Global Glossary

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Part No: 805-4368
Feb 5, 1999

Contents

The *Sun Global Glossary* includes more than 1,800 English-language terms and definitions for Sun™ software, hardware, and terminology.

Additionally, the *Glossary* identifies:

- Acronyms
- Parts of speech where a term is used, for example, as both a noun and a verb. Abbreviations include:
  - adj. Adjective
  - n. Noun
  - v. Verb
- Numbered usages in different products or technologies
- Cross-references
- Contrasting terms

Acknowledgments

The definitions in this glossary are the work of Sun subject-matter experts, technical writers, and researchers.

CHAPTER 1

Numbers

2:1 interlace See interlace.

24-bit color See true color.

2-D graphics Two-dimensional graphics. All 2-D graphics objects are flat; they have height and width but not depth. Contrast with 3-D graphics.

2-1/2-D graphics The front-to-back ordering of 2-D graphics on a page or screen, such as found in the OpenWindows™ environment and the icons on the desktop.

32-bit transfers The basic SBus cycle in which 32 bits of data can be transferred each clock cycle.

3-D graphics Three-dimensional graphics. All 3-D graphics objects have width, height, and depth information. Contrast with 2-D graphics.

64-bit transfers See extended transfer.

8-bit clean (adj.) In a platform or operating system, capable of supporting a common method of representing characters in the various European languages, specifically 8-bit character sets, such as ISO Latin 1, as opposed to the 7-bit ASCII character set used in the U.S. SunOS™ commands that support 8-bit character data or that do not process text are said to be “8-bit clean.” See also internationalization.

8-bit dirty (adj.) See 8-bit clean.

10BASE2 An Ethernet technology that evolved as a more cost-effective method of computer interconnection than 10BASE5. A 10BASE2

network has a data transfer rate of 10 megabits per second and uses a thinner cable, but supports individual network segments of only 185 meters. Also called Thinnet.

10BASE5 An Ethernet technology that uses a thick coaxial cable. A 10BASE5 network has a data transfer rate of 10 megabits per second and allows individual network segments up to 500 meters. Also called Thicknet.

10BASE-T An evolution of Ethernet technology that succeeded 10BASE5 and 10BASE2 as the most popular method of physical network implementation. A 10BASE-T network has a data transfer rate of 10 megabits per second and uses unshielded twisted-pair wiring with RJ-45 connector modular telephone plugs and sockets.

100BASE-T An Ethernet technology that supports a data transfer rate of 100 Mbps over special grades of twisted-pair wiring. 100BASE-T uses the same protocol as 10BASE-T. There are three subsets of the 100BASE-T technology. 100BASE-TX defines digital transmission over two pairs of shielded twisted-pair wire. 100BASE-T4 defines digital transmission over four pairs of unshielded twisted-pair wire. 100BASE-TX defines digital transmission over fiber optic cable. Also called Fast Ethernet.

CHAPTER 2

A

ABI (application binary interface) The binary system interface between compiled applications and the operating system on which they run.

abort To terminate, in a controlled manner, a processing activity in a computer system because it is impossible or undesirable for the activity to proceed.

abortive release An abrupt termination of a transport connection, which may result in data loss.

absolute address (1) An address that identifies a storage location or a device without the use of any intermediate reference.

absolute coordinate A location relative to a coordinate system's origin. In Cartesian coordinates a two-dimensional point known by its distance from the origin along the x and y axes, and a three-dimensional point known by its distance from the origin along the x, y, and z axes. Contrast with relative coordinate.

absolute path name For a file or directory, the list of directories from the root directory through the tree structure to the desired file name or directory name, each name in the series separated by a slash character (/).

abstract class A class that should never be instantiated; only its subclasses should be instantiated. Abstract classes are defined so that other classes can inherit from them.

ACAP (Applications Configuration Access Protocol) A protocol that enhances IMAP by enabling you to set up address books, user options, and other data for universal access.

accelerator (1) Obsolete term for shortcut keys.

(2) A type of frame buffer. See graphics accelerator.

access To acquire admission to memory, data, files; to use information.

access code A series of numbers, letters, and special characters that act as a password.

access time The time required to reach information or data.

account See user account.

ack (acknowledge character) A signal sent by a station to a terminating station as an affirmative response that a connection has been made, or that data has been received.

ACL (access control list) An authorization mechanism in the X protocol that maintains lists of hosts that are allowed to access each server controlling a display. By default, only the local host can use the display, plus any hosts specified in the access control list for that display.

acronym A word formed by joining the initial letters of a series of words.

ACSE (association control service element) The method used in ISO/OSI for establishing a call between two applications. Checks the identities and contexts of the application entities, and could apply an authentication security check.

action A desktop construct used to provide a user interface for running applications, executing commands, and other activities such as printing, removing files, and changing directories. See also action icon.

action icon An icon that represents an action in a File Manager or Application Manager window. It is displayed by creating an executable file with the same name as the action it represents.

action server A host computer that provides access to a collection of actions. See also application server, caching-only server, communications server, session server.

active Characteristic of a window, window element, or icon that is currently affected by keyboard and mouse input. An active window

is differentiated from other windows on the workspace by a distinctive title bar color or shade. An active window element is indicated by a highlight or selection cursor.

active caret See caret.

active file Usually, a data file that is being used.

active grab In the X protocol, keyboard keys, the keyboard, pointer buttons, the pointer, and the server can be "grabbed" for exclusive use by a client, usually for a short time. An active grab causes the pointer and keyboard events to be sent to the grabbing window regardless of the current pointer position. Contrast with passive grab.

active star A configuration of networked computers in which information goes from workstations to a central node, then on to its destination. The central node manages and controls all the traffic on the network.

active window The window containing the cursor, which can be affected by cursor movements.

additive color system In computer graphics, a color model in which colors are built by adding primary colors; for example, the RGB color system. See also RGB color.

address (1) (n.) A number used by the system software to identify a storage location.

(2) (n.) In networking, a unique code that identifies a node to the network.

address mask A bit mask used to select bits from an Internet address for subnet addressing. The mask is 32 bits long and selects the network portion of the Internet address and 1 or more bits of the local portion. Also called subnet mask.

address space The memory, both physical and virtual, that applications and the operating system can use.

address translation The process of finding an address, or location, in memory by determining an expression that represents it.

addressable point The smallest coordinate point on the raster screen that can be addressed. Usually, a pixel, which can be individually addressed and illuminated by the display-processing hardware. Raster displays were once called "all points addressable."

administration See system administration, network administartion.

advertise In networking, to make a file system available for access over the network. Compare to the “export” mechanism of the NFS™ system.

AEC (architecture, engineering, and construction) A computer graphics market requiring specialized applications that facilitate efficient planning, design, drafting, and analysis.

air restrictor board A blank board with a special air deflector fin used in Sun™ server systems to simulate the airflow pattern of an actual board. If air restrictor boards are not installed in blank slots, a condition called a “thermal short” is created. A thermal short severely reduces the cooling capability of the system, which can lead to equipment damage.

alarm Usually, an audio or visual warning to indicate that attention to the computer is required.

alarm clock Part of the signal C library function. The signal SIGALRM is sent to the invoking process after a specified number of seconds. Unless caught or ignored, the SIGALRM signal kills the process.

alert A warning that is similar to an alarm, but not of such a critical nature.

alert box A GUI element that displays a visual warning or notice. Also called alert window.

algorithm A sequence of steps designed to solve a problem or execute a process such as drawing a curve from a set of control points.

alias (1) In email, an easy-to-remember name used in place of a full name and address. Also, a name used to identify a distribution list.

(2) An alternate label. For example, a label and one or more aliases can be used to refer to the same data element or point in a computer program.

(3) A distortion or artifact in the digital reproduction of an audio waveform that results when the signal frequency is too high compared to the sampling frequency.

aliasing (1) The jagged artifact in a line or in the silhouette of a curve that results from drawing on a raster grid. It is especially noticeable in low-resolution monitors. Also called jaggies. See also antialiasing.

(2) See command aliasing.

allocate To set aside memory for a program.

ALM (asynchronous line multiplexer) A device that connects multiple terminals or other serial interface devices to Sun™ network file servers or workstations. Also called multiple terminal interface. The SunLink™ communications processor (SCP) is an example of an ALM.

alpha (1) In computer graphics, a fourth color component. Alpha is typically used to control color blending with a background or underlying object. Typically, an alpha value of 1.0 implies complete opacity, and an alpha value of 0.0 is complete transparency.

(2) The first letter of the Greek alphabet.

alpha channel In computer graphics, memory associated with each pixel used to store the fractional coverage of the pixel. Typically used to assign the opacity of an object.

ALU (arithmetic logic unit) A part of a computer that performs arithmetic, logical, and related operations.

ambient light Nondirectional illumination or surrounding light.

analog Contrast with digital.

ancestor window In the X protocol, a window that is a parent window or a parent of a parent window, and so on. If window W is an inferior of window A, then window A is an ancestor of window W. The root window is the ancestor of all windows on a screen. See also inferior window, parent window.

animation The simulation of motion through rapidly changing images.

ANSI (American National Standards Institute) An organization that reviews and approves product standards in the U.S. In the electronics industry, its work enables designers and manufacturers to create and support products that are compatible with other hardware platforms in the industry; for example, PHIGS and GKS. See also ISO.

AnswerBook™ online documentation The Sun™ online documentation for use with the OpenWindows™ environment. See also online documentation.

antialiasing The process of smoothing the stair-step lines and curves of computer graphics.

AOW (Asia and Oceania Workshop) An OSI implementors' workshop, equivalent to Workshop for Implementors of OSI (OIW) and European Workshop for Open Systems (EWOS).

API (application programming interface) (1) The interface to a library of language-specific subroutines (such as a graphics library) that implement higher-level functions. See also binding.

(2) A set of calling conventions defining how a service is invoked through a software package.

applet A program written in the Java™ programming language to run within the HotJava™ browser, the World Wide Web (WWW) browser.

application A software program specially designed for a particular task or the specific use of a software program.

application context A pointer to an opaque data structure containing all the information the OLIT toolkit maintains for one application.

application developer Usually, a computer engineer involved in creating an application.

application development The process of designing, specifying, and researching the appearance and function of an application program. See also application developer.

application group An Application Manager container that holds a specific software application.

application layer In the ISO/OSI model of network standards, the seventh layer, which handles such services as login procedures, file and print server operation, and other basic functions.

Application Manager The location where application groups are automatically gathered when you log in. Files are never created directly in Application Manager.

application server A host computer that provides access to a software application. See also action server, caching-only server, communications server, session server.

architecture The specific components of a computer system and the way they interact with one another.

archive A collection of several files bundled into one file by a program (such as ar, tar, bar, or cpio) for shipment or storing.

archiving The storage of backup files for later reference or use. See also SCCS.

area sampling The determination of a pixel's color and intensity based on the color and intensity of the pixels surrounding it.

arg (argument) An item of information following a command. It may, for example, modify the command or identify a file to be affected.

arg list An argument list.

array (1) A sequence of objects that are alike—of the same size and type. An array can be dimensional; a vector is a one-dimensional array, while a matrix is a two-dimensional array.

(2) A group of data items of the same type, in which each item's position is uniquely designated by an integer.

array element An object within an array, such as a char or int.

arrow keys The four directional keys on the numeric keypad.

artifact (1) A visible error or oddity in a displayed image. Aliasing, for instance, is an artifact resulting from producing images on a raster grid.

(2) An audible error or oddity in a reproduced sound resulting from the digital sampling or compression of the sound.

ASCII (American Standard Code for Information Interchange) The standard binary encoding of alphabetical characters, numbers, and other keyboard symbols.

ASET (Automated Security Enhancement Tool) A tool, bundled with the SunOS™ 5.3 operating system, that enables a user to specify an overall system security level (low, medium, or high) and automatically maintain systems at those levels.

ASIC (application-specific integrated circuit) A gate array or other nonstandard chip designed for proprietary use.

aspect ratio (1) The ratio of the height of an object to its width.

(2) In computer graphics, the ratio of a pixel's height to its width. Pixels that have equal height and width are called square pixel.

assembler A program that accepts instructions written in the assembly language of the computer and translates them into a binary representation of the corresponding machine instructions. See also compiler.

assembly language A computer-oriented language with instructions that are usually in a one-to-one mapping with computer instructions. It can provide facilities such as use of microinstructions.

asserted (adj.) Characteristic of a signal used to initiate an action. Contrast with unasserted.

assertion (1) A conditional statement in the operating system source code intended to prevent the kernel from going astray and damaging important data.

(2) A Boolean statement that determines whether a program is operating correctly.

assignment operator An operator that designates a value, usually for a variable.

association table A fast look-up table for data that must be searched frequently. Association tables associate arbitrary information with resource identifiers.

associative array A collection of data (an array) where individual items may be indexed (accessed) by a string, rather than by an integer as is common in most programming languages.

asymmetric application An application in which the decoding of data is central (as opposed to encoding and decoding playing equal parts). An example of such an application is a program that plays movies. Contrast with symmetric application.

asymmetric multiprocessing A form of multiprocessing in which a single processor acts as a master to a series of slave processors. Contrast with symmetric multiprocessing.

ATM (asynchronous transfer mode) A standard for switching and routing all types of digital information, including video, voice, and data.

With ATM, digital information is broken up into standard-sized packets, each with the “address” of its final destination.

atom (1) In XIL™ (X Imaging Library) collection, a single library function call. With the XIL library’s deferred execution feature, groups of atoms can be combined to create a molecule, which avoids redundant operations.

(2) In the X protocol, a unique numeric identifier that maps to a string name. Atoms identify properties, types, and selections to avoid the overhead of passing arbitrary-length property name strings.

atomicity The condition of an operation that is never interrupted or left in an incomplete state under any circumstances.

atomic transaction An uninterrupted sequence of instructions. Atomic transactions implement semaphores.

attachment An encapsulated data object inside a document.

attribute A quality or characteristic that especially helps define elements in a database or screen display.

AT&T System V See System V.

audio port A circuit to which the computer sends signals to be output as audible tones. The circuit is a DAC.

autoconfiguration The process by which the host fetches SBus IDs and FCodes, beginning at location 0 of each slave used to identify the device.

automounter Software that automatically mounts a directory when the user changes directories, and unmounts the directory when it is no longer in use.

autopush A STREAMS mechanism that enables a pre-specified list of modules to be pushed automatically onto the Stream when a STREAMS device is opened. This mechanism is used only for administrative purposes.

CHAPTER 3

B

back-enable To enable (by STREAMS) a preceding blocked queue's service procedure when STREAMS determines that a succeeding queue has reached its low watermark.

back-face culling The process of omitting the drawing of one or more backfacing polygons (which cannot be seen by the viewer), thus increasing drawing speed.

back-facing polygon A polygon with a normal vector that is pointed away from the viewer. Often the backfacing polygon is occluded, hidden from view by opaque polygons that are closer to the viewer. See also occlusion.

background (1) (n.) On a UNIX™ system, the process of freeing the terminal for other uses while another task is running. See also background process.

(2) (n.) The main color of a terminal screen on which contrasting characters and graphics are displayed.

background process A command that a user has directed the system to work on while the user continues to type commands to the command interpreter.

backing store In the X protocol, the off-screen saved pixels that an X server stores to maintain the contents of a window.

back porch In video, the time interval between the 50 percent point of the trailing transition of line sync and the start of the picture information on the associated video line.

backup A copy on a diskette, tape, or disk of some of or all the files from a hard disk. The two types of backups are a full backup and an

incremental backup. Also called dump. See also full dump, incremental dump, SCCS.

backup copy See backup.

backup device The device that receives a backup copy of files; for example, a diskette drive, tape drive, or disk.

bandwidth A measure of the volume of information that can be transmitted over a communications link. Technically, bandwidth refers to the width of the frequency spectrum available on a certain technology. Informally, it describes the number of bits per second a network can deliver.

banner The title page added to printouts by most print spoolers. The banner typically includes user information. Also called a burst page, because it indicates where to burst (tear apart) fanfold paper to separate one user's printout from the next.

BARB (board arbiter) A part of the bus arbitration system. One BARB is located on each system board.

baseline sequential codec A sequential coder/decoder defined by the JPEG standard. It handles images with 8-bit samples and uses Huffman coding for its entropy coding.

batch processing The scheduling of a series, or batch, of files to run at a time when the processor is least busy.

baud rate The rate at which information is transmitted between devices; for example, between a terminal and the computer.

B channel The ISDN bearer server channel. This channel carries digital voice and/or data transmission at a rate of 64Kbit/sec. Primarily used for data (as opposed to signaling) transmissions. See also D channel and ISDN.

bearer service A set of services offered over the ISDN B channel (bearer channel) that allows the exchange of signals between two user-network interfaces. See also ISDN.

BER (Basic Encoding Rules) The standard rules for encoding data units set forth in ASN.1. At times incorrectly paired with ASN.1, which applies only to the abstract syntax description language, not the encoding technique.

Bezier curve In computer graphics, a curve created from endpoints and two or more control points that serve as positions for the shape of the curve. Often used in MCAD applications.

Bezier patch A portion of a 3-D surface generated using the Bezier curve algorithm. Two 2-D Bezier curves are drawn through selected control points, and the 3-D curve is interpolated between them. See also interpolation.

bicubic interpolation See interpolation.

BIF (benchmark interchange format) In computer graphics, a standardized file structure for specifying the geometry of a particular data set from a particular application as well as the user interactions to be performed. This standard enables the same data set to run on dissimilar vendor systems and promotes testing efficiency.

bilinear interpolation See interpolation.

bilinear patch A 2-D surface patch that can be warped into a 3-D surface. Some set of points in 2-D space forms the parameters of the patch, and these points are connected by straight lines. The patch shape is warped to the surface, but the lines themselves do not warp, and remain linear.

binary (1) In mathematics, characteristic of base-2 numbers. Generally refers to two states: on and off.

(2) Characteristic of two of anything: two statements, two components, and so on.

binary chop See binary search.

binary operator An operator that has two arguments.

binary search The process of dividing an ordered list in half again and again repeatedly until an item is found.

binary search tree A binary tree that uses a recursive search algorithm to find a value in a subtree.

binary tree A type of tree structure in which one or two subtrees branch from a single node. Each node contains a key word; the subtrees contain one value less and one value more than the key value.

bind To link variables and instructions that have symbolic addresses to real machine addresses (after compiling).

binder A tool or application that provides a user interface to the binding process. See binding.

binding (1) The language-dependent code that enables a software library to be called from that computer language.

(2) The process during which a client checks where a server is so that the client can receive services. NFS™ system binding is explicitly set up by the user and remains in effect until the user terminates the bind; for example, by modifying the `/etc/fstab` file. NIS binding occurs when a client's request is answered by a server and is terminated when the server no longer responds.

(3) A logical relationship between any two elements, such as a file type, an application, a print script, a color, a filter, or another element that can be used for displaying or operating on a file.

bipolar signal A signal triggered by a series of on/off voltage polarities.

bistable Characteristic of a device or system—usually an intergrated circuit—with two states, on or off. See also flip-flop.

bistable multivibrator See flip-flop.

bit ("binary digit") The smallest unit of information stored in a digital memory. Binary digits indicate two possible values, on and off. A single bit is represented in memory as 0 (off) and 1 (on).

bit block transfer A raster operation that moves a block of bits representing some portion of an image or scene from one location in the frame buffer to another. See also ROP.

bit BLT (pronounced "bit blit") See bit block transfer.

bit gravity In the X protocol, the attraction of window contents to some region of a resized window. For example, an application that draws a graph might request that the contents be moved into the lower-left corner, if the window is resized, so that the origin of the graph will always appear in the lower-left corner. See also window gravity.

bitmap An array of binary values.

bitmap file A file containing an image composed of many pixels. Bitmaps are usually created with a paint program, digitized with a scanner, or captured from the workstation screen. See also capture.

bitmapped font A font made from a matrix of dots.

bitmapped graphics Those graphics that associate color with so many bits per pixel. Historically, bitmapping is the process of associating each pixel on a screen with one or more bits in memory.

bitmapped screen A screen in which a memory location is assigned for every pixel on the screen.

bit operator An operator that calculates AND, NOT, or OR on a bit-by-bit basis.

bit pattern A combination or layout of bits.

bit plane The hypothetical two-dimensional plane containing a bit in memory for each pixel on the raster. For any raster image, there is at least one bit plane in frame buffer memory; each bit plane has a one-to-one mapping of bits to pixels. There are additional bit planes for some raster systems. For instance, a 24-bit system has 24 bit planes. (The storage structure that represents the bit plane in memory is an array.)

blending In computer graphics, combining two color components into one, usually as a linear interpolation between the two components. The alpha value helps determine how the components are combined.

block (1) A unit of data (usually 512 bytes long) that a device can transfer.

(2) A group of audio samples.

(3) In the Java™ programming language, any code between matching braces ({ and }).

block buffering Output buffering with a block size of 1024.

block device A device that accomodates I/O transfers; usually a magnetic or optical disk.

block-special device See block device.

blocked Characteristic of a queue's service procedure that cannot be enabled because of flow control.

blocking (1) The process of breaking a data file into a group of records in storage.

(2) The transfer of fixed-size chunks of data transferred together over a modem.

blocking factor (1) The number of records, characters, or bits in a block.

(2) The number of bytes in a quantity of data transferred to or from a block device.

board ID Slot identification codes hardwired into a server backplane. These codes functionally configure the board for the slot address it occupies. You can install system boards in any slot without the need for jumper (or other) configuration.

BOC (Bell Operating Company) Commonly called RBOC (Regional Bell Operating Company). One of seven telecommunications companies in the U.S.

Boolean The Boolean logic of true/false. Usually 0 equals false and any other value equals true.

boot (bootstrap) To load the system software into memory and start it.

boot block An 8-Kbyte disk block that contains information used during booting; block numbers point to the location of the /boot program on the disk. The boot block directly follows the disk label.

boot PROM In Sun™ workstations, memory containing the PROM monitor program, a command interpreter used for booting, resetting, low-level configuration, and simple test procedures. See also EEPROM, ID PROM, NVRAM.

boot server A server system that provides client systems on the network with the programs and information that they need to start.

BootBus The bus on the server system board that connects the OpenBoot™ EPROM set on the system board to the SPARC™ module(s).

bounding box In computer graphics, a rectangular box aligned with the axes drawn around the smallest area that entirely contains a particular polygon or object. Often used in fill algorithms in which tests are made to find out which pixels are inside and which are outside the polygon. Also called an extent.

Bourne shell The shell used by the standard Bell Labs UNIX®.

bpp The parallel port on the SPARCprinter™ SBus printer card. The term also refers to the device driver that drives the port.

breakpoint A place marker in a program being debugged that will cause execution to be halted at that point so that data values can be examined, altered, and so on.

BRF (benchmark report format) In computer graphics, a standard format for reporting benchmark results. This format provides the purchaser with a consistent data-tracking system for comparing hardware platforms.

BRI (basic rate interface) One of the standard ISDN interfaces defined by the CCITT protocols. BRI consists of two B channels (64Kbyte/sec) and one D channel (16Kbyte/sec).

bring up Obsolete term for display.

broad pulse A pulse, part of the field sync sequence, that remains at sync level for a substantially longer duration than normal line sync. Conventionally a broad pulse has a duration of half a line time less the duration of normal line sync.

browse To view the contents of a database or list of files without editing the information.

BSD (1. Berkeley Software Distribution) UNIX® versions developed at the University of California, Berkeley. They bear names such as BSD 2.7 and BSD 4.2.

(2. block schematic diagram) A circuit board flowchart.

B-spline curve A curve defined by a series of control points. The control points define a series of continuous Bezier curves.

BTM (benchmark timing methodology) In computer graphics, a method of measuring how long it takes to run the purchaser's benchmark interchange format (BIF) program. This method ensures that the viewing pipelines of dissimilar graphics libraries are measured in a consistent manner. The BTM provides the conditions and parameters necessary to determine the length of time it takes to run the requested benchmark.

Btu (British thermal unit) A unit of thermal energy.

buffer (1) (n.) A storage device that holds data to be transmitted to another device.

(2) (v.) A temporary work area or storage area set up within the system memory. Buffers are often used by programs, such as editors, that access and alter text or data frequently.

bullet A character, typically a filled-in or open circle (o), used to draw attention to an item in a list.

bundled Characteristic of smaller software programs sold with larger programs.

burst page See banner.

bus (1) A circuit over which data or power is transmitted, one that often acts as a common connection among a number of locations.

(2) A set of parallel communication lines that connect the major components of a computer system, including CPU, memory, and device controllers.

bus arbitration system On Sun™ server systems with at least two SuperSPARC™ Modules, a mechanism for deciding which processor has control of the system resources at any moment.

bus cycle On the SBus, a series of clock cycles beginning (in the case of a DVMA master) with a particular master receiving a grant and, in all cases, concluding with the address strobe being unasserted by the SBus controller. For DVMA masters, a bus cycle is divided into two phases: a translation cycle and a slave cycle. However, in the case of a CPU master, the translation cycle does not occur as part of the bus cycle.

bus device A device that connects to the bus and has an assigned device address and/or priority level.

bus error A process that has attempted to access an area of memory that is restricted or does not exist. See also segmentation fault.

bus master See master.

bus priority A scheme for allocating preferential access to a bus.

bus request A request from a device on the bus for control of the bus to become the bus master and to start an interrupt or perform a data transfer.

bus sizing On the SBus, a transfer mode in which a slave requests the master to turn a word transfer into two half-words, or four byte transfers. Each transfer is performed using a separate bus cycle. The first bus cycle is called the original bus cycle; remaining bus cycles are called follow-on bus cycles.

busy pointer The mouse pointer displayed when an application is busy and cannot accept input.

button (1) A generic term for a window control that initiates an action by an application, usually executing a command, displaying a window, or displaying a menu.

(2) A control on a mouse.

(3) A computer input peripheral composed of a box with buttons, usually soft-programmed for each application. See also dials and knobs.

button binding Association of a mouse button operation with a particular behavior.

button grab In the X protocol, a pointer grab that occurs only when a specified set of keys or buttons are held down. See also keyboard grab, mouse grab.

BW (bus watcher) On Sun™ server systems, a mechanism that converts XDBus signals to XBus signals and passes them to the Module XBus Cache Controller (MXCC) on the processor module. Together, the bus watchers and MXCC control the flow of information between the XDBus and the processors (and their respective cache SRAMs).

byte A group of adjacent binary digits (bits) operated on by the computer as a unit. The most common size byte contains eight binary digits. See also character.

byte acknowledgment On the SBus, an acknowledgment to indicate that the slave has read or written a byte from the most-significant byte of the data lines. if the transfer size is greater than a byte, the master initiating the transfer can perform bus sizing.

byte addressing On the SBus, a determination that the smallest addressable unit of information is a byte.

byte order The order in which bytes of data are stored in memory. The byte order is hardware dependent.

bytecode Machine-independent code generated by the Java™ compiler and executed by the Java interpreter.

CHAPTER 4

C

cabinet-mounted A device that can be mounted in a cabinet, generally appropriate for a data center or machine room. These systems can support more terminals than deskside systems and usually have mass storage capacity suitable for an operations environment.

cache A buffer of high-speed memory filled at medium speed from main memory, often with instructions or the most frequently accessed information. A cache increases effective memory transfer rates and processor speed.

cache controller See MXCC.

caching-only server A domain name server that is not authoritative for any domain. This server queries servers that have authority for the information needed and caches that data. See also action server, application server, communications server, session server.

CAD (computer-aided design) The use of computer graphics technology to design electronic and mechanical parts and machinery.

call To transfer control to another program or subprogram so that the called program returns control when it is done.

callback function (1) In an event-driven environment, the procedure called when an event occurs. Also called a callback.

(2) The capability of a modem to connect to a remote modem that has dialed it.

callback list A list of callback procedures that are executed when some user action occurs on a widget. Also called (in OLIT) a callback resource.

callback procedures A series of steps executed when some user action occurs on a widget. The procedures are typically written as part of the applications, but invoked by the toolkit. Also called callbacks.

cancel In a window environment, to remove a window without applying any changes made in that window.

canonical Characteristic of adhering to standard, accepted, or authoritative procedures or principles.

capture (1) To save an image or data on a screen to a file, or to send an image directly to a printer.

(2) To record a series of keystrokes or save a special state of a program.

captured image An image that was acquired originally with a camera and subsequently digitized and stored digitally. Often, a distinction is made between captured images and synthetic images, which are generated with computer-graphics techniques.

CARB On Sun™ servers, a system of central arbiters (one CARB on the control board) and a board arbiter (BARB) (one on every system board) determine which processor on which system board controls the system bus at any given time.

card cage In Sun™ server systems, the boards are installed in a card cage enclosure (not a board cage). The card cage provides card guides to guide the board into the backplane.

card slot In Sun™ server systems, each system board has three card slots for SBus interface cards.

caret In desktop publishing systems, a blinking triangle, gray diamond, static solid or “shadow” rectangle shape that indicates the insertion point in a text subwindow.

carriage return Usually shortened to just Return. A keyboard key that moves the cursor to the start of the next line.

carrier A special frequency or company providing telecommunications services.

Cartesian coordinates The coordinates that form a coordinate system by which points, lines, and other primitives can be located. In 2-D, the coordinate

system forms a single flat plane, the x-y plane. In 3-D, the coordinate system is defined by three mutually perpendicular planes, usually called x, y, and z.

cascaded list In a window environment, additional elements displayed by a menu item or list box from which you can choose to interact with other screen elements. Also called cascaded menu.

cassette tape A small cartridge containing reel-to-reel magnetic tape that is used for data storage. See also archive, backup, backup device.

casting The explicit conversion from one data type to another.

catalog file An inventory of files or storage space.

Catalyst A Sun™ program, initiated to foster relationships with independent third-party vendors.

catena Those items in a list that have been linked or chained; one item leads to another, sequentially.

catenate See concatenate.

catenet A network in which hosts are connected to networks with varying characteristics, and the networks are interconnected by gateways (routers). The Internet is an example of a catenet. See IONL.

CCIR (Committee International de la Radio) A treaty organization, part of the International Telecommunications Union (ITU), responsible for obtaining international agreement on standards for radio and television transmission and the international exchange of programs.

CCIR recommendation 601 The international standard for studio digital video sampling, using a sampling frequency of 13.5 MHz.

CCITT (Comite Consultatif Internationale de Telegraphie et Telephonie) An organization established by the U.N. to recommend communication standards worldwide.

CD-ROM (compact disc read-only memory) A medium for high-capacity data storage (approximately 600 Mbytes). Uses laser optics rather than magnetic capability to read data. See also High Sierra specification.

CDE (Common Desktop Environment) A graphical user interface running on UNIX®.

cell In image processing, a four-by-four block of pixels. See cell encoding.

cell encoding A video compression algorithm, developed by Sun Microsystems, Inc. In cell encoding, a four-by-four region of pixels is represented by two colors and a 16-bit mask that indicates which of the two colors to place at each of the 16 pixel positions. The colors and mask are chosen to preserve the mean and variance luminance and the average chrominance for the four-by-four block. See also data compression.

center The text character or graphic point that is equal distance from two margins.

chaining The linking of one item to another so that the two are dependent on one another. This can refer to files, programs, or data storage.

change mode To alter a set of parameters that describe a file, detailing who can use it and how it can be used. Requires the use of the UNIX® `chmod` command. See also file permissions.

CHAP (CHallenge Authentication Protocol) A security tool offered in Point-to-Point Protocol (PPP) based on encrypted password exchange.

character A letter, numeral, punctuation mark, control character, blank, or other such symbol. See also byte.

character device A device that transfers characters, either bit-by-bit or byte-by-byte, but does not move them in blocks.

character set A set of numbers, letters, and special characters with some commonality.

character-special device See character device.

character string A series of characters.

check box In a window system, a nonexclusive control whose setting is indicated by the presence or absence of a check mark. A check box has two states, on and off.

checkpoint A place in a computer program at which a check is made, or at which a recording of data is made for restart purposes.

checksum The result of adding a group of data items that are used for checking the group. The data items can be either numerals or other character strings treated as numerals during the checksum calculation. The checksum value verifies that communication between two devices is successful.

CHI A high-speed time-division-multiplexed digital bus between a SPARCstation™ system and the SpeakerBox. CHI is capable of simultaneous input and output of 16-bit stereo audio at rates up to 48KHz, the rate used by digital audio tape (DAT).

child directory The directory directly below the working directory in the tree-structured file system. See also subdirectory.

child process A process created by another (parent) process. See also parent process.

child status A child process status.

child structure A data record in a hierarchical data structure. The child structure is said to be invoked by its parent's attributes. PHIGS uses this hierarchy.

child widget (1) In the OLIT class hierarchy, a subclass of a widget.

(2) In an application, a child widget that is owned and managed by a parent widget. Parent widgets manage the size and location of their children, and control input to their children by controlling the input area.

children windows In the X protocol, the first-level subwindows of a given window. All children windows are created from the same parent window. See also ancestor window.

chip (1) A small piece of silicon bearing the equivalent of a large number of electrical components.

(2) An integrated circuit (IC).

choose In a window system, to use the mouse or keyboard to pick a menu command, button, or icon that begins a command or action. Contrast with select.

chroma (1) A signal that conveys color independent of luminance.

(2) An aspect of color that indicates hue and saturation.

chroma key A process of controlling the overlay of one video image over another, the areas of overlay being defined by a specific color or chrominance in one of the images.

chrominance (1) The color of a scene independent of its luminance.

(2) The portion of a composite signal that carries color information.

CIE (Commission International L'Eclairage) A standard means for specifying the color of an object or light source in terms of (x, y) coordinates.

CIF format (common source intermediate format) A video format in which frames are 360 pixels wide and 288 pixels high (one half of the CCIR 601 frame size). Each pixel has its own luminance value. However, blocks of 4 pixels share chrominance values.

circuit-switched network A network that operates by establishing a dedicated connection between two systems for the duration of a call; for example, the public telephone network, ISDN.

CIS (compressed image sequence) The XIL™ library's compressors store (generally related) compressed video frames in structures called CIS buffers. The images may represent frames in a movie, pages in a document, and so on. The data in the image sequence may or may not have undergone compression. If the data is compressed, it may be in cell or JPEG formats. See also cell encoding, data compression.

cksum See checksum.

class (1) A grouping of data having similar characteristics.

(2) In the Java™ programming language, a type that defines the implementation of a particular kind of object. A class definition defines instance and class variables and methods, as well as specifying the interfaces the class implements and the immediate superclass of the class. See widget class.

class method Any method that can be invoked by using the name of a particular class. Class methods affect the class as a whole, not a particular instance of the class. Class methods are defined in class definitions. See also instance method.

class variable A data item associated with a particular class as a whole, not with particular instances of the class. Class variables are defined in class definitions. See also instance variable.

classing engine A mechanism that permits an application to query a database (the classing engine database) to determine the attributes of a desktop object.

clean See 8–bit clean.

clear (1) In a graphical user interface, to remove selected objects or data from a menu or window and leave the visible space that it occupied.

(2) To set a storage location to zero or a null value.

click In a window system, to select an object by pressing a mouse button and releasing it immediately.

client In the client-server model for communications, the client is a process that remotely accesses resources of a compute server, such as compute power and large memory capacity. See also dataless client, diskfull client, diskless client.

client system A system on a network that relies on another system, called a server system, for resources such as disk space.

clip list A list of subrectangles for a window that are not overlapped by another window and are, therefore, visible to the user.

clip mask In computer graphics, the image defined by a bitmap or list of rectangles, used to restrict output to a particular region of a window.

clipboard In a window system, a temporary storage area for keeping track of data that is cut or copied.

clipping (1) A 2-D or 3-D operation that reduces the number of drawing calculations the CPU makes by eliminating any objects, or portions of objects, outside the viewing area.

(2) The process of setting graphics display boundaries. Primitives that lie outside the boundary and are not required for display are clipped.

clipping plane In 3-D graphics, a plane inside the view volume (parallel to the x-y plane), beyond which the view volume is not calculated or rendered. The clipping plane constrains the amount of memory required by a drawing. Any object, or portion of an object, occurring beyond the clipping plane is discarded. Often, there is both a front clipping plane and a back clipping plane.

clone device A STREAMS device that returns an unused major/minor device when initially opened, rather than requiring the minor device to be specified by name in the `open(2)` call.

close (1) In programming, to end accessibility of a file.

(2) To remove a window and all associated windows from the workspace.

close routine A STREAMS procedure that is called when a module is popped from a Stream or when a driver is closed.

closed architecture A proprietary computer design that is only compatible with other computers or peripherals that have been designed to work within the same architecture.

closed surface A surface with no holes such that none of the interior is visible. See also back-facing polygon.

cluster (1) A group of computers connected by a high-speed network that work together as if they were one machine with multiple CPUs.

(2) A logical collection of packages (software modules).

(3) A group of software packages. Clusters may contain other clusters. Clusters and their components form a hierarchical tree.

CLUT (color look-up table) See color map.

CMY color (cyan-magenta-yellow) See also CMYK color. Contrast with RGB color.

CMYK color A color model that is used in printing systems. The CMYK color model includes cyan, magenta, yellow, and black. The black provides deeper colors, especially full black, compared with the CMY color model. Contrast with RGB color.

codec (1. A coder/decoder.) See decoder, encoder.

(2. compression/decompression) See data compression.

codepoint The coded representation of a single character in a coded character set.

codeset A list of unambiguous rules that establishes a character set and a one-to-one relationship between each character of the set and its bit representation. In short, a mapping between characters and

computer code. ASCII is the most common codeset; others are ISO 8859-1, JIS X0208, and Unicode.

coherence In computer graphics, the logical ordering of one pixel to its adjoining pixel.

coherent Characteristic of two periodic signals that are phase-locked to a common submultiple. The subcarrier of a studio-quality NTSC signal is coherent with its sync.

collating sort A sort that merges two or more files into a specific sequence.

collation sequence The order of information established by a collating sort. See collating sort.

color cell An entry in a color map that contains three values, specifying the red, green, and blue intensities.

color correction The adjustment of a color reproduction process to improve the perceived color conformity of the reproduction of the original.

color index In computer graphics, a single value that represents a color by name, rather than by value. Typically, color indexes are treated as continuous values while operations, such as interpolation and dithering, are performed on them. See also indexed color.

color map The color options in a graphics system, arranged by index number. See also indexed color.

color map animation An animation method in which the object or character does not actually move but is made to appear as if it is moving.

color shading See also flat shading.

command An instruction to the computer. A command typically is a character string typed at a keyboard and is interpreted by the computer as a demand for a particular action.

command aliasing In the UNIX® shell, the process of renaming or customizing the behavior of commands; for example, you can use the alias h for the UNIX® history command. In other words, to execute history, you merely type **h**.

command argument See arg.

command interface The format and use of instructions to drive a hardware device.

command interpreter A program that accepts commands from the keyboard and causes the commands to be executed. The C shell is an example of a UNIX® command interpreter.

command line A string of characters beginning with a command, often followed by arguments, including options, file names, and other expressions, and terminated by the end-of-line character.

command mode An operating mode that causes a program to wait for, then execute, a command. Contrast with text input mode.

command prompt The string of characters the system displays to tell you it is ready to accept and interpret the next RGB color. Often, the command prompt includes the name of the system.

command stream A sequence of control information passed from one processor to another.

command substitution See command aliasing.

command syntax See syntax.

comment A type of text a developer includes in code that explains what a program does, why it performs the way it does, and any exceptions or modifications.

communications server A gateway in a local area network that provides address translation, name translation, protocol conversion, and interception of unsuccessful user attempts at functions not available. See also action server, application server, caching-only server, session server.

compaction The act of packing onto a disk as much memory as possible into as small a space as possible.

comparator The hardware or software that compares two entities for sameness. A comparator also refers to signal checks that ensure that the transmission is proceeding.

compilation unit The smallest unit of Java™ programming language code that can be compiled.

compiler A translation program that converts a high-level computer language (such as FORTRAN) into machine language.

component In the context of JPEG, a rectangular array of image samples. Also called color, spectral bands, or channels.

component color A video system that conveys three color component signals independently, free from mutual interference; for example RGB color.

composite color (1) Color information encoded in a single video signal.

(2) A video system that uses the spectral interleaving (frequency interleaving) principle to encode (combine) luminance and chrominance information into a single signal. The three color components are simultaneously present in the composite signal; for example, NTSC, PAL, SECAM.

composite drive A single logical drive made up of more than one physical drive. See also disk array, RAID.

composite signal A signal that carries both luminance and chrominance information. An example is a YUV signal, where Y is the luminance component and U and V are the chrominance components.

composite sync Obsolete term for synch.

composite video (1) A video signal that includes a sync component.

(2) A video signal that includes sync, luminance, chrominance, and color (subcarrier) burst components.

composite widget A widget composed of other subwidgets. For example, the MenuButton widget consists of a MenuButton plus MenuShell.

compositing The combining of two or more separately prepared images into one, usually through pixel-by-pixel z comparison and transparency (or alpha) computation.

compression See data compression.

compute server See server.

computer graphics The process associated with producing images by digital rendering of a picture model.

concatenate To string together two or more sequences, such as files, into one longer sequence. The UNIX® `cat` command, for example, concatenates files.

concave (1) Contrast with convex.

(2) Characteristic of curving inward, like the inside of a bowl.

concurrent Characteristic of the sharing of computer resources whereby two or more processes (or programs) can access the computer's processor simultaneously. The sharing results in parallel calculations or data manipulation.

conditional A conditional statement in the operating system source code intended to prevent the kernel from going astray and damaging important data.

conditional compilation A set of circumstances that allows a program to compile according to certain set conditions.

configuration (1) The way that you have your computer set up.

(2) The combination of hardware components—CPU, monitor, keyboard, and peripheral devices—that make up a computer system.

(3) The software settings that allow various hardware components of a computer system to communicate with one another.

configure To change software or hardware actions by changing settings. For example, you give the software the necessary settings for communicating with a printer. You can configure hardware components by setting physical elements like DIP switches or jumper blocks. Hardware configurations can also be set in software.

connectionless The model of interconnection in which communication takes place without first establishing a connection; for example, LANs, Internet IP, and OSI CLNP, UDP. Also called (imprecisely) datagram.

connection-oriented Characteristic of the model of interconnection in which communication proceeds through three well-defined phases: connection establishment, data transfer, and connection release. Examples include X.25, Internet TCP, OSI TP4, and ordinary telephone calls.

connector Usually, that protion of a cable that plugs into a port or interface. Most connectors are male of female, depending on their configuration.

console A terminal, or a dedicated window on the screen, where system messages are displayed.

constant A data item that keeps the same value throughout a program's run cycle. Contrast with variable.

constructor A method that creates an object. In the Java™ programming language, constructors are instance methods with the same name as their class. Java constructors are invoked using the new keyword.

contention A situation that occurs when two or more devices compete to use a single resource simultaneously.

context object An XGL library object that is an abstraction of a renderer. It contains graphics rendering state information, graphics primitives, and nonprimitive operators used for several utility operations, such as copying pixels or clearing a device.

context operator One or more functions that affect the state of a context object.

context switching A form of multitasking in which you switch among several applications, resulting in task switching by the operating system.

continue To resume a process that has been interrupted by the operating environment so that you can proceed as originally requested.

control board On Sun™ server systems, part of the XDBus arbitration system. A central arbiter (CARB) ASIC on the control board works in cooperation with board arbiter (BARB) ASICS on system boards to determine which processor controls the bus structure at any instant. The control board mounts on top of the SCSI tray.

control character (1) In programming, a character typed by pressing a key while you press the Control key. For instance, you type a Control-H by pressing the H key while pressing the Control key.

(2) One or more of the first 32 ASCII characters used by a program to control a communications device or printer.

control point One of the points (in model coordinates) that control the shape of a curve or curved surface.

control statement A program statement that affects the order in which operations are executed.

controlling Stream A Stream above the multiplexing driver used to establish the lower connections. Multiplexed Stream configurations are maintained through the controlling Stream to a multiplexing driver.

convergence The correctness of aim of the red, green, and blue beams of an RGB color monitor. When the beams converge properly, the monitor gives the best-quality color.

convex (1) Contrast with concave.

(2) Rounded, like the exterior of a sphere.

cooperative multitasking See multitasking.

coordinate points The points in a Cartesian coordinates system at which axes converge. Specific coordinates can be selected by referring to the numbered points along the axes of the particular coordinate system.

coordinate system The particular mathematical system of axes in which points and lines can be plotted by their distance from the origin, or placed at various steps in the viewing pipeline. Locations where the x and y (2-D) or the x, y, and z (3-D) coordinates cross are called coordinate points.

copy In a window system, to duplicate selected text, graphics, or other data onto the clipboard.

Core The graphics standards developed by the Special Interest Group on Graphics (SIGGRAPH).

core file A file created when a program malfunctions and terminates. The core file holds a snapshot of memory, taken at the time the fault occurred. This file can be used to determine the cause of the malfunction.

core gateway One of a set of gateways (routers) operated by the Internet network operations center. The core gateway system forms a central part of Internet routing in that all groups must advertise paths to their networks from a core gateway, using the Exterior Gateway Protocol (EGP).

corotron A wire device that generates a high voltage potential for charging a printer drum or transferring the image from the drum to the print media.

COSINE (Cooeration for Open Systems Interconnection Networking in Europe) A European Commission program that uses the OSI to connect European research networks.

CPU (central processing unit) The part of the computer in which calculations and manipulations take place. See also ALU.

CPU master An SBus master that includes a central processing unit with a private means to perform virtual address translation (in contrast to a DVMA master, which uses the SBus controller to perform virtual address translation). A bus cycle initiated by a CPU master consists only of a slave cycle. Typical SBus systems have one CPU master.

crash The sudden failure of a disk drive or program. A disk crash usually leaves the drive unusable, with the resulting destruction of all data on the disk. A program crash usually results in the loss of all unsaved data and might require rebooting the computer.

crash dump See core file.

cron The UNIX® clock daemon that executes commands at specified dates and times. See also crontab file.

crontab file A file that lists commands to be executed at specified times on specified dates. See also cron.

crop In computer graphics, to cut off unnecessary or undesired parts of an image.

cross-device link An attempt to (hard) link to a file on a different disk or file system.

CRT (cathode ray tube) A video monitor based on cathode ray tube technology. The CRT fires an electron beam that strikes the inside of the monitor's display surface, which is coated with phosphor. The phosphor glows briefly when "excited" by the beam. Color CRTs have a shadow mask that the beam passes through on its way to the phosphor. The shadow mask ensures that the guns excite only phosphors of the color on which they were fired.

C shell The standard shell provided with Berkeley standard versions of UNIX®.

C shell remote control file The .cshrc file that runs every time a new C shell is started or invoked. Commands and settings within the .cshrc file configure the user environment, invoke programs, set universal shell variables and aliases, and set the search path for commands and applications.

CSS (central structure store) The PHIGS display list structure. An editable hierarchy of structures composed of elements, attributes, and transformations. CSS elements are drawing primitives such as lines and polygons and CSS attributes are qualities such as color and style. See also hierarchical data structures.

curly bracket In computer jargon, a brace, { or }, used for connecting or enclosing words. Contrast with square bracket.

current directory The directory searched when a file name is typed without the path specified. Also called the current working directory.

current item The currently highlighted item in a list. Also called the current selection.

current session The session saved by the operating environment's session manager when the user logs off. At the next login, unless the user specifies otherwise, this session automatically opens, enabling work to continue where the user stopped. Contrast with home session.

current setting The present state of a control such as a check box or radio button.

current working directory See current directory.

current workspace The workspace that is presently displayed on the screen.

curses A library of routines that enable the developer to write screen management programs on the SunOS™ system. The routines are C functions and macros. Many of them resemble routines in the standard C library. The name curses comes from the cursor optimization that this library of routines provides. Cursor optimization minimizes the amount a cursor has to move around the screen to update it.

cursor (1) In computer graphics, a movable, discernible mark that indicates a position on a display space.

(2) A movable spot of light on the screen of a display device, usually indicating where the next character will be entered.

cursor plane The memory space associated with each pixel (typically 2 bits) used to store the data for a superimposed cursor. This enables large or complex cursor patterns to be drawn without interfering with the memory holding the underlying image.

cut In a window system, to remove a selected object and place it into the temporary memory of the clipboard. Contrast with delete.

cut buffer A simple but limited method of client communication in the X protocol, sometimes used instead of the selection mechanism. The data placed in a single cut buffer is limited to the maximum size of a single property.

cycle A circular reference. A chain of references that lead back to the start.

cylinder In a disk drive, the set of tracks with the same nominal distance from the axis about which the disk rotates. See also sector.

cylinder group One or more consectutive disk cylinders that include inode slots for files.

cylinder group map A bitmap in a UNIX® file system that stores information about block use and availability within each cylinder. The cylinder group replaces the traditional free list.

CHAPTER 5

D

DAC (digital-to-analog converter) A mechanical or electronic device used to convert discrete digital numbers to continuous analog signals.

daemon A process that runs in the background, handling commands delivered for remote command execution; for example, the mailer daemon and the printer daemon.

daisy chain A specific method of propagating signals along a bus. This method is often used in applications in which devices not requesting a daisy-chained signal respond to a signal by passing it on. The daisy chain scheme permits assignment of device priorities based on the electrical position of the device on the bus.

DAT (digital audio tape) A magnetic tape cassette for recording and playing back digital audio.

database A data file that accepts, stores, and provides data on query by the user.

database host A host computer where an action is defined. See also data hostdata host, execution host, local host, mail host, relay host.

data bus A group of signal lines (wires) used as a common pathway among multiple devices in a computer system.

data compression (1) Any technique used to encode data so that the data takes up less storage space.

(2) The application of an algorithm to reduce the bit rate of a digital signal, or the bandwidth of an analog signal, and preserve most of the information—usually within the constraints of subsequent

portions of the system. See also entropy coding, H.261 encoding, hierarchical encoding, interframe compression, intraframe compression, lossless compression, lossy compression, predictive encoding, run-length encoding, sequential encoding.

data-encrypting key A key for enciphering, deciphering, and authenticating data for programs that perform encryption. Contrast with key-encrypting key.

data file A group of related data records with a specific purpose.

datagram In a packet-switching network, a message and associated Internet source and destination addresses.

data host A host computer where the data for an action is located. See also database host, execution host, local host, mail host, relay host.

dataless client A client system that relies on a server system for its home directory, and on a local disk for its root directory and swap space. See also diskfull client, diskless client.

data-link layer In the ISO/OSI model, the second layer, which enables establishing, maintaining, and releasing services between network entities.

data-link level The level of a data station responsible for adding transmit bits and removing receive bits; interpreting address and control fields; generating, transmitting, and interpreting commands and responses; and calculating and interpreting frame check sequences.

data resampling In presenting a video image, the sampling of the original signal and processing of the samples by a suitable algorithm to generate a new set of samples compatible with the specifications of the target system.

daughterboard A printed circuit board that is attached to or plugs into a larger printed circuit board, usually a motherboard. It connects to the motherboard memory and CPU directly instead of moving data through the expansion bus. Also called daughtercard.

DBMS (database management system) A software system facilitating the creation and maintenance of a database and the execution of programs using the database.

DC (1) (device coordinates) The coordinates in the coordinate system that describe the physical units which define the computer screen.

DCE (data communication equipment) A type of hardware, such as a modem, that encodes a digital signal for delivery to a compatible DCE connected by a data link. Contrast with DTE.

D channel An ISDN out-of-band signaling channel. The D channel carries user-network signaling information at a rate of 16Kb per second. Primarily used in call setup and teardown. See also B channel.

DCT (discrete cosine transform) An algorithm in JPEG and MPEG compressions that connects data from the time domain into the frequency domain. See also data compression.

DDA (digital differential analyzer) A differential analyzer that uses digital representations for analog quantities.

DDI (device driver interface) An interface that facilitates driver portability across different UNIX® system versions on SPARC™ hardware.

DDN (Defense Data Network) A network that includes the MILNET and several other Department of Defense networks.

deadlock A situation that describes two or more processes waiting for another process to free a resource that is required to proceed. Also called deadly embrace.

debugger A program for locating operational errors in another program. The debugger usually enables the developer to step through the malfunctioning portion of the program to examine data and check operational conditions.

decimal Contrast with hexadecimal.

decoder A facility that decompresses data that has been encoded or compressed by an encoder. A decoder can be implemented in hardware, software, or a combination of both. See also cell encoding, data compression, entropy coding, H.261 encoding, hierarchical encoding, predictive encoding, run-length encoding.

decryption The process of converting coded data to plain text. See also encryption.

default An alternative value, attribute, or option assumed when none has been specified.

definition In imaging, distinctness or clarity of detail or outline in an image reproduction.

degauss The process of neutralizing the magnetic field of objects, such as magnetic tape drives and monitors.

dejagging Obsolete term for antialiasing.

delete In a window system, to permanently remove an object or group of objects and the space that the object occupied. Contrast with cut.

delimiter (1) A value that separates and organizes items of data.

(2) A character that logically separates words or arguments on a command line. Two frequently used delimiters in the UNIX® system are the space and the tab.

demand paging A page transfer that enables a program's required area to be noncontiguous and partially nonresident. This permits the maximum use of a system's total available memory by enabling the computer system to execute programs that are larger than the allocated physical main memory within the processor..

demount Obsolete term for unmount.

depth Generally, the z window coordinate.

depth buffer See z-buffer.

depth-cueing In 3-D graphics, the process of reducing the intensity (in color or gray scale) of the lines or surfaces of an object as it recedes from the viewer. This fading technique helps establish visual order in objects that might otherwise appear confusing or flat. It also improves a scene's visual depth.

DES (Data Encryption Standard) A common algorithm for encrypting and decrypting data. See also encryption, SUN-DES-1.

descendant window See inferior window.

descriptor A data structure that uniquely identifies a hardware device or software function.

deselect In a window system, to remove highlighting or some other visual cue from a previously selected object, such as removing highlighting from an item in a list. If a widget is deselected, it is turned off.

deskside A system enclosure that stands next to the user's desk. Contrast with desktop.

desktop An entire system that fits on the top of the desk.Contrast with deskside. See also workspace.

Desktop Backup Pack A Sun™ tape drive. The Desktop Backup Pack uses 0.25-inch DC6150 cartridge tapes with a capacity of 150 Mbytes. See also Desktop Storage Pack.

Desktop Disk Pack A Sun™ disk drive. See also Desktop Storage Pack.

desktop object A discrete on-screen representation of data. This could be a data span, an application icon, file glyph, and so on.

Desktop Storage Module A Sun™ external data storage unit that contains a disk drive or a tape drive.

Desktop Storage Pack A Sun™ external data storage unit that contains a single SCSI device, such as a disk drive (Desktop Disk Pack), a tape drive (Desktop Backup Pack), or a compact disk drive (Desktop SunCD Pack) and that can be connected to a desktop SPARCstation™ system.

Desktop SunCD Pack A Sun™ CD-ROM optical disc drive. See also Desktop Storage Pack.

devguide An unbundled window application that generates OLIT, TNT, and XView™ code.

device A hardware component, such as a printer or disk drive, acting as a unit to perform a specific function.

device coordinates The coordinates in the coordinate system that describe the physical units by which the computer screen is defined.

device dependent That software which has been written for a specific computer device, and runs on that device exclusively. Software that can run only on a specific vendor's computer is called vendor dependent. Contrast with device independent.

device driver The software that converts device-independent graphics commands into device-specific (device-dependent) display.

device independent That software which has been written expressly for portability across dissimilar computer systems. An industry-standard graphics library, such as PHIGS, is a device-independent interface. Contrast with device dependent.

device name The name that the system uses to identify a device. For example, /dev/rst0 (or just rst0) is the device name for 0.25-inch tape.

DGA (direct graphics access) A method of arbitrating access to the display between the XGL™ library and an X11/NeWS™ system server. This method enables the XGL library to "talk" directly to the frame buffer, which results in maximum performance.

dialog box In an application, a window display that requires user input.

dials and knobs A computer input peripheral that is composed of a box with rotary devices, usually soft-programmed for each application.

dial-up connection A connection between two machines through a phone line.

diamond key See meta key.

diffuse highlight An object highlight that results when a light source interacts with a nonreflective surface.

digital Characteristic of discrete units that represent numbers. Similar to binary computing. Contrast with analog.

digital image An image that has been converted into an array of pixels. See also digitizedigitize.

digitize (1) To convert an image from hard copy (such as a photo) into digital (binary) data for display on a computer.

(2) To convert an analog signal (voltage or temperature) into a digital value.

DIN connector A plug and socket connector that connects many different types of devices, in compliance with the specification of the German national standards organization (Deutsch Industrie Norm).

DIP (dual in-line package) Characteristic of the physical geometry of an integrated circuit or other electronic package; rectangular, with pins on the two longer sides.

DIP switch A set of multisectioned toggle switches that have DIP geometry.

directional light The light emanating from a light source that is virtually infinite (the light rays are essentially parallel) such as the sun. Contrast with ambient light.

directory A file that contains other files and directories.

directory path name The complete name by which the directory is known. The path name gives the sequence of directories by which the directory is linked to the root directory. Also called the "directory name."

directory stack A stack, implemented in the UNIX® C shell, that enables you to save frequently used directories and then quickly jump from one directory to another without typing the entire directory path.

dirty See 8-bit clean.

disc An optical disc, as opposed to a magnetic disk, in keeping with the common spelling used in the CD (compact disc) market; for example, a CD-ROM is an optical disc. See also disk.

disk A round platter, or set of platters, of a magnetized medium organized into concentric tracks and sectors for storing data such as files. See also disc.

disk array One or more physical disk drives that can form a single logical drive. For example, the SPARCstorage™ Array Subsystem for Disk Expansion is a disk array. A disk array may contain several disk drive trays. See also composite drive, RAID.

disk partition A portion of the disk reserved for a specific file system and function.

disk quotas A mechanism for controlling how much of a file system's resources any individual user can access. Disk quotas are optional and must be configured and administered to be used.

diskette A 3.5-inch removable storage medium.

diskfull client A client on a network that relies on a server for resources, such as files, but has its own local disk storage. Some of its files are local and others are remote. The remote files can be obtained from any machine running as a network file server. Contrast with diskless client, standalone.

diskless client A client on a network that relies on a server for all of its disk storage. Contrast with diskfull client, standalone.

display (v.) To present a display image on a display surface.

display-dependent session A session that can be restored on only a particular display. Contrast with display-independent session.

display device The hardware device that displays windows, text, icons, and graphical images; for example, a frame buffer and monitor.

display function See ROP.

display-independent session A session that can be restored on any display, regardless of screen resolution or color capability. Contrast with display-dependent session.

display list A description of the desired image through a list of primitives and attributes. It provides an intermediate picture storage for quick image redraw. In GKS, the display list is a 2-D, segmented data storage method and cannot be edited. In PHIGS, the display list structure is a 3-D, hierarchical data list that can be edited. See also immediate mode.

distributed file system A file system that exists on more than one computer, enabling each user to access files on other computers.

distribution See software distribution.

dithering In computer graphics, an increase in variations between a picture's colors or gray values reduces some spatial resolution quality, but gains patterns of pixel arrays. This technique is used when there are not enough bits in the frame buffer to represent color.

divergence On computer displays, a separation that happens when the red, green, and blue electron beams in a color monitor diffuse and light different areas of the screen.

DKI (driver-kernel interface) An interface between the UNIX® system kernal and different types of drivers. It consists of a set of driver-defined functions that are called by the kernel. These functions are entry points into a driver.

DLPI (Data Link Provider Interface) The SVR4 STREAMS-based kernel-level interface that supports the services of the Data-Link Layer for both connection-mode and connectionless-mode services.

DMA (direct memory access) The transfer of data directly into memory without supervision of the processor. The data is passed on the bus directly between the memory and another device. Contrast with DVMA.

DNS (1) domain name system

(2) Domain Name Service.

document (1) (n.) A computer-generated text file, which can be saved and retrieved.

(2) (v.) To annotate a device or software process.

document editor See text editor.

domain name The name assigned to a group of systems on a local network that share administrative files. It is required for the network information service database to work properly.

DOS high density See DS HD.

dot file See hidden file.

double-click To click twice on a mouse button, accelerating a specific command's performance.

double-precision Characteristic of using two native words of memory to store a numeric datum.

doubleword A combination of two native words of memory for storing ordered data. A doubleword is most often 32 bits long.

download filter A fast filter that uses PostScript™ language structured conventions to download host-resident fonts to the printer for each print request.

downstream In STREAMS, a direction of data flow going from the Stream head toward a driver. Also called output-side, write-side.

drag To move an object by clicking and holding the mouse button while pulling the object to its new position.

drag and drop To directly manipulate an object by using a pointing device to move and place the object somewhere else.

dragging In computer graphics, moving all or part of a display group in a display space in such a way that the group continuously follows the pointer as though it were attached.

DRAM (dynamic random access memory) A type of semiconductor random access memory that stores information in integrated circuits that contain capacitors. Because capacitors lose their charge over time, the dynamic RAM must be periodically “refreshed” or recharged. Contrast with SRAM. See also VRAM.

driver (1) A software subsystem that controls either a hardware device (device driver) or another software subsystem.

(2) A STREAMS module that forms the StreamStream end. It can be a device driver or a pseudo-device driver. It is a required component in STREAMS (except in a STREAMS-based pipe mechanism), and is physically identical to a module. It typically handles data transfer between the kernal and a device and does almost no data processing.

drop After grabbing an object, the act of releasing the mouse button. If the object is dropped in an appropriate area, an action is initiated. See also drag and drop, grab.

drop zone An area of the workspace, including the Common Desktop Environment (CDE) Trash Can, Printer, and Mail control icons, that accepts a dropped object. You can drop objects on the workspace for quick access.

DS HD (double-sided, high density) The type of 3.5-inch diskettes supported by the SunOS™ 5.x system software, with a 1.44–Mbyte (formatted) capacity.

DSDM (Drop Site Database Manager) A process (not the sending client) responsible for maintaining a registry or database of potential drop sites for drag and drop operations.

DSIMM (dynamic [random access memory] single inline memory module) A small printed circuit card that contains DRAM) chips. See also DRAM.

DSP (digital signal processor) A computer oriented toward math-intensive applications, often a single chip or small chip set.

DTB (data transfer bus) A part of the VMEbus specification that contains data and address pathways and associated control signals. Functional modules called “DTB masters” and “DTB slaves” use the DTB to transfer data between each other.

DTE (data terminal equipment) That part of a data station that serves as a data source, data sink, or both, and provides for the data communication control function according to protocols. Contrast with DCE.

dual head A single workstation with two monitors, generally operating so that a single cursor traverses both displays.

dumb frame buffer A frame buffer with almost no graphics acceleration.

dumb terminal A terminal that lacks any local processing capability. Also called a TTY terminal.

dump See full dump, incremental dump.

duplex transmission See full-duplex transmission, half-duplex transmission, simplex transmission.

DVMA (direct virtual memory access) A mechanism to enable a device on the SBus to initiate data transfers between it and other SBus devices, such as system memory. Contrast with DMA.

DVMA cycle An SBus cycle initiated by a DVMA master. A DVMA cycle consists of a translation cycle and a slave cycle.

DVMA master An SBus master capable of initiating a bus cycle that uses the SBus controller to perform virtual address translation (in contrast to a CPU master, which has a private means for virtual address translation). A bus cycle initiated by a DVMA master consists of a translation cycle and a slave cycle.

dyadic Characteristic of a pair. In mathematics, a dyadic operation has two operands. In Boolean algebra, a dyadic Boolean operation has two operands, both of which are significant.

CHAPTER 6

E

E-time (execution time) The moment when an instruction is actually executed during a machine cycle.

EARN (European Academic Research Network) Now called TERENA. A network enabling BITNET technology to connect universities and research labs in Europe.

ECC (error checking and correction) The detection, in the processing unit, and correction of all single-bit errors, plus the detection of double-bit and some multiple-bit errors.

echo To repeat a stream of characters. For example, the commands the user types are echoed on the screen.

edge (1) In computer graphics, one or more vectors defining a portion of an object.

(2) In image processing, a set of values determined (by an edge detection algorithm) to be the dividing line between one image and another or an image and background color.

edge detection In computer graphics, an image-processing technique in which edge pixels are identified by examining their neighboring pixels.

edge enhancement In computer graphics, the sharpening of an edge by increasing the contrast between the lighter and darker pixels on opposite sides of the edge.

edge-triggered interrupt A pulse down a wire, sent when a device is about to generate an interrupt. The device then depends on the interrupt controller to “remember” that the pulse has been sent. An edge-triggered

interrupt enables multiple devices to share a single interrupt-request line. Contrast with level-triggered interrupt.

EDI (Electronic Data Interchange) A standard format for exchanging CAD data.

edit (1) To change the data in a document or file.

(2) To check the accuracy of a document or file.

editor A program to assist the user in creating and modifying written material to be stored in files.

EEPROM (electrically erasable PROM [programmable read-only memory]). A nonvolatile PROM that can be written to as well as read from. In Sun™ workstations, an EEPROM is used to hold information about the current system configuration, alternate boot paths, and so on. See also boot PROM, ID PROM, NVRAM.

eight-bit color In computer graphics, the color range possible with an eight-bit graphics system. Each pixel in an eight-bit system can display one of 256 colors (2^8) at any given time. These colors are typically obtained from a color map. See also indexed color.

electron beam In the computer CRT, the collection of electrons produced by an electron gun.

electron gun In the computer CRT, the mechanism that produces an electron beam. The electron beam illuminates the phosphors of the monitor to display the pixels on the raster grid in a selected pattern.

element A member of a larger set; for example, a data unit within an array or a logic element.

ellipsis A set of three dots (...) that typically signify an omission. In a graphical interface, the ellipsis that follows a menu command signifies that clicking the command leads to a pop-up window.

email (n.) An electronic message. See also mail.

embedded (adj.) Characteristic of program code or commands that are distinguished as part of the source rather than called by reference.

em dash A dash (—) the same width as the letter M in the point size of the type in use.

emission The propagation of a signal through electromagnetic radiation. Also called broadcast.

emulate To imitate a system, primarily by another system such as hardware.

emulation trap A trap used when the CPU is emulating a different CPU type. See also emulate, trap.

en dash A dash (–) half as wide as an em dash in the point size of the type in use.

enable To schedule a queue's service procedure.

encoder A facility that encodes data for the purpose of achieving data compression. Frequently, the data to be encoded is video data, but other types of data, including audio, can be compressed as well. Contrast with decoder. See also cell encoding, data compression, entropy coding, H.261 encoding, hierarchical encoding, predictive encoding, run-length encoding, sequential encoding.

encryption The process of protecting information from unauthorized use by making the information unintelligible. Encryption is based on a code, called a key, which is used to decrypt the information. Contrast with decryption.

encryption key A byte stream that controls how data is enciphered, deciphered, or authenticated. Also called the public key. See data-encrypting key.

end user A person who uses computers and computer applications.

endpoint In vector graphics, the beginning or end of a line segment.

entity (1) In ISO/OSI, a layer protocol machine. An entity within a layer accesses the layer entity below and provides services locally to the layer entity above.

(2) In computer-aided design, an element such as a line segment.

(3) In object-oriented programming, a portion of a class of objects.

(4) In database design, an object about which data can be stored.

entropy coding The final step in the compression process in DCT-based encoders (such as JPEG). In this step, the encoder compresses the quantized DCT coefficients using either Huffman coding or arithmetic coding. Values that occur frequently are encoded with fewer bits than are

values that occur infrequently. See also cell encoding, data compression, H.261 encoding, hierarchical encoding, predictive encoding, run-length encoding, sequential encoding.

entry The value or information in a table cell or list item.

enumerated data type A named set of values with an integer assigned to each member of the set.

envelope A file the sendmail program creates when it parses email addresses. The file contains information about how to deliver the message.

environment (1) In the UNIX® system, the conditions under which a user works while using a computer. A user's environment includes those characteristics that personalize the user's login and how the user is allowed to interact in specific ways with UNIX and the computer. For example, the shell environment includes the shell prompt string, specifics for backspace and erase characters, and commands for sending output from the terminal to the computer.

(2) From the personal computer perspective, "environment" includes software, a computer, and peripheral devices.

environment variable The UNIX® C shell environment variables are similar to shell variables, except that environment variables can be passed to every C shell that runs. Many applications use environment variables to set configuration directories, specify base directories for commands or data, and pass other information about the user environment to the program.

EOF (end of file) A termination point of a file, marked by a particular character (usually a Control-d). This character signals to the system that it has reached the file's end.

EPROM (erasable programmable read-only memory) A nonvolatile memory chip that is programmed after manufacture. When the contents are erased (usually by exposure to ultraviolet light), the chip can be reprogrammed. See also EEPROM, PROM, ROM.

EPS (Encapsulated PostScript) A file format for graphics and text supported by several graphics drawing applications. An EPS file can contain two versions of an image: a bitmap used to display the image on the screen, and a PostScript™ description used to print the image. See also EPSI.

EPSI (Encapsulated PostScript interchange) A version of the Encapsulated PostScript™ format that describes an image using a standard text file. See also EPS.

equalization pulse A sync pulse, part of field sync, approximately half the duration of normal sync.

errno An error number.

error A deviation of a computed or measured value or condition from the expected result.

error handling A program feature that analyzes and recovers from error conditions during program execution.

error message A displayed statement that the system or program has detected an error.

error recovery The process of correcting or bypassing an error condition to restore a computer system to its former state.

escape (1) To divest a special character of its special meaning by preceding it with a backslash (\) character. For example, the UNIX® shell interprets ? to represent any single character, but a \? (an "escaped" question mark) is interpreted to be just a question-mark character.

(2) The Esc key on the keyboard.

(3) The escape character generated by pressing the Esc key.

escape character A control character, sometimes used with one or more succeeding characters, that indicates how the code that follows it is interpreted. Also called an ESC character.

Escape key A keyboard key, usually labeled Esc, that, when pressed, cancels a window operation. Alternately, pressing the Escape key in combination with another key performs a specific keyboard function.

escape sequence The combination of the escape character and other characters or code that follow it to indicate specific actions to be performed by peripheral devices; for example, clearing a window.

ESCSI (embedded SCSI device) See SCSI.

ES-IS (End System to Intermediate System Protocol) The OSI protocol by which end systems announce themselves to intermediate systems.

ESM (External Storage Module) A Sun™ external unit that contains disk or tape drives and that can be connected to a desktop SPARCstation™ system.

Ethernet A type of local area network that enables real-time communication between machines connected directly through cables.

EUC (extended UNIX® code) An encoding scheme that allows up to four codesets to coexist in one data stream. EUC supports one primary character set and three supplementary character sets. The primary character set (codeset 0) is always ASCII. The other three character sets vary, depending on the locale.

EUC process code See wide character.

EUnet European UNIX® network.

Eurocard form factor A set of international standard board dimensions first proposed by European computer scientists.

EUUG European UNIX® Users Group.

even field In a 2:1 interlace system, the field that begins with a broad pulse halfway between two line syncs. See also odd field.

event A previous line of input from the terminal; usually either a command line or an attempted command line. The UNIX® history function maintains a numbered list of the last several events that you have entered.

event identifier A shorthand code used to identify earlier events on the history list.

event processing A server polling of incoming or outgoing events to prevent the cancellation of any event that happens at the same time as another event.

exception In CPU terminology, a computation error, usually resulting in a trap.

exclusive-OR A logic operator that combines two statements P and Q so that the result is true if either P or Q (but not both P and Q) is true. Also called XOR.

executable file A file that can be processed or executed by the computer without any further translation. When a user types the file name, the commands in the file are executed.

execute (1) To run a file as a program.

(2) To act on instructions.

execution host A host computer where an application invoked by an action runs. This may be the same computer where the action resides, or it may be another computer on the network. Also called application server. See also data host, database host, local host, mail host, relay host.

explicit address See absolute address.

export The process by which a server advertises the file systems that it allows hosts on a network to access.

extended transfer An extended SBus cycle protocol (also called a 64-bit transfer) in which 64-bits of data are transferred per clock cycle during the slave cycle. The upper 32 bits of data are multiplexed onto the Size<2:0>, Read, and PhysAddr<27:0> lines.

extent See bounding box.

CHAPTER 7

F

face In computer graphics, part of a plane. Several faces form an object surface, such as a polyhedron (cube or prism). For example, a cube has six faces.

face list The list of faces and their vertexes that make up the surface shape of a mesh model.

facet See face.

faceted shading See flat shading.

FARNET Federation of American Research NETworks.

Fast Ethernet See 100BASE-T.

fast filter A filter program that quickly prepares a file for printing and requires access to the printer while processing. Contrast with slow filter.

fatal error An error that leads to an irrecoverable system or application failure.

FBRAM (frame buffer RAM) A special type of dynamic RAM (DRAM) used in high-speed frame buffers. Similar to video RAM (VRAM), FBRAM is specifically designed for use in high-speed frame buffers and graphics accelerators.

FCodes (Forth byte codes) A small program, usually a bootstrap loader, written in the Forth language and stored in a PROM or EPROM. See also OpenBoot.

FCS First customer ship.

FDCT (forward discrete cosine transform) See DCT.

FDFS (file descriptor file system) A pseudo file system that provides an explicit name for opening a file instead of its file name.

FET (field-effect transistor) A semiconductor device with current flow between the source and the drain controlled by application of voltage between the gate and source.

FF (form feed) (n.) A command that moves printing to the top of the next page. In ASCII, the form-feed character's decimal value is 12. See also LF.

field (1) In UNIX® a subsection of a line. Programs such as sort and awk can check individual fields within a line.

(2) In computer graphics, the shortest interval of a video signal that contains a set of scan lines covering the full picture height, along with the associated synchronization elements. In a system with non-interlaced (or progressive) scanning, fields and frames are identical. In a system with 2:1 interlace, there are two fields, odd and even. Each contains half the picture lines of a frame.

field separator The character used to separate one field from the next; a string of one or more spaces is the usual field separator.

FIFO file (first-in-first-out) See named pipe.

FIFOFS (FIFO file system) The named pipe files that give processes common access to data. See also named pipe.

file format The file structure that determines a file's storage and display on the screen or in print. The format can be "plain" ASCII text or text with control instructions and device codes.

file handle In the NFS™ system environment, a data structure that enables systems to uniquely identify files over the network. A stale NFS file handle contains data with a creation date that does not match the file it refers to.

file header See header.

File Manager The software application that manages the files and directories on the system.

file name The name of a file as it is stored in a directory on a disk. See also path name.

file-name expansion The process by which UNIX® matches file names containing metacharacters to actual file names. For example, matching ?oo? to foot and loop.

file permissions A set of permissions assigned to each file and directory that determines which users have access to read, write, and execute its contents.

file system In the SunOS™ operating system, a tree-structured network of files and directories that you can access.

file system hierarchy The structure of the file system, consisting of a tree of files and directories, with a root directory at the top and directories that act as parent directories and child directories throughout. See child directory, parent directory.

file table The table containing references to all files being accessed by the current program.

fill algorithm In computer graphics, an algorithm that fills polygons with a color, gray-scale shade, or pattern.

filler panel See air restrictor board.

filling The process of adjusting line lengths in text so that all lines have about the same length.

filter A program that reads the standard input, acts on it in some way, and then prints the results as standard output.

filtering In computer graphics, an image-processing technique that reduces features or colors in an image.

find In a window system, to use criteria you specify to search for an object or search within an object displayed in the associated window.

finite element model A mathematical model of an object divided for structural analysis into an array of discrete elements.

FIPS (Federal Information Processing Standards) The FIPS PUB is the National Bureau of Standards' guide to the standards it issues. See also DES.

fixed-point arithmetic A calculation on fixed-point numbers.

fixed-point notation A numeric format in which the operator needs to track the radix point, which determines the value.

flag An argument to a command indicating a particular option or modification. UNIX® flags usually are indicated by a leading hyphen (-).

flash PROM A programmable read-only memory (PROM) that can be reprogrammed by a voltage pulse or a flash of light. See also PROM.

flat shading A shading method that applies a lighting model to only one point on each polygon face. Each face is rendered in a single color that represents the amount of light reflected from that face. This tends to give the object a faceted look, like a diamond. See also color shading.

flip-flop A circuit that assumes one of two stable states. Also called a bistable multivibrator.

floating-point arithmetic A calculation on floating-point numbers.

floating-point coprocessor See FPA.

floppy drive Obsolete term for diskette drive.

FLOPS (floating-point operations per second) A common measure for computers that run scientific, engineering, or real-time applications. See also MFLOPS, MIPS, SPECmarks.

floptical disk drive A mass storage device that uses electro-optical read / write technology.

flow control A STREAMS mechanism that regulates the rate of message transfer within a Stream and from user space into a Stream.

FNC (Federal Networking Council) The body responsible for coordinating networking needs among U.S. federal agencies.

focus The place to which keyboard input is directed.

folder (1) A directory in a graphical user interface.

(2) A file for storing mail messages.

follow-on bus cycle On the SBus, one of up to three bus cycles during a bus sizing operation that follows the original bus cycle.

footer (1) The bottom area of a window. An application uses the footer for information and error messages.

(2) That text which is displayed at the bottom of each page, such as the page number, date, or document title.

footprint (1) The area a device spans on a desktop.

(2) A trace software leaves to mark its existence or to ensure that other software takes action on a unique key press.

foreground (1) (n.) On a UNIX® system, the process of running under direct control of the terminal; the terminal cannot be used for any other activity until a foreground task finishes or is halted. Contrast with background.

(2) (n.) The color of the characters and graphics displayed on a terminal screen.

fork (1) (n.) A system call to create a new process called a child process. The original process is called a parent process.

(2) (v.) To guide a user, through navigational links, to Web pages other than the current one.

format (1) (n.) The structure of data that is to be processed, recorded, or displayed.

(2) (v.) To put data into a structure or divide a disk into sectors for receiving data.

formatting (1) The arrangement of text or data into a suitable visual form.

(2) The preparation of a disk for use.

Fourier analysis In mathematics, the strategy by which a periodic curve (a function) can be composed into elementary curves (sines and cosines).

FPA (floating-point accelerator) A device (board or integrated circuit [IC]) that speeds floating-point calculations.

FPLA (field-programmable logic array) An array of logic elements. Its interconnections are programmable after manufacture. Also called PLA.

FPU (floating-point unit) See FPA.

fractal ("fractional dimensional") An image created by a geometry that uses "self-similarity." Self-similarity is the result of recursive reproduction of an object so that each reproduction is similar (identical in geometry) to the original. A complex image results from the composite of the infinite self-similar reproductions; for example, coastlines, trees, and clouds.

frame (Obsolete term for window) (1) In video, the time interval of a video signal that contains exactly one complete picture, with all its associated sync elements.

(2) In motion video, a single image (1/25th or 1/30th of a second).

(3) A unit of transmission (that is, a transmitted data packet). When the IP passes the data-link layer a datagram and the data-link layer adds a header and trailer to the data package, the whole package is called a frame.

frame header Obsolete term for header.

free list See cylinder group map.

FRICC (Federal Research Internet Coordinating Committee) A committee replaced by the FNC.

front-end input method The architecture of an input method (IM). The front-end input method has two separate connections to the X server. Keystrokes go directly from the X server to the input method on one connection and other events go to the client connection. The input method is a "filter" that sends composed strings to the client. Synchronization is necessary between the two connections.

front panel A centrally located window containing control icons for accessing applications and utilities, including the workspace switch. The front panel occupies all workspaces.

front porch The time interval between the end of the picture information on a video line and the 50-percent point of the leading transition of the line sync that immediately follows.

FRU (field-replaceable unit) An assembly that a manufacturer replaces on failure of an assembly component.

frustum In computer graphics, the view volume warped by perspective division. See also perspective projection.

full dump A copy of the contents of a file system backed up for archival purposes. Contrast with incremental dump.

full-duplex transmission A data transmission occuring in both directions simultaneously. Contrast with half-duplex transmission, simplex transmission.

full-motion video The display of a series of related digital images at a rate sufficient to give the illusion that objects in the images are moving naturally. As with television, about 30 frames of video per second are required to create this illusion.

full-screen (adj.) Characteristic of displaying an entire face of a screen.

fully qualified domain name A domain name that contains all the elements for specifying where an email message should be delivered.

function key One of the 10 or more keyboard keys labeled F1, F2, F3, and so on that are mapped to particular tasks.

CHAPTER 8

G

gamma The numerical value of the power to which a video signal voltage is raised to obtain linear light. This nonlinear transfer function is implicit in a CRT display, so gamma characterizes a display system.

gamma correction The intensity of the luminescent phosphor on the raster display when struck by the electron beam is nonlinear. Gamma correction is an adjustment to the color map to make up for this inherent nonlinearity, and results in a truer mix of colors when objects are displayed.

gateway Now called an IP router. “Gateway” and “application gateway” indicate systems that translate from one native format to another; for example, X.400 to or from RFC 822 email gateways.

Gbyte (gigabyte) A unit of measure roughly equal to one billion bytes (exactly 1,073,741,824 bytes).

GC (graphics context) In the X protocol, the storage of various information for graphics output, such as foreground pixel, background pixel, line width, clipping region, and so on. Any graphic drawn to a window or pixmap is modified by the GC used in the drawing request.

genlock The capability of a video device to accept a synchronous signal so that the device input or output pixels are precisely in phase with the input sync.

geographic mapping An application for graphics systems used for a variety of projects such as city planning. These applications usually rely on large databases of information that can be used to provide meaningful

mapping information, such as street names, postal codes, and census data. See also GIS.

geographical addressing A mechanism by which a part of the physical address is presented to each SBus slave as an individual select signal, so that only one slave is selected at any given time.

geometric model In computer graphics, the object-coordinate vertexes and parameters that describe an object.

geometric primitive See primitive.

geometry (adj.) Capable of performing graphics operations at the level of vertexes, edges, and polygons, such as transformation and clipping, as opposed to rendering.

g-file The working copy of a file retrieved from an SCCS history file by the sccs `get` command.

GID (group identification number) The number used by the system to control access to accounts owned by other users.

GIS (geographic information systems) A graphic application using a database of specialized information, such as geographical and demographic data. Applications written for the GIS market use the database information to determine such outcomes as the best location for a new fire station or shopping center, the most likely location of archaeological remains, and so on.

GKS (graphical kernel system) An international standard 2-D graphics library consisting of a set of defined graphic primitives and a tool set for application developers. GKS frees the developer of many of the low-level programming tasks in creating and manipulating graphics on a workstation. Applications written with GKS can run in display list, immediate mode, or both.

global Capable of having extended or general scope. For example, a global substitution of one word for another in a file affects all occurrences of the word.

global file A file containing information such as user, host, and network names, network-wide in scope.

glyph A graphical element on the workspace. A glyph can be a button, folder, or other graphical element representing a document or file.

Gouraud shading (rhymes with “Thoreau”) A sophisticated shading method capable of producing realistic results. This method applies a lighting model to each vertex of a polygon face, and interpolates the results across the face for a smooth lighting effect. See interpolation.

grab (1) (v.) To move the mouse pointer over an object, and then to press and hold down the mouse button in preparation for moving the object. See also drop.

(2) (n.) In the X protocol, the act of the server obtaining exclusive use for a client of keyboard keys, the keyboard, pointer buttons, and the pointer. A grab is usually for a short time period. See active grab, passive grab.

grab handles The small squares displayed at the corners and midpoints of a selected graphic object.

graph In programming, a set of nodes with a set of edges.

graphics accelerator A hardware device dedicated to increasing the speed and performance of graphics. Graphics accelerators calculate pixel values, and write them into the frame buffer, freeing the CPU for other operations.

graphics API See API.

graphics primitive See primitive.

graphics routine A collection of code in a computer program that draws graphical objects.

gravity In the X protocol, controls for repositioning the contents of a resized window (bit gravity) or of the subwindows of a resized parent window (window gravity).

gray-scale image A type of file that contains more than one bit of information per pixel to convey shades of gray. For example, an image with 256 shades of gray requires eight bits per pixel. See also bitmap.

gray-scale manipulation An image enhancement technique that improves the appearance of a digital image by adjusting its gray levels.

group A collection of users who are referred to by a common name. Determines user access to files. The two types of groups are default user group and standard user group.

group attribute An attribute attached to a file or directory that determines user access. See also permissions.

group box A box in a window that visually associates a set of controls.

GUI (graphical user interface) The pictorial point of interaction between you and the computer and its special applications, usually with a mouse or other selection device. The GUI usually includes such conventions as windows, an intuitive method of manipulating directories and files, and icons. See also iconic interface.

CHAPTER 9

H

H.261 encoding A video compression standard developed by CCITT to work with the integrated service digital network (ISDN) and support video phone and video-conferencing applications. Data is compressed at p 64Kb per second, where p can range from 1 to 30 depending on the number of ISDN channels used. See also cell encoding, data compression, entropy coding, hierarchical encoding, predictive encoding, run-length encoding, sequential encoding.

halation The “glowing” effect of screen elements reflecting light.

half-duplex transmission A data transmission occuring in one direction at a time. Contrast with full-duplex transmission, simplex transmission.

halfword A unit of measurement equal to two bytes. Contrast with byte, word.

halfword acknowledgment On the SBus, an acknowledgment to indicate that the slave has read or written a halfword of data from the most-significant halfword of the data lines. If the transfer size is greater than a halfword, the master initiating the transfer can perform bus sizing.

halt To intentionally stop the system from running; for example, in preparation for turning off the power.

handles See grab handles.

hang To cease operation because either an unexpected condition is not satisfied or an infinite loop is occurring. See also crash.

hard disk A magnetic disk that stores data. Usually a fixed disk, permanently sealed in the drive, though the removable hard disk is becoming

popular. A hard disk can store more than 10 Gbytes of data. Access time is much faster than soft (floppy) disks. The head that reads the data floats over the hard disk's surface, while the head of the floppy disk touches the disk's surface while reading or writing data. See also disk.

hard limit For disk quotas, a maximum limit on file system resources (blocks and inodes) that users cannot exceed.

hard link A directory entry that references a file on disk. More than one such directory entry can reference the same physical file.

hardware (1) The mechanical and electrical parts of a computer system, including attached devices such as printers, cables, modems, and so forth.

(2) The components of a computer system responsible for user input, display, and mathematical processing. Often the term hardware is used in specific reference to the computing power of the CPU or the graphics accelerator, or both. The collection of compute hardware is also called a "platform."

hardware context The values in the following registers while a process is running: the program counter, the processor status word, the six general registers (R0 through R5), the stack pointer for the current access mode as well as the contents to be loaded in the stack pointer for every access mode other than the current access mode.

hash mark Computer jargon for the number sign (#).

HBA (host bus adapter) A controller board connecting the I/O expansion bus to the SCSI subsystem.

header A unit of information that precedes and identifies whatever follows.

heterogeneous network A network composed of systems of more than one architecture. Contrast with homogeneous network.

hexadecimal Characteristic of a fixed-radix numeration system having a radix of 16, a base-16 number.

hidden bits The extra bits used by hardware to ensure correct rounding of mathematical operations, not accessible by software. For example, IEEE double-precision operations are correctly rounded to 53 bits because three hidden bits are used to compute a 56-bit result that is then rounded to 53 bits.

hidden character One of a group of characters within the standard ASCII character set that are not printable.

hidden file A special type of file, such as .login, that does not display in normal file listings. Hiding protects the file from deletion, modification, or unauthorized access. Special files usually pertain to system configuration.

hidden-line removal In three-dimensional wireframe graphics, an algorithm that deletes the lines from a drawing that would be hidden if the object were opaque. This method reduces the potential of ambiguity in an object's appearance.

hidden-surface removal An algorithm that ensures that object surfaces which are closer to the viewer in three-dimensional space are drawn so that they occlude any objects or portions of objects that should be hidden behind them. See also occlusion, z-buffer.

hierarchical data structures In PHIGS, a system that defines objects in hierarchical relationship to one another. The hierarchical data organization enables structures (descendants) to inherit the attributes of other structures (ancestors), which enables the developer to manipulate objects efficiently.

hierarchical encoding The compression of still images at multiple resolutions. This type of encoding is useful when you must sometimes decode an image at full resolution and at other times need to decode the image quickly at something less than full resolution. See also data compression.

high A signal driven to a voltage greater than or equal to VOH.

high-level software Generally, software that is not operationally close to the hardware. Graphical user interfaces, for instance, are high level because they pass through a pipeline that includes the window system software, and they do not "talk" directly to the hardware. By contrast, low-level software does talk directly to the hardware. See also GUI.

High Sierra specification A format for placing data on CD-ROMs. See also HSFS.

high watermark See watermark.

highlight (1) (n.) The result of directional light sources cast on an object surface. See also specular highlight.

(2) (v.) To change the intensity or color of an object or primitive to make it more noticeable.

hint In the X protocol, certain properties, such as the preferred size of a window, which the window manager might not guarantee.

HLHSR (hidden-line, hidden-surface removal) See hidden-line removal, hidden-surface removal.

home directory The directory that the system administrator assign to you; usually the same as the login directory. Additional directories that you create stem from the home directory.

home session A choice at logout to designate a particular session, other than the current one, as the one the user will automatically return to at the next login.

homogeneous network A network composed of systems of only one architecture. Contrast with heterogeneous network.

HoneyDanBer UUCP See UUCP.

horizontal blanking The interval, expressed in microseconds or sample counts, between the end of the picture information on one line and the start of the picture information on the adjacent picture line.

horizontal centering See center.

horizontal drive A pulse containing horizontal synchronization information that begins at the end of picture information on a line and ends at the trailing edge of sync.

host access list See ACL.

host computer (1) A computer system that is accessed by computer(s) and/or workstations at remote locations. Usually the host contains the data, but in networks, the remote locations can be “the host” and provide information to the network.

(2) In a multiple computer setting, the computer that emulates another computer.

hostid See system ID.

host-resident fonts Those fonts stored on one system that are shared by a group of users of a particular printer. Host-resident fonts are usually different from printer-resident fonts, and are used less frequently.

HotJava™ browser A World Wide Web (WWW) browser, developed by Sun Microsystems, Inc., that uses the Java™ programming language. The HotJava™ browser enables the import and execution of code fragments, called applets, across the Internet.

hot-plugging The process of adding or removing hardware devices while the system is running.

hot spot In the X protocol, the point in a cursor that corresponds to the coordinates reported for the pointer.

hot-swappable Capable of enabling insertion or removal of a device while the computer is powered on and in operation.

housekeeping The process of keeping track of what files are where, of who is doing what, and the like.

HSFS (High Sierra file system) See High Sierra specification.

HTML (Hypertext Markup Language) A file format, based on SGML, for hypertext documents on the Internet. It is simple and enables the embedding of images, sounds, video streams, form fields, and basic text formatting. References to other objects are embedded by using URLs.

HTTP (Hypertext Transfer Protocol) The Internet protocol that fetches hypertext objects from remote hosts. It is based on TCP/IP.

hue The designation of a color in the spectrum, such as cyan, blue, or magenta.

hung A condition in which the system is frozen and unresponsive to commands.

hyperlink An element in a hypertext document that connects to another element in the same or another document.

CHAPTER **10**

I

IAB (Internet Activities Board) The group that administrates the development of the Internet suite of protocols (TCP/IP). The IAB has two investigative task forces, the IRTF and the IETF. See also Internet, TCP/IP.

IC (input context) An abstraction for representing the state of a particular input thread for use with an input method. Multiple ICs can be associated with an input method.

ICCCM (Inter-Client Communication Conventions Manual) The document that describes the conventions for the communication between X clients. This includes such conventions as client-to-client, client-to-window manager, client-to-session manager, and color characterization communication. This document is produced by the MIT X Consortium.

ICMP (Internet Control Message Protocol) The protocol used that handles errors and control messages at the Internet Protocol layer. For example, the ping command is an implementation of the ICMP. ICMP occurs on the IP (network) level of the TCP/IP protocol suite.

icon (1) An on-screen symbol that, when clicked, provides access to a program, command, or data file.

(2) A small pictorial representation of a base window. Displaying objects as icons conserves screen real estate while keeping the window available for easy access.

iconic interface An icon-based interface, wherein you click an icon to initiate a task. Contrast with selecting activities from a menu-driven interface or running a command on the command line.

ID PROM — In Sun™ workstations, a programmable read-only memory (PROM) that contains machine-specification information, such as serial number, Ethernet address, and system configuration information. See also boot PROM, EEPROM, NVRAM.

identifier — (1) The text string used as a label for indicating program variables or procedures.

(2) The name that identifies a device, such as a disk drive.

IESG — (Internet Engineering Steering Group) The executive committee of the IETF.

IETF — (Internet Engineering Task Force) The task force of the Internet Activities Board that addresses short-term engineering needs of the Internet.

IGP — (Interior Gateway Protocol) The protocol that enables the exchange or routing information between collaborating routers on the Internet. Examples of IGPs include Routing Information Protocol (RIP) and Open Shortest Path First (OSPF).

IHV — (independent hardware vendor) A third-party hardware manufacturer.

IM — (input method) The algorithm by which users enter the text of a language. Input methods differ for each language, depending on that language's structure and conventions.

image — A picture or graphic representation of an object.

image capture — The transducing of the information in a real image into the photographic or electronic medium.

image enhancement — The process of improving the appearance of an image by using techniques such as edge enhancement, gray-scale manipulation, smoothing, and sharpening.

image processing — One of the methods used to enhance or manipulate the characteristics of a scanned or digitized image for analysis. Typical image-processing techniques include filtering and thresholding.

image reconstruction — An imaging technology wherein data are gathered through methods such as CT-scan and magnetic resonance imaging (MRI), and then reconstructed into viewable images. See also slices.

image restoration The process of restoring an image to its original state by reversing the effects of degradations.

imaging The broad category of image-related computer technologies that includes computer graphics, image processing, image reconstruction, and scientific visualization. Imaging technologies capture, store, display, and print graphical images.

immediate mode A method for handling graphical data wherein the graphics library does not retain any copy of the data belonging to the picture on the graphics display. The application is responsible for storing (or regenerating) the data, in contrast to the display list method, in which the graphics library retains its own copy of the graphical data.

inactive Characteristic of a transaction resident in memory that has yet to be executed.

incremental dump A duplicate copy of the files that have changed since a certain date. An incremental dump is used for archival purposes. Contrast with full dump.

independent compilation The compilation of a multi-file program in which the compiler does not check for the consistent use of global names and types across different units.

index (1) A symbol, number, or word that checks for an item in an array or database.

(2) In computer graphics, a single value that is interpreted as an absolute value rather than as a normalized value in a specified range. A color index is the name of a color, which is dereferenced by the frame buffer hardware using a color map. See also normalize.

indexed color In computer graphics, a limited set of colors selected from a much larger color palette, which are indexed in a color look-up table or color map, and then accessed by their index numbers. Also called pseudo-color.

industry standard A process, protocol, or hardware specification that has been accepted and adopted by the computer industry. Standardization occurs through a rigorous ANSI and ISO procedure, or through industry-wide acceptance; for example, Ethernet.

inferior window In the X protocol, all the subwindows nested below a given window: the children, the children's children, and so on. Also called descendant window. See also children windows.

infinite light In computer graphics, a light source that is infinitely far from the surface that is being illuminated. Infinite light sources produce parallel light rays that are characterized by a direction only. See also ambient light, directional light, positional light, spot light.

inheritance The process of a widget being subclassed by another widget. The subclassed widget inherits operating characteristics and the resource set of its superclass.

init states In UNIX® System V, Version 4-based environments, one of seven initialization states or run levels that a system can run. A system can run only in one init state at a time.

initialization files In the UNIX® operating system, the "dot" files (files prefixed with ".") in a user's home directory that set the path, environment variables, windowing environment, and other characteristics that make UNIX function.

inline template A fragment of assembly language code that is substituted for the function call it defines, during the illuminating pass of the SPARCompiler™ family. Used, for example, by the math library in inline template files to access hardware implementations of trigonometric functions and other elementary functions from C programs.

inode In environments based on UNIX®, an entry in a designated area of a disk that describes where a file is located on that disk, the file's size, when it was last used, and other identification information.

input Information provided to a command, a program, a terminal, a user, and so on.

input area The place on the screen that accepts keyboard input.

input device A hardware device that enables the user to communicate information to the computer. Examples of input devices include the keyboard, mouse, track ball, light pen, and joystick.

input focus Obsolete term for input area.

input method server A process that provides input method service to X clients. X input methods can be implemented either as a stub communicating to an input server or as a local library.

input method status A change display consisting of text data or bitmap data. The IM status is displayed in the input method status region and is updated when input method conversion is enabled or disabled, or when input modes change.

input style The location of the pre-edit region during text input. In the on-the-spot input style, the pre-edit region is where the text will be inserted after it is committed. In the over-the-spot input style, the pre-edit region is above where text will be inserted. Root window refers to input methods that use a pre-edit window that is a child of the root window. See also pre-editing.

insert mode A mode in which text is added to a document or command line at the current cursor position, pushing all characters to the right, rather than overwriting them. For example, the “i” command switches the vi program to insert mode.

insertion point The point at which data typed on the keyboard, or pasted from a clipboard or a file, is displayed on the screen. In text, also called a cursor.

input side A direction of data flow moving from a driver toward the Stream head. Also called read-side and upstream.

instance An object owned by a specific class.

instance method Any method that can be invoked using an instance of a class, but not using the class name. Instance methods are defined in class definitions. See also class method.

instance variable Any item of data that is associated with a particular object. Each instance of a class has its own copy of the instance variables defined in the class. See also class variable.

instantiation (1) In the XGL™ library, the allocation of resources that occurs when a variable of an object type is declared.

(2) The process of creating a particular widget from a particular widget class. See also widget instance.

instruction stream A set of instructions that must be executed serially, although these instructions can be executed on different processors.

INTAP (Interoperability Technology Association for Information Processing) The technical organization that officially develops Japanese OSI profiles and conformance tests.

integer A whole number, such as 5, -66, or 831. In programming languages, integers are data types for counting or numbering. Also called integral number.

intensity In computer graphics, the brightness of a color value.

interactive Characteristic of an operating system, such as UNIX®. Capable of handling immediate-response communication between the user and the computer.

interface (1) (n.) A program that functions as the point of communication between a user and a computer.

(2) (n.) The point at which independent systems or diverse groups interact.

(3) (n.) The part of a program that defines constants, variables, and data structures, rather than procedures.

(4) (n.) The equipment that accepts electrical signals from one part of a computer system and renders them into a form that can be used by another part.

(5) (n.) Hardware or software that links the computer to a device.

(6) (v.) To convert signals from one form to another and pass them between two pieces of equipment.

interframe compression The compression that results from reducing the temporal (space and time) redundancy across a series of related frames of video. Contrast with intraframe compression. See also data compression, lossless compression, lossy compression.

interlace A scanning standard in which alternate raster lines of a frame are displaced vertically by half the scan line pitch and displaced temporally by half the frame time, to form an odd field and an even field. Also called 2:1 interlace.

intermediate system An ISO/OSI system that is not an end system, but which serves instead to relay communications between end systems. See repeater, router.

internationalization The process of altering a program so that it is portable across several native languages. This portability can support both different

character sets, such as the 8-bit ISO 8859/1 (ISO Latin 1) character set and the 7-bit ASCII character set, and different languages for documentation, help screens, and so on. See also 8-bit clean, localization.

internet Several networks that are interconnected by routers that effectively render the networks as a large virtual network.

Internet The vast international body of cooperating networks and organizations that agree to communicate using the standards and regulations approved by the IAB. The networks comprising the Internet run the Internet Protocol suite, more commonly known as TCP/IP. See also IAB.

Internet address See IP address.

Internet Protocol suite The network protocol suite developed by the United States Department of Defense that is used on the Internet. Note that this protocol suite was developed for the ARPANET, forerunner of the Internet. The prominent feature of this suite is the IP protocol. The Internet Protocol suite is more commonly called TCP/IP. See also TCP/IP.

Internet service provider A company providing an Internet package. This often includes a phone number access code, user name, and software—all for a provider fee.

interpolation In computer graphics, a method of determining intermediate values between those provided, such as shades of pink along a line (or across a polygon) between vertex colors of white and red. See also depth-cueing, shading.

interpreter A program that translates a high-level computer language (such as BASIC) into machine language, a line at a time. Interactive languages use interpreters instead of compilers.

interrupt (1) (n.) The signal that breaks off a command or process.

(2) (v.) To break off a command or other process, thus terminating it.

intraframe compression The compression of a single frame of video by reducing the spatial redundancy within the frame. Contrast with interframe compression. See also data compression, lossless compression, lossy compression.

inverse video The reversed light and dark portions of the screen.

I/O (input/output) The equipment used to communicate with a computer, the data involved in that communication, the media carrying the data, and the process of communicating that information.

I/O-bound (input/output-bound) Characteristic of programs with operations requiring excessive CPU wait time.

ioctl (I/O control) A UNIX® system call used for device control.

IONL (Internal Organization of the Network Layer) The ISO/OSI standard for the architecture of the network layer. The IONL divides the network layer into subnetworks interconnected by convergence protocols (internetworking protocols), resulting in a catenet or internet.

IP (Internet Protocol) The major network layer protocol in the Internet Protocol suite. IP describes the routing of packets, among its many tasks.

IP address In TCP/IP, a unique 32-bit number that identifies each host in a network.

IPC (interprocess communication) The process of sharing data between processes and, when necessary, coordinating access to the shared data.

IPI (Intelligent Peripheral Interface) A device-generic interface used for large-capacity, high-performance disks. The IPI supports disk transfer rates at 3Mbyte/sec and above.

IP network number The first octet or octets of an IP address that uniquely identify an IP network within an organization, and on the Internet, if that network has been registered with the Internet governing bodies. See IP address.

IRQ (interrupt request) A signal that a device requires CPU attention. See also interrupt.

IRTF (Internet Research Task Force) The task force of the Internet Activities Board that addresses research and development of the Internet Protocol suite.

ISDN (Integrated Services Digital Network) A communications technology offered by telephone carriers worldwide. ISDN combines voice and

digital network services in a single medium, offering customers digital data services and voice connections through a single "wire." CCITT specifies the standards that define ISDN. See also SunLink ISDN.

ISDN point-to-multipoint An ISDN configuration whereby multiple ISDN-compatible devices (as many as eight) are attached to a single ISDN line. Also called ISDN multipoint configuration. Contrast with ISDN point-to-point.

ISDN point-to-point An ISDN configuration whereby exactly one ISDN-compatible device is attached to a single ISDN line. Contrast with ISDN point-to-multipoint.

ISDN reference configuration An ISDN configuration model that describes the user-network interface in terms of predefined functional devices and reference points.

IS-IS (Intermediate-System to Intermediate-System protocol) The ISO/OSI protocol by which intermediate systems exchange routing information.

ISO (International Organization for Standardization) An international standards body that reviews and approves independently designed products for use within specific industries. ISO also develops standards for information exchange, such as the ISO/OSI model for computer networks. Compare to ANSI in the U.S. Also (incorrectly) called International Standards Organization.

ISO 9660 See CD-ROM, High Sierra specification.

ISP (Internet service provider) A company providing an Internet package. This often includes a phone number access code, username, and software—all for a provider fee.

ISV (independent software vendor) A third-party software developer.

item A menu control that initiates actions.

CHAPTER 11

J

JANET (Joint Academic Network) A U.K. university network.

Java™ programming language An object-oriented language developed at Sun Microsystems to solve a number of problems in modern programming practice. The Java language is used extensively within the HotJava™ browser.

job A user-defined task to be completed by a computer system.

job control program The specific instructions for the operating system, stating conditions necessary to run a job; this includes input and output requirements, among other details.

job number A number that the system assigns to each process running on that machine.

journal A chronological record of operations performed in a computer system.

JPEG (Joint Photographic Experts Group) A joint venture of the CCITT and ISO that developed a standard for compressing gray-scale or color still images.

jukebox A storage device for optical disk data. Typically contains one to four disks and loads them as needed.

jump table A data structure containing addresses of other routines in memory. An algorithm determines where to extract the data, then program control is transferred to that address.

JumpStart A type of installation that requires little user interaction.

CHAPTER **12**

K

Kbyte (kilobyte) A unit of measure equal to 1024 bytes.

Kermit A file transfer and terminal emulation protocol.

kernel The core of the operating system software. The kernel manages the hardware (for example, processor cycles and memory) and supplies fundamental services such as filing that the hardware does not provide.

kernel architecture The type of kernel on a system, such as sun4c for the SPARCstation™ system.

key (1) A button on a keyboard that represents a character.

(2) A character or characters that identify a record in a data file. A key field (one located in the same place in every record of a file or data set) has content that is the key for the record.

(3) Code for encrypting or decrypting data. See also encryption.

key binding The association of a keystroke with a particular behavior.

keyboard A commonly used alphanumeric input device.

keyboard accelerator A key or sequence of keys on the keyboard, or multiple clicks of mouse buttons, through which users can quickly perform specific menu or application functions without using a menu.

keyboard equivalent A specific default key sequence that provides functionality without requiring the display of a menu.

keyboard grab In the X protocol, a pointer grab that specifies that keyboard input is sent to a specific window (or client). See also button grab, mouse grab.

keyboard macro See macro.

key-encrypting key A key used to encipher and decipher other keys, as part of a key management and distribution system. Contrast with data-encrypting key.

key frame A video frame used in decoding a combined interframe compression and intraframe compression. A decoder cannot decompress most of the video frames without referring to preceding—and sometimes succeeding—frames. However, the first frame in a movie, and usually other frames, does not have interframe dependencies and can be decoded in isolation. These key frames not only start the movie, but enable the decoder to decompress other frames without playing the movie from the beginning. See also data compression.

keyword (1) A summarizing word or phrase in a document or record that is used in sorting and searching.

(2) A word or symbol that has a specific meaning in a programming-language statement. Also called a reserved word.

kHz (kilohertz) 1000 Hertz.

kill To terminate a process before it reaches its natural conclusion.

kilobaud 1000 baud (bits per second).

knot A scalar value—in addition to a control point—that influences a curve shape. It might be non-uniformly spaced in non-uniform rational B-spline (NURBS).

Korn shell In the UNIX® environment, this is a user interface shell developed by David Korn. It combines elements from the Bourne and C shells.

KWIC (key word in context) A permuted index offering lists of titles, with each of the major words as the first word, and the remaining words using key words or phrases.

CHAPTER **13**

L

label (1) Information written by the format program starting at cylinder 0 of a disk. The disk label describes the size and boundaries of the disk's partitions and its disk type.

(2) The name of a storage volume for which a mass storage device checks.

LAN (local area network) A group of computer systems in close proximity that can communicate by way of some connecting hardware and software.

lance Ethernet A 10-Mbps Ethernet interface based on the AMD LANCE (local area network for Ethernet) Am7990 chip.

landscape The orientation of a page or screen image that is wider than it is tall. Contrast with portrait. See also aspect ratio.

laser (light amplification by stimulated emission of radiation) (n.) A device that creates coherent light of precise focus.

laser printer A device that uses coherent light to cast an image onto an electrostatic drum, attracting toner and transferring the image onto paper.

latch A way to maintain an on or off or true or false state using a circuit.

latency The time lapse between an SBus master's request of the bus and the completed transfer.

layer (1) Windows and icons that overlap one another.

	(2) One of a set of services, functions, and protocols that span all open systems.
LCP	(link control protocol) Part of the point-to-point protocol (PPP) to establish, configure, and test data link connections.
leading	The white space between text lines.
leaf procedure	The outermost routines on the tree of a program, as a tree's leaf is at the end of a stem on the branch of a tree.
learn	(n.) A computer-aided instruction program provided with some versions of the UNIX® system.
legend	Obsolete term for label (usually refers to graphics).
level 0 dump	A full dump of a system's or file server's file system, usually performed once a month or just before updating the operating system or some other major system change.
level 3 dump	An incremental dump of a system's or file server's file system, usually performed once a week.
level 7 dump	A daily incremental dump of a system's or file server's file system. See dump.
level-triggered interrupt	A particular interrupt generated by a device. The device raises the voltage on a wire and then holds that voltage raised until the interrupt has been serviced and the device no longer needs to generate an interrupt. Contrast with edge-triggered interrupt.
lexical analysis	The process by which a stream of characters (often from a source program) is broken up into elementary words and symbols, called tokens. The tokens can include the reserved words of a programming language, its identifiers and constants, and special symbols such as =, :=, and ;.
LF	(linefeed) An instruction to a certain computer or printer to move down one line, without moving the cursor or print head. See also FF.
library routines	A series of SunOS™ functions that can be called by user programs written in C and other compatible programming languages.

light object In the XGL™ library, an object that defines a particular light source that can be used within a 3-D context. Four different types of lights are ambient light, directional light, positional light, and spot light.

light pen A light detection device used for graphical input. The user points the light pen at a location on the graphics display. When the electron gun illuminates the phosphor, the light pen detects the light and sends a signal to the workstation, which records the pixel event at that moment.

light source One of several types of light used by a lighting model. Light source types include ambient light, directional light, positional light, and spot light. The last two types are called local light sources.

lighting model See also shading method.

line (n.) A scan line (horizontal). Not to be confused with AC power line.

line buffering The buffering of output line-by-line.

line discipline A STREAMS module that performs termio(7) canonical and non-canonical processing. It shares some termio(7) processing with a driver in a STREAMS terminal subsystem.

line editor An editor that works on a line as the basic unit. Generally, you identify the line to change and then indicate the change desired. Contrast with visual editor.

line pattern object In the XGL™ library, an object that defines line style patterns, used when rendering vectors, curves, and edges.

line sync The sync signal pulse transition that defines the start of a scan line. Line sync in 525/59.94 and 625/50 systems is a pulse that remains at sync level for about 4.7 microseconds.

link (1) (n.) An entry in a directory file that links a user-assigned name for a file to the system's identification number for that file.

(2) (n.) A file name the user gives to a file. See also hard link, symbolic link.

(3) (v.) To join data or compiled modules to form an executable program.

link editing The process in which a symbol referenced in one module of a program is connected with its definition in another. In the C

compiler, programs are linked statically, when an executable is created, or dynamically, when it is run.

linked list A list within a program to data structures; pointers do the linking.

linker A program that converts data or compiled modules to a form that is executable. A linker can also create libraries.

list A control that contains elements from which the user selects. Also called selection list.

listenBSD An LP print service daemon that is run on a SunOS™ 5.x print server to "listen" for print requests from SunOS 4.x print clients on the network.

listenS5 An LP print service daemon that is run on a print server to "listen" for print requests from SunOS™ 5.x print clients on the network.

literal (1) A word or symbol in a program expressed as itself rather than as a reference to data.

(2) A representation of any numeric or character value.

loadable kernel module The software used to enhance the system kernel.

loading The process of putting the machine-language instructions of a program into memory.

local Characteristic of having limited scope. Contrast with global.

local file A file containing information specific to the machine where it resides. When using network information service (NIS), the local file is checked first before a corresponding global file is checked.

local host The CPU or computer on which a software application is running; the workstation. See also data host, database host, execution host, mail host, relay host.

locale A set of conventions that are unique to a geographical area and/or language, such as date, time, and monetary format.

localization The process of adding locale-specific components, translation, and language support to a product and packaging to meet regional market requirements. See also internationalization.

locked file (1) A file that is in use.

(2) A file that cannot be changed because of its usage.

locking In a relational database, the guarantee of read consistency by giving only one process at a time access to data; other processes must wait for access to the database.

LOFS (loopback file system) A file system type that lets the user create a new virtual file system. The user can access files using an alternative path name. For example, the creation of a loopback mount of `/` onto `/tmp/newroot`. The entire file system hierarchy looks like it is duplicated under `/tmp/newroot`, including any file systems mounted from NFS servers. All files are accessible either with a path name starting from `/`, or with a path name starting from `/tmp/newroot`.

logic 0 The logic state of a signal driven to VOL (or VOH if low-asserted).

logic 1 The logic state of a signal driven to VOH (or VOL if low-asserted).

logical disk A section of a formatted disk allocated by the software. Also called a partition.

logical function See ROP.

login (n.) The process of gaining access to a system.

log in (v.) To supply a user name and password to gain access to a system or desktop session.

login directory The directory that you work in after logging in. Usually, the home directory.

login name The name the computer system checks against to identify the user.

login prompt The string of characters that the system displays to let you know that it is ready to accept your user name.

login shell The name of the default shell that you use when you log in.

logout (n.) The termination of a desktop session.

log out (v.) To terminate or end access to a system or desktop session.

look-up choice region A screen region that displays alternate choices corresponding to the pre-edit string entered. The user selects the most appropriate look-up choice representation. See also pre-editing.

look-up table See color map.

lossless compression The compression of data that guarantees the original data can be restored exactly. This type of compression typically leads to compression ratios of about three to one. Some compression techniques, such as JPEG, combine lossy compression and lossless compression algorithms. See also data compression, interframe compression, intraframe compression, predictive encoding.

lossy compression A type of compression that results in the loss of some of the original data. Lossy compression trades the potential for the loss of some image quality for the opportunity for greater compression. Whereas lossless compression results in a compression ratio of about 2:1, lossy compression of video data can lead to ratios of between 10:1 and 50:1 without visibly degrading image quality. JPEG and MPEG are examples of lossy compression techniques. See also data compression, interframe compression, intraframe compression.

low-asserted The property of a signal to indicate that its logic polarity is the opposite of its physical polarity.

low-level software Generally, the software that "talks" directly to the processing hardware. Programming with low-level software gives the programmer more control, but it also requires special expertise, and tends to be more time consuming than working with high-level software such as graphics library standards.

low resolution (lo-res) The distinguishing feature of a computer screen with few pixels. Images appear poorly defined. A high-resolution screen is clear, with fine detail.

low watermark See watermark.

lower Stream A Stream connected below a multiplexer pseudo-device driver by means of an I_LINK or I_PLINK ioctl. The far end of a lower Stream terminates at a device driver or another multiplexer driver.

lpvi (1) The video port on the SPARCprinter™ SBus printer card.

(2) The device driver that controls the video port on the SPARCprinter SBus printer card.

LSI (1. large-scale integration) (n.) The process of placing from 3,000 to 100,000 transistors on one chip. See also VLSI.

(2. large-scale-integration) (adj.) Characteristic of a chip containing from 3,000 to 100,000 transistors.

luminance (1) The generic flux from a light-emitting or light-reflecting surface. The subjective response to luminance is brightness.

(2) The specific ratio of color primaries that provides a match for the white point in a specified color space.

(3) The portion of a composite signal that carries brightness information. See also chrominance.

LUN (logical unit number) See major/minor device numbers.

LUT (look-up table) See color map.

LWP (lightweight process) A class of processes that share resources with each other and therefore use fewer resources than ordinary processes.

CHAPTER **14**

M

MAC (multiplexed analog component) A color standard that transmits three color components in time-compressed serial analog form.

machine address See absolute address.

machine-collating sequence An extended alphabetical sequence that encompasses uppercase letters, lowercase letters, numerals, punctuation marks, and various other characters recognized by the system.

machine language The basic set of instructions for a given computer. A binary code represents these instructions internally.

macro (1) A user-defined keyboard shortcut that types text or plays back a sequence of commands.

(2) In a programming language, a compound instruction composed of simpler instructions.

macroblock In MPEG terminology, a 16-by-16 block of samples from a video frame. This is the unit of data associated with motion information.

macro processor A program that runs instructions without an assembler.

magic cookie See MIT-MAGIC-COOKIE-1.

magic dictionary A NeWS™ system dictionary, similar to a PostScript™ dictionary, containing keys with predefined names. The developer can change the value associated with many of the keys; other keys are read only. Unlike a PostScript dictionary, the developer can add new keys to magic dictionaries.

mail A computer system facility that enables the sending and holding of messages through a computer.

mailbox A disk directory designated for receiving email.

mail client A system that does not provide mail spooling for its users. Mail is spooled on a mail server.

mail gateway A machine that connects two or more email systems (especially dissimilar email systems on two different networks) and transfers messages between them. Sometimes the mapping and translation can be complex, and generally require a store-and-forward scheme whereby the message is received from one system completely before it is transmitted to the next system and after suitable translations.

mail host The main email system on a network that receives and distributes email outside of the network or the domain. A mail host can also be a mail server. See also database host, data host, execution host, local host, relay host.

mail server A system that stores mailboxes in a mail directory. A mail server can also serve as a mail host. See also mail client.

mail services The services provided by a set of programs and daemons that transmit email messages between systems and distribute them to individual mail boxes.

mailer A protocol that specifies the policy and mechanics used by the Solaris™ sendmail program when it delivers the email.

mailer daemon See daemon.

mailing list (1) An email address that is an alias for many other email addresses.

(2) The people who receive your email when you send it to such an address.

major/minor device numbers A numbering sequence for devices connected to the computer. Also called LUN.

makefile A file used by the make command that describes files which make must process and programs that make must run.

manager widgets A class of widgets that contain and manage other widgets.

man pages UNIX® online documentation.

map (1) (n.) A file used by NIS that holds information of a particular type; for example, the password entries of all users on a network or the names of all host machines on a network.

(2) (v.) To assign a new interpretation of a terminal key. For example, in vi, you can map, the @ key to represent the sequence a-Esc-j.

mapping In the Common Desktop Environment (CDE), an action that invokes another action rather than containing its own EXEC-STRING. The file /usr/vue/types/user-prefs.vf contains the built-in mapped actions. For example, the built-in CDE Mail action used by the front panel is mapped to the Elm action.

marker See polymarker.

marker object In the XGL™ library, an object that defines markers.

marker primitive In the XGL™ library, an image that is drawn at a particular point in space.

mass storage device A device that reads and writes data on a mass-storage medium.

master An SBus device capable of initiating an SBus transaction. The CPU master is a host CPU distinguished from a more generic SBus master. The DVMA master explicitly excludes CPU masters. Any SBus master can communicate with any other slave on the same bus, regardless of system configuration.

master driver A STREAMS-based device supported by the pseudo-terminal subsystem. It is the controlling part of the pseudo-terminal subsystem (also called ptm).

master server The server that maintains the master copy of the network information service database. It has a disk and a complete copy of the operating system.

maximize To enlarge a window to fill a workspace. Typically, a maximize push button is located in the upper-right corner of a window frame.

Mbyte (megabyte) A unit of measure roughly equal to one million bytes (exactly 1,048,576 bytes), 1024 Kbytes; or 1000 Kbytes.

MC (model coordinates) The coordinate system used for describing a single object (a graphics entity). When each object is described in its own model coordinate space, all are mapped to one world coordinate space.

MCAD (mechanical computer-aided design) A specialized computer graphics market for the design of mechanical structures, such as automobiles, airplanes, and their parts.

MDB (multiple-device boot) A diskette used to boot from a CD-ROM or from a network.

medical imaging A field that uses various image-generation techniques, such as computed axial tomography (CAT-scan), magnetic resonance imaging (MRI), and X-ray to collect image samples from a patient's internal tissue for analysis.

megaflops See MFLOPS.

memory management The system functions including the hardware's page mapping and protection.

memory raster In computer graphics, a raster object that designates a rectangular area of non-screen memory.

menu A program display that enables you to interact with a computer or device. Most menus provide a list of actions or commands and, where available, keyboard shortcuts.

menu bar The part of the application window between the title bar and the work area where menu names are listed.

mesh A graphics object composed of, typically, triangles or quadrilaterals that share vertexes and edges, and thus may be transmitted in a compact format to a graphics accelerator.

message (1) The information generated by an application that indicates a process's status.

(2) One or more linked message blocks. A message is referenced by its first message block and its type is defined by the message type of that block.

message block In STREAMS programming, a triplet consisting of a data buffer and associated control structures, an msgb structure, and a datab

structure. In a Stream, it carries data or information, as identified by its message type.

message catalog A file of message strings, separated from an application, with an indexed internal structure. The message catalog contains program messages, command prompts, and responses to prompts for a specific application.

message log A history of status messages.

message queue A linked list of zero or more messages.

message type A defined set of values identifying the contents of a message.

metacharacter A character having a special meaning to the UNIX® system. For example, the UNIX shell interprets the ? character to represent any single character. See also wildcard.

metafile A device-independent file for storing a display.

meta key On the Sun™ keyboard, the key labeled with the diamond symbol. On x86 systems, the right Control key.

method A function defined in a class. See also class method and instance method.

MFLOPS (millions of floating-point operations per second) A unit of measure of execution speed that rates the floating-point performance of a computer. See also FLOPS, MIPS, SPECmarks.

MHz (megahertz) One million Hertz.

microfloppy disk See diskette.

MIDI (Musical Instrument Digital Interface) A note-oriented control language for specifying music. MIDI data consists of codes specifying notes and timing. These codes can be generated by or output to MIDI-compatible devices, such as keyboards or synthesizers. MIDI applications, generally found in the computer music industry, are used for studio control and audio production.

MII (Media Independent Interface) A 40-pin miniature-D connector that provides the electrical interface between some Sun™ systems and 10BASE-T or 100BASE-T Ethernet network transceivers.

MILNET (military network) Originally part of the ARPANET, MILNET was partitioned in 1984 to provide military installations with reliable network service, while the ARPANET continued to be used for research. See DDN.

minimize To replace a window with an icon. The push button that minimizes a window is located near the upper-right corner of the window frame.

MIPS (millions of instructions per second) A unit of measure of execution speed that rates the performance of a computer CPU. See also FLOPS, MFLOPS, SPECmarks.

MIT-MAGIC-COOKIE-1 (developed by the Massachusetts Institute of Technology) One of the authentication protocols that the X11/NeWS™ system uses to authenticate client connections. At server start-up, a magic-cookie is created for the server and the user who started the system. On every connection attempt, the user's client sends the magic cookie to the server as part of the connection packet. The magic cookie is compared with the server's magic cookie. A match enables the connection; a mismatch denies it. Contrast with SUN-DES-1.

MMCodec An audio coder-decoder chip that handles the digital-to-analog and analog-to-digital conversions for the multimedia interface on Sun™ workstations.

MMU (memory management unit) See also physical address space, virtual address.

mnemonic key A key that represents the first letter of a command and is thus easy to remember. It is generally used with a modifier, such as Control or Shift, as a keyboard accelerator. For example, Control-P could mean print.

mnemonic symbol A symbol that elicits a memory; for example, an abbreviation such as "int" for "integer."

model transform In computer graphics, the composite of the local model transform with the global model transform. It is used in mapping geometric primitives defined in model coordinate space to WC space.

modeling The method of creating an object in computer graphics through computational descriptions of the object's polygonal makeup, surface shape, and attributes.

modem (modulator/demodulator) A device that enables a machine or terminal to establish a connection and transfer data through telephone lines. See also baud rate.

modem eliminator See null modem cable.

modifier key A key that when pressed and held along with another key changes the meaning of the second key; for example, Control, Alt, and Shift.

module A defined set of kernel-level routines and data structures that process data, status, and control information on a Stream. It is an optional element, but many modules can be in one Stream. A module consists of a pair of queues (read queue and write queue), and it communicates to other components in a Stream by passing messages.

molecular modeling A sophisticated chemical engineering application using computer graphics to simulate chemical reactions in molecules.

molecule A group of XIL™ library atoms (functions) that are grouped to enhance performance by eliminating redundant operations.

monadic See unary.

monitor (1) The video display that is part of a workstation. It is attached to the workstation by a cable.

(2) The program in the workstation PROM. The PROM program provides a limited set of commands that can be used before the kernel is available.

monochrome A monochrome monitor displays one foreground color and one background color. The most common combination is white on black. Other color combinations are black on white and green on black. Non-color screens showing shades of gray are gray-scale screens, not monochrome screens.

Mosaic The first widely used World Wide Web (WWW) browser that provided easy access to the data stored on the Internet. Mosaic was written by an NCSA team. See also HotJava™ browser.

motherboard (1) The main circuit board of a computer. The motherboard contains slots for plugging in other boards for functions such as memory, controllers, video, and so on. A motherboard usually contains the CPU, memory, BIOS, ports, controllers, and so on. See also daughterboard.

(2) In SBus terminology, a circuit board containing the central processor, SBus controller, and any SBus expansion connectors.

motion compensation In the MPEG and H.261 encoding standards, the approach to interframe compression that is based on the assumption that a macroblock in the frame being encoded can be represented mostly as a translation of a macroblock in a previous frame. That is, for the current macroblock, the encoder specifies one or two reference macroblocks (one from a previous frame and possibly a second from an ensuing frame) and one or two motion vectors that indicate how far and in which direction the macroblock has moved. See also data compression.

motion estimation The technique used to calculate the motion vectors in motion compensation. These motion vectors indicate how far and in which direction a macroblock has moved from one video frame to another. The MPEG and H.261 encoding standards do not dictate how these vectors are calculated.

motion-image encoding See interframe compression.

mount The process of accessing a directory from a disk attached to a machine making the mount request or remote disk on a network. See also unmount.

mount point A workstation directory to which you mount a file system that exists on a remote machine.

mounting The process of providing access to a file system over the network by executing the mount command.

mouse An input device that is connected to the workstation. The mouse determines the location of the pointer and thus, the active window in a window system.

mouse grab In the X protocol, a pointer grab that specifies that all mouse input is sent to a specific window (or client). See also button grab, keyboard grab.

movie A contiguous series of video frames (and optionally synchronized audio) that are displayed fast enough to provide the illusion of motion. A frame rate of 30 frames per second is a typical target for a movie.

MP (multiprocessor) A computer using two or more nearly equal processing units under integrated control.

MPEG (Moving Picture Experts Group) A group that has developed standards for compressing moving pictures and audio data and for synchronizing video and audio datastreams. The MPEG standard is similar to CCITT H.261 encoding, with compression rates in the range of 1-to-1.5 Mbits per second. MPEG images are 352 by 240 pixels. See also data compression.

MQH (Memory Queue Handler) On Sun™ server systems, the device on the system board that provides the interface between the system board SIMMs and the backplane XDBus. One MQH is on a system board.

MRI (magnetic resonance imaging) A medical imaging technique used for image capture. Tissue area is simultaneously subjected to electromagnetic radiation and a magnetic field. Sample data slices are gathered and later reconstructed into a composite image for further processing and analysis.

MSI (1. medium-scale integration) (n.) The process of placing from 100 to 3,000 transistors on a chip. See also LSI.

(2. medium-scale-integration) (v.) Characteristic of a chip containing from 300 to 3,000 transistors.

MSS (mass storage subsystem) An early version of the Sun™ pedestal disk storage system.

MTA (message transfer agent) An ISO/OSI application process that stores and forwards messages in the X.400 message handling system. Compare with Internet mail agent.

MTBF (mean time between failures) The average time a component can operate without a failure. The MTBF is the number of failures divided by the number of hours the component has operated.

MTTR (mean time to repair) The average time required for corrective maintenance.

multibit raster A raster that has more than one bit plane. The number of colors or gray-scale values that can be contained in the raster increases exponentially with an increase in the number of bits per pixel assigned to the raster. An 8-bit raster can hold 256 colors or

gray-scale values, and a 24-bit raster can hold more than 16 million values.

Multibus The Intel proprietary bus with specific board dimensions and standards.

multibyte character A character whose codepoint is stored in one or more bytes. It differs from wide-character encoding in that the number of bytes representing a character can vary.

multiclick To click the mouse button rapidly a specified number of times. Multiclicking is usually an accelerator for functions that can be accessed in other ways.

multimarker See polymarker.

multipart document A document that contains one or more attachments.

multiple terminal interface See ALM.

multiplexer A STREAMS mechanism that allows messages to be routed among multiple Streams in the kernel. A multiplexing configuration includes at least one multiplexing pseudo-device driver connected to one or more upper Streams and one or more lower Streams.

multiscan monitor A type of monitor that accepts input signals of varying frequency and enables the display of varying screen resolutions or of varying refresh rates. Sometimes called a digital monitor; that is, one that has a microprocessor that will accept input signals for more than one frequency.

multitasking (1) (n.) Enabling more than one user to access the same program at the same time.

(2) (adj.) Characteristic of the concurrent execution of two or more tasks by a computer.

multithreading A technique that enables multiprocessing applications to run more efficiently by breaking sequences of instructions (threads) into multiple sequences that can be executed from the kernel simultaneously. See also asymmetric multiprocessing, symmetric multiprocessing.

multiuser system A network system that is used by two or more people within a given time frame (usually in a serial fashion). Contrast with single system.

MUX See multiplexer.

MXCC (Module XBus Cache Controller) On Sun™ server systems, a device located on the processor module that controls the flow of data between the XBus and the module cache RAM and processor chip.

CHAPTER 15

N

NAK (negative acknowledge character) A control code returned by a receiving station indicating that a station with an established connection has sent incorrect information.

name A string associated with a widget instance. Used to specify resource values in a resource file.

named pipe A first-in-first-out (FIFO) file. A UNIX® System V process can open the FIFO file, using it for communication just like a pipe but between possibly unrelated processes.

named Stream A Stream, typically a pipe, with a name associated with it through a call to `fattach3C()` (a mount operation). A named Stream, unlike a named pipe (FIFO) is bidirectional. Also, a named Stream need not refer to a pipe but can be another type of Stream.

NAMEFS A pseudo file system used mostly by STREAMS for dynamic mounts of file descriptors on top of files.

namespace The space from which an object name is derived and understood. Files are named within the file namespace, printers are named within the printer namespace.

namespace manager The code that matches client-supplied arguments with the attributes of entries in a table.

namespace table The place where all namespace information is stored, for use by the classing engine as well as a namespace manager. Each namespace

table consists of entries (rows) and each entry consists of a set of named attributes.

NaN (not a number) A symbolic entry that is encoded in floating-point format.

NAND A logical operator that assures that, given the property that P, Q, and R are statements, the NAND of P, Q, R,... is true if at least one statement is false, false if all statements are true.

navigation keys The keyboard keys used to move the current location of the cursor. These include the arrow keys (with or without the Control key); the Tab key (with or without the Control or Shift keys); the Home and End keys (with or without the Control key); and the PgUp and PgDn keys.

NCSA (National Center for Supercomputer Applications) The University of Illinois at Urbana-Champaign developers of the original NCSA Mosaic browser.

NDC (normalized device coordinates) The coordinate system between the user's WC and the graphics system's physical device coordinates in the viewing pipeline. For each axis in the coordinate system, the normalized device coordinates are typically sized so that objects within that coordinate system range from -1.0 to 1.0.

nearest-neighbor interpolation A method that the XIL™ library uses to check that the value of an input image at nontnteger coordinates is the value of the pixel closest to a targeted point. This type of interpolation is fastest, but can introduce artifacts in the output image; for example, smooth lines in the input image might display as jagged lines in the output. Also called zero-order interpolation.

net number See network number.

netgroup A network-wide group of machines granted identical access to certain network resources for security and organizational reasons.

network Technically, the hardware connecting various systems, enabling them to communicate. Informally, the systems so connected.

network administration Tasks of the person who maintains a network, such as adding systems to a network or enabling the sharing between systems.

network administrator The person who maintains a network.

network layer In the ISO/OSI model of network standards, the third layer, which enables routing and switching blocks of data between two devices that support transport layer protocols over a connection. See also data-link layer, transport layer.

network mask A number used by software to separate the local subnet address from the rest of a given Internet protocol address.

network number A number that the network information center (NIC) assigns to your network. The network number forms the first part of a host's Internet protocol address.

network path A series of machine names used to direct mail or files from one user to another.

network role The function that a system has on a network, such as master server, slave server, dataless client, or diskless client.

networked session A session managed across multiple systems. Using a networked session enables the same session to be seen, regardless of which system was used to log in. It also provides a single home directory across multiple systems.

newline character An unseen character that marks the end of a line of text in a document. It signals to a printer or screen to break a line and start a new one. See also EOF, FF, LF.

NeWS™ system (network extensible window system) A window system based on PostScript™ that Sun developed and licenses.

newsgroups The aggregates of email messages sorted by topic, usually sent to thousands of users worldwide.

NeWSprint™ package The software for printing from Sun™ workstations.

NFS™ system A Sun distributed file system that provides transparent access to remote file systems on heterogeneous networks.

nibble A half byte (4 bits).

NIC (1. network information center) Originally, a single NIC at SRI International served the ARPANET (and later the defense data network [DDN] community). Local, regional, and national networks

worldwide now operate NICs, which provide such services as user assistance, document service, and training.

(2. network interface card) See also PCI bus.

niceness value The priority level of a UNIX® process. The niceness value ranges between 0 and 20, with 0 the system default priority and 20 the lowest priority. The higher the number, the slower the process runs. You set the niceness value with the UNIX `nice` command. You also can check the niceness values of processes with the `ps -l` command (the value displays under the NI heading).

NIS The SunOS™ 4.x Network Information Service. A distributed network database containing key information about the systems and the users on the network. The NIS database is stored on the master server and all the slave servers. See also NIS+.

NIS+ The SunOS™ 5.x Network Information Service. NIS+ replaces NIS, the SunOS 4.x network information service.

NIS domain A master set of network information service (NIS) maps maintained on the NIS master server and distributed to that server's NIS slaves.

NIS maps Database-like entities that maintain information about machines on a local area network. Programs that are part of the NIS service query these maps. See also NIS.

NIST (National Institute of Standards and Technology [formerly NBS]) See Workshop for Implementors of OSI (OIW).

NOC (network operations center) A center that operates a production network. Tasks include monitoring and control, troubleshooting, and user assistance.

node An addressable point on a network. Each node in a Sun™ network has a different name. A node can connect a computing system, a terminal, or various other peripheral devices to the network.

noise The irrelevant data that hamper the recognition and interpretation of the data of interest.

noninterlace A display refresh of all raster lines on the CRT during each scan. Contrast with interlace.

nonvolatile memory (1) That memory which does not lose its contents when the power is off; for example, EPROM, flash memory, NVRAM, PROM and ROM.

(2) Volatile memory that is always connected to a battery.

NOR A logical operator that assures that if P, Q, and R are statements, ..., the NOR of P, Q, R, ... is true if all statements are false, false if at least one statement is true.

normal (1) (adj.) Perpendicular or orthogonal. At right angles to another line segment, object, or plane.

(2) (n.) A surface normal. The vector perpendicular to a surface at a specific point.

normalize To adjust the fixed-point and exponent parts of a floating-point representation so that it meets the requirements of a specific range. Also called standardize.

normal line sync A line sync pulse that is the same duration as the line sync pulse on a line containing picture information. In interlaced systems, equalization and broad pulses during the field sync interval are used as line syncs, but have a different duration than normal line syncs.

normal number In IEEE arithmetic, a number with a biased exponent that is neither zero nor maximal (all ones), representing a subset of the normal range of real numbers with a bounded small relative error.

normal vector A vector perpendicular (or orthogonal) to a surface or plane at a specific point.

NOT A logical operator that assures that if P is a statement, the NOT of P is true if P is false, false if P is true.

NTSC (National Television Standards Committee) (1) The group that in 1941 established 525-line, 60-Hz field rate, 2:1 interlaced monochrome television in the U.S. Now called NTSC-I.

(2) The group, more properly called NTSC-II, that in 1953 established 525-line, 59.94 Hz field rate, 2:1 interlaced, composite color television signals in the U.S.

(3) A method of composite color encoding based on quadrature modulation of I and Q color difference components onto a color subcarrier and adding the resulting chroma signal to luminance.

Used only in 525/59.94 systems, with a subcarrier frequency of 455/2 times the horizontal rate (about 3.579545 MHz).

NUL (null character) An invisible character with an internal code of 0 that occupies no space if printed. Not to be confused with a blank, which is invisible but occupies a space.

null modem cable A cable that connects two computers by their communications ports to simulate a file transfer operation as if modems and a telephone system were used. The cable crosses the sending wire with the receiving wire.

NURBS (nonuniform rational B-spline) A curve definition method based on the B-spline curve, which offers additional flexibility through knots along the spline. Some knots can have more weight added (like a magnet) to pull the curve toward those knots. This feature enables you to create 2-D curves and 3-D surfaces generalized from those curves with precision.

NVRAM (nonvolatile random access memory) A type of RAM that retains information when power is removed from the system. See also EEPROM, boot PROM, ID PROM, nonvolatile memory.

NVSIMM A nonvolatile single inline memory module (SIMM) that incorporates a battery on the device to prevent data loss in a power failure. Battery current is shared among a group of NVSIMMs. This feature prevents memory failure if one battery fails.

CHAPTER **16**

O

object (1) A programming unit consisting of unchangeable code and changeable data that create a programmatic entity with which to construct programs. A widget is an object.

(2) A graphics entity. A single image or model defined in 2-D or 3-D space.

object file A file containing machine-language code. An executable file.

object layout The mechanism by which the position and dimension of objects containing strings can be modified to accommodate localized strings.

object-oriented design A software design method that models the characteristics of abstract or real objects using classes and objects.

occlusion The result of an object or a portion of an object surface being drawn behind another solid object or opaque surface. An occluded object or window is one that is hidden from view.

octet A byte composed of eight binary elements.

odd field In a 2:1 interlace system, the field that begins with a broad pulse coincident with line sync. See also even field.

OEM (original equipment manufacturer) A manufacturer that sells equipment for resale under an end-equipment manufacturer's trademark or name.

OIW See Workshop for Implementors of OSI (OIW).

OLIT (OPEN LOOK Intrinsics Toolkit) An X Window system-based widget set and library used to create applications using the OPEN LOOK graphical user interface.

On Item help A form of help in which an application provides on-screen information about a particular command, operation, dialog box, or control.

ONC+™ services The Sun™ distributed services extracted from the Solaris Operating Environment™ including RPC and NIS+.

online The state of being connected to the system and in operation.

online documentation A disk-based form of documentation provided by many application programs, consisting of advice or instructions on using program features. You can access online documentation directly without the need to interrupt work or page through a manual. See AnswerBook online documentation.

OpenBoot In SBus profiles, OpenBoot is the facility by which the FCodes program can interrogate the host and determine the state of various parameters it addresses.

open collector A bipolar bus driver driven only low. See also open drain.

open drain A field-effect transistor (FET) bus driver driven only low. See also open collector.

option A variation on or modification to a command, usually requested by use of a flag.

optional argument An argument accepted but not required by a command.

ordinary file In UNIX®, a file containing text data that is not executable. Contrast with executable file.

origin The location in Cartesian coordinates from which the axes that define 2-D and 3-D space originate. This is the location (0, 0) in 2-D graphics and (0, 0, 0) in 3-D graphics. The positions of graphical objects can be described in absolute terms, relative to the origin.

orthogonal Characteristic of a perpendicular or normal line.

OS (operating system) A collection of programs that monitor the use of the system and supervise the other programs executed by it.

OSI (Open Systems Interconnection)

OSPF (Open shortest path first) An IGP specified by the IETF.

output The information produced by a command, program, or such, and sent elsewhere; for example, to the terminal, to a file, or to a line printer.

output primitive The simple graphical objects provided by a graphics library for use in the construction of more complex objects. GKS output primitives include polyline, polymarker, text, fill area, cell array, and generalized drawing primitive (GDP). PHIGS output primitives include polyline, polymarker, text, fill area, fill area set, cell array, and GDP. PHIGS PLUS adds more sophisticated primitives, such as quadrilateral mesh and NURBS curves and surfaces.

output redirection See redirection.

output side See downstream.

overlay (1) A code fragment that is loaded into memory, replacing any previously loaded code fragment.

(2) A graphics image superimposed over a portion of another image; for example, when one window partially occludes another window. See occlusion.

overlay planes The bit planes in the frame buffer can be assigned as overlay planes to enable images to be superimposed over one another without damaging the image in the frame buffer. The application does not need to redraw the picture in the frame buffer when another window overlays it.

overrun See also I/O bound.

overwrite To write on an existing file, eliminating any previous text or graphics.

owner (1) The person who created a file or directory.

(2) The attribute of a file or directory that specifies who has owner permissions.

CHAPTER 17

P

packages A collection of software that is grouped into a single entity for modular installation. See also cluster, software distribution.

packet A group of information in a fixed disk format that is transmitted as a unit over communications lines.

packet mode A feature supported by the STREAMS-based pseudo-terminal subsystem. It is used to inform a process on the master side when state changes occur on the slave side of a pseudo-tty. Packet mode is enabled by pushing a module called pckt on the master side.

padding The process of inserting bytes into a data stream to maintain alignment of the protocol requests on natural boundaries. Padding increases ease of portability to some machine architectures.

page (1) (n.) A block of 8192 contiguous byte locations used for memory mapping and protection.

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

(3) (v.) To advance text displayed in a window by one full screen at a time, usually with a scroll bar.

page frame The page-sized unit into which a physical address space is conceptually divided. See also paging, virtual memory.

paging The process of replacing the contents of a page frame with different pages. A page is a fixed-size unit of memory. See also page frame.

PAL (phase alternate line) A composite color standard similar to NTSC, except that the v-axis subcarrier reference signal inverts in phase at the horizontal line rate.

palette The range of available elements, usually colors.

panic message The message printed on a system's console when it fails.

PAP (Password Authentication Protocol) A security provision in point-to-point protocol (PPP). See PPP authentication.

parallel projection The process of projecting an image from the 3-D view volume onto the 2-D graphics display with parallel projectors. Objects at any distance from the eye point maintain their apparent size under parallel projection. These projectors are orthogonal to the 2-D plane. See also perspective projection.

parameter A special type of variable used within shell programs to access values related to the arguments on the command line or the environment in which the program is executed.

parent directory A directory containing the working directory or the directory of interest.

parent process A process from which a child process is started.

parent structure The first of two or more connected objects in a hierarchical data structure system, such as PHIGS. A parent structure invokes its child structure, which inherits the parent's attributes.

parent widget (1) In the OLIT class hierarchy, a widget's superclass.

(2) In an application, a widget is the child of some parent widget. Parent widgets manage the size and location of their children and control input to their children by controlling the input focus. An application organizes widgets into a hierarchy of children and parents. See also child widget.

parent window In the X protocol, the reference window from which other children windows are created.

parity A method used by a computer for checking that the data received matches the data sent.

particle system A graphical production of amorphous substances, such as clouds, smoke, and fire. Each substance is a collection of particles that can be manipulated dynamically for animation.

partition The unit into which the disk space is divided by the software.

passive grab In the X protocol, keyboard keys, the keyboard, pointer buttons, pointer, and server can be "grabbed" for exclusive use by a client, usually for a short time. A passive grab causes an active grab to begin when a certain key or button combination is pressed. The grab is active when the key or button is actually pressed.

password aging A feature of the Solaris™ operating environment that assigns a limited lifetime to each user password to ensure secrecy.

patch (1) A quick modification to a routine or an object program.

(2) In computer graphics, a portion of an object surface defined by some number of points. Patches are separately defined and then grouped to form the shell of an object. Surface patches can either be planar (flat) or curved.

path name The location of a file or directory in the UNIX® file system.

pattern recognition In image processing, the analysis, description, identification, and classification of objects or other meaningful regularities.

pause To temporarily suspend a process without ending it.

PC (program counter) A register that contains the address (location) of the instruction to be executed next in the program sequence.

PC profiling data The performance data that shows how much time the application accrues in its execution of functions, modules, or segments. It also reveals what functions, modules, or segments are consuming the most time and the least time.

PC and stack profiling data The performance data that shows how much time is accrued by calls in the application that address other calls. It provides a more detailed analysis than PC profiling data, yet it does include PC profiling data.

PCFS (PC file system) A file system specification that provides the capability to read and write files in DOS format on the SPARC

system internal floppy drive. The PC file system is mounted to the workstation's file system as `/pcfs`.

PCI (protocol control information) The protocol information added by an OSI entity to the service data unit passed down from the layer above, which together form a protocol data unit (PDU).

PCI bus A 32-bit, Peripheral Component Interconnect bus providing a maximum 132–Mbyte/sec data transfer rate. PCI devices have autoconfiguration capabilities and do not have to be configured by users.

PCMCIA (Personal Computer Memory Card International Association) An organization that supports several standards for a compact hardware interface that accepts a variety of devices.

PDU (protocol data unit) The ISO/OSI term for packet. A PDU is a data object exchanged by protocol machines (entities) within a given layer. PDUs consist of both protocol control information (PCI) and user data.

peer In networking, any functional unit in the same layer as another entity.

permanent file The data stored permanently in the file system structure. To change a permanent file, you use a text editor, which maintains a temporary work space or buffer apart from the permanent files. After you have made changes to the buffer, you must write the changes to the permanent file.

permissions The attribute of a file or directory that specifies who has read, write, or execution access.

persistent link In STREAMS, a connection below a multiplexer that can exist without having an open controlling Stream.

perspective projection The process of projecting an image from the 3-D view volume to the 2-D graphics display with projector lines that converge at the eye point. Objects appear to diminish if they are further from the eye point.

PEX The PHIGS extension to X; a protocol for 3-D graphics in a network window system that supports both PHIGS and PHIGS PLUS features.

PHIGS (Programmer's Hierarchical Interactive Graphics System) An international standard 3-D graphics library consisting of a graphical tool set for application developers. PHIGS uses hierarchical data structures. You can create, alter, manipulate, and store objects dynamically. PHIGS is easily ported to many graphics systems.

PHIGS PLUS (Programmer's Hierarchical Interactive Graphics System Plus Lumiere Und Surfaces) An extension to PHIGS that includes additional capabilities, such as lighting from single and multiple sources, depth-cueing, NURBS, and complex geometric primitives. PHIGS PLUS is a proposed standard, currently under review.

PHIGS structures See hierarchical data structures.

Phong lighting The illumination on a surface achieved by calculating a dot-product and diffuse color at each vertex. These values are interpolated across the facet with reflectance value factored in at each pixel.

Phong shading A sophisticated shading method, developed by Phong Bui-tuong. By calculating the light at many points across an object surface, Phong shading produces highly realistic effects and more accurate specular highlights than Gouraud shading.

phosphor A red, green, or blue dot that makes up a pixel. See also luminance.

physical address space The set of possible 22-bit physical addresses that can refer to locations in memory (memory space) or I/O space (device registers).

physical block See block.

physical layer In the ISO/OSI model of network standards, the first layer, which supplies the mechanical, electrical, and procedural means of establishing, maintaining, and releasing physical connections. See also session layer.

physical memory Main memory. The memory connected to the processor that stores instructions, which the processor directly fetches and executes, and any other data the processors must manipulate.

pica A unit of measure used in printing. There are six picas to the inch. Each pica contains 12 points.

pick aperture In computer graphics, the area (2–D) or volume (3–D) used to test primitives for picking.

pick ID In computer graphics, the value used to identify a primitive that has been picked.

picking A feature of a graphics library that enables you to select primitives and objects with a pointing device.

picture line A raster line that might contain picture information (possibly black).

PID (process identification number) A unique, system-wide, identification number assigned to a process. Also called process ID, process number.

ping (v.) To test the reach of destinations by sending them an ICMP: "Ping host X to see if it is up!"

pipe (1) (n.) The software connection between two programs.

(2) (n.) The UNIX® operator (|) that makes the output of one command or program into the input of another.

(3)(v.) To make the output of one command or program into the input of another.

pipeline The program linkage established by performing one or more pipes.

pipelining A hardware feature enabling operations to reduce to multiple stages, each of which takes (typically) one cycle to complete.

pixmap (1) The array of values in the frame buffer for a given picture, particularly in the case of multi-bit displays. See also bitmap.

(2) A 3-D array of bits. A pixmap is usually a 2-D array of pixels but can also be a stack of n bitmaps.

Pixrects A current low-level graphics software package for 2-D applications.

Pixwin A 2-D software subroutine library used to implement the lower levels of the Sun™ window system.

PLA (programmable logic array) See FPLA.

plane An infinite space defined by any three points that do not lie in the same straight line; for example, draw a triangle on a piece of paper. (The three points of the triangle are the minimum number of points that can define a plane.) Reposition the paper anywhere. Imagine

that the triangle defines a plane that stretches into infinity in all directions.

platform The basic hardware or software for a system. A hardware platform might be a PC, Macintosh, or SPARC™ system. Software platforms include Windows and UNIX®. Because of the variations on UNIX, always refer to the Solaris™ UNIX platform.

PLB (picture level benchmark) In computer graphics, an industry-standard benchmark method used to measure graphics performance.

PMI files (protected mode interface files) Files used to initialize graphics adapters on x86 systems.

point (1) (n.) A unit of measure used in printing. Twelve points are in a pica and 72 points are in an inch.

(2) (v).To move an indicator to an on-screen item with direction keys or a mouse.

point operation An image-processing operation in which the value of a point (or pixel) in the destination image depends only on one corresponding point in the source image or images. For example, to add two source images to produce a destination image, the value of the pixel in the upper-left corner of the destination image depends solely on the values of the pixels in the upper-left corner of the two source images.

pointer A screen symbol that you move with a pointing device.

pointer grab In the X protocol, a client can actively grab control of the pointer, causing button and motion events to be sent to the grabbing client rather than to the client indicated by the pointer.

pointing device A mechanical or electronic device, such as a mouse, that manipulates the screen pointer.

poll To periodically check the condition or state of a hardware device, data item, or software subsystem.

polygon A planar shape created by a set of connected line segments (or vectors) that form vertexes at their meeting points. Note that an n-gon is a polygon with an undetermined number of sides.

polygon mesh A portion of a mesh model surface constructed from polygons (usually quads).

polyline A set of coordinate points connected by a set of line segments, defined in GKS as an output primitive. The set of points is contained in an array or list of points.

polymarker In GKS and PHIGS, a set of points defined as an output primitive. These primitives appear as small symbols, and are often used in graphs and charts. Common marker types are crosses, circles, squares, and dots.

portmapper A network system service on which all other remote procedure call-based services rely. The portmapper tracks the correspondence between ports (logical communications channels) and services on a machine, and provides a standard way for a client to look up the port number of any remote procedure call program supported by the server.

port monitor A program that continuously checks for requests to log in, or requests to access printers or files. After the port monitor detects a request, it sets the required parameters to establish communication between the operating system and the device requesting service. The port monitor then transfers control to other processes (for example, the login program) that provide the services needed.

port numbers The numbers used by TCP/IP protocols to identify the end points of communication.

portrait The orientation of a page or screen image that is taller than it is wide. Contrast with landscape.

positional light In computer graphics, a single light source, specified by a color and a location, which radiates light rays uniformly in all directions (like a bare incandescent light bulb). See also ambient light, directional light, infinite light, spot light.

positional parameters The numbered variables used within a shell procedure to process the strings specified as arguments on the command line invoking the shell procedure.

POSIX (Portable Operating System Interface) A set of standards that define the applications interface to basic system services for input/output, file system access, and process management. It uses the C

programming language, which establishes standard semantics and syntax.

postmaster In an email system, the person who administers to problems with a mail account.

PostScript A page description language published by Adobe Systems Incorporated. PostScript™ describes the appearance of text and graphics on printed pages.

power cycling The process of turning the power to a system off and then on again.

PPP authentication An optional phase of the Point-to-Point Protocol negotiation process that determines the source of an incoming call based on the verification of an identifier-password pair. SunLink™ ISDN uses it as part of its global acceptance policy.

predictive encoding An encoding technique in which an encoder uses the values of past samples to predict the value of the sample being encoded. The encoder then subtracts this predicted value from the actual value of the sample and encodes the difference. The interframe decoding of MPEG uses predictive encoding. See also cell encoding, data compression, encoder, entropy coding, H.261 encoding, hierarchical encoding, lossless compression, run-length encoding, sequential encoding.

pre-editing The process of composing characters from keystrokes. Pre-edit capability is a common feature of many input methods: you type multiple keystrokes to compose a single character.

preening To run `fsck` with the `–-o p` option, which automatically fixes any basic file system inconsistencies normally found when a system halts abruptly without trying to repair more serious errors.

PreLimn Filter manager software for use with the NeWSprint™ package.

presentation layer In the ISO/OSI model of network standards, the sixth layer, which provides services that establish, maintain, and terminate communication. See also physical layer.

press To push down and hold a mouse button.

PRI (Primary Rate Interface) An ISDN standard, similar to basic rate interface (BRI), defined by CCITT protocol, but providing multiple B channels (23 or 30) supported by a single D channel.

primitive In computer graphics, the fundamental shapes and objects used primarily in the construction of more complex objects. Graphics primitives include point, line segment, polyline, circle, ellipse, triangle, square, and rectangle.

primitive widget A class of displayable widgets that usually perform some type of information display or user interaction function. Buttons, gauges, scroll bars, sliders, and drop targets are all primitive widgets.

print client Any system on a network that has printing services provided by a print server.

print queue A temporary lineup of print jobs waiting to be output on a printer.

print server A host computer to which one or more printers are connected, or the UNIX® process that manages those printers.

printer-resident fonts See host-resident fonts.

priority interrupt The part of the VMEbus specification that enables devices that request interruption of normal bus activity to be serviced by an interrupt handler. Interrupt requests are prioritized into a maximum of seven levels. The associated functional modules, called interrupters and interrupt handlers, use signal lines called the "interrupt bus."

process A particular computer activity or job.

process code See wide character.

process status The current state of a process: running, stopped, waiting, and so on.

processor A hardware device that executes the commands in a stored program in the computer system. In addition to the CPU, many sophisticated graphics systems contain a dedicated processor for the graphics accelerator.

processor bus A bus on the SuperSPARC™ Module.

PROCFS (process file system) A type of file system that resides in memory. The PROCFS contains a list of active processes, by process number, in the `/proc` directory. Information in the `/proc` directory is used by commands such as `ps`.

profile packet A unit of profiling data that is included in a sample that has collected either PC profiling data or PC and stack profiling data.

program A sequence of instructions signaling to a computer how to perform a task. A program can be in machine language or it can be in a higher-level language that is then translated into machine language.

progress message The information generated by an application that notifies users of a process's status.

progressive encoding See hierarchical encoding.

projection The process of reducing the dimension of a 3-D image for viewing on a 2-D graphics display. Among several methods are parallel projection and perspective projection.

PROM (programmable read-only memory) A permanent memory chip programmed by the user rather than at the chip manufacturer, as is true with a ROM. You need a PROM programmer or burner to write data onto a PROM. PROM has been mostly replaced by EPROM, a type of PROM that can be erased by ultraviolet light and reprogrammed.

PROM monitor A command interpreter, stored in the workstation boot PROM, used for booting, resetting, low-level configuration, and simple test procedures.

prompt A character or character string sent from the computer system to a terminal to indicate that the system is ready to accept input. Exampes include $ and %.

property (1) A characteristic of an object that you can set, such as the color of a window.

(2) In the X protocol, window-identifying information, consisting of name, type, data format, and some data. The protocol places no interpretation on properties; they are intended as a general-purpose data storage and intercommunication mechanism for clients. See also atom.

protection The safeguarding a file from accidental erasure or from unwanted inspection of others. You can protect a file, for example, by using chmod to deny others the right to read a file.

protocol reference point See reference point.

pseudo-color See indexed color.

pseudo-device A software subsystem or driver with no associated hardware.

pseudo-device driver A STREAMS software driver, not directly associated with a physical device, that performs functions internal to a Stream such as a multiplexer or log driver.

pseudo-terminal subsystem A STREAMS user interface identical to a terminal subsystem except that a process is in place of a hardware device. It consists of at least a master device, slave device, line discipline module, and hardware emulation module.

PSN (packet switch node) A node in the ARPANET and MILNET, formerly called an interface message processor (IMP).

push button A control that immediately starts an action as soon as it is chosen; for example, OK, Cancel, and Help in dialog boxes.

push-down list A list designed so that the next item to be retrieved and removed is the most recently stored item still in the list, that is, last-in-first-out (LIFO). Also called stack.

pushable module A STREAMS module interposed between the Stream head and driver. It performs intermediate transformations on messages flowing between the Stream head and a driver. A driver is a non-pushable module.

put procedure In STREAMS, a routine in a module or driver associated with a queue that receives messages from the preceding queue. It is the single entry point into a queue from a preceding queue. The put procedure can perform processing on the message and then generally either queues the message for subsequent processing by this queue's service procedure, or passes the message to the put procedure of the following queue.

CHAPTER **18**

Q

QCIF (quarter common source intermediate format) A video format in which frames are 180 pixels wide and 144 pixels high ($\frac{1}{4}$ the size of the CIF format). Each pixel has its own luminance value; however, blocks of 4 pixels share chrominance values. All codecs that conform to the H.261 encoding standard must support this format.

QIC (1. quarter-inch cartridge) An industry-standard $\frac{1}{4}$ -inch magnetic tape cartridge used for data backup or storage.

(2. Working Group for Quarter-Inch Cartridge Drive Compatibility) An industry trade association that promotes QIC standards.

quad (quadrilateral) A closed, four-sided polygon. Quadrilaterals, or quads, can be planar (in which case all vertexes lie on the same plane) or non-planar. With non-planar quadrilaterals (sometimes called bow ties, because of their shape), calculating orientation and lighting is more difficult and thus many systems tessellate quads to triangles, which are definitively planar.

quadrilateral mesh A surface defined by four-sided polygons, each attached to other quadrilaterals.

quantization (1) In image processing, a process in which each pixel in an image is assigned one of a finite set of gray levels.

(2) The division of an element into separate, distinct units (quanta) and the assignment of a value to each resulting unit, particularly in the time domain. Quantization is used in communications and CD-ROM technology to divide analog signals (such as voice and music) into discrete units in time that can be assigned binary values. Compare with digitize.

quark In the X protocol, an integer that identifies a name, class, or type string for the resource manager. Like atoms and resource identifiers, quarks eliminate the need to pass strings of arbitrary length over the network.

query (1) The process by which a primary station checks that a secondary station identifies itself and gives its status.

(2) The process of interrogating a database for specific information.

(3) A set of instructions that can extract data repetitively.

question mark (?) In the UNIX® operating system, a wildcard character often used to represent any other single character.

queue (1) (n.) A line or list formed by items in a system waiting for service.

(2) (n.) A temporary data storage area from which elements are removed in a FIFO order.

(3) (v.) To form a queue.

quiet NaN A NaN (not a number) that propagates through almost every arithmetic operation without raising exceptions.

CHAPTER 19

R

rack-mounted Characteristic of components installed into a cabinet with a standard panel width of 19 inches or 23 inches. Components can be bolted to the rack or put on shelves. The height of a rack-mounted component is measured in rack units (RUs); for example, 1.75 inches.

radio group A box containing a set of radio buttons that might have a distinct label. At most, one of the radio buttons can be activated at a time. Also called radio button group.

radiosity A technique that calculates the lighting in a complex diffuse-lighting environment, based on the scene's geometry. Because the radiosity calculations do not include the eye point of the viewer, the geometry and lighting in the environment do not need to be recalculated if the eye point changes. This enables the production of many scenes that are part of the same environment (the rooms in a building, for instance), and a "walk through" the environment in real time. See also ray tracing.

RAID (redundant array of independent disks) A subsystem for expanding disk storage. Used in the SPARCstorage™ Array Subsystem for Disk Expansion.

RAM (random access memory) Contrast with ROM.

RAMDAC (random access memory digital-to-analog converter) A digital-to-analog converter that also contains tables for translating input digital color values.

RARE Reseaux Associes pour la Recherche Europeenne. The European Association of Research Networks. Now called TERENA.

raster A rectangular grid of picture elements, or pixels. The frame buffer stores the graphical data to be displayed on the raster. Raster operations (or ROP) can be performed on some portion or all of the raster. Such operations efficiently handle blocks of pixel data. For example, bit BLTs move blocks of bits from one portion of the frame buffer to another.

raster file A bitmap file or a file containing a gray-scale or color image.

raster scan A display device technology in which raster data are scanned onto the monitor by an electron beam that sweeps constantly across the surface. Also, the process of methodically scanning the raster (the contents of the frame buffer), and using the values to control the intensity of the electron beam.

ray tracing An advanced method of determining light interaction, such as reflection and refraction, in a graphical lighting environment. Rays are traced from the light source to the eye point, or from the eye point to the light source, to determine what the eye sees through each pixel on the display. Ray tracing mainly yields realistic results, but it is computationally intensive. See also radiosity.

RBOC (Regional Bell Operating Company) See BOC.

read-ahead The capability of the UNIX® system to read and interpret your input while sending output information to the terminal in response to previous input. The UNIX system separates input from output and processes each correctly.

read-side See upstream.

real time (1) An event or system that must receive a response to some stimulus within a narrow, predictable time frame, provided that the response is not strongly dependent on highly variable system-performance parameters, such as a processor load or interface latency.

(2) The accelerated graphics processing that makes objects appear to move naturally and at a realistic speed. Also, the visual result of some combination of effective transformation algorithms, fine-tuning of the graphics software to the graphics hardware, and graphics accelerators.

reassembly The process of reassembling the smaller pieces of an IP datagram into the original data format.

recursive Characteristic of a computer program that calls itself.

redirection (1) The channeling of output to a file or device instead of to the standard output.

(2) The channeling of input from a file or device instead of from the standard input.

redirect output To send to a file what the system would normally display on the screen as the result of a command. Basic output redirection requires use of the > or >> symbols. Also called redirection.

reference configuration See ISDN reference configuration.

reference point A part of the ISDN reference configuration. A conceptual protocol interface between two types of ISDN device.

refresh rate The rate at which successive frames of a raster display are swept by the scanning beam.

regular expression A pattern representing a class of character strings. For example, grep interprets the regular expression h.t as any three-character string beginning with h and ending with t.

relational database A database in which relationships between data items are explicitly specified as equally accessible attributes.

relative coordinate The coordinates relative to a coordinate system whose origin is set at the initial position of a point selected on an object. This new coordinate system represents a transformation relative to the origin in absolute coordinates. Relative coordinates provide the application with the flexibility to wait till the last minute for final placement of an object in device coordinates. Then, the location of the initial coordinate is established, and the remaining object coordinates are organized with respect to that coordinate.

relative path name A series of directory names separated by the slash (/) character, which locates a file or directory with respect to the working directory. See also absolute path name, simple path name.

relay host A system that transmits to and receives mail from outside the network or domain using the same communications protocol. See also data host, database host, execution host, local host, mail host.

remark See comment.

remote Characteristic of a system or other device in another location (room or building) that can be accessed through a network.

remote control file See C shell remote control file.

remote network A network that does not physically connect to your system but with which your system can still communicate.

remote sensing A method of gathering image data remotely, such as by aerial photography or satellite.

remote shell A command interpreter that you initiate on one machine, but that executes on another machine specified on the command line.

remote system A system other than the one on which you are working.

rendering The process of computing a graphical model's surface qualities, such as color, shading, smoothness, and texture, and creating a raster image.

rendering attribute In computer graphics, a description property belonging to graphics primitives (for example, color, width, pattern definition, and so on).

rendezvous In networking, the set of events that are needed to identify the sending client to the receiving client.

repeater A device that propagates electrical signals from one cable to another without making routing decisions or providing packet filtering. In ISO/OSI terminology, a repeater is a physical layer intermediate system. See router.

replaceable unit A subassembly that trained, qualified service personnel can replace at the customer site.

request ID The identification number assigned by the LP print service to each print request.

resize handle A control used to change the size of a window or a pane in a window.

resize pointer The mouse pointer displayed when an object, such as a window, is being resized.

resolution (1) The number of pixels in the horizontal and vertical dimensions of a display, considering the size of the display, and thus the size of the pixels.

(2) The number of elements per unit length available for display or printing by a particular device. For example, 1200 dots per inch is considered excellent print resolution.

resource A mechanism of the X Window system for specifying an attribute (appearance or behavior) of a window or application. Resources are usually named after the elements they control.

resource manager In the X protocol, the routines and database structures used for managing user preferences. User preferences include colors or patterns for the window border; foreground colors; starting window size, position, and configuration; selected fonts; and so on.

RGB color (red-green-blue color) The color systems obtain their colors through a direct combination of red, green, and blue components. The range of colors that can be displayed depends on the number of bits that have been assigned to each pixel. See also true color.

RIP (Routing Information Protocol) An IGP with Berkeley UNIX®.

RIPE (Reseaux IP Europeenne) The European continental TCP/IP network operated by EUnet.

RISC (1. reduced instruction set computer) A computer using the RISC architecture.

(2. reduced instruction set computing) A computer architecture that uses fewer and less complex instructions than complex instruction set computing (CISC). Some complex instructions performed by hardware in CISC computers are done by software in RISC computers. RISC computers have fewer transistors, so they cost less to design and produce.

RJ-45 connector A modular cable connector standard, used with consumer telecommunications equipment, such as systems equipped for ISDN connectivity.

robust Reliable or dependable. Not prone to error. Usually refers to an application program.

Rock Ridge file system An extension to the High Sierra file system (HSFS). The extensions enable any Rock Ridge CD-ROM to resemble a full UNIX® file

system, with long file names, case sensitivity, symbolic links, block and character devices, and other UNIX file system features. See also High Sierra specification.

ROM (read-only memory) See also boot PROM, EEPROM, EPROM, PROM.

root In a hierarchy of items, the one item from which all other items are descended. The root item has nothing above it in the hierarchy. See root directory, root file system, root user name.

root directory The base directory from which all other directories stem, directly or indirectly.

root disk On Sun™ server systems, the disk drive where the operating system resides. The root disk is located in the SCSI tray behind the front panel.

root file system A file system residing on the root device (a device predefined by the system at initialization) that anchors the overall file system.

root user name The SunOS™ user name that grants special privileges to the person who logs in with that ID. The user who can supply the correct password for the root user name is given superuser privileges for the particular machine.

root window (1) (n.) In the X protocol, a window with no parent window. Each screen has a root window that covers it.

(2) (adj.) Characteristic of an input method that uses a pre-edit window that is a child of the root window.

ROP (raster ops) The logical operations (called ANDs, ORs, NORs, and so on) performed on portions of the bit planes—called bitmaps or pixmaps—in the frame buffer. These operations perform fundamental movements and transfers of pixel data. See also bit BLT.

ROSE (Remote Operations Service Element) A lightweight RPC protocol used in ISO/OSI message handling, directory, and network management application protocols.

rotation A geometric transformation that causes a graphical object to revolve around a point (in 2-D) or an axis (in 3-D).

roundoff error The error introduced when a real number is rounded to a machine-representable number. Most floating-point calculations incur roundoff error. For any one floating-point operation, IEEE Standard 754 specifies that the result shall not incur more than one rounding error.

router A system that assigns a path for network (or Internet) traffic to follow. See gateway, repeater.

routing The process of deciding on a pathway for data to move from one machine in a network to another machine through a gateway.

RS-232–C standard (recommended standard) This standard for serial transmission using serial devices such as a mouse or modem was approved by the Electronics Industries Association (EIA) and Telecommunications Industry Association (TIA). The complete standard name (after 1991) is EIA/TIA-232-E. An RS-232 cable uses a 25-pin DB-25 or 9-pin DB-9 connector.

RS-449 standard (recommended standard) The definition of a 37-pin connector for RS-422 and RS-423 circuits.

RS-530 recommended standard) The definition of a 25-pin connector for RS-422 and RS-423 circuits.

RTSE (reliable transfer service element) A lightweight ISO/OSI application service used above X.25 networks to handshake application PDUs across the session service and TP0. Not needed with TP4, and not recommended for use in the U.S. except when "talking to" X.400 ADMDs.

RTU (right to use) The Sun™ software licensing, usually included in the price of the software.

run code A way of indicating the number of identical tokens that appear contiguously within a data stream. For example, the SunVideo™ capture and compression single SBus card uses 32-bit run codes to indicate that some number of consecutive cells within a frame have a constant intensity.

run-length encoding A compression technique that stores counts of the number of consecutive and identical tokens in a data stream. A token might define areas of the same luminance (brightness) or areas of the same color. See also data compression.

run level The system initialization state. In the SunOS™ 4.x system, the run levels are PROM monitor, single user, and multiuser. In the SunOS 5.x system, the run levels are shutdown, single user, normal multiuser without NFS™ file systems exported, normal multiuser with NFS file systems exported, alternative multiuser (not used), software reboot, reboot, and single-user state with all file systems mounted. See also init states.

runnable process A program that is ready to run, that is, it is not waiting for resources to become available (for example, data from disk or a user).

runtime library A file of written routines that do specific tasks, eliminating the need for redundant programming.

CHAPTER **20**

S

SAC (Service Access Control) The Service Access Facility (SAF) master program.

SAD (STREAMS Administrative Driver) A driver that provides an interface to the autopush mechanism.

SAF (Service Access Facility) A tool provided with the SunOS™ 5.3 operating system that controls access to local and network system services, such as printers, modems, and terminals. SAF lets the user manage access to all services in a similar way, whether they are on the network or attached only to local systems. SAF uses Service Access Control (SAC) commands to set up and manage services.

sampling (1) In computer graphics, a procedure that samples many points across an object's lines or surfaces to determine its placement in pixels. This occurs during scan conversion; used to digitize analog data.

(2) The process of acquiring data from some source.

(3) The examination of a continuous signal to determine its value.

(4) The act of selecting study samples to draw conclusions.

sampling rate The frequency of taking samples, such as sound. The more samples that are taken, the better the digitized result.

SAP (service access point) The point at which the services of an OSI layer are made available to the next higher layer. The SAP is named according to the layer providing the services. For example, transport services are provided at a transport SAP (TSAP) at the top of the transport layer.

saturation In color graphics, the amount of color in a specified hue, often specified as a percentage from 0% to 100%. See also chroma.

SBI (Speaker Box Interface) An interface that integrates audio capability with ISDN on the Sun™ workstation.

SBus A 32-bit self-identifying bus used mainly on SPARC™ workstations, the SBus provides information to the system so that it can identify the device driver that needs to be used. An SBus device might need to use hardware configuration files to augment the information provided by the SBus card. See also PCI bus.

SBus bridge A device providing additional SBus slots by connecting two SBuses. Generally, a bus bridge is functionally transparent to devices on the SBus. However, there are cases (for example, bus sizing) in which bus bridges can change the exact way a series of bus cycles are performed. Also called an SBus coupler.

SBus controller The hardware responsible for performing arbitration, addressing translation and decoding, driving slave selects and address strobe, and generating time-outs.

SBus device A logical device attached to the SBus. This device might be on the motherboard or on an SBus expansion card.

SBus expansion card A physical printed circuit assembly that conforms to the single- or double-width mechanical specifications and that contains one or more SBus devices.

SBus expansion slot An SBus slot into which you can install an SBus expansion card.

SBus ID A special series of bytes at address 0 of each SBus slave that identifies the SBus device.

SBus master See master.

SBus slave See slave.

scalable font A bitmapped font for a particular size, slant, or weight. A font in a language such as PostScript™ defining the shape of each character, not size. Also called outline font.

scalar Characteristic of a factor or variable, in contrast with a complex data structure.

scaling (1) In computer graphics, a geometric transformation that causes an object to be increased or decreased in size.

(2) In programming, the process of determining the number of digits occupied by fixed-point or floating-point numbers.

scan conversion The process of converting picture data in digital form to pixel data in analog (voltage) form.

scan line (1) The parallel lines that are defined by the scan of the electron beam inside the CRT. Also, one line of pixels in the frame buffer corresponding to the above.

(2) A list of pixel or bit values, viewed as a horizontal row (all values having the same y coordinate) of an image, with the values ordered by increasing x coordinate values.

scanner A hardware device that converts a hard-copy image, such as a photograph, into digital data for display on a graphics system.

SCCS (Source Code Control System) A software development tool for tracking file versions during a long, involved software development or documentation project.

SCCS history file The file that contains a given file's delta history. All SCCS history files must be located in a directory named SCCS, which is located in the same directory as the g-file. Also called an s-dot file.

SCD (SPARC Compliance Definition) A formal specification of the system hardware and software to be met by manufacturers of SPARC™ systems to ensure that those systems run compliant applications. The SCD also specifies the interfaces that an application can safely use, with the assurance that the application binary will run on all compliant SPARC hardware platforms.

scheduler (1) A program that manages other shared resources, such as printers.

(2) An automated calendar program.

scientific visualization A technology that enables scientists to store vast amounts of mathematical data, generate graphical models that represent the data, and visually analyze the results, usually through interactive software programs.

scissoring See clipping.

scope The range over which an action or definition applies.

SCP (SunLink™ communications processor) A printed circuit board that enables multi-vendor connection with either synchronous or asynchronous operation. The SCP works with SNA 3270 and X.25 SunLink™ software products.

scratch file A file used as a work area.

screen coordinates See device coordinates.

screen capture The act of duplicating text and/or graphics displayed on a screen, and saving them in a file. The screen capture results in a graphics file.

screen-door translucency A graphics effect produced by rendering only a patterned subset of the pixels for an object so that otherwise-occluded objects will be partially visible. See also occlusion.

screen editor An editing program in which text is operated on relative to the position of the cursor on the screen. Commands for entering, changing, and removing text involve moving the cursor to the area to be altered and performing the necessary operation. You can view changes on the screen as they are made. Examples include the UNIX® vi program. Contrast with line editor.

screen lock A function that locks the workstation screen, barring further input till the valid user password is typed.

screen saver A utility that causes the workstation, after a specified time, to switch off the display or to vary the images that are displayed, thereby prolonging the life of the screen.

screen space The space defined by pixel coordinates. See also device coordinates.

script A program that another program interprets or runs.

scroll To shift the focus of text up, down, or across the screen.

scrollbar A control located at the side or bottom of a window that enables you to display window content not currently visible.

SCSI (Small Computer Systems Interface) An industry standard for connecting disk and tape devices to a workstation.

SCSI tray On Sun™ server systems, a tray that holds up to six SCSI-2 devices and the control card. The chassis accommodates one SCSI device tray.

s-dot file See SCCS history file.

search and replace An operation that finds one or more occurrences of a word or pattern and replaces it with another.

SECAM (sequential couleur avec memoire) A composite color standard based on line-alternate U and V color difference signals that are frequency-modulated onto a color subcarrier.

secondary prompt A cue displayed in a Shell Tool window to inform you that the command typed in response to the primary prompt is incomplete. The UNIX® system default secondary prompt is the greater-than character (>).

sector A data storage area on a disk, or sections of each disk ring. A sector can usually hold 512 bytes.

sector map (1) A map pointing out unusuable sectors on a disk.

(2) A table with sector numbers that can be translated into physical sector numbers.

seek Usually, a disk seek, that is, positioning the read/write head of the disk so that data can be read or written.

seek time The time a program or device needs to find a bit of data.

segment (1) A portion of a primitive or picture, such as a line segment, sometimes called a polyline. In the GKS graphics library, a collection of picture data composed of primitives and attributes. See also structure.

(2) In ISDN, the expanded packet created when the transport control protocol (TCP) adds an information header to a packet of data for decoding by the TCP on the remote machine The segment is then passed to the network layer, which converts it to a datagram. It then goes to the data-link layer, which converts it to a frame.

(3) A varying-sized part of data swapped in memory.

segmentation fault A condition that occurs when a process has attempted to access an area of memory that is restricted or does not exist. See also bus error.

select (1) (v.) To distinguish an object (or objects) on the screen so that they can be operated on. Contrast with deselect.

(2) (v.) To indicate a span, a contiguous sequence of characters, by pointing at and clicking.

selection (1) A span of characters, highlighted in inverse video, underlining, or gray shading.

(2) In the X protocol, a means of communicating between clients using properties and events. From the user's perspective, a selection is an item of data that can be highlighted in one instance of an application and pasted into another instance of the same or a different application.

selector The identifier used by an ISO/OSI entity to distinguish among multiple service access points at which it provides services to the layer above. See SAP.

selector pen See light pen.

semantics The difference between the meaning or a program's instructtion and its format. The format is recognized as syntax.

semaphore A flag that helps govern processes that are competing for time or ports.

sequential encoding The encoding of a still image in a single pass through the image data. The sequential encoder first processes a block of pixels in the upper left corner of the image and then proceeds from left to right and top to bottom until it has processed the entire image. Contrast with hierarchical encoding. See also cell encoding, entropy coding, H.261 encoding, predictive encoding, run-length encoding.

serial Characteristic of one bit at a time, the opposite of parallel, where more than one bit transmits simultaneously.

serial port A port for serial transmission.

serration The interval between a broad pulse and the following sync pulse. It indicates the absence of pulse rather than the presence of one and

has been replaced with broad pulse, equalization pulse, and normal line sync pulse.

server A network device that manages resources and supplies services to a client. See also action server, application server, caching-only server, communications server, print server, session server, X server.

server grab In the X protocol, a transient state to perform such tasks as rubber-banding and pull-down menus or to execute requests indivisibly. See also active grab, button grab, grab, keyboard grab, mouse grab.

server system A system that is on a network and provides resources, such as disk space and file transfers, to other systems.

service interface In STREAMS, a set of primitives that define a service at the boundary between a service user and a service provider and the rules (typically represented by a state machine) for allowable sequences of the primitives across the boundary. At a Stream/user boundary, the primitives are typically contained in the control part of a message; within a Stream, in `M_PROTO` or `M_PCPROTO` message blocks.

service procedure A STREAMS routine in a module or driver associated with a queue that receives messages queued for it by the appropriate put procedure. The procedure is called by the STREAMS scheduler. It can perform processing on the message and generally passes the message to the put procedure of the following queue.

service provider See Internet service provider.

session layer In the ISO/OSI model of network standards, the fifth layer, which provides services that establish, maintain, and terminate communication. See also physical layer.

session server A system that provides networked sessions. Session files reside on the session server and are used whenever you log in to a system on the network. See also action server, application server, caching-only server, communications server.

sexadecimal See hexadecimal.

SGML (Standard Generalized Markup Language) A method of tagging a document to apply to many format elements. This language has become popular with the increased use of the Internet.

SGMP (Simple Gateway Management Protocol) The predecessor to SNMP.

shading The interpolation of color across objects, typically after lighting.

shading method A technique for creating graphical realism by applying the lighting model at points on the object primitives. The result is the identification of appropriate colors for the object's pixels. See also flat shading, Gouraud shading, interpolation, Phong shading.

shadow file The SunOS™ 5.x file in the /etc directory that contains user passwords.

shadow mask A metal plate with tiny holes carefully positioned inside the CRT hardware. The electron beam passes from the electron gun, through a hole in the shadow mask, which guides the beam and ensures its precise placement on the inside display surface. The mask ensures that electrons from the red gun hit the red phosphor, that electrons from the green gun hit the green phosphor, and that the electrons from the blue gun hit the blue phosphor.

Shapes A graphics software product for 2-D applications and the platform on which the X11/NeWS™ system is implemented.

shared object A function that is part of a shared library.

sharpening An image enhancement technique in which the effect of blurring in the original image is reduced.

shell (1) The outer layer of a program, or a user interface.

(2) The command shell is a programmable command interpreter. The shell provides direct communication between the user and the operating system. UNIX® systems use the C shell, Bourne shell, and Korn shell.

shell procedure An executable file that is not a compiled program. A shell procedure calls the shell to read and execute commands contained in a file. This process enables you to store a sequence of commands in a file for repeated use. Also called a command file or shell program.

shell variable In the UNIX® system, a facility that affects how the shell runs and is displayed. For example, certain variables specify the list of arguments on the current command line or set the number of command lines saved in a command history.

shortcut A mouse gesture that simplifies completing a dialog box. For example, double-click an item in the Filename list box to select it and choose OK in one action.

shortcut keys A keyboard key sequence that activates a menu command. Shortcut keys usually include a key sequence that uses a special accelerator key, or an underlined letter (mnemonic) sequence. For example, press Alt+F4 or Alt+F+P to choose the command FilePrint.

sibling An item that branches from a parent tree. This description applies to processes, modes, and windows.

SID (SCCS delta ID) The number used to represent a specific SCCS delta.

SIGGRAPH (Special Interest Group for Graphics) A group sponsored by the Association for Computing Machinery. SIGGRAPH holds an annual conference on graphics that includes vendor product displays, lectures, and graphics technology courses.

signal An electrical quantity that transmits a sound or prompt. Also, a C library function; the software signaling facility. A signal is generated by some abnormal event. Most signals cause a process to terminate if no action is taken.

sign bit A bit or a binary element that occupies a sign position and indicates the algebraic sign of the number represented by the numeral with which it is associated.

SIMM (single in-line memory module) A circuit board that holds surface-mount memory chips. A SIMM is compact and efficient.

simple path name A file or directory name, without mention of any associated directories, that you use to access a file or directory in the working directory. See also absolute path name, relative path name.

simplex transmission A transmission in one preassigned direction only. See also full-duplex transmission, half-duplex transmission.

single-precision A floating-point number containing the least amount of precision, when compared to two or more options given in a programming language. See also double-precision.

single system A system that is not connected to a network, has its own disk, and does not require support from any other system. Also called a standalone system.

single-user mode A mode that allows a user to log in to a system as superuser and perform administrative tasks without interference from other users.

SIP (single in-line package) The packaging of an electronic component with all leads protruding from one side only.

skip codes The codes that are used in the encoding of video data, either spatial or temporal. Spatial skip codes apply when all the pixels in several consecutive blocks within a video frame are the same color. In this case, the first block is fully described and a spatial skip code indicates that the next n blocks contain the same data. Temporal skip codes apply to the interframe compression process, instructing the decoder to skip over blocks in the current frame that are similar to those in the preceding frame. See also data compression.

slave An SBus device that acknowledges a slave select-and-address strobe signal. Any SBus master can communicate with any slave on the same bus, regardless of system configuration.

slave cycle The portion of a bus cycle that begins with placing an address on the physical address lines and ends with the address strobe signal being asserted.

slave driver A STREAMS-based device supported by the pseudo-terminal subsystem. It works with a line-discipline module and hardware-emulation module to provide an interface to a user process. Also called pts.

slave server A server system that maintains a copy of the network information service (NIS) database. It has a disk and a complete copy of the operating system.

sleep To halt an operation without termininating it. A sleep process can remain temporarily suspended in memory till a predetermined event “awakens” it. See also suspend.

slice See partition.

slices The sample 2-D data arrays gathered through one of several methods, such as CAT-scan and magnetic resonance imaging, for 3-D image reconstruction.

slider A control that uses a track and arm to set a value from among the available values. The position of the arm (or a separate indicator) gives the currently set value.

SLIP (Serial Line Internet Protocol) An Internet protocol used to run IP over serial lines such as telephone circuits or RS-232 cables interconnecting two systems. SLIP is now being replaced by PPP.

slot (SBus expansion slot) An SBus entity for which there is an independent slave select wire.

slow filter A filter that takes a relatively long time to prepare a file for printing and does not require access to the printer while the filter is processing. Contrast with fast filter.

SLSI (1. super-large-scale integration) (n.) The process of placing from 50,000 to 100,000 circuit components. Also, the quality of their connections.

(2. super-large-scale-integration) (adj.) Characteristic of a chip containing from 50,000 to 100,000 circuit components. Compare with SSI, VLSI.

SMD (storage module device) An industry-standard interface used for large-capacity, high-performance disks.

SMDS (switched multimegabit data service) An emerging high-speed networking technology to be offered by the telephone companies in the U.S.

SMI (structure of management information) The rules that define the objects that can be accessed through a network management protocol.

smoothing An image enhancement technique in which irregularities in the original image are reduced.

smooth shading A shading method, such as Gouraud shading or Phong shading, that blends colors smoothly across the object.

SMP (symmetric multiprocessing) A form of multiprocessing in which more than one processor can run kernel-level code simultaneously. Contrast with asymmetric multiprocessing.

SMPTE Society of Motion Picture and Television Engineers.

SMPTE time code A standard code developed by the SMPTE for identifying frames of video. A time code has the form hours:minutes:seconds:frame.

SMTP (Simple Mail Transfer Protocol) The Internet email protocol. Defined in RFC 821, with associated message format descriptions in RFC 822.

SNA (Systems Network Architecture) The proprietary network architecture of IBM.

SNMP (Simple Network Management Protocol) The preferred network management protocol for TCP/IP-based internets.

socket A software endpoint for network communication. Two programs on different machines each open a socket to communicate over the network. This is the low-level mechanism that supports most networking programs.

soft limit For disk quotas, a threshold limit on file system resources (blocks and inodes) that you can temporarily exceed. Exceeding the soft limit starts a timer. When you exceed the soft limit for the specified time (default one week), no further system resources are allocated till you reduce file system use below the soft limit.

software distribution A collection of software clusters and packages that is to be installed; for example, an installation CD-ROM.

solid model See surface model.

solids modeling The creation and rendering of graphical models as solids with properties such as mass and weight.

source The original data contained on a disk or in a file.

source code The uncompiled version of a program written in a language such as C or Pascal. The source code must be translated to machine language by a compiler before the computer can execute the program.

spaghetti code Code that has been added to and worked on till it is long and involved. The program flow is a labyrinth of GOTO and JUMP statements.

span A contiguous sequence of characters.

SPARC™ system The 32-bit Scalable Processor ARChitecture from Sun Microsystems. SPARC is based on a reduced instruction set computer (RISC) concept. Sun and its suppliers designed the architecture to significantly improve price and performance.

SPARCprinter™ A video interface laser printer.

SPARCprinter™ port One of two ports on the SPARCprinter™ SBus printer card. The SPARCprinter port connects the system to the SPARCprinter.

spd The video port on the NeWSprinter™ SBus printer card. Also, the device driver that controls the port.

SPEC (Systems Performance Evaluation Cooperative) A group of participating computer system manufacturers that develops a series of accepted test programs to measure system computing performance.

SPECfp92 A performance specification based on two C programs and 12 FORTRAN programs that rely on floating-point math to measure workstation performance. The resulting SPECfp number is a geometric mean of the elapsed time for running each program. See also SPECint92.

SPECFS (special file system) A pseudo file system that provides access to character special and block devices.

SPECint92 A performance specification based on six C programs that rely exclusively on integer math to measure workstation performance. The resulting SPECint number is a geometric mean of the elapsed time to run each program. See also SPECfp92.

SPECmarks A benchmark measure of relative computer system performance, developed by the Systems Performance Evaluation Cooperative. See SPEC. See also MFLOPS, MIPS.

SPECrate_fp A variation of the SPECfp92 performance specification for multiple-processor machines.

SPECrate_int A variation of the SPECint92 performance specification for multiple-processor machines.

special character A character that is not alphabetic or numeric, or a space; for example, punctuation marks. See metacharacter.

specific address See absolute address.

specular highlight The light reflected from a shiny surface. Typically, a specular highlight appears as a small but intense reflection on an object

surface. Metallic objects have specular reflections in bright light. The Phong shading method is most accurate in producing this effect.

spin box A window element with a text box and two arrow buttons that displays a set of related but mutually exclusive choices, such as days of the week.

spline curves Those curves that are calculated mathematically on a series of points. Used in computer-aided design applications, among others. See B-spline curve, Bezier curve, NURBS.

spooler A software device that holds data.

spot light In computer graphics, a light source specified by color, location, and direction, which radiates light rays from a single point with a maximum intensity along the specified direction. See also ambient light, directional light, infinite light, positional light.

SPS (structured PostScript) That PostScript™ code which has been commented and structured in a strict way to enable filters and print spoolers to manipulate it without actually processing any of the PostScript code.

SQL (structured query language) The international standard language for defining and accessing relational databases.

square bracket Computer jargon for either of the bracket signs, [and], used for connecting or enclosing words. Contrast with curly bracket ({ and }).

square pixel A pixel (picture elements) of equal height and width. Square pixels are normal for workstation monitors, but not for television.

SRAM (static random access memory) SRAM is faster and more reliable than DRAM (dynamic random access memory). DRAM offers access times of about 60 nanoseconds, while SRAM access can be as low as 10 nanoseconds. It is static because it does not require refreshment as does DRAM. See also VRAM.

SSI (1. small-scale integration) (n). The process of placing fewer than 10 components on one chip.

(2. small-scale-integration) (adj.) Characteristic of a chip containing fewer than 10 components.

stack An area of reserved memory that contains important programming data. See push-down list.

staircasing The visual stairstep effect that results from drawing pictures on a grid (raster). See also aliasing.

stale NFS™ file handle A data structure that contains data with a creation date that does not match the file it refers to.

standalone (1) A computer that does not require support from any other machine. Also called single system.

(2) A standalone diagnostic means the program can load from either local disk or Ethernet and runs in an environment other than UNIX®.

standard error An open file normally connected directly to a primary output device, such as a terminal, printer, or screen. Error messages and other diagnostic output normally go to this file and then to the output device. You can redirect the standard error output into another file instead of to the printer or screen.

standard input (standard input device) The device from which a program or system normally takes its input. Usually a terminal or the keyboard.

standard output (standard output device) The device to which a program or system normally sends its output. Usually a terminal or the screen.

standardize See normalize.

state flag A flag in the superblock that the file system check (`fsck`) program updates to record the condition of a file system. If a file system state flag is clean, the `fsck` program is not run on that file system.

statement In a programming language, each line of code and an individual instruction.

static (n.) A noise on an electronic gadget incurred by electrical interference with a signal.

static allocation The allocation at startup time of certain memory. It remains in that state till the program is finished. See also allocate.

static linking The process in which external references in a program are linked with their definitions when an executable is created.

status message The information generated about an application that notifies you of a process's progress.

stderr The UNIX® file pointer to standard error output. The file is opened when you start a program.

still-image coding Also called intraframe compression.

stopped job A job that you have halted temporarily and one that you can resume with a command.

stream An open file with its associated buffering.

Stream A kernel aggregate created by connecting STREAMS components, resulting from an application of the STREAMS mechanism. The primary components are the Stream head, the driver, and zero or more pushable modules between the Stream head and driver.

Stream end A Stream component furthest from the user process, containing a driver.

Stream head A Stream component closest to the user process. It provides the interface between the Stream and the user process.

STREAMS A kernel mechanism that supports development of network services and data communications drivers. STREAMS defines interface standards for character input/output within the kernel, and between the kernel and user level. The STREAMS mechanism comprises integral functions, utility routines, kernel facilities, and a set of structures.

STREAMS-based pipe A mechanism for bidirectional data transfer implemented using STREAMS, and sharing properties of STREAMS-based devices.

string A connected sequence of characters, words, or other elements.

string variable A sequence of characters that can be the value of a shell variable. See variable.

strip A mesh of, usually, triangles or quadrilaterals that is one primitive wide.

striping The combining of one or more physical disks (or disk partitions) into a single logical disk. The operating system views a logical disk the same as any other disk-based file system.

stroke font object In the XGL™ library, an object that defines the stroke font used by the context object.

structure In PHIGS, a sequence of structure elements describing graphical objects, and possibly invoking other structures in a hierarchical fashion.

structure element In PHIGS, the graphical data (such as output primitives and their attributes) that are used to create graphical objects. See also hierarchical data structures.

Style Manager The software application used to customize some of the visual elements and system device behaviors of the workspace environment, including colors and fonts, keyboard, mouse, window, and session start-up behaviors.

subclass (1) A class that is derived from a particular class, perhaps with one or more classes in between. See also superclass.

(2) A widget class created from another widget class. A subclassed widget is created by modifying and specializing another widget class called the superclass. The subclass inherits some or all of the characteristics of its superclass.

subdirectory A directory that resides within another directory.

submenu A menu that displays additional choices, dropped down from a menu.

subnet A working scheme that divides a single logical network into smaller physical networks to simplify routing.

subnet mask See address mask.

subnet number The part of an Internet address that refers to a specific subnet.

subnetwork A collection of ISO/OSI end systems and intermediate systems under the control of a single administrative domain and using a single network access protocol; for example, private X.25 networks and a collection of bridged LANs.

subpanel A component of the front panel that provides additional controls. Subpanels usually contain groups of related controls.

subsampling A mathematical reduction of the data in a data set to a subset of its original components. For example, if you have captured a 512-by-512 image, but want to encode it at a resolution of 256-by-256, you can subsample the data before encoding it by

discarding every other pixel in both and x and y directions. On systems that work with YUV data, you can also subsample the U and V chrominance information so that each pixel has a unique luminance value, but shares chrominance information with one or more nearby pixels. See also data compression.

subwidget A widget that is a component of another widget.

SunAlis™ system The Sun version of Alis, an office automation system produced by Applix.

SUN-DES-1 An authentication protocols that the X11/NeWS™ system uses to authenticate client connections. The SUN-DES-1 authorization protocol was developed by Sun Microsystems, Inc. It is based on Secure RPC (remote procedure call) and requires data encryption software (DES) support. The authorization data is the machine-independent netname, or network name, of a user. This data is encrypted and sent to the server as part of the connection packet. The server decrypts the data and, if the netname is known, the connection is allowed. The SUN-DES-1 protocol provides a higher level of security than the MIT-MAGIC-COOKIE-1 protocol.

SunGKS™ library The Sun™ software graphics library based on the GKS standard.

SunINGRES system The Sun™ version of INGRES, a database system produced by RTI.

SunLink™ ISDN The software developed to work with the SunISDN-BRI/SBI™ card. See also BRI, ISDN, SBI.

SunPHIGS™ library The Sun™ software graphics library based on the PHIGS standard.

superblock A block on the disk that contains information about a file system, such as its name, size in blocks, and so on. Each file system has its own superblock.

superclass (1) A class from which a particular class is derived, perhaps with one or more classes in between. See also subclass.

(2) A widget class that is modified and specialized to create another widget class (a subclass). The subclass inherits some or all of the characteristics of the superclass.

SuperSPARC™ Module A 3-by-5-inch card containing one SuperSPARC processor, cache memory, and a cache controller. A system board can have two SuperSPARC modules. A SPARCserver™ 1000 system can have up to four such boards that equal eight modules.

superuser A special user who has privileges to perform all administrative tasks on the system. Also called root.

surface model A model constructed of polygons. These can be hollow (giving the model an appearance of a wireframe model) or solid-filled. Also called solid model, although this term can be misleading.

surface normal The vector that is perpendicular to a point on an object's surface or plane. You can use a surface normal to calculate light on the object surface.

surge An electrical increase, usually sudden and unexpected. A surge protector inserted between the power source and equipment can prevent damage.

suspend To put a process temporarily on hold. See also sleep.

SVR4 The AT&T System V Release 4 operating system.

swap To write an active file from RAM to a hard disk space.

swap file A disk partition or file that temporarily holds the contents of a memory area until it can be loaded back into memory.

SWAPFS A pseudo file system that the kernel uses for swapping.

swap space The memory used for the transfer of a currently operating program from system memory to an external storage device. Also called swapping area.

switch (1) Usually, a command-line argument, such as -r, -d, and so on.

(2) A circuit element controlling a signal.

symbol table An accumulation of a program's identifiers, assembled at compile time.

symbolic link A special file or directory that points to another file or directory so that both files or directories have the same contents.

symmetric application An application that involves nearly equal use of compression and decompression operations. For example, video mail is a symmetric application because the sender of mail must be able to compress video and audio data, and the receiver must be able to decode that

data. Contrast with asymmetric application. See also data compression.

symmetric multiprocessing — A form of multiprocessing in which more than one processor can run kernel-level code simultaneously. Contrast with asymmetric multiprocessing.

sync — (1) The process of synchronizing the scanning of receiving, processing, or display equipment with a video source.

(2) A signal that consists of just the horizontal and vertical elements necessary to accomplish synchronization.

(3) The component of a video signal that conveys synchronizing information. See also sync level, sync pulse.

sync level — The level of a sync signal or component.

sync pulse — A normal line sync pulse, equalization pulse, or broad pulse.

synchronous — Characteristic of being under the control of a clock or timing mechanism.

syntax — The order in which you type the parts of an operating system command; grammar of a programming language.

syntax error — A grammatical error in the programming language syntax.

synthetic image — An image that was generated originally with computer-graphics techniques, as opposed to one that was originally acquired with a camera. The latter type of image, after it has been digitized and stored on a computer, is called a captured image.

system — A computer and its peripherals that enable you to run computer programs. A system can also include software that operates the system.

system administration — The tasks of a person who performs system maintenance.

system administrator — The person who performs system maintenance.

system board — On Sun™ server systems, a printed-circuit board that can contain two SuperSPARC™ Modules and associated SIMMs. The board also accommodates three optional SBus cards.

system call A program's request that an action be performed by the UNIX® system kernel.

system ID A sequence of numbers, and sometimes letters, that is unique to each system and is used to identify that system.

system kernel See kernel.

system message A message that the system generates automatically to provide you important information, such as new mail or login information.

system name A unique name assigned to the network system.

system number A unique number assigned to the network system.

system state object An object that maintains state information about all operations occurring during a single XGL™ library session.

system type The name that identifies a specific kind of system, such as a Sun-4™ system or a Sun386i™ system.

system unit The part of a workstation that contains the central processing unit (CPU), the disk, and other devices essential to operate the system.

System V A version of the UNIX® operating system produced by AT&T.

CHAPTER 21

T

T1 A communications service providing leased-line support for 1,554,000 bits per second on twisted copper wire.

TA (terminal adapter) An ISDN-compatible device that converts non-ISDN transmission to ISDN transmission. See also TE.

table A display of data in rows and columns.

tablet A hardware device used with a pen-like stylus or mouse-like puck to digitize an image for graphical display.

tar file A file, usually a tape, containing archived data created by the UNIX® tar program.

task management In a multitasking environment, the operating system's checking and handling of the processes and programs running on a computer.

Tbyte (terabyte) A unit of measure roughly equal to a trillion bytes (exactly 1,099,511,627,776 bytes).

TCP (Transmission Control Protocol) A communications protocol that ensures data is sent between computers on the Internet. See TCP/IP, TP4.

TCP/IP (Transmission Control Protocol/Internet Protocol) The protocol suite originally developed for the Internet. SunOS™ networks run on TCP/IP by default. Also called Internet Protocol suite.

TE (terminal equipment) An ISDN-compatible terminal device that is attached to the ISDN at the user interface; for example, an

ISDN-compatible telephone system running SunLink™ ISDN. See also TA.

TE1 The devices that support the standard ISDN interface, including digital phones, digital facsimile, and integrated voice and data terminal devices.

TE2 The equipment that does not support the standard ISDN interface, including serial (RS-232-C standard) communications devices, such as computers and terminals.

Telnet The virtual terminal protocol that enables users of one host to log in to a remote host.

temporal redundancy In movies, the similarities, or shared elements, in consecutive frames. This redundancy enables groups of individually compressed frames to be compressed further. That is, if five frames in a group look the same in the upper-left corner, that area needs to be encoded only once; then the encoder can simply note that the same data is displayed in the next four frames. This type of encoding is called interframe compression. See also data compression.

TERENA The merger of RARE and EARN.

terminal (adj.) Characteristic of a process running on a machine that originates with the physical device called a terminal, or as the software representation of such a physical device; for example a window.

terminal emulator A window that emulates a particular type of terminal for running nonwindowing programs. Most commonly used for typing commands to interact with the computer's operating system.

terminal port name The name of the serial port to which a terminal is connected.

terminal session The time you dedicate to working at a terminal, from login to logout.

terminal type The name that identifies a specific kind of terminal, such as a Wyse 50 or a VT-100.

tessellate To divide a curve or surface into geometric forms to calculate their shapes and dimensions for simplified processing and rendering. Many systems tessellate quads, which are not always planar, into triangles, which are definitively planar.

texel In computer graphics, a texture element. Obtained from texture memory, it represents the color of the object to be applied to a corresponding fragment.

text, data, and stack segment In the UNIX® system, a part of a process represented by three memory segments. The other part is a set of data structures collectively called the "process environment." A text segment contains code and constant data, a data segment contains variables, and a stack segment holds a process's stack.

text editor The software for creating, changing, or removing text with the aid of a computer. Most text editors have two modes: an input mode for typing text and a command mode for moving or modifying text. Two UNIX® system examples are the editors ed and vi. See line editor and screen editor.

text field A rectangular area in a window where information is typed. Text fields with keyboard focus have a blinking text insertion cursor.

text formatter A program that prepares a file of text for printed output. To make use of a text formatter, your file must also contain some special commands for structuring the final copy. These special commands tell the formatter to justify margins, start new paragraphs, set up lists and tables, place figures, and so on. Two UNIX® text formatters are nroff and troff.

text input mode A text editing mode in which the characters you type are entered as text into the text editor's buffer. To execute a command, you must leave text input mode. Contrast with command mode.

texture In computer graphics, a 1- or 2-D image that is used to modify the color of fragments produced by rasterization.

texture mapping The process of superimposing a 2-D texture or pattern over the surface of a 3-D graphical object. This is an efficient method for producing the appearance of texture, such as that of wood or stone, on a large surface area.

TFS (Translucent File Service) A copy-on-write file system that enables users to share file hierarchies while providing each user with a private hierarchy for saving files as they are modified.

Thicknet See 10BASE5.

Thinnet See 10BASE2.

three-dimensional graphics The display of objects and scenes with height, width, and depth information. The information is calculated in a coordinate system that represents three dimensions through x, y, and z axes. Also expressed as 3-D.

three-way-handshake The synchronization of two protocol entities as they establish a connection.

threshold In image processing, a specified gray level used for producing a binary image. See also thresholding.

thresholding The process of producing greater contrast in a gray-scale image by assigning each pixel the value 1 if the image portion it represents is at or above a specified gray level (the threshold) and the value 0 if the image portion is below that threshold. The result is a high-contrast, black-and-white image that highlights certain features.

throughput A measure of the work of a computer system in a set period (for example, floating-point instructions per second).

tile (1) (n.) A rectangular area used to cover a surface with a pattern or visual texture. For example, Workspace Manager supports tiling, enabling users with limited color availability to create new color tiles blended from existing colors.

(2) (v.) To cover a surface with non-overlapping polygons or other geometric objects.

tiled window A type of window that does not overlap, forming a pattern like pieces of a mosaic.

timeout A situation in which the SBus controller terminates a bus cycle that a slave has failed to acknowledge. In a correctly designed and operating system, timeouts should happen only during system configuration.

time-slice multitasking See multitasking.

timesharing system A Sun™ workstation with terminals attached to its serial ports. The terminals rely on the workstation for processing power as well as file service and disk storage.

title bar Obsolete term for header.

TLI (Transport Layer Interface) An interface that is to supersede the socket-based interprocess communications mechanisms as the way to access transport services. Modeled after the industry standard ISO Transport Service Definition (ISO 8072).

TMPFS (temporary file system) A file system type that uses local memory for disk reads and writes.

TNT (The NeWS™ Toolkit) See NeWS system.

TODC (time-of-day clock) In Sun™ systems, a clock module that contains the system date and time (year-month-day-hour-minutes).

toggle (v.) To change the state of a two-state control, such as a radio button or check box, using either the mouse or keyboard.

token A piece of data passed around within the software.

ToolTalk™ service A service for communications between applications on the desktop.

top-level window In the X protocol, a child window of the root window. See also children windows.

TP0 The ISO / OSI transport protocol class 0 (simple class). The OSI transport protocol best paired with an X.25 network (or similar network that does not often lose or damage data).

TP4 The ISO / OSI transport protocol class 4 (error detection and recovery class). The most powerful OSI transport protocol, it can be paired with any type of network. TP4 is the OSI equivalent of TCP.

TPI (Transport Provider Interface) The kernel components of the Transport Layer Interface (TLI). In STREAMS messages TPI specifies the transport interface.

trace/breakpoint trap A trap for tracing and debugging programs. See also breakpoint.

track A concentric ring on a disk that passes under a single stationary disk head as the disk rotates.

transceiver (transmitter-receiver) A device that transmits and receives signals.

transcoding The conversion of data in one compressed format to another compressed format; for example, converting a JPEG-compressed image to its cell-encoded counterpart.

transform object An XGL™ object that specifies geometric transformations on output primitives. The default for all transforms is the identity transform, which uses the identity matrix.

transformation A change made in an object's size, location, or orientation; for example, scaling, translation, and rotation. Also called transform.

transformation matrix In computer graphics, a matrix that specifies a linear mapping of one coordinate space to another coordinate space.

transformation pipeline In computer graphics, the series of transformations used in mapping geometric data and their attributes from model coordinate space to device coordinate space.

translation cycle On the SBus, that portion of a bus cycle between the assertion of grant and the placing of an address on the physical address lines by the SBus controller. After receiving the grant, the designated master places a virtual address on the SBus data lines.

translation filter A filter that converts a file from one format to another, while retaining the actual contents of the file; for example, ASCII to PostScript™.

transparent (1) Characteristic of a device, function, or program that works without user interference.

(2) Characteristic of a transmission that includes but does not restrict the use of transmission control characters.

transparent access The process of using files, data, and programs that are part of another file system on a network.

transport The means by which an object is passed from one process to another.

transport endpoint The destination of a network connection.

transport interface The library routines and state transition rules that support the services of a transport protocol.

transport layer In the ISO/OSI model of network standards, the fourth layer, which controls the transfer of data between session layer entities.

transport provider The transport protocol that provides the services of the transport interface.

transport user The user-level application or protocol that accesses the services of the transport interface.

trap A software mechanism that causes control of the machine to be instantly transferred to the kernel, even if a user process is currently running.

Trash Can A window that contains deleted files that have not yet been removed.

traversal The process of reading a display list and passing on the graphics information to the viewing pipeline.

tree view A view of a directory or files that includes all higher-level directories in the search path.

tristate An output capable of removing its drive from a wire.

true color A graphics system are usually equipped with at least 24 bits per pixel. In the 24-bit system, for example, three primary colors in the color graphics system—red, green, and blue—are allotted 8 bits each. There are 2^8, or 256 intensities each for red, green, and blue. This translates to a total palette range of 16.7 million colors (256 x 256 x 256). Because the human eye cannot detect the subtlety available in a palette of 16.7 million colors, this range makes it possible to compute what appears to be gradual shading. Also called 24-bit color, RGB color.

TSDU (transport service data unit) The amount of user data whose identity is preserved from one end of a transport connection to the other.

TTY Historically, Teletypewriter equipment. Today, any dumb terminal that can access a computer or workstation.

tty driver A STREAMS-based device in a terminal subsystem.

TTY subwindow A subwindow that includes a command interpreter, but does not support all the text facility operations; for example, a Shell Tool window.

twenty-four-bit color See true color.

two-dimensional graphics

Those graphics displayed in two dimensions: height and width. The two-dimensional display is represented by two axes, x (horizontal) and y (vertical). The surface spanning the parameters of the horizontal and vertical axes is called the x-y plane. Also expressed as 2-D.

CHAPTER 22

U

UA (user agent) An ISO/OSI application process that acts on behalf of a user or organization in the X.400 message handling system. The UA creates, submits, and receives messages for you.

UFS (UNIX® file system) The default disk-based file system under the SunOS™ 5.x operating system.

UI (UNIX® International) A consortium consisting of Sun, AT & T, and others that formed to advance a UNIX® System V-based environment, including the Open Look GUI. See also GUI.

UID number (user identification number) The number assigned to each login name. The system uses UID numbers to identify, by number, the owners of files and directories.

ulp (unit in last place) In binary formats, the least-significant bit of the significand, bit 0, is the unit in the last place.

ULSI (1. ultra-large-scale integration) (n.) The process of placing more than 100,000 components on a chip.

(2. ultra-large-scale-integration) (adj.) Characteristic of a chip containing more than 100,000 components (transistors and other elements).

unary Also called monadic.

unary operator An operator having only one operand. You can use the + (plus) and - (minus) unary operators in absolute, relocatable, and arithmetic expressions.

unasserted Characteristic of a signal that terminates an action. Contrast with asserted.

unavailable Characteristic of a window element that cannot be selected in the current context. For example, the OK button is unavailable until the user selects an item in the list.

undo To reverse the effect of the most recently performed operation on an object.

UniForum The Uniforum Technical Committee, formerly the /usr/group, is an association of individuals, corporations, and institutions with an interest in the UNIX® system. This organization provides input to POSIX and other standards committees and consortia to aid in the development of independent industry-driven standards.

universal address A hexadecimal address of a type of network, such as TCP/IP, that configures the port monitor to check for print requests from print clients on a network.

unmount The process of removing access to a directory on a disk attached to a machine or a remote disk on a network. See also mount.

upper Stream A Stream that terminates above a multiplexer. The beginning of an upper Stream originates at the Stream head or another multiplexer driver.

upstream In STREAMS, a direction of data flow moving from a driver toward the Stream head. Also called input side, read-side.

URL (Uniform Resource Locator) A standard for writing a textual reference to an arbitrary piece of data in the World Wide Web (WWW). A URL looks like "protocol://host/localinfo" where "protocol" specifies a protocol for fetching the object (like HTTP or FTP), "host" specifies the Internet name of the targeted host, and "localinfo" is a string (often a file name) passed to the protocol handler on the remote host.

user account A record of essential user information that is stored on the system. Each user who accesses a system has a user account.

user-defined (adj.) Characteristic of a setting or some other customization that you determine.

user ID A number that identifies a user to the system.

user name A combination of letters, and possibly numbers, that identifies a user to the system.

utility A standard program, usually furnished at no charge with the purchase of a computer, that does housekeeping.

UUCP (1. UNIX-to-UNIX Copy Program) A program that uses the UNIX-to-UNIX Copy Protocol.

(2. UNIX-to-UNIX Copy Protocol) A protocol for communication between consenting UNIX® systems.

UUNET A network that carries electronic newsgroups, aggregates of many electronic messages sorted by topic, to thousands of users on hundreds of workstations worldwide.

CHAPTER 23

V

validate To have an application verify that the contents of a text field are appropriate to the function.

VAR (value-added reseller) A company that buys hardware and software, adds more features or services to it, then resells the upgraded product.

variable A symbol with a value that may change. In the shell, the variable is a symbol representing some string of characters. You can use a variable in an interactive shell as well as within a shell procedure. Within a shell procedure, examples include positional parameters and keyword parameters.

VDC (virtual device coordinates) In computer graphics, a device-independent coordinate system that isolates the specification of view boundaries from device coordinates.

VDC transform In computer graphics, the final transform in the transformation pipeline that provides the mapping between virtual device coordinates (VDC) and device coordinates.

VDC transformation matrix In computer graphics, the transformation matrix that maps the clip-space window onto a rectangular region of the raster called the raster viewport.

vector (1) A line segment on a display surface with start and end points identified by x, y coordinates on a grid.

(2) A conceptual direction (perhaps with length) denoting, for example, a light-ray direction or an object's boundary.

vertex The location at which vectors and polygon faces or edges intersect. In transformation algorithms, an object's vertexes describe the object's location and its location in relation to other objects.

vertical blanking The number of scan lines in a field that are mandated to contain nothing except field sync and blanking. Only a small number of vertical interval lines are blanked.

vertical drive A pulse containing vertical synchronization information that lasts the duration of vertical blanking.

vertical interval The raster lines that are precluded by a video signal standard from containing a picture. You can convey those vertical interval lines that are not required to be blanked as test signals (VITS), a reference signal (VIRS), timecode (VITC), closed captioning data (CC), teletext, or other information.

vertical refresh rate A monitor specification that describes the rate at which one horizontal refresh cycle completes. The higher the vertical refresh rate, the less flickering on the screen.

VESA local bus (Video Electronics Standards Association local bus) The first standardized local bus. Common on x86 systems, it is an extension of the ISA bus, which is directly connected to the CPU data bus.

video interface A high-speed interface used with the SPARCprinter™ and the SPARCprinter SBus printer card.

viewing pipeline The process by which picture data are translated from user input to the screen display. In the 3-D viewing pipeline, for example, an object is defined by the application developer in model coordinates. The model coordinates are mapped to world coordinates; the world coordinates are mapped to normalized device coordinates (NDC); the NDCs are mapped into device coordinates; and the final picture is displayed.

view model In computer graphics, a model that specifies the geometric aspects of image formation, determining the orientation of images and the spatial relationships between objects.

viewport A specified window on a display surface that usually shows only part of a document or graphic.

view transform In computer graphics, the transform that maps graphic objects defined in world coordinates to normalized device coordinates where viewing operations occur.

view transformation matrix In computer graphics, the transformation matrix that maps graphic objects from world coordinates to normalized device coordinates. The view transformation matrix can be specified directly or derived from the matrix product of the view orientation matrix and the view mapping matrix.

view volume In 3-D graphics, the conceptual 3-D space between the user's eye point and infinity. The depth of the view volume becomes finite if front and back clipping planes limit the drawing space available to the application. The width of the view volume, though theoretically infinite, is limited by the display surface's edges.

virtual address (1) A 16-bit integer identifying a byte "location" in virtual address space. The memory management unit translates the virtual address into a physical address.

(2) The address that identifies a virtual block on a mass-storage device.

virtual circuit An apparent connection between processes that is facilitated by transmission control protocol (TCP). A virtual circuit enables applications to "talk" to each other as if they had a physical circuit.

virtual memory A condition in which a user program can be larger than physical memory. This is possible through a storage hierarchy in which a program's virtual image is stored in secondary storage while main memory only stores active program segments.

visual In the X protocol, the specifications for color handling for a drawable, including visual class, depth, type, and so on. The visual accounts for the differences between various types of hardware in determining the way pixel values are translated into visible colors within a window. A particular screen can support only one visual type.

visual editor An editor that shows a screenful of text at a time and enables you to move the cursor to any part of the screen and make changes; for example, the UNIX® system vi program. See also screen editor. Contrast with line editor.

visualization A method for creating graphical models to represent complex (typically scientific) data. See also medical imaging, volume rendering.

VLSI (1. very-large-scale-integration) (n.) The process of placing more than 100,000 transistors on one chip.

(2. very-large-scale-integration) (adj.) Characteristic of a chip containing more than 100,000 transistors.

VMEbus An interfacing system that connects data processing, data storage, and peripheral control devices in a closely coupled configuration.

volatile memory Compare with nonvolatile memory.

volume rendering A method of computing solid volume data for graphical display in volumetric models composed of 3-D elements called voxels. Direct volume-rendering techniques enable you to manipulate the volume data as a solid structure that you can slice to expose internal views.

voxel (volume element) A three-dimensional element that describes the data in a volumetric structure. See also volume rendering.

VRAM (video random access memory) A type of dynamic RAM (DRAM) used in high-speed graphics frame buffers. With conventional DRAM, both the processor and the frame buffer logic must access RAM by sharing the same signal lines or buses on the RAM chips. VRAM provides separate buses for the processor and the frame buffer logic. See also DRAM , SRAM.

VSIMM (video [random access memory] single inline memory module) A small printed circuit card that contains dynamic random access memory (DRAM) chips for storing video images.

CHAPTER **24**

W

wait state A condition whereby a microprocessor awaits the arrival of data.

WAN (wide area network) A network consisting of many systems that provide file transfer services. This network can cover a large physical area, sometimes worldwide.

watermark In STREAMS, a limit value used in flow control. Each queue has a high watermark and a low watermark. The high watermark value indicates the upper limit related to the number of bytes contained on the queue. When the queued character reaches its high watermark, STREAMS causes blocking of another queue that attempts to send a message to this queue. When the characters in this queue are reduced to the low watermark value, the other queue will be unblocked by STREAMS.

WC (world coordinates) The coordinate system that is scaled so that user-defined objects can be represented in units appropriate to the application, such as inches, meters, and miles. Each object in a picture is first described in its own model coordinates, and all are then mapped into world coordinates.

WebTone The Sun term for the 21st-century Internet equivalent to the dialtone. It facilitates information flow across devices, from smartcards to supercomputers.

wide character A data type with a fixed number of bytes in which a character from any supported character set is stored. Interpretation of a wide character is usually locale dependent. ANSI-C uses a data type called wchar_t as the name of the data type.

widget — In a window system, a reusable user interface component such as a button, scrollbar, control area, text edit area, and so on. When an X Toolkit Intrinsics function creates a widget, it is returned as an opaque data handle and assigned to a variable called a widget identifier. See also OLIT.

widget class — The widget's type. Class defines the resource set for instances of that class of widgets.

widget class hierarchy — The hierarchy of widget superclasses and subclasses.

widget instance — A value for the resource set defined by the corresponding widget class.

widget set — A family of widgets used together to produce a unified user interface.

wildcard — A metacharacter that represents a range of ordinary characters; for example, the shell's use of * and ?

window frame — The visible part of a window that surrounds a software application. A window frame can contain up to five controls: title bar, resize borders, minimize button, maximize button, and the Window menu button.

window gravity — In the X protocol, a capability that automatically repositions resized windows, with respect to an edge, corner, or center of the window. See also bit gravity.

window icon — A minimized window.

window list — A window element that presents a list of all the open windows associated with the window from which the action was selected.

window management — A set of functions with which you can control the layout and state of windows on the screen. The agent that implements these functions is called the "window manager." The functions include moving, resizing, opening, closing, raising, lowering, and quitting windows.

Window menu — The menu displayed when you choose the Window menu button. The menu choices enable you to manipulate the location or size of the window, such as Move, Size, Minimize, and Maximize.

Window menu button — The control at the upper-left corner of a window, next to the title bar. Choosing it displays the Window menu.

window raster In computer graphics, a raster object that designates a rectangular area on the display device screen.

window system A system that provides you with a multiuse environment on the display device. Separate windows are like separate displays on the monitor screen. Each window can run its own application. You open some number of windows for various applications, and the window system handles the communications between each of the applications and the hardware.

wireframe model An object with edges created by line segments. Because it is wholly transparent, the object's hidden lines are visible (unless you use an algorithm to remove them). Such an object can be drawn quickly because no surfaces need to be rendered or highlighted. However, in a complex 3-D drawing (a car engine, for example), it might be difficult for the viewer to make visual sense of the drawing. See also depth-cueing, hidden-line removal.

word A character string of 8-bits, 16-bits, 32-bits, or 64-bits. The SPARCstation™ system uses a 32-bit word.

wordwrap The automatic continuation of text from the end of one line to the beginning of the next.

work area The part of a window where controls and text are displayed.

working directory The directory in which the user's commands take place, given that no other directory is specified.

Workshop for Implementors of OSI (OIW) The North American regional forum at which OSI implementation agreements are decided. It is equivalent to EWOS in Europe and AOW in the Pacific. Also called NIST OIW or the NIST Workshop.

workspace (1) The current screen display, the icons and windows it contains, and the unoccupied screen area where you can place objects.

(2) A specially designated (but standard) directory and its subdirectory hierarchy. Usually, each developer on a project works in his or her own isolated workspace concurrently with other developers programming in other workspaces.

workspace background The portion of the display with no windows, icons, or objects.

Workspace Manager The software application that controls the size, placement, and operation of windows within multiple workspaces. The Workspace

Manager includes the front panel, the window frames that surround each application, and the Window and Workspace menus.

Workspace menu The menu displayed by pointing at an unoccupied area of the workspace and clicking a mouse button.

workspace object An object that has been copied from the File Manager to the workspace.

workspace switch A control that enables you to select one workspace from among several workspaces.

wrapping On the SBus, the process—during burst transfers—by which the burst can begin at an arbitrary word boundary within the block, with the address incremented by 4, modulo the size of the burst in bytes.

write (1) To place text in a file.

(2) To use the write command to communicate with other users.

write protect To restrict writing in a file to authorized users or programs.

write queue A message queue in a module or driver containing messages moving downstream. Associated with the `write(2)` system call and output from a user process.

write side See downstream. Also called output side.

WWW (World Wide Web) The web of systems and the data in them that is the Internet. See also Mosaic, URL.

CHAPTER 25

X

X11 The X Window System, Version 11, developed by the Massachusetts Institute of Technology (MIT) Consortium. X11 is a network-based protocol.

X11/NeWS system A Sun™ window system based on both X and NeWS™ systems.

X11R5 The X Window System, Version 11 revision 5. See also X11.

x86 Any personal computer based on the Intel 80x86 architecture.

x-axis The horizontal axis in the Cartesian coordinates system. Although coordinate systems can be moved and their orientations altered, the x-axis is always perpendicular to the y-axis. See also z-axis.

XBus A packet-switched bus that supports multiple buses by way of a cache controller in large multi-processing configurations.

XDBus On Sun™ server systems, the main card cage backplane bus.

XDM (X Display Manager) A program supplied with the OpenWindows™ interface that manages X displays.

XDR (External data representation) A standard for machine-independent data structures developed by Sun.

XGL™ library The Sun™ graphics library.

XIL™ library X imaging library. The XIL library is a platform programming interface for imaging and video support. It provides a common implementation of imaging functionality that is common to multiple

higher-level interfaces, provides imaging capabilities that are not currently available, and provides a way for ISVs to access low-level and hardware capabilities.

Xlib The C language interface to the X protocol.

X server In the X protocol, a basic windowing mechanism that handles interprocess communication (IPC) connections from clients, demultiplexes graphics requests onto the screens, and multiplexes input back to the appropriate clients. An X server controls a single keyboard and pointer and one or more screens that make up a single display.

XView toolkit An X11 toolkit for building applications. The XView™ API is derived from the SunView™ API and is based on Xlib, the lowest level of programming available to the X window system developer.

X Window System Protocol The computer protocol by which clients communicate with the X server and the X server communicates with clients.

X Window System Toolkit An X consortium standard that provides the structure and library functions for creating and assembling widgets into a user interface. Also called the X Toolkit, Xt Intrinsics, Intrinsics, and Xt.

x-y plane The plane created by the x and y axes in a coordinate system.

CHAPTER **26**

Y

y-axis The vertical axis in the Cartesian coordinates system. Although coordinate systems can be moved and their orientations altered, the y-axis is always perpendicular to the x-axis. See also z-axis.

YUV A color model used in the PAL (European) television format. Each color is represented by a combination of three components: Y, U, and V. The Y component represents the luminance, or brightness, of the color, and the U and V components carry 1.3 MHz chrominance information.

CHAPTER **27**

Z

z-axis The axis in 3-D graphics representing depth. When the z-axis—perpendicular to the x-y plane—is added to the x-axis (width information) and the y-axis (height information), it forms a virtual three-dimensional space.

z-buffer The depth buffer in 3-D graphics. The z-buffer memory locations, like those in the frame buffer, correspond to the pixels on the screen. The z-buffer, however, contains information relating only to the z-axis (or depth axis)—useful in hidden-surface removal algorithms.

z clipping The clipping of a three-dimensional object in the depth dimension in 3-D graphics.

zero-order interpolation See nearest-neighbor interpretation.

zombie A process that has terminated but remains in the process table because its parent process has not sent the proper exit code. When a user reboots a system, Zombie processes are removed from the process table. They consume no system resources.

zone The administrative boundary within a network domain, often made up of one or more subdomains.