

# DATA TELECOMMUNICATIONS D I C T I O N A R Y

Julie K. Petersen

STANDARD-SETTING 820-PAGE TECHNICAL  
REFERENCE WRITTEN IN PLAIN LANGUAGE.  
GENEROUSLY ILLUSTRATED WITH MORE THAN  
300 CHARTS AND DIAGRAMS.



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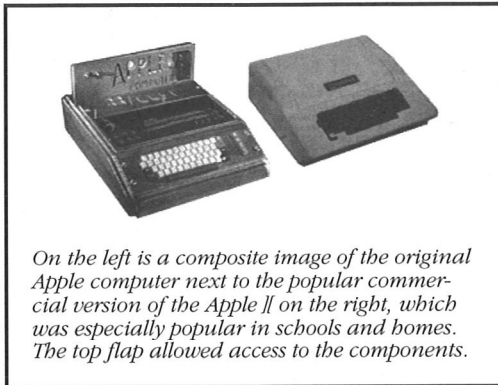
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portable, individualist computer with an upbeat design and appeal similar to that of the Volkswagen 'Bug' in the 1960s. The *iMac* evidently attracted more than loyal Macintosh users, with 16% purchased by new computer owners or those who had previously used other brands.



*On the left is a composite image of the original Apple computer next to the popular commercial version of the Apple II on the right, which was especially popular in schools and homes. The top flap allowed access to the components.*

Apple Computer went public in 1980 and forged new directions, pioneering the graphical user interface developed at Xerox PARC, and incorporating the point-and-click style of interaction into the Lisa computer in 1983. The Lisa was ahead of its time, and under-appreciated. It did not sell well, probably due to the steep price tag. However, most of the characteristics of the Lisa showed up over the years in the Macintosh line, introduced in 1984, which eventually began to sell very well, after a slow start with the cute, but limited *Little Mac* which had a small black and white screen and a single floppy drive.

Apple Computer continues to market computers and software, continually bringing out new desktop models and laptops, and now offering two operating systems, MacOS and Rhapsody. See Jobs, Steven P.; Macintosh; Wozniak, Stephen.

**AppleTalk** A proprietary computer network protocol developed by Apple Computer, Inc., which functions independently of the layer on which it runs. Implementations vary, and include 1. LocalTalk and similar (230 to 300 Kbps), commonly used among printers, Macintosh computers, and emulators; and 2. EtherTalk (10 Mbps), which provides broader multiplatform communications.

**AppleTalk Address Resolution Protocol** AARP. A protocol in the AppleTalk networking protocol stack which maps a data link address to correspond to a network address.

**AppleTalk Control Protocol** ATCP. A means for configuring, enabling, and disabling

AppleTalk Protocol modules at both ends of a point-to-point (PPP) link. ATCP uses the same basic packet exchange mechanism as the Link Control Protocol (LCP). See RFC 1378.

**AppleTalk Remote Access** ARA. A capability which allows remote access, through two or more Macintosh computers, connected through an AppleTalk network, to share a serial device on the remote system, usually a modem. In other words, if there is only one phone line and one modem, and four computers attached to the network, ARA can be set up so any one of the people using the computers without a modem can access the modem through the other computer (one at a time) as though it were attached to the local machine.

**application, applications program** A catch-all designation for computer software programs, especially high-level ones intended for end-users, such as databases, spreadsheets, word processors, graphics programs, telecommunications programs, programming tools, etc.

**application framework** The basic logical structure in an object-oriented development environment. When software is being designed, there is often a pre-existing set of assumptions within which the user interacts with the computer. For example, when a user sees something on a screen that looks like a button, he or she will expect something to happen when it is clicked, or double-clicked, depending upon the system, and the experience of the user.

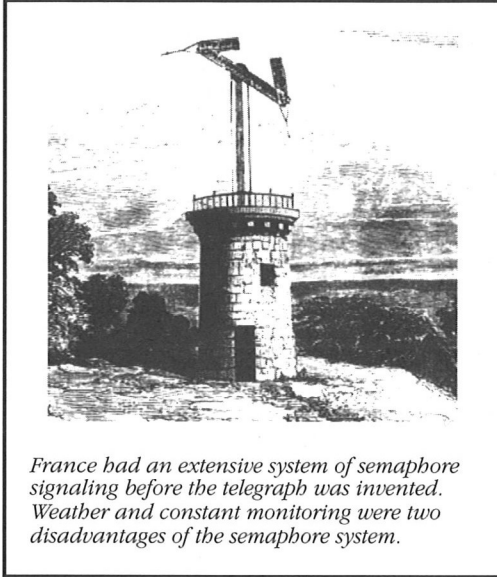
These basic assumptions are cultural and experiential, and are important in the design of software. If the software interface is obscure, or too radical to be understood, it may not be of practical use. A certain degree of consistency, immediacy, and familiarity are important factors.

By using an application framework, not only will the user be presented with a consistent set of stimuli and tools, but the programmer will have a context within which to create the software. The framework exists at several levels, at the user interface level, at the applications design level, and at the lower levels in which the parts, components, interactions, and processes are created.

In an object-oriented programming environment, it is easier to apply a framework, and to work within a framework, when shared objects, classes, and other programming primitives and structures are being used and reused. For this reason, most of the thinking about application frameworks has arisen in object-oriented programming environments, such as those utiliz-

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the arms or flags. While electronic communications have superseded most semaphore systems, they are still sometimes preferred in situations where electronic messages might be overheard. See Chappé, Claude.



*France had an extensive system of semaphore signaling before the telegraph was invented. Weather and constant monitoring were two disadvantages of the semaphore system.*

**semaphore, programming** 1. An access or exclusion indicator, such as a variable flag. Semaphores are useful for controlling file locks to preserve data integrity. In other words, they can be used to prevent multiple users from accessing a file simultaneously and changing data in a way that could disrupt the information or corrupt the data. 2. A low level integer variable having only nonzero values; a primitive which can be used for synchronization in concurrent processing implementations.

**semiconductor** A material widely used in electronics due to its relative balance of electrical conducting and insulating properties (hence the name *semiconductor*). Semiconductor materials are typically crystalline in structure, and their properties of enabling or impeding the flow of current are used in designing solid state electronic circuitry.

Materials which are commonly used to create semiconductor components include silicon, germanium, and gallium arsenide. Doping, the addition of other elements, is used in the creation of semiconductors to further control and enhance their properties. Current flow in semiconductors is commonly controlled by electricity, but may also be controlled by the influence of light or magnetic fields. Semiconductors are important materials used in the manufacture of integrated circuits. See inte-

grated circuit.

**sensor glove, data glove** A human interface device which fits over the hand and uses electronics to translate hand movements into signals which can be interpreted by a software program. Data gloves are used for many purposes: video games, virtual reality environments, special effects in movies, experimental computer interfaces, and scientific studies in human movement and perception. They are often combined with special types of monitors mounted in helmets, on glasses, or on tiny headsets, in order to facilitate natural movement and the illusion of a 3D virtual environment.

**sequential** A nonoverlapping succession or series, in chronological or data order, with no significant intervening time or data. See concurrent, consecutive, parallel, serial.

**serial communication** A means of transferring data one element at a time, often through a single wire or trace in a circuit. While it may not seem very fast or efficient, serial communication is easily implemented and very commonly used in computing systems. The RS-232 standard is the most common specification for the physical/pin connections for serial communications. See modem, parallel, RS-232.

**serial interface card** A printed circuit card which fits into a slot in a computer or other computerized device, or piggybacks on a motherboard to provide standardized electrical connections for the synchronous serial transmission of digital data. The connection on the card is typically a 25-pin D connector. On consumer desktop computer systems, most serial interface cards support data rates up to about 28,800 bps or 38,400 bps. A serial interface card is a common way to connect remote computer terminals and data modems to a computer. See RS-232.

**Serial Line Interface Protocol, Serial Line IP** SLIP. Originating with an early 1980s 3COM UNET TCP/IP implementation, SLIP became a de facto standard encapsulation protocol for serial lines, used for point-to-point communications with TCP/IP. SLIP has now been superseded by Point-to-Point Protocol (PPP). See Point-to-Point Protocol, RFC 1055.

**SERN** See Software Engineering Research Network.

**server** A system which provides services to other computers connected to it through a network. A server may store and administrate



software applications, security measures, access to peripherals or external systems, etc. The server does not necessarily have to be an enhanced system, as servers can be specialized as print servers, mail servers, etc. (and there may be several servers on a system), but servers performing the bulk of centralized or generalized tasks often have more memory, processing speed, and storage than other systems on the network.

The software is probably the most important aspect of a good server. Good network software is robust, configurable, and usually fully multitasking. There are many well-tuned network workstation options that are reliable and do not crash, except in the most unusual of circumstances. Shop around when selecting your network server software; if you pay a few hundred or a few thousand extra dollars initially, you may recoup it in only six months in terms of downtime, software reinstallation, and administrative costs that accrue on unreliable systems.

**server agent** In server/client systems, software that handles the major processing or protocols and serves a request from a client as a Web server, mail server, or FTP server.

**Service Advertising Protocol** See Service Location Protocol.

**Service Agent** A network utility which, when queried, provides information about a network service (printer, modem, etc.) such as its URL.

**service bureau** A center providing services that usually require specialized equipment and/or expertise. Copy centers, private postal centers, data entry services, and facsimile centers are examples of common service bureaus. Service bureaus commonly arise when there is a service occasionally required by many businesses or individuals, but those businesses or individuals don't have the equipment or the expertise to do the job themselves. See outsourcing.

**Service Control Point** SCP. A point which provides access to the database in an Intelligent Network (IN), which is connected to a Service Management System (SMS), and which accesses Internet Protocol (IP) as needed. SCPs enable advanced services by processing the format or content of transmitted information. See Intelligent Network.

**Service Location Protocol** SLP. An intelligent resource discovery and registration protocol developed in the mid-1990s. Described as a 'quieter' alternative to Service Advertising Protocol (SAP), SLP includes extended at-

tributes information to reduce network traffic queries. Thus, a printer may be described in terms of its capabilities (such as duplex printing, PostScript-capable, tabloid paper) and found transparently, without the user querying for its IP address. See Service Advertising Protocol, Service Agent, SLIP, RFC 2165.

**Service Management System** SMS. An interactive computer system dedicated to coordinating national 800 numbers, from International Business Machines (IBM).

**Service Profile Identifier** When hooking up ISDN BRI services, the carrier provides the user with a SPID for each number being installed, typically two. The SPID points to a memory location in the carrier's central office where ISDN parameters, including which services are enabled for a particular subscriber, are stored. As not all phone carriers have automatic SPID detection, some newer modems can determine what type of ISDN service is connected and configure the SPIDs accordingly. When connected to carriers with automatic SPID detection, they can configure themselves whether or not a computer is attached to the modem. Modems with these capabilities help compensate for some of the problems traditionally associated with the installation of ISDN services. It is recommended that the subscriber keep a record of SPID numbers filed away somewhere, as it's easier to look up a lost SPID than to have to get it again from the phone carrier.

**service quality** Standards of service established by businesses that include such things as service without outages, available lines without lag or busy signals, technical support availability, good data integrity, etc. This is not the same as quality of service (QoS), which has a more specific meaning.

**Service Specific Convergence Sublayer** See SSCS.

**Service Switching Point** SSP. A point which provides local access and an ISDN interface for a Signaling Transfer Point (STP), which, in turn, provides packet switching for message-based signaling protocols in an Intelligent Network (IN). See Intelligent Network.

**services-on-demand** SoD. Services provided to an audience on a request basis, rather than on a scheduled broadcast basis. The concept is not new, in fact, it has been available for media services for over 100 years, but new digital technologies are providing automated services, thus making available cost-effective SoD delivery options which were not previ-