Glossary

*E*ditor's Note: Cross-references in the text refer to chapters in the companion book, *UNIX: The Complete Reference, Second Edition,* by Rosen, Host, Klee, Farber, and Rosinski.

This glossary contains definitions of important terms used in the book. When a term used in a definition is also defined in this glossary, it is shown in italics.

a.out
The name given to the executable output file created during compiling, assembling, or loading a UNIX C language source file.

absolute pathname
The complete pathname for a file, starting at *root* and listing every directory down to the one in which the referenced file is located. An absolute pathname can be used to reference a file regardless of where the user is in the file system.

access control list (ACL)
A list that specifies user and group read, write, and execute permissions for a file. Using an ACL allows you to specify which *users* or which *members of a group* have a particular permission for a file. HP-UX supports ACLs.

address
A name that identifies a location on a computer network, on a peripheral device, or in computer memory. A network address identifies the location of a computer so that other machines can communicate with it.

advertising (a resource)
The act of making a *Remote File System (RFS)* resource available by providing resource information to its *domain server.* This information is updated in a database on the server for potential users to see when looking for a particular resource.

aging   Using the length of time something has been in existence as a key for some action. *Password aging* is used to make users change passwords at regular intervals. *File aging* is used by the administrator to determine when old files can be deleted.

AIX (Advanced Interactive Executive)   IBM's version of UNIX, run on IBM processors from personal computers up to mainframes. It is based on UNIX System V Release 3 and 4.3 *BSD*, and it is *Open Group* compliant.

alias   A user-created alternative name for a command or string. Also the command to create or display aliases. Aliases are often used for long or complex command strings or long mail addresses.

anonymous FTP   An *FTP* login that accepts any password. Often used to access systems on the *Internet* with publicly readable files for copying.

ANSI Standard C   A specification for the *C language* that conforms to the definition approved by the *A*merican *N*ational *S*tandards *I*nstitute. UNIX System V Release 4 C language supports this standard.

Apache   A free web server that provides robust performance and has become the most popular web server among web developers. The name comes from the many security patches made to the standard NCSA HTTPd web server (it became " a patchy" server).

API (applications programming interface)   A programming language interface that provides a uniform interface between the operating system and the applications programs that run on it, so that programmers can write applications without detailed knowledge of the internals of the operating system.

append (text)   To add text immediately following existing text. While one is editing a file, the append mode will place any newly input text after the current line.

append (shell)   Standard output may be appended to the end of an existing file through *redirection* of the output.

applet   A little program that can be stored in the panel area of your desktop, usually represented by an *icon*.

application   A program that performs a specific function or functions, such as accounting or word processing.

application binary interface (ABI)
A specification that defines how executable programs (called *binaries*) are stored and how they interface with hardware.

application software
Software that performs a specific function or functions, such as accounting or word processing.

archive
To store data on a medium intended for long-term storage (such as a tape); the collection of storage media that contain stored data.

argument (to a command)
A word, such as a filename, that is part of a *command line.* The *shell* interprets arguments for commands to see if the syntax is correct before executing the command.

ARPANET
A network created by *DARPA* that connects approximately 150 sites at universities and corporations doing research for the U.S. government. The ARPANET uses the *TCP/IP* protocol suite. It is part of the *Internet.*

array
A data structure that treats contiguous elements as a series of repeating patterns. Each element in an array is referenced by an index, which gives the location of the element in relation to other elements.

ASCII (American Standard Code for Information Interchange)
A standard character code used in many computer systems. Traditional ASCII uses only seven bits out of eight possible to represent data, but extended ASCII uses all eight bits to define additional characters.

associative array
An array in which sets of data are arbitrarily associated with each other by field, or pairs of strings. **awk** and **perl** use associative arrays for flexibility in processing.

asynchronous terminal
A device that can either send data or receive data, but not both simultaneously, as opposed to a *synchronous terminal.* An asynchronous terminal uses start and stop bits to determine whether it is ready to send or receive data.

AT&T Laboratories
The research and development arm of AT&T. AT&T Labs provides design, development, and engineering for services offered by the business units within AT&T, as well as conducting basic research. It is the former parent of AT&T Bell Laboratories, the inventors of UNIX.

A/UX
Apple Computer's variant of UNIX designed to run on Macintosh computers. It is based on UNIX System V Releases 2 through 4, and 4.2/4.3 BSD. It is compliant with POSIX and the System V Interface Definition.

awk   A utility with a built-in programming language, used to manipulate text in files. Chapter 21 is devoted to **awk**, as well as its counterparts **nawk** and **gawk**.

background job   A process that is started by a *parent process* but not waited for by the parent. Background processes are initiated at system startup to monitor the system. Users can execute commands in the background by ending a command with an ampersand (&). Low-priority jobs are usually run as background jobs.

backslash   The character \ used as an *escape character.* A backslash preceding a character tells the shell to ignore any special meaning of the character and use the literal character itself. Also used as an escape character in **troff**.

backup   To save a copy of a file, directory, or complete file system. Backups are important in the event of system failure, as a way to *restore* the system. Users can schedule regular backups using the **cron** command.

backup strategy   A plan implemented by a system administrator to ensure that information is backed up on a regular basis, based on user patterns and needs.

bang-style addressing   A network addressing scheme that uses the exclamation point (!), also called "bang," to separate the machine names in a path (for example, *systema!systemb!user*).

bash shell   The Bourne-again shell, part of the GNU. The **bash** shell is the default shell for Linux.

basic networking utilities   A group of utilities, including the *UUCP system* and the **cu** and **ct** commands, that provide such basic networking capabilities as file transfer and mail transfer.

Bell Laboratories   Lucent Technologies' research and development arm, originally established in 1925, as part of AT&T. The UNIX operating system was developed at AT&T Bell Laboratories in 1969.

Berkeley remote commands   A set of commands used for networking tasks on remote machines, including *remote login, remote execution,* and file transfer. These commands are also called the **r*** commands.

Berkeley Software Distribution   *See* BSD.

binary file   Usually, a file stored in machine code (in non-ASCII format), although data files may also be stored in binary format (in contrast to a text file).

bit map   In graphics, a table that relates bit settings to represent shading or color in a display. On graphic output, these bits represent the shading of a point (called a "pixel") on a monitor.

block   A group of data that is treated as a unit during input/output *(I/O)* operations. Disk and tape devices are called *block devices,* meaning that they read and write blocks of data at one time.

block device   A device such as a tape or disk that reads and writes blocks of data at one time. Block devices are capable of supporting a *file system.*

block special file   A UNIX file that interfaces the UNIX operating system with input/output block devices, such as disk drives and tapes, that support a file system.

boot   The process of initialization that loads the *kernel,* initializes the memory, starts the system *processes* running, and prepares the user *environment.*

boot disk   A floppy disk used to boot the operating system. Used initially to load the operating system onto the hard disk, and subsequently when there are problems on the hard disk that prevent booting properly.

Bourne shell   A *shell* that is the ancestor of the standard Release 4 shell, named after its author, Steven Bourne.

BSD (Berkeley Software Distribution)   A series of UNIX System implementations developed at the University of California, Berkeley.

buffer   A temporary storage location used to hold data before transferring it from one area to another. Buffers are used primarily to increase efficiency during input/output processes. The *kernel* uses buffers to move blocks of data between processes and devices such as disks and terminals.

bug   A programming mistake that causes unpredictable results, such as stopping all running processes. Bugs can be traced and corrected using a *debugger.*

built-in application   An application that is packaged with a larger application, and works well because it is tightly integrated with the larger application. Many web browsers and desktop environments use built-in applications to perform specific functions.

byte   The amount of storage needed to store a character. In most systems, this is equal to eight bits. Memory size and disk storage capacity are measured in bytes, kilobytes, megabytes, gigabytes, and even terabytes.

C language	A widely used, general-purpose programming language, developed by Dennis Ritchie of Bell Laboratories in the late 1960s. C is the primary programming language used to develop applications in UNIX System environments. Much of the UNIX Operating System is written in C.
C++ language	An enhanced, object-oriented version of the C language, developed by Bjarne Stroustrup of Bell Laboratories.
C shell	A shell, called **csh**, developed at the University of California, Berkeley by William Joy and others. It has been added to UNIX System V in Release 4.
CAE (Common Applications Environment)	An interface standard for the development of portable applications published by The Open Group (formerly *X/Open*), based on the System V Interface Definition *(SVID)*.
carriage return	The ASCII character produced when the RETURN key is depressed, used as a *delimiter* for lines or commands.
cartridge tape	A tape that can be used in a cartridge drive on a PC or workstation to retrieve or store data or programs. Quarter-inch-cartridge (QIC) tapes are relatively slow, but Exabyte or 8 mm cartridges are fast and store enough information to back up most systems.
cat	A command to con*cat*enate files together. One of its most common uses is to display file contents.
CD-ROM (Compact Disc Read-Only Memory)	Usually a read-only mass storage device, containing around 670 megabytes of data, derived from the technology in audio CDs. There are also writable CD-ROMs.
central processing unit (CPU)	The part of the computer hardware that executes programs. In smaller computers this may be a single chip.
character special file	A UNIX file whose primary purpose is to interface the UNIX operating system with input/output devices such as terminal displays that do not support file systems. Contrast with *block special file.*
chat script	A script embedded in a *UUCP System* file that defines what a system expects from a remote system and what it sends as a reply.
child process	A process started via the ***fork*** command to run another command. The starting process is called the *parent process.*
class	A method of categorizing users, devices, or processes. The *shell* uses these classes to authorize access to files or programs.

client   In a *network,* a user of services or resources, such as file access or print services, available on a *server.*

client/server   An architecture that divides the processes run on a network between a computer or computers that request services—called the *client*—and the computer or computers that provide the services—called the *server.*

command   An instruction to perform some action that the *shell* interprets and then executes. Commands can be put together with *options* and *arguments* to build a *command line.*

command alias   An *alias* or alternative assigned to a command. It is often used to reduce the typing necessary to build a *command line.*

command history   A chronological list of *command lines* that can be used to analyze events or to execute a previous command without retyping it. *See also* history list.

command interpreter   A program that evaluates and executes user input. The *shell* is a command interpreter.

command line   A line consisting of one or more commands, options, and arguments used in the command(s). The *shell* expands the line before execution and either allows execution or rejects it, with error messages to the user.

command line interface   An interface with the operating system that uses keystrokes to input commands and arguments (options) in order to complete a task. UNIX initially was developed with a command-line interface, but it now uses a variety of *desktop interfaces* (*see*) to perform tasks.

command mode (editor)   A mode in which characters entered on the keyboard are interpreted as commands, as opposed to input text (*see also* input mode).

command substitution   A mechanism in which a command, delimited by backquotes (`), is replaced by the output of the command. It is frequently used in *shell scripts* to produce a single output value from a series of related commands.

comments   Text preceded by a *delimiter* in a program (such as a *shell script,* a C program, or **troff** code) that is used to help readers understand what the routine and its individual statements do.

Common Desktop Environment (CDE)   An industry-standard graphical user interface for UNIX systems developed in the *Common Open Software Environment (COSE),* adopted by many of the important developers of UNIX System software.

Common Open Software Environment (COSE)	A consortium formed in 1993 by major UNIX vendors to define industry-standard specifications for a graphical user interface, multimedia, networking, object technology, graphics, and system management on UNIX systems.
communications utility	Software that performs initialization and monitoring of communication links between machines to allow file access and file transfer between them.
comparison pattern	A pattern-matching scenario in which patterns are compared on equality—such as equal to, not equal to, less than, or greater than.
compatibility package	A software package used to enable programs that were designed to run on a variant of the UNIX System to run on UNIX SVR4. Compatibility packages are available for the *BSD* System and the *XENIX* System.
compiler	A program that takes user source code and produces machine-executable code.
compound pattern	A pattern-matching scenario that includes multiple pattern searches linked by and, or, or not comparisons.
compression	A method of reducing file size for storage. File contents are often compressed using an algorithm for replacing ASCII code with code words of variable length.
conditional execution	Execution of a program that is dependent on the outcome of a prior program. Process status indicators are used to determine if the program completes successfully; they can be checked prior to execution of the next program.
conditional statement	A program statement that tests a condition to determine which statement should be executed next.
console	The main terminal, used by the *system administrator* to monitor processes and user requests or to perform system administration functions.
control character	An ASCII character generated by depressing the control (CTRL) key and another keyboard key simultaneously.
CORBA (Common Object Request Broker Architecture)	A specification developed by the Object Management Group for how object messaging is handled across different platforms.

core dump   A display of main memory content that is produced when a program does not complete successfully. The information may be used to help determine where the failure occurred.

COSE   *See* Common Open Software Environment.

CPU   *See* central processing unit.

cron   A utility used to schedule processes for routine execution. System file backups and machine maintenance routines are often scheduled to run by **cron**.

crontab   A system utility that allows information concerning a **cron** job to be entered into a formatted file. The *crontab* file is checked regularly to see if a scheduled process should be started.

csh   *See* C shell.

current directory   The directory that a UNIX user is in at any given moment, also called the present working directory, symbolized by the notation **.** (dot), and displayed with the **pwd** command.

cursor   An indicator used to show the current position on a display. A blinking underscore symbol is the most common cursor form, but others may be used.

daemon   An unattended process (sometimes spelled "demon") that performs a standard routine or service. A daemon process may be started as the result of an event or may be a regularly scheduled process.

DARPA (Defense Advanced Research Projects Agency)   A military agency whose network, the *ARPANET,* was the first to use the *TCP/IP* protocol over its *wide area network.* DARPA has sponsored the development of wide area networks and networking software.

DAT tape   The newest form of tape storage for PCs and workstations. Digital audio tapes have a 4 mm format that can store two or more *gigabytes* of information.

database management system   A system that stores and retrieves data in a database based on some relationship. There are *hierarchical file systems* that store data in a hierarchy structure, and relational databases that store relations between data in files as a basis for information access.

datagram   A packet that contains data and addressing information. Datagrams are self-contained and carry a complete *address.*

DCE (Distributed Computing Environment)   An initiative started by the Open Software Foundation to define a standardized, vendor-independent environment for distributed applications.

debugger   A package that shows the logic path and values of registers and variables during execution of a process or program to determine where a failure occurs. The UNIX System has a debugger named **sdb** that can help find what instruction was executing during a *core dump.*

DEC OSF/1   A UNIX variant based on the integration of System V, BSD, and OSF/1 (developed by the Open Software Foundation). Formerly called ULTRIX, it has been enhanced to provide 64-bit support as well as a number of rich operating system features.

decryption   The act of re-creating normal file content from a file that has been *encrypted* with a key.

default user environment   The environment that is set up for a user who is added to a system by the **useradd** command, unless specifically overridden.

default value   The value used by a program for an *argument* or variable when none is supplied.

defunct state   The *zombie* state caused when a process cannot terminate properly because the *child process* exit is not acknowledged by the parent.

delimiters   Characters used to set off fields or strings in files, strings, or expressions. For *command lines,* the *shell* uses white space for the default word delimiter.

desktop interface   An interface with the operating system that allows the use of a mouse to locate and select both icons and menu items from a visual environment to perform a task. UNIX has a number of desktop interfaces. Contrast to a *command line interface (see).*

desktop publishing   The use of personal computers or workstations and high-resolution printers, coupled with software capable of producing images and text, to produce formatted output previously available only from larger computing environments.

destination   The end point for the results of a process such as file processing or file printing. The *standard output* is the default destination for processes, but the user can specify alternate ones.

/dev   A directory that contains the filenames used to access the hardware drivers for terminals, printers, and other devices on the computer system.

device   A peripheral piece of equipment used in input or output *(I/O)* of data. The UNIX System uses the philosophy of separating processes from the I/O devices to allow flexibility. Device names and device files are stored in the directory */dev.*

device driver   A program that permits the UNIX System to transmit data between a computer and one of its peripheral devices.

device independence   The capability of a program to accept input and provide similar output regardless of specific peripheral hardware.

/dev/null   A special file used as a *destination* when no output is desired, or as an input when nothing is to be read in. Often used to see *standard error* while throwing away *standard input.*

DHTML (Dynamic Hypertext Markup Language)   A document formatting language used to define positioning of text, forms, and images on World Wide Web pages. It is an enhancement to *HTML* that allows handling of moving images and multimedia objects, including sound.

diagnostic output   Error message output of a process that is useful in determining where a failure occurred in the completion of a process or to show the actual routines that are called during the process.

Digital UNIX   *See* Tru64 UNIX.

directory   A directory is a holding area for files or other directories. A file can be accessed by supplying all of the directory names from *root* down to the directory holding the file, in order. This is called the *full pathname.*

disk hog   A user who indiscriminately saves files that should be deleted or archived, reducing available disk space for other users on the system. *See also* quota.

display   A CRT (cathode-ray tube) unit used to input data, or receive output. *See also* standard input and standard output.

distributed database system   A database system that appears as a single database to its users, even though its data physically resides on more than one machine.

distributed file system   A file system in which user programs and data files are physically distributed over more than one machine but can be used by any user who has access to any of them in almost the same way as a local file. *See also* Network File System and Remote File Sharing.

distribution   A version of Linux or UNIX that has a specific audience, installation procedure, built-in applications, and package management system. Linux, in particular, has a huge number of distributions.

DNS   *See* Domain Name Service.

Documenter's Workbench   A UNIX System V software package that includes tools for text formatting. The tools include **nroff**, **troff**, and **mm**, as well as preprocessors such as **tbl**, **eqn**, **pic**, and **grap**.

domain   A named group in a hierarchy that has control over all groups under it, some of which may be domains themselves. A domain is referenced through a construct called *domain addressing.*

domain addressing   The method of stringing together domain names to identify a user within a *domain.* The @ (at sign) is used to separate the domain name in a *path* (for example, *dah1@att.com*).

domain name   A unique name that identifies a computer within a hierarchical network structure, e.g., *eecs.nwu.edu.*

domain name server   A software program on a machine (also sometimes referring to the machine) that provides *domain name* translation information for registered IP addresses on the server.

Domain Name Service (DNS)   A public registration service that links a *domain name* and its *IP address*, allowing Internet users to access a machine by the domain name instead of the IP address.

domain (RFS)   A logical grouping of machines in a Remote File System (RFS) network.

DOS (Disk Operating System)   An operating system for personal computers, developed by Microsoft for use on IBM PCs. Over the years DOS has been evolved to use the Windows interface, to resemble the UNIX architecture (including the X Window System), and to perform a number of functions similar to those available on UNIX systems.

dot command   A command beginning with a dot (**.**) and followed by a filename. A dot command tells the *shell* to read and execute the contents of the given file.

downsizing Moving computer architectures from mainframe-centric environments to smaller ones such as client/server, to distribute applications more efficiently. The evolution of LANs is a result of downsizing.

DVI A device-independent format for text files. Programs such as TeX write this format. There are translators and viewers that can manipulate and print DVI-format files.

dynamic web page A web page that has been generated dynamically by one of a number of web tools, such as Java, JavaScript, PHP, ASP, CGI, or ISAPI. Dynamic web pages allow interaction with the user, including multimedia, that is not available from a simple *static web page*.

e-mail *See* electronic mail.

echo A command that echoes strings from the *standard input* (e.g., terminal keyboard) to the *standard output* (e.g., terminal screen), allowing you to see characters as they are typed.

echoing The repetition of typed input. Normally, characters you type are sent to your system, and the system echoes them back to you. Echoing is turned off when you enter sensitive information such as your *password* or an *encryption* key.

ed A *line-oriented editor,* included in UNIX System V, for creating and modifying ASCII text files.

editing mode The mode within an *editor* that includes changing, deleting, or displaying text.

editor A tool for creating and managing text data within a file. Both *line-oriented editors* (such as **ed**) and *screen-oriented editors* (such as **vi** and **emacs**) are available.

electronic mail (e-mail) A facility that lets users send messages to users on other computer systems.

emacs A programmable, *screen-oriented* text editor, using a single mode for both text editing and commands, created by Richard Stallman at MIT. Although not part of UNIX System V, it is available as an add-on package.

emulator Features in the hardware (called hardware emulation) or software (called software emulation) of a computer that enable it to act as though it were another type of computer environment. *Terminal* emulation allows a terminal to act like a terminal known to the operating system (e.g., a VT100).

encryption	Encoding of file contents, via a key, so that they are unreadable, or at least difficult to read, to anyone but a user who can decode them by using the original key. Encryption facilities serve as a security measure for critical or sensitive files.
end-of-file character (EOF)	The character that marks the end of a file. In the UNIX System, the EOF character is CTRL-D.
Enlightenment	A user graphical user interface (GUI) available for Linux systems. Red Hat 6.0 Linux comes with Enlightenment as the default GUI.
environment	The set of values of all *shell variables.* These variables can be set automatically at login by setting them and exporting them in your *.profile.*
environment file	A file containing parameters that set the environment for a user under the *Korn shell.* Coupled with the values of variables set in users' *.profile* files, the environment file can restrict or enhance different users' capabilities on the same system.
environment variable	A *shell* variable whose value determines part of the total environment. Examples are the user's home directory *(HOME)* and path to search for command execution *(PATH).* The values of these variables must be set, and they must be exported to a *shell* for commands to use them. *See also* export.
eqn	A preprocessor for equations to be formatted via the **troff** text formatter.
error message	An output message indicating the nature of an error that occurred when a command was run. The default *destination* for error messages is the *standard error,* which by default is directed to the same place as the *standard output.*
escape	A mechanism that provides for the *shell* to treat special characters literally, rather than perform the functions they represent. A shell escape is used to escape temporarily from within a shell in order to perform a command. The interactive shell escape command is the exclamation point (!). The ESC key is an ASCII escape character found on the keyboard. *See also* escape character.
escape character	The backslash character (\), which tells the *shell* to ignore the special meaning of the following character and use the literal character itself.

escape sequence   A string of characters that represents another character. For example, the tab character is represented by the escape sequence \t. Also, a string of octal codes that performs special functions such as cursor movement or special keying sequences. These codes are often programmed into function keys to allow one keystroke to perform several tasks.

Ethernet   A *local area network protocol,* commonly used to network computers, that conforms to industry specifications for CSMA/CD (Carrier Sense Multiple Access/Collision Detection).

exec   A fundamental *system call* that replaces the current running process with another one.

executable file   A text or *binary file* that has permissions set to allow execution by simply typing its name.

execute   To run a program or *shell script.* Programs are executed directly by the *operating system*; shell scripts are run under a shell process that reads the script and performs each requested task.

execute permission   A permission setting *(x)* on a file that indicates that a user can execute the file. *See also* read permission and write permission.

exit (a process)   To terminate a running process or program. Processes may be exited successfully or unsuccessfully. The *exit code* determines the completion status of the process at the time of exit.

exit code   A code returned by a process or program indicating the status of the process, such as whether it completed successfully or not. Exit codes are used to perform *conditional execution* of subsequent processes.

expert system   A software system that automates problem solving in a particular area using rules based on the knowledge of experts in that area.

expert system shell   A set of software used for building *expert systems.*

export   To make the value of an *environmental variable* available to all processes running under the *shell.*

external data representation (XDR)   A data format used in a *network file system (NFS)* network to provide a common representation of data on different machines running different operating systems.

FACE (Framed Access Command Environment) A user interface for performing administrative and office environment tasks. FACE uses menu selections and *function keys* to do file management, program execution, printer management, and *system administration.*

fdisk A menu-driven program that allows the user to manipulate the hard disk partition table.

FIFO (first in, first out) A rule for providing service in the order in which requests entered the queue. *See also* queuing.

file A sequence of bytes within the file system referenced by its *filename.* Files can be *ordinary* (that is, contain ASCII or binary data) or *special* (perform special functions such as input and output).

file descriptor A number used by programs to identify files for input and output operations. The *standard input, standard output,* and *standard error* are assigned file descriptors 0, 1, and 2, respectively.

file server A server on a local area network whose purpose is to provide storage and transfer of data files for its users, typically PCs.

file sharing The process of allowing files on one system to be accessed by users on another. *Remote File System (RFS)* and the *Network File System (NFS)* are file sharing environments on UNIX System V Release 4.

file system A hierarchical structure of directories and files. There can be multiple file systems on a Release 4 machine, some of which are mounted at boot time and others by user request when needed.

filename The name given to a particular file. Filenames must be unique within a directory, but the same name may be used in multiple directories.

filename completion A *C shell* feature that allows completion of a filename by supplying only part of the name to the *shell.*

filling A process used by text formatters (such as **troff**) or word processors to put as much output on a line as the margins will allow.

filter A program that reads input and provides output based on some characteristic of the input. Filters used in a *pipe* are an important part of UNIX.

finger A command that produces detailed user information, such as login name, real name, and environment information, about a local or a remote user.

FIPS (Federal Information Processing Standard) A government standard developed by the NIST (National Institute of Standards) to ensure that government-purchased platforms are uniformly compliant. UNIX compliance is assured if the vendor follows POSIX standards.

Firefox A free, open-source web browser, developed by Mozilla, that is very popular among UNIX users and Microsoft Windows users alike.

firewall A World Wide Web security program that prevents unauthorized users from obtaining web information from a site. Although the term actually refers to the security software itself, many people also refer to the web server on which it runs as the firewall.

fixed media Media that is not normally removed from a system. A hard drive is an example of fixed media. Contrast with *removable media* (see).

floating display A formatted display that is allowed to move to a subsequent page where it fits without leaving a lot of white space on the previous page. *See also* static display.

FMLI (Forms and Menu Language Interpreter) A programming environment that provides customized menu interface creation and management routines for user interface environments such as *FACE.*

foreground The interactive processing environment in which current commands are processed before returning control to the user. *See also* background job.

fork A *system call* that makes a running process create another process, called a *child process.*

formatting program A program that takes raw source input and formats it according to a set of instructions. **nroff** and **troff** are the major UNIX System text formatting programs.

fourth-generation language (4GL) A high-level programming language used to develop customized database management applications.

FQDN (fully qualified domain name) The name of your host as well as the name of the domain that it is in.

frame A rectangular region displayed in the working area of a *FACE* screen that lists items that can be selected by the user.

freeware   Software that is usually provided free of charge, asking only that the user abide by the copyright laws associated with the software.

fsck   An interactive UNIX tool used for diagnosing file system integrity and performing any necessary repairs if errors are found in the file system.

FSF (Free Software Foundation)   A nonprofit free software distribution organization founded by Richard Stallman.

ftp   A networking command, based on the *DARPA FTP* protocol, that allows connection between two machines, as well as file movement, using the File Transfer Protocol.

FTP (File Transfer Protocol)   A *protocol* used to transfer files between machines in a *TCP/IP* network. This protocol is a *DARPA* protocol, created for use on the *ARPANET.*

full pathname   The complete name of a file from the *root directory* down to the *filename,* including all intermediate directory names.

function key   A type of keyboard key that can be defined to the system to perform a task or sequence of tasks when the key is pressed (for example, one function key could clear a screen and then display a menu).

getty   A part of the UNIX login process in which the user login and password are validated and associated to a terminal session.

gigabyte   A quantity equal to 1,024 megabytes. The capacity of newer hard disks on workstations is measured in gigabytes.

global   Relating to all occurrences of an object; for instance, a global change to a string in a file changes all occurrences of this string in the file; a global variable retains its value throughout a program.

global option line   Using the **tbl** preprocessor, the table *macro* line that describes the layout of the table, such as centering and boxing features.

glyph   The pictorial representation of an object on a computer screen, such as a bell or a clock.

GNOME   A desktop environment developed as part of the GNOME Project, which was started by GNU (*see also*) to create a free software environment that provided a complete computing platform for Linux/UNIX users.

GNOME Project A software project started in 1997 by GNU (*see*). The GNOME project provides two things: The GNOME desktop environment, an intuitive and attractive desktop for users, and the GNOME development platform, an extensive framework for building applications that integrate into the rest of the desktop.

GNU (GNU's Not Unix) Software initially developed by the Free Software Foundation *(FSF)*; now a complete project called the GNU Project. GNU software makes up a large part of the Linux utilities.

GOSIP (Government Open Systems Interconnect Profile) A program within the government to assure that any products and services purchased adhere to existing OSI standards.

grap A preprocessor that produces output graphs for documents produced using the **troff** text formatter.

graphical user interface (GUI) A user interface that uses such objects as *icons, glyphs, menus,* pointers, and scrollbars to allow the user to choose various options and run programs using graphical interactions such as moving, pointing, and clicking.

grep A command that finds instances of a *regular expression* in a file or files. It gets its name from *g*lobal *r*egular *exp*ression. **grep** is a useful tool for finding files with references to a particular date, to an individual, and so on.

group A class of users on a system who access common data. The *group ID* can be used to set file access permissions for a given group of users on a system.

group ID (GID) A number assigned to a user to specify the group of the user. This class identifier can be used by the *system administrator* or other users to restrict or allow access to data and program files.

guru An expert who understands the UNIX System and its philosophy (some people think the term came from the phrase "*g*reatly *u*nderestimated *r*esource for *U*NIX"). *See also* wizard.

hard delete (of a user) Unconditional and immediate delete of a user's login and home directory. *See also* soft delete.

hash A form of *array* that uses strings instead of integers for its indices. The index strings are called *keys*. Also referred to as an associative array.

header file   A file that contains source code definitions of macros and variables. The name of the header file can be included at the beginning of a user-developed program. The files, also called "include files," have names that usually end with *.h,* indicating that they are header files. Files can also be hard-deleted.

helper application   An external application that is used by a larger application (such as a web browser) to perform an action. An example would be opening a document file in a browser using Microsoft Word as a helper application. *See also* plug-in.

here document   An input to a shell program created by redirection of the standard input. The input is seen as all the text following a string chosen as the *here document* identifier, up to a line with just this identifier.

hidden file   A file whose name begins with a dot (.). It is called hidden because filenames beginning with a dot are not included in the output of **ls** (unless an argument, such as **–a**, which tells **ls** to include hidden files, is supplied). An example is your *.profile.*

hierarchical file system   A system that organizes files in a ranked series. The UNIX System uses a hierarchical file structure that starts at the *root directory.* Files or directories can be located using a *pathname* formed from the series of directories leading to the desired file or directory.

history list   A list of previously issued command lines. The list is helpful for checking the flow of a session, and for use in *history substitution.* A history list is kept by the *Korn shell* and by the *C shell.*

history substitution   Using a command stored in a *history list* as a new command that should be executed by the *shell.* History substitution is often used to avoid reentering long command lines, or lines with complex options.

home directory   The *root directory* of a user's file system. You are placed in your home directory at login time. This directory can be specified in your *.profile.*

home page   The initial (or topmost) page on a *web site.* The home page provides information about all of the other pages that you can access on the web site.

horizontal application   A software application that performs functions that are not specific to a trade or industry. Word processors and spreadsheets are examples of horizontal applications, as are accounting and statistics packages.

host (or hostname)   A name used to describe a computer that is connected to an Internet network and provides services to a user or group of users.

host-level security   A security schema that establishes a level of trust between machines (hosts). *See also* user-level security.

HP/UX   A UNIX variant developed by Hewlett-Packard for use on its computers and workstations, based on UNIX System V Release 2. It conforms to many of the Open Group *(X/Open)* standards as well as *XPG4.*

HTML (Hypertext Markup Language)   A document formatting language used to define positioning of text, forms, and images on World Wide Web pages.

HTTP (Hypertext Transfer Protocol)   A protocol used to transfer *hypertext* from another computer to your own, so that you can view it in a *web browser.*

hypermedia   Similar to *hypertext,* with the addition of media such as video and sound to plaintext.

hypertext   A method of linking currently displayed text to additional related material through use of highlighted keywords; also referring to the actual text itself. Hypertext contains not only text, but multimedia images and sounds as well.

icon   Under a graphical desktop environment, a representation of an application window or an executable program as a small graphical object.

IEEE P1003.2   The IEEE subcommittee that developed the POSIX operating system interface standard.

inbox   The storage area (file) designated by a user as the place to put incoming electronic mail messages sent by other users until they are read. *See also* outbox.

incremental search   A feature of the **emacs** editor that searches for strings of text as you type them. Each entered letter finds the first occurrence of a word with that letter or letters.

inference engine   Part of an *expert system shell* that contains procedures used to take input data and reach a conclusion.

init   The initialization process to bring a system to a particular *system state.* When a UNIX System computer starts up, **init** has a *process ID* of 1 and is the parent of other processes.

inode   An entry in a table list (called an i-list) that contains all information about a file except its name, such as its type, its mode, ownership info, where it is, and access information.

inode number   A number assigned to a specific *inode* in a file system. The inode number is associated with a file in order for the file system to track information about the file.

input mode   The editor mode that accepts user keyboard input and appends it into the file that is being edited.

input redirection   A method of obtaining input to a process from a source other than the *standard input.* Alternate sources may be a file containing the input statements, or a *here document.*

insert   To place new input text into a file before the line being pointed to. *See also* append.

instant messaging (IM)   A form of electronic communication available on the Internet that is intended for quick, short messages between users. Longer conversations are usually held using the *Internet Relay Chat* facility.

installation   The procedure used to set up all of the necessary directories and files for an application or utility package to run. Release 4 uses a standard system administration routine, called "installpkg," to perform standard software package installation.

interactive   Involving dialog between user and computer. An interactive application prompts the user for input and performs actions based on the user's reply.

interactive shell   A shell that you interact with by typing commands directly on the command line and waiting for a response from the system. You can invoke interactive shells after you log in using your *login shell*.

Internet   The *DARPA* network using the *Internet protocol* suite for connectivity. The Internet connects several different networks, including the *ARPANET.* It is used to share information and resources among its sites and to provide a way to test new networking developments.

Internet address   An address consisting of four fields of eight bytes each that uniquely identifies a machine to the Internet network, to allow *TCP/IP* communications to occur.

Internet Explorer   A *web browser* offered by Microsoft that lets you access the Internet and view *HTML* pages and web information.

Internet Relay Chat (IRC) A communications service on the Internet that allows multiple users to simultaneously carry on an electronic conversation in a "room". There are numerous rooms available on the IRC, called channels.

Internet telephony A platform that enables use of the Internet's TCP/IP capabilities to make and receive telephone calls rather than the traditional telephone network. A special telephone set and connection are required for this capability, also referred to as Voice Over IP.

interpreter A program that executes user instructions directly instead of turning them into machine language first. *Shell scripts* are interpreted.

interrupt A signal sent to indicate that an action is required by the interrupt handler. Interrupts are used to coordinate *I/O* devices and the processes with which they interface.

I/O (Input/Output) Transmittal of information between a computer and its peripherals, such as printers, terminals, and storage devices. The UNIX System uses the philosophy of separating the I/O from the process itself, so that alternate sources of input and output can be defined at execution time. The *kernel* carries out I/O using services of device drivers.

IP (Internet Protocol) A standard for transferring data over a communications network, now used by many networks for LAN/WAN routing.

IP address A four-part numbering sequence that uniquely identifies a computer on a network using TCP/IP. An example would be 127.64.11.9.

IRC (Internet Relay Chat) A popular service that lets multiple users on the Internet converse with each other by entering phrases that conform to a certain format. This is an evolution of the UNIX **talk** command, in which two users can talk simultaneously using keyboard input.

IRIX A proprietary version of UNIX System V Release 4 developed by Silicon Graphics for use on its MIPS-based workstations. It complies with POSIX, XPG3, the SVID3, and most of the System V Release 4 APIs.

Java A powerful object-oriented programming language, developed by Sun Microsystems, that allows development of platform-independent programs that can be run on a wide variety of operating system platforms.

job
A process running on a system. Also, a command, or group of commands, executed by the *job shell.* Jobs can be run in the *foreground* or *background,* depending on the urgency of the job.

job completion message
A message returned to the *shell* upon completion of a process.

job control
The capability to change the state of a process, including suspending, resuming, or stopping it.

job ID
A number given to the *job shell* to reference a process to be executed. The job ID can be used to perform *job control.*

job shell (jsh)
A *shell* that supports *job control.* The job shell is a superset of the default shell, *sh.*

KDE
The K Desktop Environment. KDE is an X Window desktop *GUI* for UNIX systems running on workstations, such as Linux.

kernel
The part of the UNIX System that controls process scheduling, I/O operations, and hardware. The kernel is always in memory and is deliberately small, leaving nonessential system operations to other processes and utilities.

key ring
A file used in *PGP* encryption that contains encryption keys to use when reading encrypted information from other users. There are private key rings (used by you only) and public key rings (used by many people with a common need to access certain encrypted data).

key server
A server that contains *key ring* information for public keys; ones that can be accessed by any user on a system to be used for encryption and decryption.

keyboard
The input mechanism for a display terminal or typewriter console, used to enter commands or data to the *operating system.*

%keyletter
A variable name used in a *mail surrogate* file, so called because the variable name begins with the percent sign (%) followed by some key letter.

keyword
A word or term that has a special meaning. Keywords usually relate to tasks or functions that the system performs and are reserved so that users do not attempt to use them as normal identifiers.

kill (a process)
To stop the execution of a process. This capability is often used to stop time- or resource-consuming processes.

kill character   A user-definable character used to delete the preceding character entered from the terminal. The default kill character is CTRL-H (BACKSPACE), but it can be changed.

kill line   A user-definable character used to delete the current line being entered from the terminal. The default kill line character is the @ (at sign), but it can be changed.

kilobyte   A quantity equal to 1,024 bytes. File sizes are often measured in kilobytes.

Korn shell (ksh)   A *shell,* created by David Korn, which is one of the standard shells in Release 4. The Korn shell provides enhanced features such as *command line editing* and a *history file.*

Label (MLS)   A two-part identifier used to describe files and processes on UNIX System V/MLS. The first part describes the hierarchical level (such as secret, top secret), and the second describes a category within that level. *See also* UNIX System V/MLS.

LAMP   A powerful web development environment created by linking together Linux, Apache, MySQL, and Python/Perl/PHP. Sometimes referred to as just AMP, since the environment can be developed on other platforms besides Linux.

LAN   *See* local area network.

LaTeX   A macro package for *TeX* that allows users to perform structured text formatting and typesetting.

Level (MLS)   The hierarchical level of security associated with a file or process on UNIX System V/MLS. Levels provide or deny access to users based on the security of the file or process (from unclassified to top secret).

lex (*lex*ical analyzer)   A program that generates a *C* program to perform lexical analysis. *See also* **yacc**.

library   An archive of functions commonly used in programming. Library directories usually have names that begin with *lib,* and they are usually sharable by many users.

limit   A useful system administration command that can be used to restrict the size of user-created files as well as *core dumps.*

line-oriented editor   A process that acts on a line or group of lines at a time, as opposed to acting on a screenful of data. The **ed** editor is a line-oriented editor. Line-oriented editors can be used on terminal devices or CRTs, but they are less effective on a CRT than a *screen-oriented editor.*

link (modules)	To combine individual modules into an executable program. Common subroutines contained in libraries can be linked to user programs at compilation time.
link (file)	A connection between a file and its *inode.*
link count	The number of *inodes* referencing the same copy of a given file. File linking is a mechanism to eliminate having multiple copies of a file.
lint	A tool used to check C language programs for unused variables, improper function handling, syntax errors, and other usage errors.
Linux	A freely distributed POSIX-compliant, UNIX-like operating system that runs on PC hardware, originally developed by Linus Torvalds at the University of Helsinki.
listener	A *port monitor* that listens for network address requests for communication across a *network,* and that provides the appropriate network services.
little language	A term used to describe tools that make up an independent environment to perform a set of functions such as editing, shell programming, and file manipulation, all within one process. **awk** is an example of a little language.
local area network (LAN)	A localized network that has a centralized device, called a *server,* providing services to multiple attached devices, called *clients.* Examples of LANs are StarLAN and *Ethernet.*
log in	To establish a session on a system by providing a valid user ID and *password* to the operating system.
log off	To exit the system. The normal way to log off is to press CTRL-D or to type **exit**.
login ID	The number associated with a *logname* in the */etc/passwd* file that uniquely identifies a user; also called a *user ID.*
login shell	The *shell* started when a user logs into a system. The login shell is identified in the */etc/passwd* file.
logname	A login ID for a user. Lognames are unique for each user, made up of two to seven alphanumeric characters. Lognames are used by other users to reference a particular user, to communicate with that user, or to find information about the user.

look and feel   The particular way in which a user interacts with a *graphical user interface,* including the way objects and functions are represented to the user.

loop   In shell programming, a condition where a sequence of commands can be repeated a number of times before exiting the sequence, based on satisfying a check for certain criteria.

macros   Groups of instructions combined into one instruction, referenced by a name. There are a number of macro packages for memorandum writing, called the *memorandum (**mm**) macros.* There are also editor macros, such as those found in **vi** and **emacs**.

magic numbers   Numbers in the first 16 bits of a file that contain coded information about the file type for interpretation by the kernel, usually referenced by the file */etc/magic.*

mail (shell)   A shell command used to send mail to and receive mail from other system users.

mail (text)   A message sent from one user to another. There are a number of UNIX mail facilities that can administer both incoming and outgoing mail. *See also* mailx.

mail client   A set of software programs that allows a mail user to read, send, and manage mail messages (sometimes called a *mail user agent*—or *MUA*).

mail surrogate   A mechanism that controls the delivery and processing of mail sent over the *UUCP System.* The instructions for this mechanism are normally kept in a file called the mail surrogate file.

mail transport agent (MTA)   A set of software programs that routes mail, moves it between and among different systems, and delivers it to a user's mailbox (*see also* mail client).

mailbox   A file in a directory designated by the user or system as a place to hold incoming *mail.*

mailx   An enhanced version of the *mail* utility, which allows editing and administration of mail messages from within the package.

main menu   The first *menu* that is displayed on the screen when a program that uses menu control is executed. The main menu is the control point for all of the menus underneath it, called submenus.

make   A program that creates or maintains a list of all of the modules that constitute an executable program, using a file called a *makefile* to describe the order of combining the modules.

makefile   The name of the file that is used to determine file dependencies and actions to take when executing the **make** command.

man(ual) page   A formatted page for a specific command that describes the purpose of the command, its format and arguments, and its usage. Manual pages can be produced with the **man** command.

megabyte   A quantity equal to 1,024 kilobytes. Computer memory and most disk drive storage capacities are measured in megabytes.

memorandum macros (mm macros)   A set of macros used in text formatting, provided in the macro package **mm** in the *Documenter's Workbench.* The macros provide commonly used formats (for example, page layouts, headings, and footers) used in letter and memo preparation.

memory   A region of in-core storage where program text and data are readily accessible. Typically the bytes are read in from hard disk.

memory allocation   The method by which the *kernel* determines what pages of memory are assigned to which processes.

menu   A list of items, often commands, from which a user can select. Menus are used in all graphical user interfaces, and menu items may contain both words and icons (*see also*).

metacharacter   A special character used in a *regular expression* to provide a certain pattern for searching. Metacharacters are used when an exact pattern is not known or desired.

MIME (Multipurpose Internet Mail Extensions)   An architecture that allows users to send non-ASCII text mail in a specific architected format.

MIPS (Millions of Instructions Per Second)   A CPU performance indicator that lets users compare the performance of various CPUs, based usually on the execution of one instruction per clock cycle.

modem (*m*odulator/ *dem*odulator)   A device that converts analog signals to digital, allowing computers to communicate over a telephone line.

moderated newsgroup   A newsgroup on the *Usenet* that has a moderator who decides which articles get posted into that newsgroup.

module   A part of a larger program that performs a specific function. Modules are linked to the larger program as required prior to execution.

Mosaic   A program used on the Internet with the World Wide Web to access and display information in a *web browser.* The Mosaic browser was one of the first widely used browsers for WWW.

Motif   A *graphical user interface* introduced by the *OSF* (Open Software Foundation) as an alternative to the *OPEN LOOK* graphical user interface developed by AT&T and Sun Microsystems.

mount   To make a file system available for use on a UNIX system using the **mount** command.

mount point   The directory name where a file system is mounted.

mouse   A device used to locate positions or addressable information on a computer display screen. Windows and the X Window System enable use of a mouse to perform functions such as selecting a task and initiating it, by pointing to an activity and clicking a button on the mouse.

MS Windows   *See* Windows.

MS Windows NT   *See* Windows NT.

MS-DOS (Microsoft Disk Operating System)   The most widely used single-task operating system for Intel-based PCs. *Windows* systems run a version of MS-DOS underneath the Windows graphical user interface that actually performs most of the processing tasks, similar to the way UNIX performs tasks under a GUI like CDE or KDE.

MUA (Mail User Agent)   The software that the user interfaces with when composing, reading, or sending mail. **elm**, **pine**, **mush**, and **mailx** are examples of MUAs.

Multics (Multiplexed Information and Computing Service)   An interactive, multiuser operating system developed in the mid-1960s by MIT and GE that was the predecessor to the UNIX operating system.

multimedia   Information displayed or manipulated in more than one format; i.e., the combination of text, audio, and video.

multitasking   The capability of a computer to run more than one task (process) at a time. The UNIX System has multitasking capabilities, as does Microsoft's Windows 95.

multi-user The capability of a computer to support more than one user connected to the system simultaneously and provide access to the same files or programs. The UNIX System supports multiuser systems.

multi-user state An operating system state in which all user files and processes are made available to enable a normal user to log into the system.

named pipe A special *pipe* that allows unrelated processes to pass data; for example, a *FIFO* (first in, first out) file. Normally, pipes only pass data between related processes.

nameserver A designated machine on a *TCP/IP* network that provides *Internet* network addresses to machines wishing to communicate with other machines on the *network.*

Netnews The collection of articles available for users on the *Usenet* network. There is a wide variety of news articles, arranged by categories called *newsgroups.*

Netscape browser A *web browser* offered by Netscape Communications, Inc. The newest version is Netscape Communicator, although there are still a number of Netscape Navigator browsers being used by web users.

NetWare A network-based operating system developed by Novell for use on PCs. It is part of Novell's UnixWare operating system now, and it supports both LANs and WANs (*local area networks* and *wide area networks*).

network A group of computers connected either directly or over dial-up connections. Network sizes can range from local—called *local area networks*—to geographically dispersed—called *wide area networks.*

Network File System (NFS) A protocol set and associated programs, developed by Sun Microsystems, which allow file transfer to occur over heterogeneous networks. All major UNIX variants support NFS.

Network Lock Manager An NFS utility that provides a locking capability for an NFS resource to prevent more than one client from accessing it at a time.

Networking Software Utilities Software that provides basic setup features on a System V Release 4 machine for networking software such as *TCP/IP.*

newline The character that UNIX System applications recognize as the end of a line. It is used by the *shell* as the end of *command line* input.

news Timely information that can be read by users by entering the command **news**.

newsgroup A category on the *Usenet* that contains news articles on a particular topic. Topics range from technical issues, to hobbies, to items for sale.

newsreaders Programs for reading *Usenet* newsgroup items. Examples of news readers are **nn**, **rn**, **trn**, and **xrn**.

NFS *See* Network File System.

NIS/NIS+ (Network Information Service) A service developed by Sun Microsystems that provides user and host machine name information to computers on an *NFS* network. This information can allow or deny access to resources on a particular machine on the network. The NIS version was also called Yellow Pages, or *YP*.

NNTP (Network News Transfer Protocol) A protocol that defines how *Usenet* articles are transferred over networks, allowing a single site to store the news while multiple users access the articles.

noclobber A variable setting that prevents inadvertent overwriting of an existing file when output is redirected to a file from the *standard output*.

node name The name given to your system to identify it to other systems in a network environment. In the Internet environment, it is also referred to as the *hostname*.

non-ASCII character A character not part of the *ASCII* character set.

nroff A text formatter that produces memos and letters to be output on terminal devices and line printers. *See also* **troff**.

nroff command A command that gives instructions to the **nroff** formatter. The primitives (basic commands) all begin with a dot (.) followed by lowercase letters and arguments.

number register A register used in **troff** (or **nroff**) formatting to store information. Predefined number registers track things like the current line and page. Users can define other number registers for their own process control.

numbered buffer A special-purpose buffer used by the **vi** editor and referenced by its number.

object A single entity that receives or contains information, such as a program, a printer, a page, or a record.

object code   Executable code that is produced by compiling a source program.

object-oriented   Of a methodology of software development using "objects" to build and share modules among users. Use of objects simplifies programming and provides uniformity across programs.

octal dump   A display of the contents of a file in octal format, including printing and nonprinting characters, using a program such as **od**. This format is helpful to view the contents of a *binary* file.

office automation package   A package that combines several common applications, such as a word processor, database manager, spreadsheet program, graphics program, and communications package, into a single environment.

Open Group   An association of international computer and software vendors, previously know as X/Open, whose goal is to promote open systems (systems that may be implemented by any company or individual; the opposite of proprietary systems) with many of the properties of the UNIX System.

OPEN LOOK   A *graphical user interface* developed by AT&T and Sun Microsystems, built around the *X Window System.* The *Open Software Foundation (OSF)* created *Motif* as an alternative to OPEN LOOK.

Open Software Foundation (OSF)   A consortium led by IBM, DEC, and HP in 1988 to develop a version of the UNIX operating system called OSF/1, and related technology, including the *Motif* graphical user interface.

open source   Software that is freely available for distribution. Open source platforms encourage multiple vendors to contribute programs, resulting in a rich variety of software that is both stable and easily supported.

operating system   The software that controls the activities taking place on the computer. The UNIX operating system has at its center a piece called the *kernel* that controls all of the processes and devices, leaving other tasks to other operating system components.

option   A variable used to change the default conditions under which a process executes. Options are supplied to commands on the *command line.*

ordinary file   A file containing data, shell commands, or programs. Ordinary files are created and maintained by users. *See also* special file.

OS/2 (Operating System/2)   A *multitasking* 32-bit operating system for personal computers, developed by IBM and Microsoft. IBM has assumed ownership of the operating system, its latest version being OS/2 Warp.

OSF   See Open Software Foundation.

outbox   A file or directory designated to hold outgoing mail until it is sent. *See also* inbox.

output redirection   The sending of output of a process to a destination other than the default *standard output,* such as a file or printer.

owner (file)   The user who is listed as the person who owns a file and has owner *permissions.* The owner may transfer ownership of the file to another user.

pager   A program that displays the contents of a file one screen at a time, such as **more** or **pg**.

panel   A bar on either the top or bottom of a desktop window display screen that contains most of the useful items that users access on a regular basis.

parent directory   The directory immediately higher in the UNIX file system hierarchy. Also referred to and noted as the characters **..** (pronounced "dot dot").

parent process   A process which, during a **fork**, generates a new process, called the *child process.*

parent process ID (PPID)   A number given by the *shell* to a *child process* to identify its *parent process.*

partition   An assignable segment of disk space on a hard drive. The UNIX System uses separate partitions to mount its *file systems.*

password   A string that must be supplied at *login.* Passwords provide security from unauthorized access.

password aging   A security feature of UNIX that requires users to change their passwords at regular intervals.

path   The list of directories that is searched to find an executable command.

pathname   A list of directory names, separated by slashes, that identifies a particular file. This list can be a *relative pathname,* which references the location of a file in relation to the directory you are currently in, or a *full pathname,* which specifies the complete path in relation to the root directory.

pattern matching   A technique to determine the occurrence of a particular character or sequence of characters, using expressions called *regular expressions.*

Perl (Practical Extraction and Report Language) An interpretive scripting language used for scanning, extracting, and printing data.

permissions Groups of codes associated with files and directories that define read, write, and execute restrictions.

permuted index An index of commands, based on keywords in the NAMES section of manual pages, describing the purposes of commands. This format is helpful if you do not know a command name but you do know its action.

PHP (Personal Home Page) One of the most popular server-side scripting languages used to develop *dynamic web pages*. PHP is an evolution of the Perl scripting language. It is part of the *LAMP* platform for web development.

pico A simple to use screen editor, developed at the University of Washington to compose and edit PINE (*see also*) e-mail messages.

PGP (Pretty Good Privacy) A secure encryption system that uses public and private key encryption methods to send and receive information over a network. It is free for noncommercial use.

pic A **troff** preprocessor that formats simple line drawings.

PINE A very powerful screen-oriented e-mail program, developed at the University of Washington. It is one of the most popular e-mail readers among UNIX users, especially university students.

pinned menu In the *OPEN LOOK graphical user interface,* a menu in which the *pushpin* is depressed to keep the menu visible until the pin is removed.

pipe A connection between the *standard output* of one process and the *standard input* of a second process. Pipes are used to chain multiple UNIX processes together to perform a logical series of steps.

pkgadd A UNIX utility command used to install software from a disk or tape onto a UNIX machine.

Plan 9 A distributed computing operating system developed by the original inventors of the UNIX Operating System at Bell Laboratories. It incorporated features for networked and distributed computing that were not available when UNIX was first developed.

plug-in	A software program that provides a specific function for a larger application. Web browsers and e-mail programs use plug-ins to extend their functionality without having to rewrite the larger applications. *See also* helper application.
pop-up window	A window that is selected temporarily to perform a specific function, such as selecting commands, setting the environment, or displaying help information.
port	A connection point from a processor to an external device such as a terminal, printer, or modem. Ports can be dynamically reconfigured as the system requires.
port monitor	A process that monitors *port* activity as part of the *Service Access Facility.*
portability	The capability to move software code from one machine environment to another with no (or minimal) changes. The UNIX System is a portable operating system.
positional parameter	A parameter to a command that must appear in a specific field in the *command line* to be used correctly by the command.
POSIX (*P*ortable *O*perating *S*ystem *I*nterface for Computer Environments [*X*])	An IEEE standard that defines requirements for portable UNIX-like systems, particularly the way in which applications interact with the operating system.
posting news	Making a news article of interest available to other users by posting it on the *Usenet.*
PostScript	A page description language, developed by Adobe Systems, that can be used to specify high-quality output for laser printers.
PPP (*P*oint-to-*P*oint *P*rotocol)	A protocol that defines packet communications on networks such as *TCP/IP, Ethernet,* and Novell.
preemptive multitasking	The capability to interrupt a task to service another task.
preprocessor	A process that preformats a class of objects (such as tables, graphs, equations, or picture drawings) and sends its output to another process. An example is the **tbl** processor that formats tables for the text formatter **troff**.
primary nameserver	The central point in a *Remote File Sharing domain* that administers the file sharing environment for the entire domain. It tracks available resources, maintains addresses of other servers in the network, and assigns access passwords.

primary prompt	The string (the default is $) that acts as a cue to tell the user that the *shell* is ready to accept user input.
print server	A special-purpose server whose function is to accept print requests and distribute print jobs to available printers on a network.
priority	The relative ordering given to a process with respect to other processes. System processes have a higher priority than user processes.
priority class	A value assigned to a process that indicates with what priority the process will execute. Priorities may be set for *real-time class* or *time-sharing class* processes.
privilege	The level, category, and group identifiers that form the security restrictions for files and processes under *UNIX System V/MLS* (*M*ulti-*L*evel *S*ecurity system).
process	An instance of a program. Processes are started by the *shell* and given a *process ID,* used to track the process until its completion.
process ID	A unique number that identifies a running process. This number is used when you want to take an action on the process, especially *kill* it.
profile	A description of the *shell* operating environment for a given user, including, among other things, paths for commands, terminal descriptions, and definitions of key directories used. This information is normally stored in a file called *.profile.*
.profile	A file that contains commands executed by the *shell* at *login.* Commonly, *environment variables* are set by a *.profile.*
Programmer's Workbench	A set of tools available to SVR4 application programmers that makes software code generation easier.
project management software	Software developed to aid in project management, in order to perform tasks such as resource estimation and scheduling, critical path analysis, and cost management.
prompt	A cue that tells the user to enter input. The *shell* provides a *primary prompt* to indicate that commands can be entered, and a *secondary prompt* to indicate that an entered command is incomplete and requires more input. A *tertiary prompt* is used by the **select** command for menu selection.
protocol	A set of rules established between two devices to allow communications to occur.

proxy server   A software program that sits between your web client and a *firewall.* It acts as a proxy for you (hence the name) when interacting with the firewall. It also uses a concept of caching (storing) previously accessed information to speed up delivery of information to your *web browser*.

public-key cryptography   A method of secure file encryption that uses separate encryption and decryption keys. The recipient's public encryption key can be looked up in a public directory, but only the recipient of the content knows the decryption key.

public domain   Publicly owned items, such as software, for which the author has given up all copyrights as well as rights to sale and distribution.

public domain software   Software that can be used by anyone, because the author has made it available with no restrictions and no licensing fee.

pushpin   In the *OPEN LOOK graphical user interface,* a *glyph* (in the shape of a pushpin) that can be used to keep a menu or other *pop-up window* visible.

PWB   *See* Programmer's Workbench.

Python   A dynamic, object-oriented scripting language that offers support for integration with other languages and tools. It is open-source, and runs on many different platforms.

quantum (time)   A specification for the maximum time allotted for a real-time process to run.

query language   A language employed by database users to retrieve, modify, add, or delete data.

queuing   Putting requests for services into a list for handling. Service can be provided to requests in a queue using *FIFO,* LIFO (*l*ast *i*n, *f*irst *o*ut), or another set of rules.

quota   A method of limiting a user's disk resources on a system to avoid indiscriminate use by a *disk hog.* A *soft* quota warns a user who is over the disk space limit, but a *hard* quota stops the user from writing new file information immediately when the limit is exceeded.

quoting   Use of special characters to instruct the *shell* that the contents contained between the quotes are to be treated as a string.

RAM (random access memory)   Computer memory that can be read from and written to by user and system programs. The contents of RAM are lost once the computer's power is turned off.

range pattern
A pattern matching scenario in which a pattern is checked to see if it falls within a specific starting range pattern and a specific ending range pattern.

.rc file (*r*un command file)
A script file that contains parameters or commands that are executed at the startup of a certain command in order to set up an environment under which to run that command. Examples of *.rc* files are the *.mailrc* file, used by the **mailx** command, the *.exrc* file, used by **ex** and **vi**, and the *.newsrc* file, used by **readnews**.

r* commands
A set of commands that provide networking capabilities for UNIX users. The name comes from the fact that the first letter of the commands is *r* (for remote).

read permission
A *permission* setting on a file that indicates that a user can read the contents of the file. *See also* write permission and execute permission.

real-time class
A class of processes that has a higher execution priority than the *time-sharing class.* Real-time processing is usually reserved for processes that need guaranteed execution before other processes.

record locking
A facility that allows only one user at a time to access a particular record in a file, so that updates can take place properly.

redirection
Directing input from a file other than the *standard input* or directing output to a file other than the *standard output.*

reference manual
A document that includes *manual pages* and other information. Reference manuals describe commands and provide useful information for users, system administrators, and programmers.

regular expression
An expression used in *pattern matching* in files. Regular expressions consist of letters and numbers, as well as special characters that have specific functions in the search, called *metacharacters.*

relative pathname
A pathname that is identified by its relationship to the current directory, as opposed to using its *absolute pathname.*

remote command
A command that can be executed on a TCP/IP networked machine, allowing access to resources on that machine. The Berkeley Remote Commands are an example of this.

remote execution
A mechanism to perform a process on a machine other than the one you are on, without having to log in to the remote machine.

Remote File System (RFS)	A networking facility that allows processors to share file systems with one another, eliminating the need to have multiple copies of files stored on individual machines. RFS was available starting with UNIX System V, Release 3.
remote login	The capability to log in to a remote machine and become a user, just like a local user.
Remote Procedure Call (RPC)	A system network call that allows execution of a procedure on a remote networked machine also running RPC. RPC is used by the *Network File System (NFS).*
remove (a file)	To delete a file from the directory structure. Files that are inadvertently removed can be restored, provided a *backup* was made of the file.
removable media	Media that can be inserted into and then removed from a system. CDs, DVDs, flash drives, and floppies are all examples of removable media. Contrast with *fixed media* (see).
restore	To take a file from a *backup* device, such as a disk or tape, and put it back into a directory on the file system for use.
restricted shell (rsh)	A shell environment that prevents a user from accessing all but certain allowed commands. *System administrators* use the restricted shell to prevent users from accidentally getting into unknown environments in which they might cause system or file damage.
RFS	*See* Remote File System.
right justification	A method of producing block text in a text formatting process. The text on a line is filled (padded) with spaces between words to produce a uniform right margin.
rights profile	A set of profiles on Solaris systems that describe access rights beyond those of a normal user. Part of the role-based access control (*see*) security environment.
RISC (Reduced Instruction Set Computing)	An architecture that reduces the number of instructions in the operating system to increase the speed of the CPU.
Role Based Access Control (RBAC)	A powerful security feature of Solaris that restricts access to files based on the role of the user on a particular system.
root	As a login ID, root is the user ID of the *system administrator* or *superuser* who has responsibility for an entire system. Root has permissions for all users' files and processes on the system. As a file, root is the first file in the file system hierarchy.

root directory	The base directory (identified as /) on a system. All other directories and files are under the root directory and can be found by providing a *full pathname* from the root directory.
root file system	The file system that contains the root directory and is used during booting of the operating system.
router	A designated machine on a network that enables communications between a machine on that network and one using another *protocol,* such as a machine on a *TCP/IP network* using X.25 talking to one using *Ethernet.*
RS-232C	The standard protocol used between devices such as a computer and any serial connection such as a modem or printer. A subset of the V.24 communication protocol.
RTFM	Read the F****** Manual. A response usually given to someone asking a simple question that could be easily answered by reading one of the UNIX manuals.
run-time environment	An environment in which applications are built using specialized routines that run quickly and efficiently.
Samba	A software package that allows UNIX and Windows users to share print and file resources transparently. It is a free implementation of the *SMB* protocol.
sar	A UNIX command that reports on a range of system activity data to help system administrators understand what resources are being used.
scheduling	A method used to run programs at designated times, such as a regular time of the day, week, or month. The **cron** facility is used to schedule tasks.
screen-oriented editor	An editor that allows manipulation of a screenful of data at a time using a CRT, as opposed to a *line-oriented* editor. The **vi** editor is a screen-oriented editor.
secondary name server (RFS)	A computer in a *Remote File System domain* that is designated to temporarily take over the responsibilities of the *primary name server* in the event of failure.
secondary prompt	A user cue issued by the *shell* (default is >) indicating that a user command is incomplete and requires more input.
sed (stream *editor*)	A text editing tool that uses files for batch mode input, in contrast to the editors **vi** and **ed**, which are interactive.

semaphore A value made available to processes to check whether or not a resource is currently being used.

server A computer in a networked environment that provides resources for *clients* on the network.

Service Access Facility (SAF) A feature of UNIX System V Release 4 that provides consistent handling of all requests for connection, whether from local devices such as a console or terminal, or remote network connections.

Set Group ID (sgid) A permission setting (*s* instead of *x* in a group permission) that enables processes created by a particular program to retain the same permissions as the owner of the program. Used as a security measure to allow privileged execution of programs in a controlled environment.

Set User ID (suid) A permission setting (*s* instead of *x* for the owner) that enables a user to have the same execution privileges for a program as the owner of the program. Used as a security measure to allow privileged execution of programs in a controlled environment.

SGML (Standard Generalized Markup Language) A format specification and development environment for building text markup languages. *HTML* is a text markup language that conforms to this specification.

Shadow Password File A security file that contains password information used to validate user passwords by *root.* This feature keeps users from obtaining user passwords from the */etc/passwd* file.

share (a resource) To allow other users of a *distributed file system* access to your files.

shared library A binary library that can be loaded once and then shared by many different applications, thus saving load time as well as memory.

shareware Software that can be used on a trial basis before purchase. Shareware is owned and copyrighted by the author.

shell A control process under which a user executes commands. UNIX provides several different shells, including the standard shell, the *job shell,* the *C shell,* the *Korn shell,* the *tcsh shell*, the *bash shell*, and the *restricted shell.*

shell script A program written using the shell language. Most shell scripts are a series of command line structures saved to a file that is made executable. Your *.profile* file is an example of a shell script.

shell layers   A facility that allows a user to run multiple shell sessions at one time, under the control of the shell layer manager, **shl**.

shell parameter   An *argument* that is passed to a shell process on a *command line* to modify the default way in which the shell will execute. Parameters may be things such as filenames, variables, or values. *See also* shell variable.

shell program   A program made up of a group of shell commands. *See also* shell script.

shell programming   A technique for combining shell commands into a *shell script* that performs a series of useful related tasks.

shell script   A group of shell commands combined into a sequence that can be executed by invoking the name of the shell script. *See also* shell programming.

shell variable   A variable defined within the *shell* to hold values used by other processes during a user session. Common shell variables are *PATH, HOME,* and *TERM.* Their values can be displayed by entering the variable with a dollar sign ($) at the beginning (for example, *$PATH*).

shutdown   The orderly closing of all processes, files, and system resources to stop a UNIX system correctly. A shutdown may be complete, so that nobody can access the system, or partial, so that the system administrator can perform maintenance tasks with no users logged in.

signal   A communication sent from one process to another to notify the process of an event taking place. The receiving process can either ignore the signal, or handle it through a process called the *interrupt* handler.

Single UNIX Specification   A specification (formerly called Spec 1170) that allows a UNIX software vendor to develop an application that will work on all UNIX System platforms that support this specification.

single-mode editor   An editor that performs input, modification, and display all in the same mode (as opposed to separate input and command modes). **emacs** is a single-mode editor.

single-user state   An operating system state in which only the root file system is mounted, and the root user is the only allowable user of the system by using the *console*.

sleep   A command that causes a process to stay quiet (be suspended) for a specified time.

SLIP (Serial Line Internet Protocol)
A protocol that defines how IP communications take place over voice-grade telephone lines.

SMB
An Open Group *(X/Open)* standard for file and printer sharing among computer systems. LanManager, Windows for Workgroups, Windows NT, and OS/2 all use SMB.

SMTP (Simple Mail Transfer Protocol)
A *protocol* defining how mail is sent in a *TCP/IP* environment.

sockets
A session layer programming interface that uses special file structures as endpoints for communication devices on virtual circuit and client/server networks. Sockets have been used to build networking applications such as *TCP/IP* application services.

soft delete (of a user)
The process of notifying users who may share files with a user whose user ID is about to be deleted before it is actually done, giving them time to respond to the system administrator. Files can be soft deleted by moving them to another directory for a short time, and then deleting them.

Solaris
Sun Microsystems' version of UNIX developed by its SunSoft division, originally based on SunOS and evolved from a merge with UNIX SVR4. Solaris runs on many platforms, from desktop PCs to servers. The most recent version is Solaris 10.

sort
To arrange fields within a file according to a desired order, such as alphabetically or numerically.

source code
A file or group of files that contains programming instructions written in a computing language (such as *C*) that needs to be compiled before the instructions can be executed by a computer.

Source Code Control System (SCCS)
A UNIX facility developed by Bell Labs to catalog and document changes to source code to enable programmers to manage and access specific versions of a source code module.

Spec 1170
A specification developed by a UNIX consortium that included 1170 APIs from various vendors and standards bodies trying to define a common application programming interface for UNIX. It is now controlled by the Open Group *(X/Open)* and called the *Single UNIX Specification.*

special file
A type of file that contains information about a device such as a disk or a user terminal. Special files are used by the system for input and output operations.

spooling   Moving input or output data to a temporary storage device until a process is ready to receive the data. Most printer jobs are spooled to free up the processor to do subsequent tasks.

SQL (Structured Query Language)   An ANSI standard *query language* for database management systems.

standard   An agreed-upon model. There are standards for operating systems, communications techniques, data storage, data representation, and so on. There are *de facto* standards, which become so by a large number of people adhering to them, and *de jure* standards, which are set by standards groups such as ANSI, ISO, IEEE, or ITU.

standard error   A logical channel that receives *error messages* generated during processing. By default, standard error is sent to your screen, but it can be redirected to a file or *pipe.* Standard error is *file descriptor* 2.

standard input   A logical channel through which a command accepts input. By default, standard input is assigned to your keyboard (in this case, what you type in is standard input). It can be redirected to take input from a file or a pipeline. Standard input is *file descriptor* 0.

standard output   A logical channel for transmitting output from a command. By default, standard output is assigned to your screen (in this case, standard output is displayed on your screen by the system). Standard output can be redirected to a file, a *device,* or a *pipe.* Standard output is *file descriptor* 1.

startup   The orderly initialization of processes, resources, and files during the boot process that brings the system to a specific state; usually the *multi-user state*.

state   A specific system environment. UNIX has a number of system states that can be set by the system administrator to allow or deny access to files, processes, and resources.

stateful service   A network service in which the server monitors all of the resources that are open, and which *clients* have them open. *Remote File Sharing* is a stateful service. *See also* stateless service.

stateless service   A network service in which the server does not keep track of which of its *clients* has open files at any given time. The *Network File System* is a stateless service. *See also* stateful service.

static display   A display produced by a text formatter, such as **troff**, which appears in the output exactly where it appears in the input, in contrast to a *floating display.*

static web page   A web page that has been generated using *HTML*. This was the original way of displaying web pages. However, newer *dynamic web page* displays allow the user to interact with the web page for a richer experience.

status monitor   A system administration process that reports on the status of the processes that are currently running.

sticky bit   A permission setting (**t**) that can be assigned to a file by the *system administrator* and that can reduce the system overhead for frequently used programs. Setting the sticky bit causes an executable image of the program to be temporarily stored in swap space when the program is not being executed.

STREAMS   An SVR4 facility for controlling character *I/O* that allows network modules to be used with different protocols. The entire terminal subsystem was modified in Release 4 to be STREAMS-based.

string   A sequence of characters or symbols.

string substitution   A process in which a string in a script or command is replaced by its defined value.

string variable   A variable used in a program that consists of a string of ASCII characters used as a unit.

stty (set *tty*)   A command that allows a user to see or change settings for the terminal device used to communicate with the processor.

subdirectory   A directory contained in another directory. All directories are subdirectories of the next higher–level directory all the way up to the *root* directory.

substitute   To replace one expression with another. The **ed** line editor and the *Korn shell* editor allow individual replacements of expressions, or global substitution (which replaces all occurrences of an expression with the new expression). The term "substitute" refers also to *command substitution* as well as *history substitution.*

SunOS   Sun Microsystems' original version of its UNIX System. Many of the features of SunOS 4.0 have been merged over the years into *Solaris.*

supercomputer   A computer that performs an extremely large number of operations in a second relative to other types of computers. Supercomputers are designed to process large volumes of data or perform complex tasks quickly.

superuser   A user with the same privileges as the *root* login. To become a superuser, a user must supply the superuser password.

suspend   To temporarily stop a process from executing. Suspended processes may be resumed at a later time or killed. *See also* kill.

SVID   *See* System V Interface Definition.

SVR4 (System V Release 4)   A UNIX implementation developed by Bell Labs and Sun Microsystem in the early 1990s. SVR4 is the basis for many major variants, including Solaris, HP-UX, and Linux.

SVR5 (System V Release 5)   The latest implementation of UNIX System V, offered by The SCO Group, formerly SCO (Santa Cruz Operation). It has many enhancements to UNIX SVR4. It is also referred to as UnixWare 7 SVR5. The SCO Group also introduced SCO OpenServer6 based on SVR5.

symbolic debugger   A *debugger,* such as **sdb**, that allows programmers to trace the sequence of events in a program using displays of program variables at key spots in the program.

symbolic link   A pointer from a file to another file or files. Only one copy of the file exists, and any updating done using any linked filename updates that copy. This technique is used to share a file across file systems.

synchronous terminal   A device that can receive and send data simultaneously (as opposed to an *asynchronous terminal*). Data is sent and received at regular timed intervals that are synchronized with the device to which the terminal is attached.

system administration   Maintenance of the files, users, and processes on a system. While users can perform simple administrative tasks, complex and routine administration is done by the *system administrator.*

system administrator   The person who maintains a system, including setting up user environments, maintaining resources for users of the system, and tuning the system for performance.

system call   A call made by a process to the *operating system kernel,* to perform some function such as *I/O* or process handling.

system class   A class of processes reserved for the operation of the system. These processes have the highest priority.

system log files   Files used by the system administrator to capture and analyze hardware, software, and other resource use, as well as perform security analysis.

system name   The name of the operating system environment that is, by convention, given to your system to identify it. The system name and the *node name* are the two pieces of information that uniquely identify your system.

system state   The state of the operating environment at any given time. The states can be anything from the multiuser state—meaning fully operational—to the firmware state, used for system maintenance.

system tray   An area on the desktop *panel* that contains system information, such as the date, time, battery control, and volume control.

System V Interface Definition (SVID)   A set of specifications developed by AT&T that helps developers on variant systems understand how to develop code that is compatible with UNIX System V.

System V Verification Suite (SVVS)   A set of test programs that can be used by system developers to verify that the SVID specifications have been met on a new port or version of UNIX System V.

tar (tape archiver)   An archiving utility that allows computer information to be stored on a medium such as a tape (hence the name) according to a specified format, and subsequently restored to the computer.

taskbar   Part of a *panel* that allows a user to switch between active windows on the desktop, called a *window list*.

tbl   A *preprocessor* to **nroff** and **troff** that is used to produce tables within documents.

Tcl (Tool command language)   An interpreted script language that allows the user to create tools as well as applications that can be embedded in other applications such as C programs.

tcsh shell   An enhanced version of the *C shell* that is available on Linux systems as an alternative to the *bash shell.*

TCP/IP (Transport Control Protocol/Internet Protocol)   A family of protocols that provide reliable transmission of packet data over networks.

telnet   A process to access remote systems on the *TELNET* network.

TELNET   A *DARPA* service that provides access to remote systems. The service was originally used for terminal access, hence the acronym from *tel*etype *net*work.

term	A program that runs over a serial line and allows multiple concurrent connections as well as remote execution of *X Window* applications.
termcap	A collection of subroutines that controls the display of output on terminal screens, allowing for output at specific locations on the screen. This functionality has been augmented in Release 4 with *terminfo.*
terminal	A device used to display input to and output from a connected system. Terminals can be asynchronous or synchronous; the UNIX System uses asynchronous terminals for its displays.
terminal emulator	A program that allows a personal computer to act like an *asynchronous terminal.* Access to the UNIX System is achieved through an asynchronous terminal.
terminfo	A database that describes the capabilities of devices such as printers and terminals. These descriptions enable the correct terminal interface to be chosen when performing screen-oriented processes (such as the **vi** editor), or the correct printer interface when printing a file.
tertiary prompt	A prompt used in the *Korn shell* by the **select** command. The command reads a reply from the *standard input* and sets a variable that can be used to carry out an action based on the reply.
test	A shell instruction to determine whether a variable meets a certain condition.
TeX	A text processing language that allows users to create typesetter-independent output files.
text formatting	Creation of letters, memos, and documents. There are text formatting processors (**nroff** and **troff**) as well as *preprocessors* to format text input.
text formatting tool	A process that aids in *text formatting.* **nroff** and **troff** are text formatting tools, as are their *preprocessors* **eqn**, **neqn**, **tbl**, **pic**, and **grap**.
tftp	A process that connects to a remote machine using *TFTP.*
TFTP (Trivial File Transfer Protocol)	A protocol that uses the *UDP* to transfer files over the Internet.

time-sharing class A class of processes that has lower priority than the *real-time class* or the *system class.* Processes running in this class are scheduled based on a number of input factors, such as resources required and expected length of execution.

Tk A set of extensions to **Tcl** that allow programmers to write X applications as simple **Tcl** scripts.

TLI (Transport Layer Interface) A programmable interface that allows applications to be built independent of the networking protocols below them, and provides reliable network transmission.

toggle variable A *C shell* variable that can be set on (via the **set** command) or off (via the **unset** command).

tool A program or process that makes performing a task easier. UNIX System V has a large number of software tools to do file manipulation, programming, text filtering, and calculations.

touch A program to update a file's time stamp without actually editing the file. This command is helpful in keeping files from being deleted by automatic processes created by the user. It can also be used to create a file with zero length.

transport A method by which data is moved across a *network.* The *TLI* allows programming interfaces to be built; these ensure that the transport mechanism transmits data to the network reliably.

trap A shell command that guarantees that routines receiving an *interrupt* are handled correctly when a process stops prematurely. An example is deleting temporary files that would normally be deleted on process completion.

tree structure A structure resembling an upside-down tree, which has a root and branches, which themselves have branches, and so on. The *file system* directory structure is a tree structure.

troff A text formatter whose output is produced on a display phototypesetter or laser-quality printer.

troff command A command within a **troff** source file that provides instructions on such things as page layout, point size, and spacing. *See also* **nroff** command.

Trojan horse A program that masquerades as another program and performs some function without the permission or the knowledge of the person who executes it. A *virus* can be spread through a Trojan horse program.

Tru64 UNIX   A 64-bit UNIX implementation developed by Digital Equipment Corporation (now part of Compaq) that is commercially available to run UNIX on Compaq computers.

TSR program (terminate-stay resident)   A DOS program that stays in computer memory after it is finished executing. The program may be reexecuted without having to be loaded again from disk, thus saving time.

tty   A UNIX process that manages the characteristics of a terminal's data transmission to and from the host processor; also a command to display the terminal's device name.

UDP (User Datagram Protocol)   A transmission *protocol* using *datagrams* that can be implemented on top of the *Internet protocol.*

UID   *See* user ID.

unalias   To remove the *alias* given to a command. Once a command is unaliased, a user can no longer execute it by using its alias.

uncompress   To return a file from a compressed state back into its normal state, using an algorithm for undoing compression. Also the name of the program that performs this function.

UniForum   An international organization of UNIX System users. Formerly known as */usr/group,* this organization is active in defining standards. It sponsors a yearly trade show, also called UniForum.

UNIX   The operating system developed by Ken Thompson and Dennis Ritchie at Bell Labs in 1969, which is the grandfather of all UNIX System variants. UNIX is now a registered trademark of the Open Group (formerly *X/Open*).

UNIX 95   A specification for standardized UNIX developed by SCO and the Open Group; also called the *Single UNIX Specification.* This version has been superceded by *UNIX98.*

UNIX98   A specification for standardized UNIX based on Version 2 of the *Single UNIX Specification.*

UNIX International   A consortium of vendors that advised AT&T UNIX Software Operation (USO) on the development and marketing of UNIX System V Release 4.

UNIX philosophy   The philosophy that *small is beautiful.* Utilities should be designed for a single task, and they should be designed so they can be connected. The design of the UNIX System is based on the idea that a powerful, complex computer system can still be simple, general, and extensible, in order to benefit both users and developers.

UNIX System V One of the major UNIX variants from which Solaris, HP-UX, and Linux evolved. System V Release 4 is still used on many UNIX systems even though Release 5 is available.

UNIX System V/MLS (UNIX System V/Multi-Level Security) A version of the UNIX operating system that meets the B1 level of security as defined by the U.S. Department of Defense. This version is offered for users who need a higher degree of security than in a normal environment.

UNIX System V Release 4 (UNIX SVR4) An important release of UNIX System V. UNIX System V Release 4 had significant enhancements over previous versions, because it was a combination of System V, SunOS, the BSD System, and the XENIX System. Many of these features have become part of other major variants such as Solaris, HP-UX, and Linux.

UnixWare Novell's UNIX operating system based on UNIX System V Release 4.2. UnixWare 2 contains NetWare, a client/server networking environment.

unmount To remove a mounted *file system* from a machine. *See also* mount.

URL (uniform resource locator) A data format used for communications on the World Wide Web that includes the address of the information as well as the type of information requested.

Usenet A global network, built using the *UUCP System,* which allows users to read and exchange news items electronically on a wide variety of topics. *See also* news.

USENIX Association A group consisting primarily of UNIX technical users whose purpose is to exchange ideas on UNIX technical issues.

user ID (UID) A uniquely assigned number associating a user to a login ID and password. The UID is carried with all files that the user creates, and it helps determine file access privileges for those files.

user-level security A security schema that establishes a level of trust between users on different machines. *See also* host-level security.

utility A specialized program that performs routine system functions, such as file sorting, generating reports, and backing up and restoring files.

UUCP System A system of commands used for communications between computers, including file transfer, remote execution, and terminal emulation. The UUCP System includes many different commands, including the **uucp** program itself.

variable	An identifier in a command or script which can be set to different values. One of the key features of a variable is that it can be used many times in a command or script while its value only needs to be set once prior to using it.
vertical application	An application designed to solve problems in a specific industry, such as retailing, hotel management, or the financial industry.
vi	A *screen-oriented editor* that allows full-screen text manipulation. **vi** is a more powerful editor than its line-oriented counterpart, **ed**. *See also* **ed**.
virtual desktop	An instance of a desktop. Desktop window environments can have multiple desktops open simultaneously, but only one—the current virtual desktop—can be worked on at one time. Also called a *virtual workspace*.
Virtual File System (VFS)	A file system architecture in UNIX System V Release 4 that allows multiple types of file systems to exist on the same machine. It also allows programmers to define new file system types easily and quickly.
virtual memory	A method of using hard disk space on a computer to act as additional memory for program execution, allowing for execution of larger programs.
Virtual Network Computing (VNC)	Remote control software that allows a client on one network to view and control the actions of another computer on a different network.
virtual terminal	An intelligent device, such as a personal computer, which appears to be a terminal to the host computer to which it is connected. This is usually accomplished on a personal computer through use of *terminal emulator* software.
virus	A piece of code that attaches itself to a program and may cause an action unintended by the users when they access the program containing the virus. Some viruses are harmless, for example, merely displaying a message to the user, but others cause damage by erasing or modifying files.
wait state	A time interval on a system in which no processing occurs in the *CPU*. Most systems use techniques to minimize wait states and avoid the resulting unproductivity.
web browser	A visual screen-oriented environment that allows you to send and receive information on the Internet via the World Wide Web. Firefox, Netscape and Microsoft Internet Explorer are examples of web browsers.

web page A visual display in your *web browser* of the information contained on a *web server,* You move from web page to web page by supplying a *URL* to locate and access the web page.

web server A program that handles a request by a *web browser* to supply information , and sends (serves) the information back to the browser. This term also is applied to the computer that is running the web server software and houses all of the information being requested by web users.

web site A specific location on the *World Wide Web* that is accessed by entering its *URL* in your *web browser.* The location may be a specific *web page* on the site, or its *home page.*

wide area network (WAN) A network that consists of machines connected over a wide geographic area. The *ARPANET* is an example of a wide area network.

widgets The graphical objects used by a *graphical user interface (GUI).* Different applications using the same GUI may have the same widgets.

wildcard A special character used in a *regular expression* to match a range of patterns. *See also* metacharacter.

window In a *graphical user interface,* a rectangular region of a screen corresponding to an application. Multiple applications can appear in different windows on a screen in a multitasking environment.

window list Part of a *panel* that allows a user to switch between active windows on the desktop. Also called a *taskbar.*

window manager A program that manages the icons, objects, macro functions, pointer and button functions, and general user interface in an *X Window System.*

Windows A graphical user interface for DOS developed by Microsoft, originally released in 1985. It has been enhanced over the years to perform multitasking in some versions, such as Windows 98, Windows NT, and Windows XP.

Windows NT Microsoft's 32-bit multitasking operating system developed as an alternative to UNIX-based servers as well as an environ-ment in which to run DOS, Windows, and OS/2 programs.

Windows XP Microsoft's current version of its multitasking operating system, built on the Windows NT kernel. It is the most heavily used version of the Windows platform in the consumer environment today.

wizard An expert on the UNIX System. Someone who seems to be able to perform magic with its routines and processes. *See also* guru.

workstation A single-user microcomputer that provides higher performance, better graphical capabilities, and more robust networking than a personal computer. Workstations are heavily used in engineering and graphics-oriented environments.

World Wide Web A worldwide information system, based on the Internet, that provides a hypertext interface. This interface allows users to select and display text and images through the use of hypertext links to other sources of information.

worm A program that can replicate a working version of itself onto other networks and then run itself in those environments. Worms can be harmless (for example, they might execute a game) or they can be destructive by replicating themselves so much that the network slows down because it is running so many versions of the worm program.

wrap around To treat the end of a file and its beginning as a contiguous looping path in a search. This technique is used by text editors, such as **vi**, to search for patterns during file searches.

write (file) To save the contents of an editing session in a file.

write (command) To send electronic mail to a user interactively.

write permission A permission setting (w) that indicates that a user can change the contents of a file. Owners of files can allow other users to make modifications to them by changing the *permissions* of the file.

Writer's Workbench (WWB) A UNIX *SVR4* software package developed at Bell Laboratories that is used to analyze and suggest improvements in writing. WWB checks for errors in diction, punctuation, and spelling. It determines the grade level of the writing, finds possible sexist language, and performs a variety of other analyses.

WWW *See* World Wide Web.

WYSIWYG (*What You See Is What You Get*) A term used to describe word processing packages that show you the appearance of the document (or how it would look if printed) at all times.

X11/NEWS   A system developed by Sun Microsystems that allows programmers to build *windows,* which allow users to perform more than one task at a time through different screens presented to them.

X.25   An ISO (International Standards Organization) packet network transmission *protocol* used in many *wide area networks.* The X.25 protocol is part of the OSI (Open Systems Interconnection) model.

X.400   An ISO standard *protocol* for sending messages from one network to another. X.400 is part of the OSI model.

X client   An application running on an *X server.*

X server   Software that allows remote users to access *X Window System* applications on a server system.

X Window System   A graphical windowing system for UNIX developed at MIT. The X Window System allows a user to access programs from multiple windows on both the local host and remote machines.

xargs   A programming tool that takes the output of a command and uses it to construct a list of arguments for another command.

XENIX   A UNIX System variant developed by Microsoft for use on personal computers. XENIX has been merged into UNIX System V Release 4.

XFree86   A free port of MIT's *X Window System* that runs on x86-based systems.

XML (Extended Markup Language)   A markup language based on the *SGML* standard that improves on *HTML* by allowing more flexibility in handling dynamic data, especially links to and from other *web pages.*

X/OPEN   An association of international computer and software vendors, formed in 1984, whose goal was to promote open systems (systems that may be implemented by any company or individual; the opposite of proprietary systems) with many of the properties of the UNIX System. This group is now called the Open Group.

X/OPEN Portability Guide   A portability guide published by the X/Open consortium (now called the Open Group) to define standards in portability. UNIX SVR4 complies with XPG3; XPG4 was published in 1992 to include many new interface and interoperability specifications.

XPG The published open systems specifications developed by X/Open. The XPG specs have been enhanced to include much more than portability issues, and they are now referred to as just XPG. The most recent specifications are XPG4.

xterm An *X Window* terminal emulation program used to connect the user to a UNIX machine via an *X server.*

yacc A lexical analyzer and parser tool, often used along with *lex.*

yank A command within the **vi** editor that allows text from a file to be moved into a buffer. This command is helpful to select parts from a few files that can then be combined into a separate, new file.

YP A UNIX System V Release 4 network service (previously known as the *Yellow Pages*) that allows users to find files and services on a *Network File System* network.

zero width Taking up no horizontal space in output. The **troff** formatter uses the sequence \& to specify a zero-width character.

zeroth argument The name of the command in a command line. This is the value of the variable $0.

zombie A process that cannot terminate because its link back to its *parent process* has been lost. Zombies are neither living nor dead, and must be terminated by the *system administrator.*