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mainframe system. PROFS is frequently used for electronic mail and is said to give a user an edge in productivity in three areas: business communications (including electronic mail), time management and document handling.

program Instructions given to a computer or automated phone system to perform certain tasks. Most vendors improve (update) their software programs continuously. It's a good idea to ask what the deal is with getting updates.

program circuit A voice circuit used for the transmission of radio program materials. It is a telephone circuit which has been equalized to handle a wider range of frequencies than are required for ordinary speech signals.

program counter A device inside a computer which keeps track of which instruction in the program is next, etc.

program evaluation reviews An activity many of us are consigned to spend our aging years doing. In the early days of our careers, we used to do things—actually do tasks hands-on. Then many of us, sadly, got “successful.” Our jobs then became telling younger people what to do and checking that they do what we told them, or doing something better (hopefully). To do all this, we sit in meetings. We call these meetings “Program Evaluation Reviews.”

Program Evaluation Review Technique PERT. A management tool for graphically displaying projected tasks and milestones, schedules and discrepancies between tasks.

program file A file that starts an application or program. A program file has an .EXE, .PIF, .COM, or .BAT filename extension, AKA executable.

Program Information File PIF. A file that provides information about how Windows should run a non-Windows NT application. PIFs contain such items as the name of the file, a start-up directory, and multitasking options for applications running in 836 enhanced mode. See PIF.

program log Records once kept by a broadcasting station in a public file which provided a record of programs broadcast, program type and program length. The logs also included commercial and public service spots. Broadcasters are no longer required by the FCC to maintain program logs.

program logic The particular sequence of instructions in a program.

program store In an electronic switching office, the semipermanent memory used for the controlling stored program.

programmable In telephony, the ability to change a feature or a function or the extension assigned to a telephone without rewiring.

programmable call forwarding This feature of a telephone system allows a user to instruct his phone to send all his calls to another phone. That phone might be another extension in the same phone system or it might be another phone number altogether in a different part of the country. This feature is great. You're going to a meeting but don't want to miss that one special call. You can send your calls to a person close to the meeting and ask them to interrupt you if that “special” call comes in. The problem with this feature is that often people forget their phone is on “forwarding” and when they return to their office, they sit around all afternoon waiting for that special call, which got call forwarded elsewhere. There are two ways to overcome this. Some phones have lights or messages on their screens which indicate all calls are being forwarded. Also, some telecom managers program their total phone systems so that twice a day, all call forwarding shall cease and all calls shall return to their original phone.

programmable configuration select Refers to the EEPROM setup routine which allows jumperless configuration of the system board.

programmable logic A Programmable Logic device is typically a chip that can be reconfigured. It consists of arrays of basic logic gates laid out in a grid of connecting wires. These chips offer the advantage of being able to be reconfigured in minutes rather than the months that is needed to revise the design of a custom-made chip. They are ideally suited for products where flexibility is needed, such as when industry standards are still undetermined. Disadvantages of programmable logic chips include that they are invariably larger due to their inherent inefficiency, which can make them more expensive. See also Custom Chip.

programmable memory Memory that can be both read from and be written into by the processor. Synonym for Random Access Memory—RAM.

programmable terminal A user terminal that has some limited processing power. Also, intelligent terminal.

programming language A language used by a programmer to develop instructions for the computer. It is translated into machine language by language software

called assemblers, compilers and interpreters. Each programming language has its own grammar and syntax.

programming overlay Typically a piece of cutout cardboard, which you place over certain of the keys on a phone or console. When you punch in a certain code, the buttons become what's written on the programming overlay.

program sharing The ability of several users or computers to use a program simultaneously.

program store Permanent memory in a stored program control central office that contains the machine's generic software program, parameters and translations.

progressive conference A PBX feature. Allows the extension user to create conferences of more than three people using the consultation hold and add-on conference features. To create a conference, an extension user typically uses the consultation hold, dials the desired internal or external number and effects an add-on conference. The conference may then be progressively expanded, in this same fashion, to the maximum capability of the phone system offering this feature. A good question to ask before you get sold this feature is “does the conferencing have amplification and balancing?” Without these features, the conferencing conversation will simply get more and more difficult to hear on.

progressive dialing A form of predictive dialing, progressive dialing is slightly more automated than preview dialing. The customer data is not displayed until the number is dialed, giving the agent less time to review it and a shorter time between calls. See also Predictive Dialing and Preview Dialing.

progressive display See Interlaced GIF.

progressive tuning A method of painting pictures on computer monitors or TV screens in which the picture is painted line by line. It is today's most common way of painting a picture or an image on a computer screen.

Project 25 P25. Project 25 is a joint government/industry standard setting effort to develop technical standards for the next generation of two-way communications equipment for public safety communications agencies. To do their jobs well, Public safety radio users require specific functions:

- Control of group communications and dispatching, with purpose-built security, dynamic management of talk groups, emergency calls, talk-around capability (ad hoc calls between handsets without involvement of a base station), prioritization of communications, etc.
- “Instant” connections, with voice call set-up time in the range 0.3 to 1 second; 0.5 second often is cited.
- Seamless radio coverage throughout the geographic area, including guaranteed coverage under the harsh environments of disasters. Handsets can relay connections when events take out network base stations.
- Ability to provision additional radio capacity during major incidents automatically, while guaranteeing capacity for rescue and law enforcement.
- Uncompromising voice quality to allow a listener to recognize the speaker, regardless of the background noise.

Initially, the Association of Public-Safety Communications Officials, International (ARCO) led the development with the ARCO Project 25, a standard for first response radio. Project 25 is now a joint effort, with the participation of local, state, and federal governments. The primary objectives are to provide high quality digital, narrowband radios. Additional objectives include optimizing radio spectrum efficiency and ensuring market competition among multiple vendors based on standards throughout the life of systems. Project 25 considered various access technologies in an attempt to make the best use of the available radio frequency spectrum. Under Phase I of P25, upgrades moved the existing equipment from analog technology with a 25 kHz bandwidth to digital technology with a 12.5 kHz bandwidth. The modulation selected for Project 25 is C4FM, which is a modified, four-level, frequency-shift keying (FSK), with a raised cosine filter to minimize inter-symbol interference. TIA-102 requires new equipment to be “backward compatible” with the analog equipment to allow for a smooth transition.

In Phase II, more spectrum-efficient equipment using Frequency and Time Division Multiple Access (FDMA and TDMA) will need no more than 6.25 kHz per voice channel. This equipment will also be backward compatible with Phase I. Additionally, P25-II allows support compatibility with TETRA radios (originally Trans-European Trunked Radio, renamed Terrestrial Trunked Radio). In addition to the voice encoding method, the P25 specifications define the following open interfaces and equipment definitions:

-Common air interface (CAI) -RF sub-system -Inter-system interface -Telephone inter-connect interface -Network management interface -Host and network data interfaces.

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Implementations can take the form of software-defined radios, which means the same hardware can, in principle, upgrade from phase 1 to phase 2 and possibly later versions with new firmware.

Project Evaluation Review Technique PERT. A technique for managing a project—say the installation of a PBX—which produces a guess at the project's critical path (longest task to complete) and of project milestone completion dates. See PERT.

PROM Programmable Read Only Memory. A PROM is a programmable semiconductor device in which the contents are not intended to be altered during normal operation. PROM acts like nonvolatile memory. When you install an autoboot PROM on a LAN network board, the workstation can boot up from the network server. This is particularly useful for diskless workstations.

promiscuous mode Most Ethernet cards ignore all the packets on the network that aren't destined for them. But in a Remote server—one serving multiple remote users all calling in over modems—the Ethernet LAN card has to get access to all the packets and grab those that are meant for it—so it can pass them over to the remote callers. I assume it's called "promiscuous mode" because it means that the Ethernet card has to have a relationship with all the packets traveling on the local area network. Another application for promiscuous mode is if you want to attach software or hardware to your computer, monitor and analyze all the packets flying around your network. You can set some (but not all) Ethernet cards to promiscuous mode. See also Incestuous Amplification.

promotion According to various dictionaries, "promotion" means to raise in station, status, rank or honor. Once upon a time, a promotion meant you got a better title, a bigger office and a raise in pay. Today, it means that a software release or your hardware product just made a change in status from alpha test to beta test, or from beta test to general release. See also Alpha Test and Beta Test.

prompt An audible or visible signal to the system user that some process is complete or some user action is required. Also used to signify a need for further input and/or location of needed input. See also the next three definitions.

prompt tagging and encoding According to Steve Gladstone, author of the book, "Testing Computer Telephony Systems," (available from 212-691-8215) many test applications require the test system "know" which prompt is being played by the computer telephony system. This is often accomplished by prompt tagging, also known as prompt encoding. Prompt tagging has the computer telephony system play-out an audio tone that can be heard by the test system with each prompt that is played. Prompt tagging is relatively inexpensive to perform, and inexpensive to automate. Prompt tagging can be accomplished in two ways, either by inserting tones into actual user prompts ("insert" mode), or by having a special programmatic switchable test mode that may be toggled on/off by the computer telephony system that will play out a tone sequence before or after each prompt is played ("append" mode).

prompting Visually or audibly indicating to a user of a telephony device that a call has reached (and been accepted by) the device and is capable of being answered. This is typically done by ringing the device, flashing a lamp, or presenting a message on the device display.

prompts 1. Recorded instructions delivered by voice processing units. Prompts may include MENUS or other information that is played each time you get into the system.

2. Messages from the computer instructing the user on how to use the system. See Menu and Audio Menu.

proof of concept You're at a trade show. You go to a booth. You see some great new technology. You can't buy it. It's simply a demonstration of new technology. What's called "proof of concept." It proves that the idea works. It doesn't mean there's a market for it. The idea of "proof of concept" is to excite people—customers or security analysts. Maybe someone will place a big order or buy the company's stock?

proof of relativity When you're with your wife's relatives, time slows down.—from comedian Don McMillan.

propagation delay The length of time it takes a signal to travel from transmitter to receiver across a circuit. At the most fundamental level, propagation delay is a factor of the finite speed at which electromagnetic signals can travel through a transmission medium. The basis for comparison is the velocity of light in a vacuum, which is 300,000 (actually 299,792) kilometers per second, or 186,280 miles per second. Signal propagation is approximately 272,000 kilometers per second in an optical fiber, depending on factors such as impurities in the fiber core, temperature, and the refractive index of the cladding. Signal propagation in CAT 5 copper wire is roughly 200,000 kilometers per second, depending on a variety of factors including the nature of the dielectric insulating material.

Propagation delay is a huge issue in satellite communications. Given the fact that the originating signal must travel from the earth station 22,300 miles up to the satellite and 22,300 miles back down, a roundtrip (i.e., up and down in one direction) transmission takes about .25 seconds. When you add the time imposed for signal processing at the transmitting earth station (i.e., satellite dish), the space station (i.e., satellite), and the receiving earth station, the total delay is about .32 seconds. Therefore, it takes at least .64 seconds to get a response to your query. This level of propagation delay renders satellite communications ineffective for highly interactive data communications applications, as the users get really bored. Satellite communications also is highly aggravating for voice communications.

This satellite example illustrates the fact that propagation delay is affected by not only the characteristics of the physical transmission medium, but also the nature and number of various devices associated with the circuit. Examples include terminal equipment, bridges, hubs, switches, and routers. Such devices accomplish various processes, including buffering, queueing, protocol conversion, and error detection and correction. Each of these processes takes some amount of time, which generally is sensitive to the complexity of the process. Buffering and queueing of data is a means of dealing with issues of congestion in the network, or a given network element, and the level of delay imposed on the data is variable in nature, sensitive to the level of congestion existing at a given moment in time.

Propagation delay is a factor of great significance in many data communications protocols (e.g., Synchronous Data Link Control, or SDLC), where there may be a tight timing relationship between the transmitter and the receiver across the circuit. These timing considerations are significant in the control of access to the transmission medium, and in the detection and correction of errors in transmission. See also Path Delay Value and Velocity of Light.

propagation delay skew The difference between the propagation delay on the fastest and slowest pairs in a UTP cable. When one pair is much higher or lower in delay than the others, a very high skew may result.

propagation time Time required for an electrical wave to travel between two points over a transmission circuit. See also Propagation Delay.

propagation velocity The speed at which electrons or photons travel through a transmission medium. See also Propagation Delay.

propeller head An excessively technical person, whose social skills are lacking.

properties Windows 95 treats all objects, such as windows, icons, applications, disk drives, documents, folders, modems, and printers as self-contained objects. Each object has its own properties, such as the object's name, size position on-screen, and color, among others. You can change an object's properties using the properties dialog box.

Property Management Interface PMI. A telephony system's ability to talk to a hotel's computer system.

proportional font A font in which different characters have varying widths. All magazines and newspapers are printed in proportional characters, which make reading easier. By contrast, in a monospaced font, such as one on an old typewriter, all characters have the same widths.

proprietary If something is proprietary it means it will only work with one vendor's equipment. See the next three definitions.

proprietary LAN A LAN (Local Area Network) that runs the equipment of only one vendor. A proprietary LAN, for example, cannot join IBM PCs to DEC minicomputers. Some people say such LANs are more "bug-free" because they have only one vendor's wares to deal with. They also tend to be more expensive. They also tend to tie you to one vendor, although some makers are now coming out with bridges which connect proprietary LANs to non-proprietary LANs. Since Ethernet and the Internet, proprietary LANs are effectively dead.

proprietary network A network developed by a vendor that is not based on protocols approved by standards body or on standards that are "open." Typically, you won't be able to connect to a network with any equipment other than that made by the manufacturer who created it.

proprietary telephone sets Proprietary telephones are feature phones that are specific to a particular make of PBX, ACO or other switching system. They may be digital or analog. As they are custom designed for that system, they have non-standard electrical interfaces and have non-standard protocols to communicate between the telephone and the switch. This has several implications: 1. You can't take a proprietary phone from one switch and expect it to run on another switch. It won't. 2. Proprietary phones are expensive, and are highly profitable to their makers. Hence the manufacturers' insistence

on keeping is richer the preferable. Sometimes times he w factorar ha attempt to ISDN-like p prosod speaker en that only o also Prosod prosod ups and do prospe sion rate co Some rate pices and money to retroactive take effect members. Prospe Prosod us relieve file usas to co structure in prosun em that's therefore if they're not ed from int Protect imition: A acoustic, encrypted tree includes the protect grabbing ne protect system (the OS can ex enforced or protect extended in (the 80386 memory. I mode, it en software up to 16MB of raising the ry address equals 1.6 application Processes e memory m in protecte system pro Mode and Protect telephone ment and t

an keeping them proprietary. 3. Signaling between proprietary phones and their switches is richer than signaling between switches and single line analog phones. As a result, it's preferable to integrate voice mail and automated attendants through proprietary phones. Sometimes the manufacturer of the switch will divulge his secret signaling scheme. Other times he won't. Most times he won't. And you, as a voice mail or auto attendant manufacturer, have to reverse engineer it, which is sometimes successful. ISDN is actually the first attempt to make "proprietary" sets standard. So far, only a few manufacturers have used ISDN-like phones as their proprietary phones.

prosodics In speech recognition, prosodics refers to the parts of the sentence the speaker emphasizes. For example, "I am going to Paris" with emphasis on the "I" means that only one person is going to Paris and therefore only one ticket should be issued. See also Prosody.

prosody Intonation. In text to speech, prosody refers to how natural it sounds—the ups and downs of the sentence. See also Prosodics.

prospective The opposite of Retrospective or Retroactive. Most regulatory commission rate cases are prospective, which means they relate to prices and things in the future. Some rate cases, however, are retroactive or retrospective, which means they apply to prices and things in the past. Most of these decisions involve forcing the company to return money to its subscribers in the form of a refund. Interestingly—try this one—most retroactive commission decisions are prospectively retroactive. In other words, they only take effect some time in the future, when the decision is voted upon by all the commission members.

Prospero UNIX software which helps you search archives connected to the Internet. Prospero uses a virtual file system which enables users to transparently view directories and retrieve files. In short, Prospero is a distributed directory service and file system that allows users to construct customized views of available resources while taking advantage of the structure imposed by others.

prosumer A cross between a professional and a consumer. Imagine you make a camera that's too good and too expensive for consumers, but too cheap for professionals. Therefore the camera is a new classed as being for prosumers—whoever they are. I guess they're rich consumers, or poor professionals.

protected area A zone defined by a station's FCC license which is legally protected from interference (on the station's authorized channel or channels) by all other stations.

Protected Distribution System PDS. This is a US Federal Government definition: A wireline or fiber-optics telecommunication system which includes adequate acoustic, electrical, electromagnetic, and physical safeguards to permit its use for the unencrypted transmission of classified information. A complete protected distribution system includes the subscriber and terminal equipment and the interconnecting lines.

protected memory An operating system feature that keeps one program from grabbing memory set aside for another program and corrupting data to that program.

protected memory allocation mode A mode in which the operating system (the OS) reserves memory for itself. By switching the processor to this mode, the OS can execute several programs at once, transcending the one-megabyte limit normally enforced on the processor.

protected mode A computer's operating mode that is capable of addressing extended memory directly. The operating mode for the Intel 80286 and higher processors (the 80386, 80486 and Pentium) that supports multi-tasking, data security, and virtual memory. The 80286 processor can run in either of two modes: real or protected. In real mode, it emulates an 8086 (it accesses a maximum of 640KB of RAM and runs only one software application at a time). Protected mode allows the 80286 processor to access up to 16MB of memory. It uses a 24-bit address bus. Since a bit can have one of two values, raising the base number of 2 to the power of 24 is equal to 16,777,216 unique memory addresses. Each memory address can store one byte of information (16,777,216 bytes equals 16MB). Protected mode operation also makes it possible to run more than one application at once and to handle more processes because more memory is available. Processes can be requests from an operating system or an application to perform disk I/O, memory management, printing, or other functions. Processes are assigned priority numbers in protected mode. The processor gives priority to those with higher numbers. Operating system processes always have higher priority than application processes. See also Real Mode and Virtual 8086 Mode.

Protective Coupling Arrangement PCA. A device leased from the telephone company and placed between your own (customer-provided) telephone equipment and the lines of the telephone company. The idea was to protect their lines from your

junky equipment. No instance/case was ever proven of harm occurring to the network from faulty customer-provided equipment and the PCAs were thrown out and replaced by the FCC's Part 68 Registration Program. Under this program, customer-owned equipment which passes FCC tests can be registered and connected directly to the phone network without these devices. The phone industry eventually refunded most of the fees it charged on the PCAs. NATA and many manufacturers claimed the PCAs were designed to prevent the growth of the interconnect or customer-owned phone industry. They were probably right. The question is now moot, since the charges and the devices no longer exist, except in a museum or attached to very old equipment. See also Protective Coupling Arrangement and PCA.

Protective Coupling Arrangement PCA. A device placed between the phone company's trunks and your particular telephone gadget. The objective of the PCA is to isolate the telephone company's lines from your equipment and thus protect their lines from your equipment. The device is not needed if your equipment has passed FCC approval—under Part 68 of the FCC's rules. See also Protective Connecting Arrangement, which is another term for the same thing.

protector block A device connected to an exchange access line to protect connected equipment from over-voltage and/or over-current. Hazardous voltages and currents are shunted to ground. In other words, a surge protector limits unwanted surge voltages to values which can be handled safely by the insulation on inside wire and by the electronics in the customer terminal equipment. Protectors are very important in high-lightning areas, where they (theoretically) keep wires and phones from melting, phone systems from being blown off the wall, and end users from being electrocuted.

The original protectors were based on carbon blocks which effectively blocked aberrant voltage surges. Subsequently, gas tube protectors were used. Solid state protectors were the third generation. Improvements in the speed of reacting to incoming high voltage and high currents have been at the forefront of the improvements in technology. While all variety of protectors currently are in place, those currently being deployed are either solid-state or hybrids, which incorporate both gas tube and solid-state technology. Protectors often are an element of a multi-function NID (Network Interface Device), also known as a NIU (Network Interface Unit), which acts as the point of demarcation between the local exchange carrier and the customer premise.

protector frame A frame, usually part of the MDF, that serves as termination for loop cables. The protector frame contains electrical protection devices that normally provide conducting paths, but will break down and electrically isolate a loop from the switching equipment when an abnormally high voltage contact occurs.

PROTEL Procedure Oriented Type Enforcing Language. Protel is a block-structured, type-enforcing, high level, software language that enables extensive type checking on the source code at compile time. It was developed at Bell Northern Research, a subsidiary of Northern Telecom. Protel is used in the DMS-100, a family of Northern Telecom central office telephone switches. Both the central control CPU and the DMS SuperNode CPU are programmed in Protel.

protn Protection. See Protector Block.

protocol Protocols define the rules by which devices talk with each other, or more formally, a protocol is a set of rules governing the format of messages that are exchanged between computers and people. Imagine making a phone call. You pick up the phone, listen for dial tone, then punch out some buttons on your phone, then listen for ringing and for an answer. The person says "Hello." You say "Hello." Then you talk... What you're doing is following a protocol to make a call. When computers make calls between themselves—to transfer data, for example—they follow a protocol. They aren't smart, like you and I. They can't distinguish between dial tone and fast busies, unless those sounds and signals are specifically defined. A protocol defines the procedure for adding order to the exchange of data (i.e. a "conversation.") A protocol is a specific set of rules, procedures or conventions relating to format and timing of data transmission between two devices. It is a standard procedure that two data devices must accept and use to be able to understand each other. The protocols for data communications cover such things as framing, error handling, transparency and line control. There are three basic types of protocol: character-oriented, byte-oriented and bit-oriented.

Protocols break a file into equal parts called blocks or packets. These packets are sent and the receiving computer checks the arriving packet and sends an acknowledgement (ACK) back to the sending computer. Because modems use phone lines to transfer data, noise or interference on the line will often mess up the block. When a block is damaged in transit, an error occurs. The purpose of a protocol is to set up a mathematical way of meas-

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