block (JIB)

A data structure associated with a job that contains the quotas pooled by all processes in the job.

job tree

A hierarchy of all processes and subprocesses, with the main process at the top.

journal

Name of the auditing log file where the system records events with security implications, such as logins, breakins, or changes to the authorization database.

journal file

A file containing the data input to the terminal for one editing session.

journaling

The recording of input during an editing session.

K

A unit for measuring the size of memory or similar resources. K is short for kilo and is used to mean roughly 1000, although K is equal to 2^{10}, or 1024.

kernel mode

The most privileged processor access mode (mode 0). The operating system's most privileged services, such as I/O drivers and the pager, run in kernel mode.

kernel-mode stack pointer (KSP)

The process context stack pointer for kernel mode.

key

(1) In indexed files, a character string, a packed decimal number, a 2- or 4-byte unsigned binary number, or a 2- or 4-byte signed integer within each data record in an indexed file. The user defines the length and location within the records; RMS uses the key to build an index. See *primary key*, *alternate key*, and *random access by key value*.

(2) In relative files, the relative record number of each data record in a data file; OpenVMS Record Management Services (RMS) uses the relative record numbers to identify and access data records in a relative file in random access mode. See *relative record number*.

(3) In the Sort utility, the data field in a record that contains the information required to sort the records.

keyboard

An input device that can be operated similarly to a typewriter.

keypad

The small set of keys next to the main keyboard on a terminal.

keyword

A word reserved for use in certain specified syntax formats, usually in a command string or a statement.

known component

The classification for one or more of the same DECnet for OpenVMS components. This classification includes all active and inactive occurrences of the component type. For example, known nodes include all active and inactive nodes in the network.

KSP

See *kernel-mode stack pointer*.

label

A record that identifies and delimits a magnetic tape volume or file section.

label group

A collection of one or more contiguous label sets.

label identifier

The first three characters of a label name, which identify one or more labels within a label set. These characters will always be the same; for example, a file identifier of HDR will always be used to identify header labels within a header label set.

label number

A number that indicates the position of a label within a label set. For ANSI labels, label number 1 is always present if the label set exists.

label set

One or more contiguous labels on a magnetic tape volume or file section with the same label identifier.

language support procedure

A procedure implicitly called to implement higher-level language constructs. Such procedures are not intended to be explicitly called from user programs.

LAP

See *link access protocol.*

LAT

See *local area transport.*

LBN

See *logical block number.*

LCN

See *logical channel number.*

level 1 router

A DECnet for OpenVMS node that can send and receive packets, and route packets from one node to another node within a single area.

level 2 router

A DECnet for OpenVMS node that can send and receive packets, and route packets from one node to another within its own area and between areas. See *area router.*

lexical function

A command language construct that the DIGITAL Command Language (DCL) command interpreter evaluates and substitutes before it parses a command string. Lexical functions return information about the current process (the user identification code [UIC] or default directory, for example) and about character strings, (their length or the location of substrings, for example).

librarian

A program that allows the user to create, update, modify, list, and maintain object library, help library, text library, and assembler macro library files.

library file

A direct access file containing one or more modules of the same module type.

library procedure

A procedure explicitly called using the equivalent of a call statement or function reference. Such procedures are usually language independent.

LIFO

Last-in/first-out; the order in which processing is performed. For example, a LIFO queue would process data on a last-come, first-served basis. See *FIFO.*

limit

The size or number of given items requiring system resources (such as mailboxes, locked pages, I/O requests, open files, and so on) that a job is allowed to have at any one time during execution, as specified by the system manager in the user authorization file. See *quota.*

line

The network management component that provides a distinct physical data path.

line buffer

A storage area used to store the last line deleted by an EDT delete line operation.

line feed

The ASCII command character that moves the cursor position down one line.

line number

A number used to identify a line of text in a file processed by a text editor.

line printer

An output device that prints files one line at a time. It is used for printing large amounts of output that would otherwise tie up a slower device. Almost every system has a device designated as the line printer. In some cases, the "line printer" is actually a high-speed terminal.

link access protocol (LAP)

A set of procedures used for link control on a packet switching data network. X.25 defines two sets of procedures:

- LAP—The data terminal equipment/data circuit-terminating equipment (DTE/DCE) interface is defined as operating in two-way simultaneous asynchronous response mode (ARM) with the DTE and DCE containing a primary and secondary function.

- LAPB—The DTE/DCE interface is defined as operating in two-way asynchronous balanced mode (ABM).

linker

A system program that creates an executable program, called an image, from one or more object modules produced by a language compiler or assembler. Programs must be linked before they can be executed.

linking

The resolution of external references between the object modules used to create an image; the acquisition of referenced library routines, service entry points, and data for the image; and the assignment of virtual addresses to components of an image.

LMB

See *logical memory block*.

load assist agent

An image that provides additional data required to perform a downline system load to a node in a local area VMScluster configuration.

load balancing

A function of the operating system by which work is distributed equally among all processors in a system. For more information, see *static load balancing* and *dynamic load balancing*.

load device

The drive that holds the distribution media during software installation.

load/store architecture

A machine architecture in which data items are first loaded into a processor register, then operated on, and finally stored back to memory. No operations on memory other than load and store are provided by the instruction set.

local area transport, LAT

A communications protocol that the operating system uses within a local area network to communicate with terminal servers.

local area VAXcluster system

A type of VAXcluster configuration in which cluster communication is carried out over the Ethernet by software that emulates certain computer interconnect, or CI, port functions. A VAXcluster node can be a VAX or a MicroVAX processor; hierarchical storage controllers, or HSCs, are not used.

local disk

A disk drive in a computer interconnect, or CI, environment that is independent of the hierarchical storage controller, or HSC.

local drive

Any drive that is connected directly to a computer.

locality

See *program locality*.

local node

The network node at which the user is physically located.

local symbol

(1) A symbol meaningful only to the module that defines it. Symbols not identified to a language processor as global symbols are considered to be local symbols. A language processor resolves (matches references with definitions) local symbols. They are not known to the linker and cannot be made available to another object module. They can, however, be passed through the linker to the symbolic debugger. See *global symbol*.

(2) A command language symbol name that is accessible only at the current command level and subsequently invoked levels. It is deleted when the command level at which it is defined exits.

locate mode

A OpenVMS Record Management Services (RMS) record access technique in which a program accesses records in a OpenVMS RMS I/O buffer area to reduce overhead. See *move mode*.

lock

An association between a job and a resource maintained by the OpenVMS Lock Manager. A lock is normally used to synchronize access by multiple processes to shared objects.

locked password

A password that cannot be changed by the account's owner. Only system managers or users with the SYSPRV privilege can change locked passwords.

locking a page in memory

Making a page in a process ineligible for either paging or swapping. A page stays locked in physical memory until the operating system specifically unlocks it.

locking a page in the working set

Making a page within a process ineligible for paging out of the working set for the process. The page can be swapped when the process is swapped. A page stays locked in a working set until it is specifically unlocked.

lock manager

A facility that mediates lock requests.

lock mode

A value associated with a request to the lock management system services, indicating the compatibility of the requested lock with other locks.

lock status block

Location containing the lock identification, final completion status, and optionally, a lock value block.

lock step

When two or more CPUs execute exactly the same operations at exactly the same time.

lock value block

An optional block of data associated with a lock-status block. The lock value block can be used to communicate information among processes sharing a resource.

log

A record of performance or system-relevant events.

logging

The network management component that routes event data to logging sinks such as a console or file.

logging file

The destination to which a machine-readable record of events is sent for later retrieval. The logging file is user defined.

logging in

The identification of a user to the system. When users log in, they type a user name and password in response to prompts from the system. If the user name and the password match an account on the system, the user is allowed access to the system.

logging console

The destination to which a record of events is sent in a form that is comprehensible to system users. Typically, a logging console is a terminal or a user-specified file.

logging monitor

The destination to which a machine-readable record of events is sent for possible real-time decision making. Typically, the logging monitor is a user-defined program.

logging out

Entering the DIGITAL Command Language (DCL) command LOGOUT, which informs the operating system that the user has finished using a particular terminal.

logical block number (LBN)

A volume-relative address of a block on a mass storage device. The blocks that form the volume are labeled sequentially starting with logical block 0. Volume shadowing duplicates data by writing it to identical logical blocks on multiple disks. See *physical block number* and *virtual block number*.

logical channel

A logical link between data terminal equipment (DTE) and its data circuit-terminating equipment (DCE). The physical communications line between a DTE and DCE is divided into a set of logical channels.

logical channel number (LCN)

A unique reference number that identifies a logical channel. Data terminal equipment (DTE) recognizes a virtual circuit by its associated LCN.

logical device name

Equate a somewhat cryptic device name to a short, meaningful name.

logical expression

An expression that has a true or false value.

logical I/O access

Right to perform a set of I/O operations that allow restricted direct access to device level I/O operations using logical block addresses.

logical I/O function

A set of I/O operations (for example, read and write logical block) that allow restricted direct access to device level I/O operations using logical block addresses.

logical link

(1) A communication path between programs on two network nodes. See *physical link*.

(2) A carrier of a single stream of full-duplex traffic between two user-level processes.

logical memory block (LMB)

The portion of information written to the dump file during a selective crash dump. Each LMB includes a header block describing the data structure, blocks describing the parts of the address space that could not be dumped, and the dumpable parts of virtual address space.

LMBs exist for system and global page tables, system space, global pages in use by a process or processes, and for individual processes.

logical name

A user-specified name for any portion or all of a file specification. For example, the logical name INPUT can be assigned to a terminal device from which a program reads data entered by a user. Logical name assignments are maintained in logical name tables for each process, each group, and the system. Logical names can be assigned translation attributes, such as terminal and concealed. See *search list*.

logical name table

A table that contains a set of logical names and their equivalence names for a particular process, a particular group, or the system.

logical record

A group of related fields treated as a unit.

login command procedure

A command procedure that is automatically executed at login and at the beginning of a batch job

login directory

The default directory established by LOGINOUT when a when a user logs in.

login file

A command procedure that is automatically executed at login and at the beginning of a batch job.

log manager

Software that provides a mechanism for storing a permanent record of transaction states in log files. A log file is a sequence of transaction records.

longword

Four contiguous bytes (32 bits) starting on any addressable byte boundary. Bits are numbered from right to left, 0 to 31. The address of the longword is the address of the byte containing the low-order bit (bit 0). A longword is naturally aligned if its address is evenly divisible by 4.

loop node

A local node associated with a particular line and treated as if it were a remote node. All traffic to the loop node is sent over the associated line.

loosely coupled system

A multiprocessing system configuration consisting of separate operating systems that communicate through some message transfer mechanism. See *tightly coupled system*.

macro

A statement that requests a language processor to generate a predefined set of instructions.

magnetic tape

Medium on which data can be stored and accessed.

magnetic tape ancillary control process (MTACP)

The internal software process of the operating system that interprets the logical format of ANSI-labeled volumes.

mailbox

A software data structure that is treated as a record-oriented device for general interprocess communication. Communication using a mailbox is similar to other forms of device-independent I/O. Senders write to a mailbox, the receiver reads from that mailbox. Some systemwide mailboxes are defined; the error logger and operator communication manager (OPCOM) read from systemwide mailboxes.

main memory

See *physical memory*.

main text buffer

In a text editor, the default text buffer for keyboard input and for input files, and the source for output files.

manual record unlocking

A OpenVMS Record Management Services (RMS) capability that allows users to lock multiple records in a file simultaneously. The user has explicit control over the unlocking of records. A lock occurs when the RAB$V_ULK bit is set in the record processing options field on the execution of a Get, Find, or Put service. Once a record is locked when record unlocking is enabled, it will remain locked until it is explicitly unlocked by either the Free or Release service, or until the stream terminates.

mapping window

A subset of file retrieval information used to translate virtual block numbers to logical block numbers.

marginal vector consumer

A process executing an image that has issued VAX vector instructions, but has not issued any instructions in the amount of time determined by the VECTOR_MARGIN system parameter. A marginal vector consumer relinquishes its need for the VECTOR capability and, thus, need no longer be scheduled on an available scalar-vector processor pair. A marginal vector consumer is eligible for execution on any processor in the system. See *vector consumer*.

MASSBUS adapter (MBA)

An interface device between the backplane interconnect and the MASSBUS device.

mass storage control protocol, MSCP

The software protocol used to communicate I/O commands between a VAX processor and DSA-compliant devices on the system.

mass storage device

An input/output device on which data and other types of files are stored while they are not being used. Typical mass-storage devices include disks, magnetic tapes, and floppy disks.

master file directory (MFD)

The file directory on a disk volume that contains the name of all user file directories (UFDs) on a disk, including its own.

maximum visits

The maximum number of nodes through which a packet can be routed before reaching its destination.

MBA

See *MASSBUS adapter*.

MBZ

See *must be zero*.

MCR

See *monitor console routine*.

mean-time-between-failures (MTBF)

The average time that passes before a computing component fails such that remedial action is required.

member number

The second number or its alphanumeric equivalent in a user identification code (UIC) that uniquely identifies that code.

member unit

See *shadow set member*.

memory

A series of physical locations into which data or instructions can be placed in the form of binary words. Each location in memory can be addressed and its contents can be altered. Memory should not be confused with mass-storage devices.

memory management

The operating system functions that include the hardware's page mapping and protection and the operating system's image activator and pager.

merge member

A shadow set member that is partially consistent with all other merge members of the shadow set. Only partial inconsistencies exist among the merge members so that some number of blocks were written and some were not at the time of a hardware failure.

merge operation

An operation that brings shadow set members, which are in a partially consistent state, into a fully consistent state while also permitting I/O operations to occur on the shadow set. A merge operation also attempts to correct blocks that are inconsistent on disk devices that were once members of the same shadow set. For a merge operation to occur, the shadowing software recognizes that the shadow set members are all former members of the same shadow set and the data on one member is just as correct as the data on any other member.

MFD

See *master file directory*.

Mixed Interconnect VMScluster System

Any VMScluster system that utilizes more than one interconnect (CI, DSSI, Ethernet, LAN) for SCA traffic. Mixed interconnect VMScluster systems provide maximum flexibility in combining CPUs, storage, and workstations into highly available configurations.

minimerge assist

Provides more efficient volume shadowing merge operation processing by logging information about write operations in the controller's memory. These write logs are used to locate exactly the LBNs in the shadow set that had write I/O requests outstanding when a node failed. The remaining nodes merge those LBNs that are inconsistent across the shadow set.

modem

Contraction of modulator/demodulator. A device that modulates signals for sending over communications facilities and demodulates signals being received.

modify access type

A type of access in which the specified operand of a VAX instruction or procedure is read and potentially modified and written during execution.

module

(1) A portion of a program or program library, as in a source module, object module, or image module.

(2) A board, usually made of plastic covered with an electrical conductor, on which logic devices (such as transistors, resistors, and memory chips) are mounted, and circuits connecting these devices are etched, as in a logic module.

(3) A network management component.

monitor console routine (MCR)

The command interpreter in an RSX–11 system; also an optional command interpreter in the operating system.

mounting a volume

(1) Logically associating a volume with the physical unit on which it is loaded (an activity accomplished by system software at the request of an operator).

(2) Loading or placing a magnetic tape or disk pack on a drive and placing the drive on line (an activity accomplished by a system operator).

mount verification

A feature that suspends I/O to and from volumes while they are changing status. Mount verification also ensures that, following a suspension in disk I/O, the volume being accessed is the same as was previously mounted. When volume shadowing is installed, the mount verification feature also maintains and validates shadow set membership for Files–11 shadow sets.

move mode

A OpenVMS Record Management Services (RMS) record I/O access technique in which a program accesses records in its own working storage area. See *locate mode*.

MSCP

See *mass storage control protocol*.

MTACP

See *magnetic tape ancillary control process*.

MTBF

See *mean-time-between-failures*.

multiaccess channel

A media (for example, Ethernet) on which many transmitters contend for access.

multicast addressing

An Ethernet addressing mode in which a given message packet is targeted to a group of logically related nodes.

multicast group address

An address assigned to a number of nodes on an Ethernet and used to send a message to all nodes in the group in a single transmission.

multinational character set

A set of 8-bit character international alphanumeric characters, including characters with diacritical marks.

multipoint circuit

A circuit connecting two systems, with one of the systems (the control station) controlling the circuit and the other system serving as a tributary.

multiport memory

A memory unit that can be connected to multiple VAX processors and that can contain resources (for example, mailboxes, common event flag clusters, and global sections) for use by processes running on different processors.

multiprocessing system

A system containing two or more general-purpose processors. These processors are connected, through hardware, so that they can work on the same application concurrently. See *asymmetric multiprocessing* and *symmetric multiprocessing*.

multiprogramming

A mode of operation in which hardware resources are shared among multiple, independent software processes.

must be zero (MBZ)

A field that is reserved and must be supplied as zero. If examined, it must be assumed to be undefined.

mutex

A semaphore used to control exclusive access to a region of code that can share a data structure or other resource. The mutex (mutual exclusion) semaphore ensures that only one process at a time has write access to the region of code.

NAM

See *name block*.

name block (NAM)

A OpenVMS Record Management Services (RMS) user data structure that contains supplementary information used in parsing file specifications.

National Replacement Character (NRC)

A 7-bit character set that is a country-specific version of ASCII.

native image

An image whose instructions are executed in native mode.

natural alignment

Data storage in memory such that the address of the data is evenly divisible by the size of the data in bytes. For example, a naturally aligned longword has an address that is evenly divisible by 4, and a naturally aligned quadword has an address that is evenly divisible by 8. A structure is naturally aligned when all its members are naturally aligned.

NCP

See *Network Control Program.*

NETACP

See *network ancillary control process*.

NETPROXY

See *network proxy authorization file*.

network

A collection of interconnected individual computer systems.

network ancillary control process (NETACP)

An ancillary control process that controls all lines and circuits, maintains a picture of the network topology, and creates a process to receive inbound logical link requests.

network connect block (NCB)

(1) For a DECnet for OpenVMS network, a user-generated data structure used in a nontransparent task to identify a remote task and optionally send user data in calls to request, accept, or reject a logical link connection.

(2) For the VAX Packetnet System Interface (PSI), a block that contains the information necessary to set up an X.25 virtual circuit or to accept or reject a request to set up an X.25 virtual circuit.

Network Control Program (NCP)

An interactive utility program that permits you to control and monitor the network.

network object

Any task with a nonzero object type, for example, those programs such as FAL and NML that provide generic services across a network.

network proxy authorization file (NETPROXY)

A file (NETPROXY.DAT) containing an entry for each user authorized to connect to the local system from a remote node in the network. It is sometimes referred to as the network user authorization file (NETUAF.DAT).

network services protocol (NSP)

A formal set of conventions used in a DECnet for OpenVMS network to perform network management and to exchange messages over logical links.

network status notification

Information about the state of both logical and physical links over which two tasks communicate. A nontransparent task can use this information to take appropriate action under conditions such as third-party disconnections and a partner's exiting before I/O completion.

network task

A nontransparent task that is able to process multiple inbound connection requests; that is, it has declared a network name or object number.

node

(1) An individual computer system in a network that can communicate with other computer systems in the network.

(2) A VAXBI interface—such as a central processor, controller, or memory subsystem—that occupies one of 16 logical locations on a VAXBI bus. See *VAXBI*.

(3) A VAX processor or HSC that is recognized by system communications services (SCS) software.

node address

The required, unique, numeric identification of a specific node in the network.

node name

An optional alphanumeric identification associated with a node address in a strict one-to-one mapping. A node name must contain at least one alphabetic character.

node specification

The first field in a file specification. This field identifies the location of a computer system in a network.

noncommand image

A program not associated with a DCL command. To invoke a noncommand image, use the file name containing the program as the parameter to the RUN command.

nonprinting character

A character in the computer code set for which there is no corresponding graphic symbol.

nonprivileged

(1) An account with no privilege other than TMPMBX and NETMBX and a user identification code (UIC) greater than the system parameter MAXSYSGROUP.

(2) In DECnet for OpenVMS, this term means no privileges in addition to NETMBX, which is the minimal requirement for any network activity.

nonrouting node

See *end node*.

NRC

See *National Replacement Character*.

NSP

See *network services protocol*.

null

(1) The character with the ASCII code 000.

(2) An absence of information.

null string

A string without content or an empty string represented by adjacent quotation marks.

null value

A string with no characters that is represented in a command procedure by double quotation marks (`""`).

numeric expression

A mathematical statement consisting of a collection of operands connected by arithmetic operators.

numeric string

A contiguous sequence of bytes representing up to 31 decimal digits (one per byte) and possibly a sign. The numeric string is specified by its lowest addressed location, its length, and its sign representation.

object

(1) A passive repository of information to which the system controls access. Access to an object implies access to the information it contains. Examples of protected objects are files, volumes, global sections, and devices.

(2) A DECnet for OpenVMS process that receives a logical link request. It performs a specific network function or is a user-defined image for a special-purpose application.

(3) A VAX Packetnet System Interface (PSI) management component that contains records to specify account information for incoming calls and to specify a command procedure that is initiated when the incoming call arrives.

object class

On VAX systems, a set of protected objects with common characteristics. For example, all files belong to the FILE class whereas all devices belong to the DEVICE class.

object module

The binary output of a language processor such as the assembler or a compiler, which is used as input to the linker.

object program

A source program that has been translated into machine language.

object time system

See *Run-Time Procedure Library*.

object type

A discrete identifier for either a task or DECnet for OpenVMS service on a remote node. Object type identifiers can either be 0 plus a name (alternatively, TASK=name) or nonzero without a name (for example, 17= or FAL=).

octal number

A number in the base-8 numbering system. Only the numerals 0 through 7 are used in this system. If a number includes an 8 or a 9, it cannot be an octal number. Octal numbering is used in computer systems because it is easy to convert to the binary numbers that are actually used by the computer.

octaword

Eight contiguous words (128 bits) starting on any addressable byte boundary. Bits are numbered from right to left, 0 to 127. The address of an octaword is the address of the word containing the low-order bit (bit 0). An octaword is naturally aligned if its address is evenly divisible by 16.

offset

A fixed displacement from the beginning of a data structure. System offsets for items within a data structure normally have an associated symbolic name used instead of the numeric displacement. Where symbols are defined, programmers always reference the symbolic names for items in a data structure instead of using the numeric displacement.

OLTP

See *Online Transaction Processing*.

On-Disk Structure Level 1 (ODS1)

See *Files–11 On-Disk Structure Level 1.*

On-Disk Structure Level 2 (ODS2)

See *Files–11 On-Disk Structure Level 2.*

Online Transaction Processing (OLTP)

An environment in which many users are simultaneously reading and writing to a collection of shared data, generally a database. Results are usually expected immediately (real time). In contrast to standard transaction processing, when an OLTP transaction is completed, all data is fully updated during the request and output stages. No files are created for later batch updates of the stored data. See *transaction processing.*

opcode

The pattern of bits within an instruction that specifies the operation to be performed.

OPCOM

See *operator communication manager.*

open

To prepare a data set or file for processing.

open account

An account that does not require a password.

operand

The part of an expression that contains a value. Operands are acted on by operators during expression evaluation to produce a result.

operating system

An integrated collection of programs that controls the execution of computer programs and performs system functions.

operator

(1) The person responsible for daily maintenance of the system at a particular installation. The operator does such things as mounting disks and tapes, changing ribbons and paper on line printers, rebooting the system, keeping records, and so forth. In small systems, these duties may be combined with those of the system manager or informally divided among several people.

(2) The part of an expression that tells the computer how to manipulate the operands. For example, the plus sign (+) is an operator that tells the computer to perform addition.

operator communication manager (OPCOM)

A system process that receives input from a process that wants to inform an operator of a particular status or condition, passes a message to the operator, and tracks the message.

operator console

Any terminal identified as a terminal attended by a system operator.

operator terminal

A terminal attended by a system operator. The system can send system event messages to the terminal, provided the event class is enabled.

out-of-order packet caching

The mechanism by which the network services protocol (NSP) maintains a buffer of data packets received out of order so that they can be reassembled in the correct order before being forwarded to the destination node.

outbound connection

A task's request for a logical link connection to another node.

output file

A file that contains the results of a processing operation, for example, a file that has been sorted or edited.

owner

A user with the same user identification code (UIC) as the protected object. An owner always has control access to the object and can therefore modify the object's security profile. When the system processes an access request from an owner, it considers the access rights in the owner field of a protection code.

owner process

The process or subprocess that created a subprocess.

P0

See *program region*.

P1

See *control region*.

P1 through P8

See *parameter*.

P1BR

See *control region base register*.

P1LR

See *control region length register*.

P1PT

See *control region page table*.

packed decimal

A method of representing a decimal number by storing a pair of decimal digits in 1 byte, taking advantage of the fact that only four bits are required to represent the numbers 0 through 9.

packed decimal string

A contiguous sequence of up to 16 bytes interpreted as a string of 4-bit fields. Each field represents a digit except for the low-order four bits of the highest addressed byte, which represent the sign. The packed decimal string is specified by its lowest addressed location and by the number of digits.

packet

A unit of data to be routed from a source node to a destination node; for the VAX Packetnet System Interface (PSI), the unit of data switched through a packet switching data network (PSDN). Normally, a user data field accompanied by a header carrying destination and other information.

packet assembly/disassembly (PAD) facility

A device at a packet switching data network (PSDN) that allows access from an asynchronous terminal. The terminal connects to the PAD, and the PAD puts the terminal's input data into packets (assembles) and takes the terminal's output data out of packets (disassembles).

Packetnet System Interface (PSI)

A software product that allows the user to communicate across packet switching data networks (PSDNs).

packet switching

A data transmission process, utilizing addressed packets, whereby a channel is occupied only for the duration of transmission of the packet.

PAD

See *packet assembly/disassembly (PAD) facility*.

packet switching data network (PSDN)

A set of equipment and interconnecting links that provides a packet switching communications service to subscribers.

page

(1) set of contiguous byte locations used as the unit of memory mapping and protection. An AXP memory page can be 8KB, 16KB, 32KB, or 64KB depending upon system implementation. A VAX memory page is always 512 bytes. On either system, a page is aligned on a boundary that is an even multiple of its size.

(2) The data between the beginning of file and a page marker, between two markers, or between a marker and the end of a file. See *pagelet*.

page fault

An exception generated by a reference to a page that is not in the working set of the faulting process. See *translation-not-valid fault*.

page fault cluster

See *cluster*.

page fault cluster size

The number of pages read into memory on a page fault.

page frame number (PFN)

The high-order bits of the physical address of a page in physical memory.

page frame number mapping (PFN mapping)

Mapping a section to one or more pages in physical memory or I/O space (as opposed to mapping it to a disk file).

pagelet

A 512-byte unit of memory in an AXP environment. On AXP systems, certain DCL and utility commands, system services, and system routines accept as input or provide as output memory requirements and quotas in terms of pagelets. Although this allows the external interfaces of these components to be compatible with those of VAX systems, AXP systems internally manage memory only in even multiples of the CPU memory page size. See *page*.

page marker

A character or characters (generally a form feed) that separates pages in a file processed by a text editor.

pager

A set of kernel mode procedures that executes as the result of a page fault. The pager makes the page for which the fault occurred available in physical memory so that the image can continue execution. The pager and the image activator provide the operating system's memory management functions.

page size

The number of bytes that a system's hardware treats as a unit for address mapping, sharing, protection, and movement to and from secondary storage.

page table

A memory management data base used to account for virtual pages. See *system page table, process page table,* and *global page table*.

page table base register (PTBR)

On AXP systems, the processor register or its equivalent, in a hardware privileged context block that contains the page frame number of the process's first level page table.

page table entry (PTE)

The data structure that identifies the physical location and status of a page of virtual address space. When a virtual page is in memory, the PTE contains the page frame number needed to map the virtual page to a physical page. When it is not in memory, the page table entry contains the information needed to locate the page on secondary storage (disk).

paging

The action of bringing pages of an executing process into physical memory when referenced. When a process executes, all of its pages are said to reside in virtual memory. Only the actively used pages, however, need to reside in physical memory. The remaining pages can reside on disk until they are needed in physical memory. A process is paged either when it references more pages than it is allowed to have in its working set or when it first activates an image in memory. When the process refers to a page not in its working set, a page

fault occurs. This faulting causes the operating system's pager to read in the referenced page if it is on disk (and, optionally, other related pages depending on a cluster factor), replacing the least recently faulted pages as needed. The operating system's pager does not read in a referenced page if that page is on the free or modified list.

parallel processing

A method of computing that occurs when a section of an application is divided into multiple tasks, and those multiple tasks are executed simultaneously on multiple processors.

parameter

(1) A value passed to a command procedure equated to a symbol ranging from P1 through P8. See *command parameter*.

(2) An entry in the volatile or permanent database for a network management component.

parsing

(1) Breaking a command string into its elements to interpret it.

(2) Interpreting a file specification, as is done by OpenVMS Record Management Services (RMS).

password

A character string that users provide at login time to validate their identity and as a form of proof of their authorization to access the account. There are two kinds of passwords—system passwords and user passwords. User passwords include both primary and secondary passwords.

path

The route a packet takes from source to destination.

path cost

The sum of the circuit costs along a path between two nodes.

path length

The number of hops along a path between two nodes; that is, the number of circuits a packet must travel along to reach its destination.

PC

See *program counter*.

PCB

See *process control block*.

performance assist

OpenVMS Volume Shadowing uses controller performance assists to improve full copy and merge operation performance. There are two distinct types of performance assists: the full copy assist and the minimerge assist.

peripheral device

Any unit, distinct from the CPU and physical memory, that can provide the system with input or accept any output. Terminals, line printers, and disks are peripheral devices.

permanent database

A file containing information about network management components. See *volatile database* and *configuration database*.

permanent virtual circuit (PVC)

A permanent logical association between two DTEs (data terminal equipment), which is analogous to a leased line. Packets are routed directly by the network from one DTE to the other.

per-process address space

See *process address space*.

PFN

See *page frame number*.

PFN mapping

See *page frame number mapping*.

PHD

See *process header*.

physical address

(1) The address used by hardware to identify a location in physical memory or on directly addressable secondary storage devices such as disk. A physical memory address consists of a page frame number and the number of a byte within the page. A physical disk block address consists of a cylinder or track and sector number.

(2) The unique address value associated with a given system on an Ethernet circuit. An Ethernet physical address is defined to be distinct from all other physical addresses on an Ethernet circuit.

physical address space

The set of all possible physical addresses that can be used to refer to locations in memory (memory space) or device registers (I/O space).

physical block number

The physical address of a block on a mass storage device. See *logical block number* and *virtual block number*.

physical device name

Uniquely identifies a physical device (such as a storage disk or a terminal) to the system.

physical I/O access

Right to perform a set of I/O functions that allows access to all device-level I/O operations except maintenance mode using physical block addresses.

physical link

A signal-carrying media that links two nodes in a network. See *logical link*.

physical memory

The memory modules connected to the backplane interconnect that are used to store both instructions that the processor can directly fetch and execute and any other data that a processor is instructed to manipulate. Also called main memory.

PID

See *process identification*.

point-to-point circuit

A circuit that connects two nodes, operating over a single line.

polling

The activity that the control station performs with a multipoint circuit's tributaries to grant the tributaries permission to transmit.

position-dependent code

Code that can execute properly only in the locations in virtual address space that are assigned to it by the linker.

position-independent code

Code that can execute properly without modification wherever it is located in virtual address space, even if its location is changed after it is linked. Generally, this code uses addressing modes that form an effective address relative to the program counter (PC).

primary key

The mandatory key within the data records of an indexed file; used by OpenVMS Record Management Services (RMS) to determine the placement of records within the file and to build the primary index. See *key* (indexed files) and *alternate key*.

primary password

A type of user password that is the first password requested from the user. Systems may optionally require a secondary password, as well. As a user password, this password must be associated with the user name that is supplied with it.

primary processor

The processor in a symmetric multiprocessing system that is either logically or physically attached to the console device. Only the primary processor performs the initialization activities that define the environment and prepare memory for the entire system. In addition, the primary processor serves as the system timekeeper. See *secondary processor*.

primary vector

A location that contains the starting address of a condition handler to be executed when an exception condition occurs. If a primary vector is declared, that condition handler is the first handler to be executed.

print queue

A list of files waiting to be printed.

priority

See *process priority* and *interrupt priority level*.

private section

An image section of a process that is not shareable among processes. See *global section*.

private volume

A volume that has been allocated by a process for its own exclusive use.

privilege

A means of protecting the use of certain system functions that can affect system resources and integrity. System managers grant privileges according to user's needs and deny them to users as a means of restricting their access to the system. See *process privileges*, *user privileges*, and *image privileges*.

privileged

Generally refers to instructions, images, or accounts intended for use by the operating system, specific system programs, or a subset of the system users.

procedure

A closed sequence of instructions (routine) entered by means of a call instruction and then returns control to the calling program. See *command procedure*.

procedure value

An address value that represents a procedure. In the VAX environment, a procedure value is the address of the entry mask that is interpreted by the CALLx instruction invoking the procedure. In an AXP environment, a procedure value is the address of the procedure descriptor for the procedure.

procedure value register

On AXP systems, integer register 27 (R27). In a standard call, the procedure value of the procedure being called is passed in this register.

process

The basic entity scheduled by the system software, a process provides the context in which an image executes. A process consists of an address space and both hardware and software context.

process address space

See *process space*.

process affinity

In a symmetric multiprocessing system, a close association of a process with a specific processor or set of processors in the system. Process affinity can be indicated as either a requirement that a process run only on the processor with a specific CPU identification or on a processor or set of processors that have a needed capability. See *capability*.

process context

The set of data defining the environment, both hardware and software, in which a process executes. See *hardware context* and *software context*.

process control block (PCB)

A data structure used to contain process context. The hardware PCB contains the hardware context. The software PCB contains the software context, which includes a pointer to the hardware PCB.

process header (PHD)

A data structure that contains the hardware process control block (PCB), accounting and quota information, process section table, working set list, and the page tables defining the virtual layout of the process.

process header slots

That portion of the system address space in which the system stores the process headers for the processes in the balance set. The number of process header slots in the system determines the number of processes that can be in the balance set at any one time.

process identification (PID)

A 32-bit binary value that uniquely identifies a process. Each process has a process identification and a process name.

process I/O channel

See *channel*.

process I/O segment

That portion of a process control region that contains the process permanent OpenVMS Record Management Services (RMS) internal file access block for each open file, and the I/O buffers, including the command interpreter's command buffer and command descriptors.

process name

A 1- to 15-character ASCII string that can be used to identify processes executing under the same group number.

processor-memory interconnect

On AXP systems, an interconnect on which the CPU and memory communicate. I/O widgets and I/O adapters can also connect to the PMI.

processor register

A part of the processor used by the operating system software to control the execution states of the computer system. Processor registers on VAX systems include, for example, the system base and length registers, the program and control region base and length registers, the system control block base register, and the software interrupt request register. On AXP systems, processor registers include the page table base register, software interrupt request register, and privileged context base register.

processor status (PSL)

On VAX systems, a privileged processor register, known as the processor status longword (PSL), consisting of a word of privileged processor status and the processor status word itself. The privileged processor status information includes the current interrupt priority level (IPL), the previous access mode, the current access mode, the interrupt stack bit, the trace trap pending bit, and the compatibility mode bit.

On AXP systems, a privileged processor register known as the processor status (PS). It consists of a quadword of information including the current access mode, the current IPL, the stack alignment, and several reserved fields.

processor status word (PSW)

On VAX systems, the low-order word of the processor status longword. Processor status information includes the condition codes (carry, overflow, 0, negative), the arithmetic trap enable bits (integer overflow, decimal overflow, floating underflow), and the trace enable bit.

process page tables

The page tables used to describe process virtual memory.

process permanent file

A file that is opened or created through OpenVMS Record Management Services (RMS) by supervisor or executive mode when the process permanent bit is set in the file-processing options field.

process priority

The priority assigned to a process for scheduling purposes. The operating system recognizes 32 levels of process priority, where 0 is low and 31 high. Levels 16 through 31 are used for real-time processes. The system does not modify the priority of a real-time process (although the system manager or the process itself may). Levels 0 through 15 are used for normal processes. The system may temporarily increase the priority of a normal process based on the activity of the process.

process privileges

The privileges granted to a process by the system. These privileges are a combination of user privileges and image privileges. They include, for example, the privilege to affect other processes associated with the same group as the user's group, to affect any process in the system regardless of user identification code (UIC), to set process swap mode, to create permanent event flag clusters, to create another process, to create a mailbox, to perform direct I/O to a file-structured device, and to perform network operations.

process section

See *private section*.

process space

The lowest addressed half of virtual address space, where process instructions and data reside. Process space is divided into a program region and a control region.

program

A series of instructions aimed at a particular result. Programming languages are a means of describing procedures so that they can be performed by a computer. See *image*.

program counter (PC)

A CPU register that contains the virtual address of the next instruction to be executed. The register is incremented as each instruction is executed. On VAX systems, R15 serves as the PC. On AXP systems, the PC is a special processor register.

program locality

A characteristic of a program that indicates how close or far apart the references to locations in virtual memory are over time. A program with a high degree of locality does not refer to many widely scattered virtual addresses in a short period of time.

programmer number

See *member number*.

program region (P0)

The lowest addressed half of process address space (P0 region). The program region contains the image currently being executed by the process and other user code called by the image.

program section (PSECT)

A portion of a program with a given protection and set of storage management attributes. Program sections that have the same attributes are gathered together by the linker to form an image section.

project number

See *group number*.

prompt

A character string appearing on a terminal indicating that the user must provide input.

protected subsystem

An application with enhanced access control. While users run the application, their process rights list contains identifiers giving them access to objects owned by the subsystem. As soon as they exit the application, these identifiers and, therefore, access rights to objects are taken away.

protection

The attributes of an object that limit the type of access available to users. See *user identification code (UIC)*, *protection code*, and *access control list*.

protection code

A code defining the type of access that users are allowed to objects, based on the user's relationship to the object's owner. The code defines four sets of users: those with system rights, those with ownership rights, those belonging to the same group, and all users on the system, who are called world users.

protocol

An agreed set of rules governing the operation of a communications link.

proxy login

The procedure that permits a remote user to access a specific account at the local node, without supplying the user name and password.

PSDN

See *packet switching data network*.

PSECT

See *program section*.

pseudodevice

An entity similar to a mailbox that is treated as an I/O device by the user or system, although it is not any particular physical device.

PSI

See *Packetnet System Interface*.

PSL

See *processor status*.

PSW

See *processor status word*.

PTBR

See *page table base register*.

PTE

See *page table entry*.

public volume

A file-structured disk volume that contains public files.

pure code

See *reentrant code*.

PVC

See *permanent virtual circuit*.

QIO

See *Queue I/O Request system service*.

quadword

Four contiguous words (64 bits) starting on any addressable byte boundary. Bits are numbered from right to left, 0 to 63. The address of a quadword is the address of the word containing the low-order bit (bit 0). A quadword is naturally aligned if its address is evenly divisible by 8.

qualifier

A portion of a command string that modifies a command verb or command parameter by selecting one of several options. A qualifier, if present, follows the command verb or parameter to which it applies and is in the format /qualifier[=option]. For example, in the command string "PRINT filename /COPIES=3," the COPIES qualifier indicates that the user wants three copies of a given file printed.

quantum

The minimum amount of time that a process can remain in memory; also the maximum amount of time that a process can be the executing process. A specified amount is deducted from the quantum whenever a process enters a wait state.

queue

(1) A line of jobs to be processed, for example, a batch job queue or a printer job queue. Processing occurs primarily in first-in/first-out (FIFO) order, but does reflect the priority of the process that submitted the job. See *state queue* and *system queue*.

(2) To make an entry in a list or table, perhaps using the INSQUE instruction.

Queue I/O Request system service (QIO)

The system service that handles $QIO and $QIOW requests. The QIO prepares an I/O request for processing by the driver and performs device-independent preprocessing of the request. This system service also calls driver function decision table (FDT) routines.

queue priority

The priority assigned to a job placed in a spooler queue or a batch queue.

quota

The total amount of a system resource, such as CPU time, that a job is allowed to use in an accounting period, as specified by the system manager in the user authorization file. See *limit*.

RA

See *record address register*.

RAB

See *record access block*.

random access

A method for retrieving or writing data in which the location of the data to be retrieved or written is not dependent on the location of previously retrieved or written data. Random access refers to memory or mass-storage devices on which all information is equally accessible.

random access by key

The retrieval or storage of a record by specifying the key value. This method of record retrieval and storage applies only to indexed files.

random access by record file address (RFA)

The retrieval of a record by its unique address, which is provided to the program by OpenVMS Record Management Services (RMS) upon successful $GET or $FIND operations. The record's file address can subsequently be used to randomly access that same record.

random access by relative record number

The retrieval or storage of a record by specifying its position relative to the beginning of the file. This method of record storage and retrieval applies only to sequential files with fixed-length records and relative files.

reachable node

A node to which the local node has a usable communications path.

read

The act or capability of an image to accept data. For example, when a TYPE command is entered, the system reads the designated file from the disk and writes it to the terminal. See *write*.

read access type

An instruction or procedure operand attribute indicating that the specified operand is only read during instruction or procedure execution.

read miss

An event in which a read operation cannot be serviced by the processor's hardware cache.

read-modify-write operation

A hardware operation that involves the reading, modifying, and writing of a piece of data in main memory as a single, uninterruptible operation.

read-write ordering

The order in which memory on one CPU becomes visible to an execution agent (a different CPU or device within a tightly-coupled system).

real-time process

A process that responds to events in related or controlled processes as they occur, rather than when the computer is ready to respond to them. The results of the computation can thus be used in the processing. A real-time process is assigned to a software priority level between 16 and 31, inclusive. The scheduling priority assigned to a real-time process is never modified by the scheduler, although it can be modified by the system manager or by the process itself.

real-time system

A system in which inquiries and data entered on a terminal are processed based on need and priority.

record

A set of related data that a program treats as a unit.

record access block (RAB)

A OpenVMS Record Management Services (RMS) user control block allocated at either assembly or run time to communicate with RMS. The control block describes the records in a particular file and associates with a file access block to form a record access stream. A RAB defines the characteristics needed to perform record-related operations, such as update, delete, or get.

record access mode

The method used in OpenVMS Record Management Services (RMS) for retrieving and storing records in a file. Access is by one of four methods: sequential, random by key, random by record's file address, and random by relative record number.

record access mode switching

Term applied to the switching from one type of record access mode to another while processing a file.

record blocking

The technique of grouping multiple records into a single block. On magnetic tape, an interrecord gap (IRG) is placed after the block rather than after each record. This technique reduces the number of I/O transfers required to read or write the data; and, in addition (for magnetic tape), increases the amount of usable storage area. Record blocking also applies to disk files.

record cell

A fixed-length area in a relative file that is used to contain one record.

record file address (RFA)

The unique address of a record in a file, the RFA allows previously accessed records to be accessed randomly at a subsequent time. This access occurs regardless of file organization.

record format

The way a record physically appears on the recording surface of the storage media. The record format defines the method for determining record length.

record length

The size of a record in bytes.

record locking

The ability to control operations being performed on relative and indexed files that are being simultaneously accessed by more than one program or more than one record stream. Record locking makes certain that when a program is adding, deleting, or modifying a record on a given stream, another program or stream is not allowed to access the same record or record cell. See *automatic record locking* and *manual record unlocking*.

Record Management Services (RMS)

A set of operating system procedures that is called by programs to process files and records within files. RMS allows programs to issue GET and PUT requests at the record level (record I/O) as well as read and write blocks (block I/O). RMS is an integral part of the system software; its procedures run in executive mode.

record-oriented device

A device such as a terminal, line printer, or card reader on which the largest unit of data a program can access in one I/O operation is the device's physical record.

record sorting

A sorting process where records are kept intact and an output file consisting of complete records is produced.

recoverability

The ability of a system to reconfigure itself and continue (or quickly resume) operation.

Reduced Instruction Set Computer (RISC)

A computer that has an instruction set reduced in complexity, but not necessarily in the number of instructions. RISC architectures typically require more instructions than CISC architectures to perform a given operation, because an individual instruction performs less work than a CISC instruction.

redundant

Duplicate or extra computing components that protect a computing system from failure.

reentrant code

Code that is never modified during execution. It is possible to let many users share the same copy of a procedure or program written as reentrant code.

reentrant service

A service that is safe to call from multiple threads in parallel. If a service is reentrant, there is no burden placed on calling routines to serialize their access or take other explicit precautions. See *thread-serial service* and *thread-synchronous service*.

reference

A mechanism for passing parameters where the address of the parameter is provided in the argument list by the calling program. A mechanism for passing parameters where the address of the parameter is provided in the argument list by the calling program.

register

A storage location in hardware logic other than main memory. See *general purpose register, processor register, integer register, floating-point register,* and *device register*.

relative file organization

The arrangement of records in a file in which each record occupies a cell of equal length within a bucket. Each cell is assigned a successive number, which represents its position relative to the beginning of the file.

relative record number

An identification number used to specify the position of a record cell relative to the beginning of the file. The relative record number is used as the key during random access by key mode to relative files. To randomly access a record in a sequential disk file having 512-byte, fixed-length records, a program must provide OpenVMS Record Management Services (RMS) with the relative record number of the cell containing the record.

relative volume number (RVN)

A volume number that uniquely identifies which volume set contains a file.

reliability

The ability of a computing system to operate without failing. Reliability is measured by a *Mean Time Between Failure (MTBF)* formula.

remote data terminal equipment (DTE)

Any DTE in a network other than the one at which the user is located.

remote device

A device that is not directly connected to the local node, but is available through the VMScluster system.

remote node

To any one node in the network, this node is any other network node. See *adjacent node*, *local node*, and *executor node*.

reorganization

A record-by-record copy of an indexed file to another indexed file with the same key attributes as the input file.

resource

(1) A physical part of the computer system such as a device or memory, or an interlocked data structure such as a mutex. Quotas and limits control the use of physical resources.

(2) Any entity to which access is synchronized by means of the lock management system services.

resource manager

Software that participates in distributed transactions and manages shared access to a recoverable resource. An example of a recoverable resource is a database system.

resource wait mode

An execution state in which a process indicates, when it issues a service request requiring a resource, that it will wait until a system resource becomes available. If a process requests notification when a resource is not available, it can disable resource wait mode during program execution.

restricted account

A type of account with a secure login procedure. The user is not allowed to use the Ctrl/Y key during the system or process login command procedure. Control may be turned over to the user following execution of the login command procedures.

resume

To activate a suspended process. See *waking*.

return address register (RA)

On AXP systems, integer register 26 (R26). In a standard call, the return address must be passed in this register.

return status code

See *status code*.

reverse video

A feature of a video terminal that reverses the default video contrast. If the default display is black figures on a white background, reverse video displays white figures on a black background.

RFA

See *record file address*.

rights database

The collection of data the system maintains and uses to define identifiers and associate identifiers with the holders of the identifiers.

rights list

The list associated with each process that includes all the identifiers the process holds.

RISC

See *Reduced Instruction Set Computer*.

RMS

See *Record Management Services*.

RMS–11

A set of routines that are linked with compatibility mode programs and provide similar functional capabilities to OpenVMS Record Management Services (RMS). The file organizations and record formats used by RMS–11 are very similar to those of RMS.

round robin

A form of timesharing that gives images of equal priority equal access to the CPU. The operating system uses round-robin scheduling for each of the lower 16 software priority levels. Each process at a given software priority level executes in turn before any other process at that level (a first-in/first-out (FIFO) queue).

router

A node that can send, receive, and route packets from one node to another.

routing

The network function that determines the path along which data travels to its destination.

runaway tape condition

A situation where a tape spins unceasingly on the drive. A runaway tape condition usually occurs because an operation does not incur a timeout condition. The only way to recover from a runaway tape condition is to take the drive off line.

Run-Time Procedure Library

The collection of procedures available to native-mode images at run time. These procedures may be used by all native-mode images, regardless of the language processor used to compile or assemble the program. These procedures also provide support routines for high-level language compilers.

RVN

See *relative volume number*.

RWED

The abbreviation for Read, Write, Execute, Delete, which are types of access to data files, directory files, or volumes.

save set

A file that the Backup utility creates to save files that it backs up.

satellite node

A processor that is part of a local area VMScluster system. A satellite node is booted remotely from the system disk of the boot server in this type of VMScluster system. See *boot server*.

SBI

See *synchronous backplane interconnect*.

scalar

A single data item, having one value.

scalar consumer

A process executing an image that issues VAX scalar instructions only. See *vector consumer*.

scaleability

How well the software or hardware product is able to adapt to future business needs.

scatter/gather

The ability to transfer in one I/O operation data from discontiguous pages in memory to contiguous blocks on disk, or data from contiguous blocks on disk to discontiguous pages in memory.

scavenging

See *disk scavenging*.

SCB

See *system control block*.

scheduling priority

See *process priority*.

screen width

The number of character positions that can be displayed on a line.

scrolling

A feature of a video terminal that allows the display of more than one screenful of text by vertical movement. For example, when the TYPE command is entered, new output appears at the bottom of the screen as the oldest output disappears off the top.

SCS

See *system communications services*.

search list

A logical name in which the equivalence name has multiple values instead of a single value. A common use of a search list is to examine multiple directories to locate a file.

search string

A group of characters defined in a command as the object of a search operation.

secondary password

A user password that may be required at login time, immediately after the primary password has been correctly submitted. Primary and secondary passwords can be known by separate users, to ensure that more than one user is present at the login. A less common use is to require a secondary password as a means of increasing the password length so that the total number of combinations of characters makes infiltrating a system by password more time consuming.

secondary processor

The processor or processors in a symmetric multiprocessing system that do not have the initialization and timekeeper responsibilities of the primary processor.

secondary storage

Random-access mass storage that is implemented on disks.

secondary vector

A location that identifies the starting address of a condition handler to be executed when a condition occurs and when either the primary vector contains 0 or the handler to which the primary vector points chooses not to handle the condition.

section

A portion of process virtual memory that has common memory management attributes (protection, access, cluster factor, and so on). It is created from an image section, a disk file, or as the result of a Create Virtual Address Space system service. See *global section*, *private section*, *image section*, and *program section*.

secure terminal server

A piece of software designed to ensure that users can only log in to terminals that are already logged out. When the user presses the Break key on a terminal, the secure server (if enabled) responds by first disconnecting any logged in process and then initiating a login. If no process is logged in at the terminal, the login can proceed immediately.

security alarm

A message sent to operator terminals that are enabled to receive security class event messages. Security alarms are triggered by the occurrence of an event previously designated as worthy of the alarm because of its security implications.

security audit

An auditing message written to the security audit log file. These messages report the occurrence of events with security implications, such as logins, breakins, and changes to the authorization database. A system administrator uses the log file to examine system activity for possible security violations or improper use of the system.

security auditing

See *auditing*.

security object

A protected object to which the system controls access. See *object*.

security operator terminal

A class of terminal that has been enabled to receive messages sent by the operator communication manager (OPCOM) to "security operators." These messages are security alarm messages. Normally such a terminal is a hardcopy terminal in a protected room, so that the output provides a log of security-related events and details that identify the source of the event.

selective crash dump

A crash dump that saves only those portions of physical memory critical to an analysis of system failure.

semaphore

In a DECnet for OpenVMS network, a common data structure used to control the exchange of signals between concurrent processes.

sequential access mode

The retrieval or storage of records where a program reads or writes records one after the other in the order in which they appear, starting and ending at any arbitrary point in the file.

sequential file organization

A file organization in which records appear in the order in which they were originally written. The records can be fixed length or variable length. Sequential file organization permits sequential record access and random access by the record's file address. Sequential file organization with fixed-length records also permits random access by relative record number.

served device

A device whose local node makes it available to other nodes in the VMScluster system.

server

A computing system entity that provides a service to other system entities called *clients*.

shadow set

One or more disk volumes of the same device type and the same physical LBN geometry that are united for volume shadowing and represented by a virtual unit. Thus, the term shadow set refers to the physical units *and* the virtual unit.

shadow set member

A physical disk mounted as part of a shadow set. Normally, shadow set members are consistent with each other both structurally and in content.

shareable image

An image that has all of its internal references resolved, but must be linked with one or more object modules to produce an executable image. A shareable image cannot be executed. A shareable image file can be used to contain a library of routines. A shareable image can be used to create a global section by the system manager.

shared image

An image that is installed so that multiple users in a system can share the memory pages where the image is loaded.

shared memory

A generic term referring to any memory that can be accessed by two or more concurrent processes. In a symmetric multiprocessing system, a single copy of the operating system resides in memory. Each processor in the system can access this memory, as can any process executing on any processor. See *multiport memory*.

shell process

A predefined process that the job controller copies to create the minimum context necessary to establish a process.

shrinking the working set

An alternative available to the swapper process to obtain pages in physical memory. The swapper will shrink the size of the working set of selected processes to obtain pages in physical memory. See *swapping*.

signal

(1) An electrical impulse conveying information.

(2) The software mechanism used to indicate that an exception condition was detected.

(3) In threads, a mechanism used to wake only one thread waiting for a condition variable. See *broadcast*.

single point of failure

A portion of a computing system that, if it fails, causes the system to cease providing service.

sink node

A node on which logging sink types, such as a file or console, are actually located.

slave terminal

A terminal that sends and receives I/O from an image and directly from the operating system. It is not possible to enter commands to the command interpreter from a slave terminal.

small process

A system process that has no control region in its virtual address space and has an abbreviated context. Examples are the working set swapper and the null process. A small process is scheduled in the same manner as user processes but must remain resident until it completes execution; that is, it cannot be swapped.

SMP

See *symmetric multiprocessing*.

software

The collection of images, procedures, rules, and documentation associated with the operation of a particular computer system. For example, the operating system is software.

software-based fault tolerance

The ability to detect, isolate, and bypass faults that are executed through software.

software context

Information, residing in the control blocks, that describes the software status of a process. Examples of software context are page tables and the user's identification number. See *software process control block*.

software interrupt

An interrupt generated on interrupt priority levels 1 through 15, which can be requested only by software.

software priority

See *process priority* and *queue priority*.

software process control block (software PCB)

The data structure used to contain a process's software context. The operating system defines a software PCB for every process when the process is created. The software PCB includes the following kinds of information about the process: current state, storage address if it is swapped out of memory, unique identification of the process, and address of the process header (which contains the hardware PCB). The software PCB resides in system region virtual address space. It is not swapped with a process.

sorting

The ordering of records in a prescribed sequence.

source file

A text file containing material suitable for translation into an object module by an assembler or compiler. Such files cannot be run or linked.

source member

Any shadow set member that is in a consistent state and can be a source for full copy or merge operations. During full copy operations, the shadowing software reads data from source members and copies the data to inconsistent members to bring them into full shadow set membership. All shadow sets must have at least one source member.

source program

A program that expresses an algorithm in a programming language such as FORTRAN, COBOL, or assembly language.

source task

The task that initiates a logical link connection request in a task-to-task communication environment.

SP

See *stack pointer*.

spanned record

A record that can cross block boundaries. A spanned record consists of one or more data segments. The position of a segment within the record and the length of the segment is denoted by the segment control word, the first five characters of each segment.

specification file

A command file used in the Sort/Merge utility to specify the commands and qualifiers needed to complete a sort operation.

spin lock

In a symmetric multiprocessing system, a semaphore associated with a set of system structures, fields, or registers whose integrity is critical to the performance of a specific operating system task. There are two types of spin lock: static and dynamic. Static spin locks are assembled permanently into the system; the same static spin locks exist in the same memory locations in all multiprocessing systems. A fork lock is a form of static spin lock. Dynamic spin locks are created as required by the I/O configuration of a system; as a result,

the set of dynamic spin locks differ from processor to processor. A device lock is a form of dynamic spin lock. See *fork lock* and *device lock*.

spin wait

In a symmetric multiprocessing system, an execution loop performed by a processor attempting to acquire a spin lock already owned by another processor in the system. This activity is also known as a busy wait.

spooling

The technique of using a high-speed mass storage device to buffer data passing between low-speed I/O devices and high-speed memory. Output spooling is the method by which output to a low-speed peripheral device (such as a line printer) is placed into queues maintained on a high-speed device (such as disk) to await transmission to the low-speed device. Input spooling is the method by which input from a low-speed peripheral (such as the card reader) is placed into queues maintained on a high-speed device (such as disk) to await transmission to a job processing that input.

spool queue

The list of files, supplied by processes, that are to be processed by a symbiont. For example, a line printer queue is a list of files to be printed on the line printer.

SPT

See *system page table*.

SSP

See *supervisor-mode stack pointer*.

stack

An area of memory set aside for temporary storage or for procedure and interrupt service linkages. A stack uses the last-in/first-out (LIFO) concept. As items are added to ("pushed on") the stack, the stack pointer (SP) decrements. As items are retrieved from ("popped off") the stack, the SP increments.

stack frame

See *call frame*.

stack pointer (SP)

On VAX systems general register 14 (R14) and on AXP systems integer register 30 (R30), SP contains the address of the top (lowest address) of the processor-defined stack. On VAX systems, reference to SP accesses one of the five possible stack pointers—kernel, executive, supervisor, user, or interrupt—depending on the value in the current mode and interrupt stack bits in the processor status longword. On AXP systems, there is no interrupt stack.

standalone BACKUP

A version of the Backup utility that is booted into memory and runs without the control of the operating system.

standalone system

A computer system that is not incorporated into a network or VMScluster system.

standard call

Any transfer of control to a procedure by any means that presents the called procedure with the environment defined by this document and does not place additional restrictions, not defined by the *OpenVMS Calling Standard*, on the called procedure.

start I/O routine

The routine in a device driver that is responsible for obtaining necessary resources (for example, the controller data channel) and activating the device unit.

state

The functions that are currently valid for a given network component. States include line, circuit, local node, module, data terminal equipment (DTE), and logging.

state queue

A list of processes in a particular processing state. The scheduler uses state queues to keep track of processes' eligibility to execute. State queues include processes waiting for a common event flag, suspended processes, and executable processes.

static load balancing

A method of work distribution in which every process in an application is preassigned to a processor during process creation.

status

A display type for the Network Control Program (NCP) commands SHOW and LIST. Status refers to dynamic information about a component that is kept in either the volatile or permanent database.

status code

A longword value that indicates the success or failure of a specific function. For example, system services always return a status code in general register R0 upon completion.

steady state

A shadow set is in a steady state when all its members are consistent and there is no full copy operation or merge operation in progress to any members of the set.

store through

See *write through*.

stream

An access window to a file associated with a record access control block, supporting record operation requests.

stream record format

Property of a file specifying that the data in the file is interpreted as a continuous sequence of bytes, without control information. Stream record format applies to sequential files only.

string

A connected sequence of characters. When a text editor searches for a word or phrase in a text file, it is looking for a string. The character sequence that forms a command is often called a command string.

string search buffer

A storage area used to store a connected sequence of characters being searched for.

strong definition

Definition of a global symbol that is explicitly available for reference by modules linked with the module in which the definition occurs. The linker always lists a global symbol with a strong definition in the symbol portion of the map. The librarian always includes a global symbol with a strong definition in the global symbol table of a library. See *weak definition*.

strong reference

A reference to a global symbol in an object module that requests the linker to report an error if it does not find a definition for the symbol during linking. If a library contains the definition, the linker incorporates the library module defining the global symbol into the image containing the strong reference.

stub

A temporary section of code that is used during the testing phase of writing command procedures. A stub usually outputs a message stating the procedure it is replacing.

subdirectory

A directory file, cataloged in a higher-level directory, that lists additional files belonging to the owner of the directory.

subprocess

A subsidiary process created by another process. The process that creates a subprocess is its owner. A process and its subprocesses share a pool of quotas and limits. When an owner process is removed from the system, all its subprocesses (and their subprocesses) are also removed.

subroutine

(1) A subsidiary routine that executes when called by another program. A subroutine is often called repeatedly until a certain condition is met.

(2) On VAX systems, a routine entered by means of a JSB or BSB instruction. See *procedure*.

substate

An intermediate circuit state that is displayed for a circuit state display when the Network Control Program (NCP) commands SHOW or LIST are entered.

summary

The default display type for the Network Control Program (NCP) commands SHOW and LIST. A summary includes the most useful information for a component, selected from the status and characteristics information.

supervisor mode

The third most privileged processor access mode (mode 2). The operating system's command interpreter runs in supervisor mode.

supervisor-mode stack pointer (SSP)

The process context stack pointer for supervisor mode.

suspension

A state in which a process is inactive but known to the system. A suspended process becomes active again when another process requests the operating system to resume it. It also becomes active to service executive mode and kernel mode ASTs. See *hibernation*.

SVA

See *system virtual address*.

swap mode

A process execution state that determines the eligibility of a process to be swapped out of the balance set. If process swap mode is disabled, the process working set is locked in the balance set.

swapper

The process that performs systemwide memory scheduling. The swapper writes modified pages to secondary storage, creates a shell for new processes, shrinks the physical size of inactive processes, removes processes from the balance set, and brings processes waiting for execution into the balance set.

swapping

The method for sharing memory resources among several processes by writing an entire working set to secondary storage (swap out) and reading another working set into memory (swap in). For example, a process's working set can be written to secondary storage while the process is waiting for I/O completion on a slow device. It is brought back into the balance set when I/O completes. See *paging*.

switch

See *qualifier*.

switched virtual circuit (SVC)

A temporary logical association between two DTEs (data terminal equipment) connected to a packet switching data network (PSDN), which is analogous to connection by a dialup line. An SVC is set up only when there is data to transmit and is cleared when the data transfer is complete.

symbiont

A process that transfers record-oriented data to or from a device. For example, an input symbiont transfers data from card readers to disks. An output symbiont transfers data from disks to line printers.

symbiont manager

The function (in the system process called the job controller) that maintains spool queues and dynamically creates symbiont processes to perform the necessary I/O operations.

symbol

An entity that when defined will represent a particular function or entity (for example, a command string, directory name, or file name) in a particular context. See *local symbol*, *global symbol*, and *universal symbol*.

symbolic debugger

See *debugger*.

symbol scope

The set of command procedure levels from within which the symbol can be accessed.

symbol table

(1) The portion of an executable image that contains the definition of global symbols used by the debugger for images linked with the /DEBUG qualifier.

(2) A table in which the DIGITAL Command Language (DCL) places local symbols. DCL maintains a local symbol table for each command level.

symmetric multiprocessing (SMP)

A multiprocessing system configuration in which all processors have equal access to operating system code residing in shared memory and can perform all, or almost all, system tasks.

synchronization

A method of controlling access to some shared resource so that predictable, well-defined results are obtained when operating in a multiprocessing environment or in a uniprocessing environment using shared data.

synchronous backplane interconnect (SBI)

The part of the hardware that interconnects the VAX processor, memory controllers, MASSBUS adapters, and the UNIBUS adapter.

synchronous disconnect

The disconnect that occurs when a nontransparent task can issue a call to terminate I/O operations over a logical link without deassigning the channel. Thus, the task can use the channel for subsequent I/O operations with the same or a different remote task.

synchronous record operation

A mode of record processing in which a user program issues a record read or write request and then waits until that request is fulfilled before continuing to execute.

syntax

The particular form of a command, including spelling and the order of qualifiers and parameters. Misspelled words are the most common syntax errors.

system

In the context of a protection code, identifies a set of users in a system. System users typically have a UIC in the range 1 through 10 (octal). However, the exact range of a system UIC is determined by the system parameter MAXSYSGROUP. Other ways to become a system user are to have SYSPRV privilege or to be in the same group as the owner and hold GRPPRV. System operators and system managers are usually system users.

system address space

See *system space* and *system region*.

system communications services (SCS)

A protocol responsible for the formation and breaking of intersystem process connections and for flow control of message traffic over those connections. System services such as the VMScluster connection manager and the mass storage control protocol, or MSCP, disk server communicate with this protocol.

system control block (SCB)

On VAX systems, the data structure in system space that contains all the interrupt and exception vectors known to the system.

system-defined identifier

See *environmental identifier*.

system device

The random access mass storage device unit on which the volume containing the operating system software resides.

system disk

The disk that contains the operating system. In a VMScluster environment, a system disk is set up so that most of the files can be shared by several processors. In addition, each processor has its own directory on the system disk that contains its page, swap, and dump files.

system dynamic memory

Memory reserved for the operating system to allocate as needed for temporary storage. For example, when an image issues an I/O request, system dynamic memory is used to contain the I/O request packet. Each process has a limit on the amount of system dynamic memory that can be allocated for its use at one time.

system image

The image that is read into memory from disk when the system is started up.

system manager

The person responsible for the policies, procedures, and the daily operation of a computer system. System management tasks are sometimes performed by more than one person and might include responsibilities for cluster management.

system operator

Person responsible for maintaining the system. Within small systems, the job may be combined with that of the system manager or informally divided among several people. The responsibilities of the operator include changing ribbons, rebooting the system, and keeping records.

system page table (SPT)

The data structure that maps the system region virtual addresses, including the addresses used to refer to the process page tables. The SPT contains one page table entry (PTE) for each page of system region virtual memory. The physical base address of the SPT is contained in the system base register.

system password

A password required by a terminal before login can be initiated at the terminal.

system queue

A queue used and maintained by operating system procedures. See *state queue*.

system region

The third quarter of virtual address space (the S0 region); the lowest-addressed half of system space. Virtual addresses in the system region are shareable between processes. Some of the data structures mapped by system region virtual addresses are system entry vectors, the system control block (SCB), the system page table (SPT), and process page tables.

system services

A set of routines (part of the operating system and used by images) to control resources, allow process communication, control I/O, and perform other such operating system functions.

system space

The highest-addressed half of virtual address space. See *system region*.

system virtual address (SVA)

A virtual address identifying a location in system space.

system virtual space

See *system space*.

SYSUAF

See *user authorization file*.

tape mass storage control protocol (TMSCP)

The software protocol used to communicate I/O commands between a VAX processor and DSA-compliant tape devices on the system. Equivalent to mass storage control protocol, or MSCP.

target node

The node that receives a memory image from another node during a downline load; a node that loops back a test message.

target task

The task that receives and processes a logical link connection request in a task-to-task communication environment.

task

(1) In networking, an image running in the context of a process.

(2) In transaction processing, a unit of work that performs a specific function and that a terminal user can select for processing. Tasks implement the business unit of work. For example, a task might book an airline reservation, update a parts inventory, or debit an account.

task specifier

Information provided to DECnet for OpenVMS software that enables it to complete a logical link connection to a remote task. This information includes the name of the remote node on which the target task runs and the name of the task itself.

terminal

The general name for peripheral devices that have keyboards and video screens or printers. Under program control, a terminal enables users to type commands and data on the keyboard and receive messages on the video screen or printer. Examples of terminals are the LA36 DECwriter hardcopy terminal, the VT100 video display terminal, and the VT240-series video terminal.

Terminal Fallback Facility (TFF)

A facility that provides table-driven character conversion for terminals.

terminal server

A communications device that connects terminals, modems, or printers to an Ethernet network.

text buffer

A text editor's storage area for text (either terminal input or file input).

TFF

See *Terminal Fallback Facility*.

thread

A single, sequential flow of control within a program. It is the active execution of a designated routine, including any nested routine invocations. A single thread has a single point of execution within it. A thread can be executed in parallel with other threads.

thread-serial service

A reentrant system service is thread serial if it blocks the current thread and all other threads that attempt to call the same service or other related services until the first call returns.

thread-synchronous service

A reentrant service is thread synchronous if it blocks only the current thread and allows other threads to execute the same operation while the current thread is blocked.

throughput

The number of transactions or jobs a computer can complete in a given period of time.

TIE

See *translated image environment*.

tied account

See *captive account*.

tightly coupled system

A multiprocessing system configuration consisting of multiple processors sharing a single copy of the operating system. These processors are connected so that they can communicate and share data. See *loosely coupled system*.

timeout

The expiration of the time limit in which a device is to complete an I/O transfer. The driver's wait for interrupt request specifies the timeout limit.

timer

Two system interrupt service routines: one (the hardware clock) that maintains the time of day and the date and another (the software timer) that scans for device timeouts and performs time-dependent scheduling upon request.

timesharing

A method of allocating computer time in which each process gets use of the CPU in turn. See *real-time processing*.

timeslicing

A mechanism by which running threads are preempted at fixed intervals. Timeslicing ensures that every thread is allowed time to execute.

time stamp

A text string which fully specifies a date and time. For example, 29-OCT-1993 17:13:21.

TMSCP

See *tape mass storage control protocol*.

TP monitor

See *Transaction Processing Monitor*.

traceback

The system facility that examines and displays the status of the user call stack when an image terminates abnormally.

track

A collection of blocks at a single radius on one recording surface of a disk.

transaction

An exchange of information between a user and a database or file. The operations in a transaction are treated as a group; either all of them are completed at once or none of them is completed. A transaction is a complete process from input to output, regardless of the number of events in between.

transaction manager

Software that coordinates the reliable completion of a transaction.

transaction processing

A technique for organizing multiple-user, high-volume, online applications that provides control over user access and updates of data.

Transaction Processing Monitor (TP monitor)

The master control executive for controlling a transaction processing system. The TP monitor includes a collection of software that schedules operations, allocates resources, and controls the operation of user and system programs which perform I/O, and updates files or databases.

A TP monitor is designed to handle medium-to-large-scale transaction processing systems that require high levels of availability, performance, and productivity.

transfer address

The address of the location containing a program entry point (the first instruction to execute).

transient state

A change of state. A shadow set is in a transient state if some of its members are undergoing either a full copy operation or a merge operation.

transition time

The amount of time (experienced as a gap in user response time) that a failed system takes to reconfigure itself following a component failure.

translated code

The native AXP object code in a translated image. Translated code includes:

- AXP code that reproduces the behavior of equivalent VAX code in the original image
- Calls to the translated image environment (TIE)

translated image

An AXP executable or shareable image created by *translating* the object code of an VAX image. The translated image, which is functionally equivalent to the VAX image from which it was translated, includes both *translated code* and the original image. See *VAX Environment Software Translator*.

translated image environment (TIE)

A native AXP shareable image that supports the execution of translated images. The TIE processes all interactions with the native AXP system and provides an environment similar to VAX for the translated image by managing VAX state; by emulating VAX features such as exception processing, AST delivery, and complex VAX instructions; and by interpreting untranslated VAX instructions.

translation

The process of converting a VAX binary image to an AXP image that runs with the assistance of the TIE on an AXP system. Translation is a static process which converts as much VAX code as possible to native Alpha AXP instructions. The TIE interprets any untranslated VAX code at run time.

translation buffer

An internal processor cache containing translations for recently used virtual addresses.

translation-not-valid fault

See *page fault*.

transparent

The performance of functions not visible to the user. For example, when a command is entered, the command interpreter parses the command string and invokes the appropriate system software. The user sees only the result of the processing, not the processing itself.

transparent failover

The ability of a computing system to reconfigure itself or switch processing to a redundant component and continue processing without writing any user code or taking any corrective action.

trap

An exception condition that occurs at the end of the instruction that caused the exception. The program counter saved on the stack is the address of the next instruction that would normally have been executed. All software can enable and disable some of the trap conditions with a single instruction.

trap enables

Three bits in the processor status word (PSW) that control the processor's action on certain arithmetic exceptions.

tributary

A physical termination on a multipoint circuit that is not a control station.

tributary address

A numeric address that the control station uses to poll a tributary.

Trojan horse program

A program that gains access to otherwise secured areas through its pretext of serving one purpose when its real intent is far more devious and potentially damaging. When an authorized user performs a legitimate operation using a program, the unauthorized program within it (the Trojan horse) performs an unauthorized function.

turnkey account

See *captive account*.

Two-Phase Commit Protocol

A protocol that DECdtm services implement to guarantee that a transaction will have a single outcome; for example, either a transaction has a permanent effect on a resource or has no effect. An example of a resource is a database system.

two's complement

A binary representation for integers in which a negative number is one greater than the bit complement of the positive number.

two-way associative cache

A cache organization that has two groups of directly mapped blocks. Each group contains several blocks for each index position in the cache. A block of data from main memory can go into any group at its proper index position. A two-way associative cache is a compromise between the extremes of fully associative and direct mapping cache organizations that takes advantage of the features of both.

type-ahead

A terminal handling technique where the user can enter commands and data while the software is processing a previously entered command. The commands typed ahead are not echoed on the terminal until the command processor is ready to process them. They are held in a type-ahead buffer.

UAF

See *user authorization file*.

UCB

See *unit control block*.

UETP

See *User Environment Test Package*.

UFD

See *user file directory*.

UIC

See *user identification code*.

UIC identifier

An identifier in alphanumeric format that is based on a user's identification code (UIC). Such an identifier can appear with or without brackets.

UIC protection code

See *protection code*.

unblocked record

A record that is contained in a single block. No other records or parts of records are contained in that block.

uninterrupted service

The ability of a computing system to continue providing application service during and after component failure without interruption or perceptible pause.

unit

See *device unit*.

unit control block (UCB)

A structure in the I/O database that describes the characteristics of and current
activity on a device unit. The unit control block also holds the fork block for its
unit's device driver; the fork block is a critical part of a driver fork process. The
UCB also provides a dynamic storage area for the driver.

unit initialization routine

The routine that readies controllers and device units for operation. Controllers
and device units require initialization after a power failure and during the driver
loading procedure.

unit record device

A device such as a card reader or line printer.

universal symbol

A global symbol in a shareable image that can be used by modules linked with
that shareable image. Universal symbols are typically a subset of all the global
symbols in a shareable image. When creating a shareable image, the linker
ensures that universal symbols remain available for reference after symbols have
been resolved.

unwind the call stack

To remove call frames from the stack by tracing back through nested procedure
calls using the current contents of the frame pointer (FP) register and the FP
register contents stored on the stack for each call frame.

upline dump

A DECnet for OpenVMS function that allows an adjacent node to dump its
memory to a file on a system.

urgent interrupt

An interrupt received on interrupt priority levels 24 through 31. These can be
generated only by the processor for the interval clock (in certain VAX systems),
serious errors, and power failure.

user authorization file (UAF)

The file that holds details of each account on the system. It contains the user
name, password, user identification code (UIC), quotas, limits, and privileges
assigned to each account.

User Environment Test Package (UETP)

A collection of routines that verify that the hardware and software systems are
complete, properly installed, and ready to use.

user file directory (UFD)

A file that briefly catalogs a set of files stored on disk or tape. The directory
includes the name, type, and version number of each file in the set. It also
contains a unique number that identifies that file's actual location and points to a
list of its file attributes. See *directory*.

user identification code (UIC)

A 32-bit value assigned to users that tells what group users belong to on the system and what their unique identification is within that group. Any UIC specification is enclosed in brackets, but it can be in either an alphanumeric or a numeric format. For example, the UIC [SALES,JONES] identifies Jones as a member of the Sales group. Protected objects like files also have UICs. In most cases, their UICs come from the users who created them.

user mode

The least privileged processor access mode (mode 3). User processes and Run-Time Library (RTL) procedures run in user mode.

user-mode stack pointer (USP)

The process context stack pointer for user mode.

user name

The name a user types on a terminal to log in to the system. Together with a password, the user name identifies and authenticates a person as a valid user of the system.

user number

See *member number*.

user password

See *password*.

user privileges

The privileges granted a user by the system manager. See *process privileges*.

USP

See *user-mode stack pointer*.

utility

A program that provides a set of related general-purpose functions, such as a program development utility (an editor, a linker), a file management utility (file copy or file format translation program), or operations management utility (disk quotas, diagnostic program).

value return registers

The general registers R0 and R1 used by convention to return function values. These registers are not preserved by any called procedures. They are available as temporary registers to any called procedure. All other registers (R2 through R11, AP, FP, SP, PC) may be preserved across procedure calls.

variable-length bit field (VBF)

A set of 0 to 32 contiguous bits located arbitrarily with respect to byte boundaries. A variable bit field is specified by four attributes: the address A of a byte; the bit position P of the starting location of the bit field with respect to bit 0 of the byte at address A; the size, in bits, of the bit field; and an indication whether the field is signed or unsigned.

variable-length record format

A file format in which records may be of different lengths.

variable-length with fixed-length control field (VFC) record format

A file format in which records of variable length contain an additional fixed-length control area. The control area may be used to contain file line numbers and print format controls.

VAXBI

The part of the VAX 8200, VAX 8250, VAX 8300, VAX 8350 hardware that connects I/O adapters with memory controllers and the processor. In VAX 8530, VAX 8550, VAX 8700, or VAX 8800 systems, or VAX 6200 and VAX 6300 systems, the part of the hardware that connects I/O adapters with the bus that interfaces with the processor and memory.

VAX

Virtual Address Extension.

VAXcluster configuration

A highly integrated organization of OpenVMS systems that communicate over a high-speed communications path. VAXcluster configurations have all the functions of single node systems, plus the ability to share CPU resources, queues, and disk storage. Like a single-node system, the VAXcluster configuration provides a single security and management environment. Member nodes can share the same operating environment or serve specialized needs.

VAX Environment Software Translator (VEST)

A software migration tool that *translates* VAX executable and shareable images into translated images that run on AXP systems. VEST is part of the DECmigrate tool set. See *translated image*.

VAX Vector Instruction Emulation Facility (VVIEF)

A standard feature of the operating system that allows vectorized applications to be written and debugged in a VAX system in which vector processors are not available. VVIEF emulates the VAX vector processing environment, including the nonprivileged VAX vector instructions and the vector system services. Use of VVIEF is restricted to user mode code.

VBF

See *variable-length bit field*.

VBN

See *virtual block number*.

VCB

See *volume control block*.

vector

(1) A storage location (known as an interrupt or exception vector) that contains the starting address of a procedure to be executed when a given interrupt or exception occurs. The system defines separate vectors for each interrupting device controller and for classes of exceptions. Each system vector is a longword.

(2) For the purposes of exception handling, users can declare up to two software exception vectors (primary and secondary) for each of the four access modes. Each vector contains the address of a condition handler.

(3) A one-dimensional array.

(4) A group of related scalar values, or elements, all of the same data type.

vector capability

A software abstraction by which the operating system makes system vector processing resources available to a process. A system manager can restrict the use of the vector processor to users holding a particular identifier by associating an access control list (ACL) with the CAPABILITY object VECTOR.

vector-capable system

A VAX system that, in its hardware implementation, complies with the VAX vector architecture. A vector-capable system that incorporates one or more optional vector processors is known as a *vector-present system*.

vector consumer

A process executing an image that issues VAX vector instructions and, thus, requires the VECTOR capability and has a vector context. The operating system *must* schedule a vector consumer on a scalar-vector processor pair in the VAX system. As long as it remains a vector consumer, a process is effectively prohibited from executing on any scalar processor in the system. See *scalar consumer* and *marginal vector consumer*.

vector context

Current vector state of a process. See *vector state*.

vectorized program

An application that makes use of a vector processor. There are several methods by which an application may be vectorized. For instance, one of its modules may have been compiled by a vectorizing compiler or call one or more vectorized routines. VAX MACRO programs that directly issue VAX vector instructions are also considered vectorized programs.

vector-present system

A VAX system that, in its hardware implementation, complies with the VAX vector architecture, and incorporates one or more optional vector processors. See *vector-capable system*.

vector processor

Specialized computer hardware that executes vector instructions. For example, hardware components that implement the VAX vector architecture.

vector state

The contents of the vector registers V0 through V15, the contents of the vector control registers, the vector processor status, and the vector exception state, as associated with a given thread of execution. A process may have several vector states: for instance, one associated with the mainline thread of execution and another associated with an AST service routine. The current vector state is referred to as the vector context of a process. See *vector context*.

version number

(1) The field following the file type in a file specification. It begins with a semicolon or period and is followed by a number which generally identifies it as the latest file created of all files having the identical file specification.

(2) The number used to identify the revision level of program.

VEST

See *VAX Environment Software Translator*.

VFC

See *variable-length with fixed-length control field (VFC) record format*.

video terminal

A terminal with a video screen for accepting output. See *terminal*.

virtual address

A 32-bit integer (or integer sign-extended from 32 to 64 bits on AXP systems) identifying a byte location in the process, control, and system regions of virtual memory. The memory management hardware translates a virtual address to a physical address. The term virtual block number (VBN) refers to the address used to identify a virtual block on a mass storage device. See *virtual address space*.

virtual address space

The set of all possible virtual addresses that an image executing in the context of a process can use to identify the location of an instruction or data. The system distinguishes between the physical memory required by a process and the virtual address space that the process defines. A process's virtual address space is the range of memory locations that the process can address.

virtual block number (VBN)

The file-relative address of a block on a mass storage device. The first block in a file is always virtual block 1. See *logical block number* and *physical block number*.

virtual circuit

An association between two DTEs (data terminal equipment) connected to a packet switching data network (PSDN), whereby they are able to interact as if a specific circuit were dedicated to them throughout the transmission. In reality a logical connection is established, the actual physical circuits being allocated according to route availability, overload conditions, and so on.

virtual disk

A dedicated portion of disk space allocated for storing console files when performing save or restore operations on console media. Virtual disks eliminate the need to create a disk or directory for the console media. Also, because the command procedure that handles the task invokes the Exchange utility, the conversion of the file format from RT–11 to Files–11 is done automatically.

virtual I/O functions

A set of I/O functions that must be interpreted by an ancillary control process.

virtual memory

The set of storage locations in physical memory and on disk that is referred to by virtual addresses. From the programmer's viewpoint, the secondary storage locations appear to be locations in physical memory. The size of virtual memory in any system depends on the amount of physical memory available and the amount of disk storage used for nonresident virtual memory.

virtual memory boot (VMB)

The primary bootstrap program that initializes a the system. The program is located in the boot block of physical memory and is the first program read by the CPU when a processor is booted after it has been halted.

virtual page number (VPN)

The virtual address of a page of virtual memory.

virtual unit

The shadowing software-created representation of the devices that compose a shadow set. The virtual unit receives and directs I/O requests to the shadow set members.

VMB

See *Virtual Memory Boot.*

VMS

Virtual Memory System.

VMS Lock Manager

See *lock manager.*

VMScluster configuration

A highly integrated organization of OpenVMS AXP systems, or a combination of AXP or VAX systems, that communicate over a high-speed communications path. VMScluster configurations have all the functions of single node systems, plus the ability to share CPU resources, queues, and disk storage. Like a single-node system, the VMScluster configuration provides a single security and management environment. Member nodes can share the same operating environment or serve specialized needs.

volatile database

A memory image that contains information about network management components.

volume

A mass storage media such as a disk pack or reel of magnetic tape. The volume is the largest logical unit of the file structure.

volume control block (VCB)

A data structure that contains the information needed to control access to a volume. It is created when the volume is mounted.

volume set

The file-structured collection of data residing on one or more mass storage media.

volume shadowing

The process of maintaining multiple copies of the same data on two or more disk volumes. When data is recorded on more than one disk volume, you have access to critical data even when one volume is unavailable.

VPN

See *virtual page number*.

VVIEF

See *VAX Vector Instruction Emulation Facility*.

wait for interrupt request

A request made by a driver's start I/O routine after it activates a device. The request causes the driver fork process to be suspended until the device requests an interrupt or the device times out.

waiting

Becoming inactive. A process enters a process wait state when the process suspends itself, hibernates, or declares that it needs to wait for an event, resource, mutex, and so forth.

waking

Activating a hibernating process. A hibernating process can be awakened by a time-scheduled wake-up call.

watchpoint

A watchpoint is a memory address, register, or (typically) a variable declared in a program whose value is monitored during program execution.

WCB

See *window control block*.

WCS

See *writable control store*.

WDCS

See *writable diagnostic control store*.

weak definition

Definition of a global symbol that is not explicitly available for reference by modules linked with the module in which the definition occurs. The librarian does not include a global symbol with a weak definition in the global symbol table of a library. Weak definitions are often used when creating libraries to identify those global symbols that are needed only if the module containing them is otherwise linked with a program. See *strong definition*.

weak reference

A reference to a global symbol that requests the linker not to report an error or search the default library's global symbol table to resolve the reference if the definition is not in the modules explicitly supplied to the linker. Weak references are often used when creating object modules to identify those global symbols that may not be needed at run time.

wildcard character

A nonalphanumeric character such as an asterisk or percent sign that is used within, or in place of, a file name, file type, directory name, or version number in a file specification to indicate "all" for the given field.

window

(1) See *mapping window*.

(2) A range of packets authorized for transmission across an X.25 data terminal equipment/data circuit-terminating equipment (DTE/DCE) interface. The lowest sequence number in the window is referred to as the lower window edge (0 when the virtual circuit is just established). The packet send sequence number of the first data packet not authorized to cross the interface is the value of the upper window edge (that is, the lower window edge plus the window size).

window control block (WCB)

A data structure that stores access control information for a file. It is created when a file is accessed on a volume. It is deleted when the file is closed.

word

Two contiguous bytes (16 bits) starting on an addressable byte boundary. Bits are numbered from the right, 0 through 15. A word is identified by the address of the byte containing bit 0. When interpreted arithmetically, a word is a two's complement integer with significance increasing from bit 0 to bit 14. If interpreted as a signed integer, bit 15 is the sign bit. The value of the integer is in the range –32,768 to 32,767. When interpreted as an unsigned integer, significance increases from bit 0 through bit 15 and the value of the unsigned integer is in the range 0 through 65,535.

word granularity

A property of memory systems in which adjacent words can be written concurrently and independently by different processes or processors.

working set

The set of pages in process space to which an executing process can refer without incurring a page fault. The working set must be resident in memory for the process to execute. The remaining pages of that process, if any, are either in memory and not in the process working set or they are on secondary storage.

working set swapper

See *swapper*.

world

A category of users whose access rights to an object are identified in the last field of a protection code. The world category encompasses all users or applications on the system, including system operators, system managers, and users both in the owner's group and any other group.

writable control store (WCS)

A hardware component of certain VAX processors that allows a customer to customize selected machine functions.

writable diagnostic control store (WDCS)

A hardware component of certain VAX processors that contains basic instruction microcode and diagnostic microcode.

writable global section

A data structure (for example, FORTRAN global common) or shareable image section potentially available to all processes in the system for use in communicating between processes.

write access type

The specified operand of an instruction or procedure is only written during that instruction's or procedure's execution.

write allocate

A cache management technique in which cache is allocated on a write miss as well as on the usual read miss.

write back

A cache management technique in which data from a write operation to cache is copied into main memory only when the data in cache must be overwritten. This results in temporary inconsistencies between cache and main memory. See *write through*.

writing

The act or capability of an image to send data. For example, when a PRINT command is entered, the specified file is read from wherever it is stored and then written to the line printer.

write miss

An event in which a write operation cannot be serviced by the processor's hardware cache.

write through

A cache management technique in which data from a write operation is copied in both cache and main memory. Cache and main memory data are always consistent. See *write back*.

X.3

A CCITT recommendation that specifies the packet assembly/disassembly (PAD) facility in a public data network.

X.25

A CCITT recommendation that specifies the interface between data terminal equipment (DTE) and data circuit-terminating equipment (DCE) for equipment operating in the packet mode on public data networks.

X.28

A CCITT recommendation that specifies the data terminal equipment/data circuit-terminating equipment (DTE/DCE) interface for a start-stop mode DTE accessing the packet assembly/disassembly (PAD) facility in a public data network situated in the same country.

X.29

A CCITT recommendation that specifies procedures for the exchange of control information and user data between a packet-mode data terminal equipment (DTE) and a packet assembly/disassembly (PAD) facility.

X.29 terminal

A terminal connected to a packet assembly/disassembly (PAD) facility.

XAB

See *extended attribute block*.

XQP

See *extended QIO processor*.

Y-connector

Hardware that joins two synchronous communications lines into a single output line.

zone

A section of a fully configured VAXft fault-tolerant computing system that contains a minimum of a CPU module, memory module, I/O module, and associated devices. A VAXft system consists of two such zones with synchronized processor operations. If one zone fails, processing continues uninterrupted through automatic failover to the other zone.