

HARGRAVE'S COMMUNICATIONS DICTIONARY

Frank Hargrave



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directed transmission

magnetic communications, a method in which a signal is aimed at a central reflective target and read by receiving nodes as the signal bounces off the target. This is in contrast to a *diffuse transmission* in which the transmission travels in multiple directions (and therefore is much weaker in any direction).

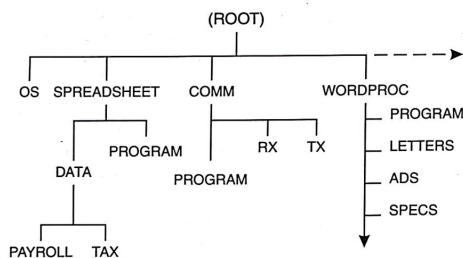
directional antenna An antenna in which the radiation pattern is not uniform in all directions. Also called a *nonisotropic antenna*.

directional coupler A multiport device inserted into a transmission line for either (1) Separately sampling either the forward (incident) wave and the backward (reflected) wave in transmission lines, or (2) It may be used to inject a signal into the transmission line in either the forward or backward direction.

directional phase shifter A passive phase shifting device in which the phase shift for signal transmission in one direction is different from the phase shift in the other direction. Also called a *directional phase changer* or a *nonreciprocal phase shifter*.

directory The name of a storage area on the medium where files are stored.

On a large storage device, it is possible to have 10,000 to 100,000 (or more) files available. It would be difficult or impossible to locate a desired file if they were randomly arranged in a single list (a *flat directory*). To make it easier to find files, the computer operator breaks the list of files into smaller lists where each item is related in some manner. The list, called a directory, may be broken further into sublists, called *subdirectories*. A *directory* may contain both *subdirectories* and *data files*. When drawn, this structure resembles an inverted tree; hence, it is called a *directory tree*. The top directory (list) is called the *root directory*. This arrangement of files and directories is called a *hierarchical directory system*. The diagram depicts one possible relationship of 15 directories in a typical computer.



Frequently, directories contain additional information about the file such as file size, creation date, date of the last modification, and number of attributes (read only, system, archived, hidden, etc.) See also *access rights*.

directory access protocol (DAP) An X.500 protocol used to communicate between a Directory User Agent and a Directory System Agent.

directory assistance call In telephony, a call placed to request the station number (directory number) of a customer.

directory caching A method of decreasing the time to find the location of a file on the disk drive.

To speed up the process, it uses a fast memory area (from which information can be quickly retrieved) to store the file allocation table (FAT) and directory entry table (DET) information about the most

directory information tree (DIT)

commonly used directory entries. As the *directory cache* fills up, the least used directory entries are eliminated from the cache. In addition to directory caching, *file caching* may be used to reduce information access time further. *Directory caching* is used in Novell's NetWare.

directory entry table (DET) In Novell's NetWare, one of two tables used to keep track of directory information. The other table is the file allocation table (FAT). The *DET*, stored on a hard disk, contains information about a volume's file, directory names, and properties. For example, an entry might contain the following:

- File name
- File owner
- Date and time of last update
- Trustee assignments (or user rights)
- Location of the file's first block on the network hard disk

The contents of the *DET* are stored in special storage allocation units called directory entry blocks (DEBs), each of which is 4 kilobytes. NetWare can support up to 65,536 of these blocks. To improve performance, NetWare can use directory caching or hashing. Directory caching keeps currently used directory blocks and the FAT in a reserved area of RAM. Frequently used directory entries will be loaded into a cache memory. Directory hashing is the indexing of the directory entries, which speeds access to directory information.

directory hashing A method for organizing/indexing directory entries to minimize the search time for an entry. The hashing provides guided access to the desired entry, so that fewer entries need to be checked along the way.

directory ID In an AppleTalk network, a unique value associated with a directory when the directory is created.

directory information base (DIB) The body of directory-related information in the ITU-T X.500 Directory Services model. Directory system agents (DSAs) access the DIB on behalf of directory user agents (DUAs).

directory information tree (DIT) Information about a directory information base (DIB) in the ITU-T X.500 Directory Services (DS) model. Since information in a DIT can get quite large, it is generally distributed. This provides faster access to the information at the distributed locations and helps keep down the size of the *DIT* materials at any single location.

A *DIT* does not contain actual objects—just information about them and a pointer to the actual body of information. Therefore, an object that appears at multiple locations in the DIT will have only one body of information associated with it. Each location in the tree has predefined attributes associated with it; the attributes will depend on the object class to which the entry belongs. An object class such as country or organization determines which attributes are mandatory and which are optional for objects belonging to that class. Objects in the tree will have specific values associated with these attributes. Two general classes of operations are possible in a DIT: retrieval (reading) and modification (creating and writing). Furthermore, a given DIT operation may apply to a single entry or to a group of entries; hence, four operation classes are possible. The X.500 model supports three of the four possible operation classes:

- Retrieve a single entry.
- Retrieve a group of entries.
- Modify a single entry.

The fourth operation class, modify a group of entries, is not supported in X.500. Both end users and processes can access the information in the *DIT* by either of two procedures:

traffic path

traffic path A channel, circuit, frequency band, line, switch, time slot, or trunk over which individual communications pass.

traffic shaping Allows the station sending information into an asynchronous transfer mode (ATM) network to:

- Specify the priority and throughput of information going into the network, and
- Monitor performance to meet required service levels.

traffic unit A synonym for *erlang* (*E*).

traffic usage recorder A device (or system) used to sample and record the occupancy of equipment, i.e., the amount of telephone traffic carried by a group, or several groups, of switches or trunks.

trailer Information occupying the last several bytes of a block or packet. *Trailers* often contain checksums or other error control information.

train (1) A sequence of events or items, such as a *pulse train*. (2) To modify the behavior of a device based on external conditions, as in the *training* of an echo canceler for each new connected path.

transaction (1) An interaction between a client and a server. A sequence of messages between a master and client station required to perform a specific function. (2) The smallest complete action when using the Structured Query Language (SQL) to search or modify a database. (If any step in the transaction cannot be completed, the entire transaction fails, and all the intermediate steps in the transaction are undone.) (3) An entry in a database.

transaction code An identifier or symbol associated with a specific transaction and representing the action to be carried out.

For example, the letter *A* may be used as a transaction code for the operation "add," *D* may be "delete," and so on.

transceiver (1) A contraction of **TRANSMITTER** and **RECEIVER**. A device that can both transmit and receive signals, such as cellular telephones, modems, and network interface controllers (NICs). Often NICs provide some form of collision detection as well. Also known as a *medium attachment unit (MAU)* in IEEE specifications. (2) In military communications, the combination of transmitting and receiving equipment which:

- Is housed in a common chassis or enclosure,
- Is usually designed for portable or mobile use,
- Uses common circuit components for both transmitting and receiving, and
- Provides half-duplex operation.

transceiver cable In Ethernet, a cable that attaches a terminal device to an Ethernet backbone cable (either 10Base2 or 10Base5).

transcoder A device that directly converts one digital code into another digital code, i.e., without returning the original code to an analog form before generating the new code.

For example, the conversion of μ 255-law encoded pulse code modulation (PCM) to A-law PCM for transmission from the United States to countries in Europe.

transducer A device for converting energy from one form (heat, light, sound, temperature, electrical, etc.) to another for either measurement of a physical quantity or information transfer.

Examples of transducers include devices that:

- Convert sound pressure levels into electrical signals (microphones).
- Convert electrical signals into sound pressure waves (speakers).

transfer time

transfer (1) The *movement of data* from one location to another. (2) The *passing of control* from one device to another. (3) In telephony, a switching system feature that allows a user to reassign a call to different end station.

transfer characteristics Those intrinsic parameters of an entity (system, subsystem, or device) which, when applied to the input of the entity, will fully describe its output. See also *transfer function*.

transfer delay A performance characteristic that expresses the amount of elapsed time required to send a message through a system. It includes not only the link's propagation time but any signal processing time required at either end of the link.

transfer function (1) A mathematical statement that describes the *transfer characteristics* of a system, subsystem, or device. (2) A rule (the *transfer characteristic*) describing how the output signal of circuit, device or system responds to an input signal. The rule may be stated in mathematical, graphical, or tabular terms. A *transfer function* is essentially the complex ratio of the output signal of the entity to the input signal.

When the *transfer function* (*T*) operates on the input (e_i), the output (e_o) is obtained. Given any two of these three entities (*T*, e_i and e_o), the third can be obtained, that is,

$$T = e_o / e_i, \quad e_o = T \cdot e_i, \quad \text{or} \quad e_i = e_o / T$$

Simple transfer functions express the ratio of output to input signals when the imaginary part of the signals can be ignored, examples are voltage and current gains, reflection coefficients, transmission coefficients, and efficiency ratios. *Complex transfer functions* include the imaginary part and are frequency dependent, examples include filter response and envelope delay distortion. *Transfer functions* are frequently expressed in terms of amplitude vs. frequency and phase vs. frequency. (3) In an optical fiber, the complex mathematical function that expresses the ratio of the variation of the instantaneous power of the optical signal at the output of the fiber (P_o) to the instantaneous power of the optical signal that is launched into the fiber (P_i), as a function of modulation frequency.

transfer mode In telecommunications, the manner in which data are transmitted and/or switched in a network, i.e., synchronous vs. asynchronous, circuit switched vs. packet switched, and so on.

transfer rate The rate at which information is conveyed across a communications channel or circuit. *Transfer rate* is expressed in units per second (e.g., bits per second, characters per second, bytes per second, and so on). It may represent either the maximum number of units per second possible or the average number of units per second (including headers, trailers, and gaps between blocks). See also *baud*.

transfer rate of information bits (TRIB) The *average* transfer rate of actual, error-free, useful information (not including overhead, error bits, or retransmitted bits) through a device or series of devices. Mathematically, *TRIB* can be expressed as:

$$\text{TRIB} = \frac{\text{Number of information bits properly received}}{\text{Total time required to get the bits}}$$

Data compression increases the transfer rate by reducing the number of bits to be transmitted so that more information can be transferred in the same time. *TRIB* is also called the *throughput* or *data transfer rate*.

transfer ratio A dimensionless transfer function.

transfer time (1) The time it takes to switch from one process or device to an alternate. (2) In gas tube surge protectors, the amount of time required for the voltage across the gap to drop into the arc region after the initial gap conduction begins. (3) The amount of time required to transmit and receive a complete message.

wirehead

wirehead Jargon (1) A hardware expert, especially one who concentrates on communications hardware. (2) An expert in local area networks (LANs).

A *wirehead* can be a network software wizard too but will always have the ability to deal with network hardware, down to the smallest component.

wireless access mode In a personal communications service (PCS), interfacing with a network access point by means of a standardized air interface protocol without the use of a physical connection to the network.

wireless cable A term referring to the use of radio networks to transmit cable-like TV programming to homes and businesses.

wireless in-building network (WIN) A wireless network that is confined to a single building.

wireless LAN (WLAN) A local area network (LAN) architecture radiated transmissions (such as radio or light) rather than conducted transmissions (including twisted pair, coax, or fiber optic cables).

wireless local loop (WLL) The use of a radio link to provide service to a remote location or to locations where it is too expensive to install copper loops.

wireless modem A modem that transmits over a wireless network rather than over telephone lines.

wireless packet network A switching network designed specifically for handling packet data communications. The network, like most telephonic systems, is a hierarchical topology. That is, at the lowest level, a base station exchanges wireless packets with nearby devices. The base stations then route these packets via traditional local area network (LAN) techniques to the destination user.

wireless switching center (WSC) The second of the two cellular systems in every market, it always belongs to the local telephone company. The frequencies used are in the 869–894 MHz band. Also called the *Block B carrier*.

wireline A term for a communications system that uses wire cable rather than radio for communications links to its customers.

wireline common carrier Common carriers that are in the business of providing landline local exchange telephone service.

wiring center (1) In general, a term for any of several components that serve as common termination points for one or more nodes and/or other wiring centers. The *wiring center* frequently connects to either an intermediate distribution frame (IDF) or a main distribution frame (MDF). (2) The IEEE 802.5 name for a token ring node concentrator. Called a *multistation access unit (MAU)* by IBM. See also *multistation access unit (MAU)*.

wiring closet The termination point for customer premises cabling. These cables connect the various areas in an office or building to the central wiring, and to the telephone or power company wiring. Usually a physical box, room, or even a closet in which the cabling on a particular floor is terminated, typically on a *wiring frame*.

wiring frame A frame used to organize and manage the termination and connection and cross connection of multiple cables.

WLAN An acronym for *Wireless LAN*.

WLL An abbreviation of *Wireless Local Loop*.

WN An abbreviation of *Wrong Number*.

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world newsgroups

WOM An acronym for *Write Only Memory*. Useful in FINO (First In Never Out) buffers.

WOMBAT An acronym for *Waste Of Money, Brains, And Time*. Describes problems that are both profoundly uninteresting in themselves and unlikely to benefit anyone, even if solved.

word A set of bits or characters treated as a single unit within a system.

- In computers, although a binary word length can be any fixed or variable length, in computer-based systems, it is generally fixed at 8, 16, or 32 bits depending on the particular computer.
- In telegraphy, six character intervals are defined as a *word* when computing traffic capacity in words per minute, which is computed by multiplying the data signaling rate in baud by 10 and dividing the resulting product by the number of unit intervals per character.

word length The total number of bits in a symbol (or character) without start, stop, or parity bits.

work space In computers and data processing systems, that portion of main storage used by a computer program for temporarily storing data.

workflow automation The flow of documents around an organization in a prescribed order (workflow) which can be automated, delivering an hierarchical and controlled form of *workgroup computing*.

workgroup A collection of network nodes grouped for administrative purposes but not sharing security information. Each workgroup has a unique name. See also *domain* and *user*.

workgroup computing A method of organizing a business around productive teams using computer support to enable cooperative working and to eliminate time/space restrictions. An extension of conventional local area network (LAN) working.

workstation (1) A networked computer typically dedicated for end-user applications (i.e., it does not provide any resources that can be shared on a network). See also *mainframe*, *microcomputer*, *microprocessor*, *minicomputer*, and *personal computer*. (2) A term used freely to mean a PC, node, terminal, or high-end desktop processor (for computer aided design or computer aided manufacturing (CAD/CAM) and similar computer intensive applications). (3) In automated systems, such as computer, communications, and control systems, the input/output, display, and processing equipment that provides the operator to system interface.

World Geodetic System 1984 (WGS 84) A geodetic reference system that includes a geocentric reference ellipsoid, a coordinate system, and a gravity field model. The ellipsoid attempts to fit the shape of the entire Earth as well as is possible with a single ellipsoid. Although *WGS 84* is often used as the worldwide reference, other models are used locally to provide a better fit to the Earth in a specific region.

WGS 84 defines the Earth-centered ellipsoid coordinates such that the Z-axis is collinear with the Earth's spin axis, the X-axis is through the intersection of the prime meridian and the equator, and the Y-axis is rotated 90° east of the X-axis about the Z-axis. *WGS84* is the geodetic coordinate system and ellipsoid commonly used by the Global Positioning System (GPS). See also *ECEF (Earth Centered Earth Fixed)* and *Global Positioning System (GPS)*.

world newsgroups The seven major newsgroup categories that are automatically distributed to every USENet site on the Internet. The seven categories are *comp*, *news*, *rec*, *sci*, *soc*, *talk*, and *misc*.

Two other classifications of newsgroups are also available in USENet: *alternative newsgroups* and *local newsgroups*. The alternative newsgroups (which are not carried by all USENet sites) are cre-