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4. Multimedia Terminal Adapter. See Multimedia Terminal Adapter and CMTS.

MTBF Mean Time Between Failure. The length of time a user may reasonably expect a device or system to work before an incapacitating fault occurs. The MBTF statistical method was developed and administered by the U.S. military for purposes of estimating maintenance levels required by various devices. Since accurate statistics (i.e. lots of numbers) require a basis of "failures per million hours of operation," an MTBF estimate on a single device is not statistically very accurate. It would take over 100 years to see if the device really had that many failures. Similarly, since the MTBF is an estimate of averages, half of the devices can be expected to fail before then, and half after. Thus, MTBF cannot be used as a guarantee of how long something might or might not work for. Telecommunications systems operate on the principle of "availability," for which there is a body of CCITT Recommendations. See Availability.

MTC Mobile Terminating Call. Mobile phone receiving the inbound leg of a call. See also MTO.

MTD Memory Technology Drive.

MTIE Maximum Time Interval Error.

MTM 1. Maintenance Trunk Monitor.

2. Mean Time Maintenance.

MTNM Version 3 Multi-Technology Network Management. On October 28, 2003, The TeleManagement Forum announced the release of the Multi Technology Network Management (MTNM) Version 3. About 40 of the world's top telecommunications software vendors and network equipment suppliers have incorporated the MTNM interface into their products, making it a de facto industry standard for network management of optical technologies. Version 3 eases the integration of multi-vendor products in an operator's network, and features a host of enhancements to support new and existing technologies, such as ATM, frame relay, SONET/SDH, DSL and Ethernet. New features in MTNM Version 3, according to the Forum, include:

- Support for new transport technologies such as Digital Subscriber Line (DSL), microwave radio, and management of Ethernet tributary interfaces
- Enhanced support for existing technologies such as ATM and DWDM and generalization of Multiplex Section Protection (MSP)
- Enhancements not specific to transport such as connection, configuration, equipment, performance and fault management.

The Forum likely will submit MTNM version 3 to the ITU (International Telecommunications Union) for acceptance as a standard.

MTP Message Transfer Part of the SS7 Protocol. It provides functions for basic routing of signaling messages between signaling points. It is Level 1 through 3 protocols of the SS7 protocol stack. MTP 3 (Level 3) is used to support BISUP. See Message Transfer Part.

MTS 1. Message Telecommunications Service. AT&T's name for standard switched telephone service. Also called DDD, for Direct Distance Dial.

2. Member of the Technical Staff. A common term at AT&T Bell Labs, Bellcore and other R&D labs.

3. Microsoft Terminal Server. Microsoft's answer to a dumb terminal.

4. Measured Toll Service.

5. Material Transfer System.

MTSO Mobile Telephone Switching Office. This central office houses the field monitoring and relay stations for switching calls between the cellular and wire-based (land-line) central office. The MTSO controls the entire operation of a cellular system. It is a sophisticated computer that monitors all cellular calls, keeps track of the location of all cellular-equipped vehicles traveling in the system, arranges handoffs, keeps track of billing information, etc.

MTTR Mean Time to Repair. The average time required to return a failed device or system to service.

MTU 1. Maximum Transmission Unit. The largest possible unit of data that can be sent on a given physical medium. Example: The MTU of Ethernet is 1500 bytes.

2. Multi Tenant Unit or Multiple Tenant Unit. A fancy name for a building or group of buildings that house many tenants—businesses and perhaps also residences. Such MTU could be an office building, office park or corporate campus, medical facility, hotel or college dormitory. The reason for this term is that the new newer carriers (such as the CLECs) or the building's owner talk about providing telecom service to the tenants. They talk about placing a DSL access router (also called a DSLAM) into the basement of a MTU and give themselves access to the building's existing copper wiring (the copper was installed when the building was built and/or renovated to support telephone lines). DSL allows high-speed data transmission (typically for access to the Internet) over that existing wiring to and from all customers inside the MTU. According to a recent study on MTUs, MTU owners deploy broadband in order to attract and retain tenants and add new revenue streams. A new class of broadband provider is moving the Internet access point of presence, or POP, into the actual buildings where tenants reside. These Mini-POPs use scaled-down versions of aggregators used in telecommunication's companies central offices, or even enterprise office switches, allowing tenants to share the cost of an expensive T-1 or other broadband Internet link. Most MTU broadband providers are offering, or looking to offer, value-added services such as voice, video, and application services as a way for customers to build new revenue streams. Many also offer remote and on-site network management, as well as cable installation services.

MU Monitoring Unit. A wireless telecommunications term. Devices added to circuit configurations that use sophisticated trending rules with fault and topology information to determine potential outages.

Mu Law The PCM voice coding and companding standard used in Japan and North America. A PCM encoding algorithm where the analog voice signal is sampled eight thousand times per second, with each sample being represented by an eight bit value, thus yielding a raw 64 Kbps transmission rate. A sample consists of a sign bit, a three bit segment specifying a logarithmic range, and a four bit step offset into the range. All bits of the sample are inverted before transmission. See A Law and PCM.

MUA An acronym for Mail User Agent, is the end user's mail program, like Eudora.

MUD 1. Multi-User Dungeons. A term that Time Magazine in its 9/13/1993 issue called "the latest twist in the already somewhat twisted world of computer communications." Time called it "a sort of poor man's virtual reality"—created by using words, not expensive head-mounted displays. The first MUD apparently was invented in 1979 as a way for British university students to play the fantasy game Dungeons & Dragons by networked computers. MUD are basically now online games environments that use a great deal of network bandwidth.

2. Multi-User Dimension. This term refers to users who connect to each other via a host computer.

3. In the mud means low volume.

mudbox An unsheltered item of equipment that is sufficiently rugged to withstand adverse environments. It is expected to work perfectly though it sits outdoors in good and bad weather.

MUDS Multi-User Dungeons. A cyberspace term. MUDS are elaborate fictional gathering places that users create one room at a time. All these "spaces" have one thing in common, according to cyberspace wisdom, they are egalitarian. Anybody can enter the rooms (provided he has the correct equipment) and everybody is afforded the same level of respect. A significant feature of most MUDs is that users can create interactive objects that remain in the program after they leave. MUD worlds can be built gradually and collectively. See also USENET.

MULDEM A contraction for Multiplexer Demultiplexer, referring to a piece of equipment which performs both functions and generally operates between two of the AT&T digital hierarchy rates (i.e., DSI to DS3).

mule tape Mule tape is very strong, flat tape which is used to pull cable through underground conduit. Here's how it typically works: First, you use a bore to make an underground hole. Then you fill that hole with hollow concrete cement pipes joined together to form one long underground conduit (i.e. tunnel). Then you go to one end of the tunnel and use a air compressed device to blow a very lightweight "birdie" attached to a lightweight string through the tunnel. Someone at the other end catches the birdie and pulls gently on the string. Attached to the end of the string is strong mule tape. He keeps pulling on it. Attached to the end of the mule tape is the telecommunications cable—fiber or wire—that you really want to instal in the underground conduit. The whole point of this elaborate procedure is that it's far better for the cable to lay it after the pipes are laid than it is during the installation process when the cable could be damaged.

mull A verb meaning to think it over. When faced with a BIG decision, my partner, Gerry Friesen, often says he'd like "to mull it over." Often he takes a day or two. It's a good strategy since it also gives you the time to do a little more due diligence, also call research.

multi entity buildings In large metropolitan areas, it is common to find one local telephone exchange building housing more than one local switch, and for each switch to handle five or more exchanges.

multi-homed computer A computer that has multiple network adapters or that has been configured with multiple IP addresses for a single network adapter.

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with one wire of the telephone circuit. Normally a parasite (i.e. takes power from the phone line). Transmits both sides of the conversation. It transmits only when the phone is off-hook. See also Series.

serve shield A type of shield used in coaxial cable systems, a serve shield, or spiral shield, is simply wound around the inner conductor. See also Coaxial Cable.

server 1. Hardware definition of server: A server is a shared computer on the local area network that can be as simple as a regular PC set aside to handle print requests to a single printer. Or, more usually, it is the fastest and brawniest PC around. It may be used as a repository and distributor of oodles of data. It may also be the gatekeeper controlling access to voice mail, electronic-mail, facsimile services. At one stage, a local area network had only one server. These days networks have multiple servers. Servers these days have multiple brains, large arrays of big disk drives (often in redundant arrays) and other powerful features. New powerful servers are called superservers. A $35,000 superserver today can match the performance of a $2 million mainframe of ten years ago. Then again, according to Peter Lewis of the New York Times, the lowliest client today has more computing power than was available to the entire Allied Army in World War II. See Downsizing for some of the benefits of running servers as against mainframes.

2. Software definition of server: A server is a program which provides some service to other (client) programs. The connection between a client program and the server program is traditionally by message passing, often over a local area or wide area network, and uses some protocol to encode the client's requests and the server's responses. Any given program may be capable of acting as both a client and a server, perhaps switching its role based on the nature of the connection. The terms "client" and "server" simply refer to the role that the software program performs during a specific connection. Similarly, any given server may function as an origin server, a proxy server, a gateway server, or a tunnel, modifying its behavior based on the specific nature of a given request from a client.

Server API A SCSA term. A communications protocol that allows a call processing application running on one computer to control SCSA hardware residing in another computer.

server appliances Little servers designed for small businesses or workgroups without supervision by a central IT department. See Server.

server application A Windows NT application that can create objects for linking or embedding into other documents.

server certificate A unique digital identification that forms the basis of a Web server's SSL security features. Server certificates are obtained from a mutually trusted, third-party organization, and provide a way for users to authenticate the identity of a Web site.

server cluster A group of server computers that are networked together both physically and with software, in order to provide cluster features such as fault tolerance or load balancing. See also Fault Tolerance and Load Balancing.

server colocation An ISP/web hoster service in which a client places their server on the Internet at an ISP's office for a monthly fee. In return, the server is, theoretically, always connected via multiple redundant high speed connections to the Internet. See also Web Hosting.

server farm Imagine a room stuffed with PCs, ranged in racks along walls, ranged in racks in lines like a library's back room. The PCs are really servers—powerful PCs containing databases and other information they are dispensing to the thousands of PCs dialing into them from afar. A server farm may be owned by one company and used by one company, or it may be owned by one company and each of the machines leased to other companies. I first heard the term when MCI described a room it had in a place called Pentagon City. There it had hundreds of servers each of which it leased to other companies who used those servers as their Web sites.

Server Message Block SMB. The protocol developed by Microsoft, Intel, and IBM that defines a series of commands used to pass information between network computers. The redirector packages SMB requests into a network control block (NBC) structure that can be sent over the network to a remote device. The network provider listens for SMB messages destined for it and removes the data portion of the SMB request so that it can be processed by a local device. In short, SMB is basically a protocol to provide access to server-based files and print queues. SMB operates above the session layer, and usually works over a network using a NetBIOS application program interface. SMB is similar in nature to a remote procedure call (RPC) that is specialized for file systems.

server mirroring Server mirroring means you have two servers on your networks and each exactly what the other is doing simultaneously. It's a backup method. In Novell's NetWare, server mirroring requires two similarly configured NetWare servers. They should be evenly matched in terms of CPU speed, memory, and storage capacity. The servers are not required to be identical in terms of microprocessors type (386/486), microprocessor revision level, or clock speed. However, identical servers are recommended for NetWare SFT III 3.11. If the two servers are unequal in terms of performance, then SFT III performs at the speed of the slower server. The NetWare servers must be directly connected by a mirrored server link. SFT III servers can reside on different network segments, as long as they share a dedicated mirrored server link.

server node An individual computer in a server cluster.

Server Operating System An SCSA definition. Operating System running on the SCSA Server.

server process A process that hosts COM components. A COM component can be loaded into a surrogate server process, either on the client computer (local) or on another computer (remote). It can also be loaded into a client application process (in-process).

server push Server push is a Internet term. With server push, the Web server sends data to display on the browser display, but leaves the connection open. At some point, the server sends additional data for the browser to display. Server push is used for displaying multimedia information on the browser.

server queuing When you have too many people trying to get on your web site and they're having trouble getting on, it's called server queuing. I don't think this is a particularly profound definition.

server scriptlet A COM object that is created with Microsoft Server Scriptlet technology.

server-based network A network in which all client computers use a dedicated central server computer for network functions such as storage, security and other resources.

Severely Errored Second SES. A second during which the bit error rate over a digital circuit is greater than a specific limit. During a severely errored second, transmission performance is significantly degraded. The specific definition of SES depends on the circuit involved, e.g. T-1, T-3, OC-3 and OC-48.

servers Servers are typically ruggedized, industrial-strength PCs, i.e. they have several fans, perhaps two power supplies, perhaps two disk drives, perhaps several central processors. They are designed to work 24 hours a day, seven days a week without breaking down. They are designed to give the reliability of demanded of a business telephone system. See also Server.

serve A filament or group of filaments such as fibers or wires, wound around a central core.

Service Access Code SACs (also called Special Area Codes) are 3-digit codes in the Numbering Plan Area (N00) format that are used as the first three digits of a 10-digit address, and that are assigned for special network uses in North America. Whereas NPA codes are normally used for identifying specific geographical areas, certain SACs have been allocated in the NANP (North American Numbering Plan) to identify generic services or provide access capability. Currently only four SACs have been assigned and are in use: 600, 700, 800, and 900. There are two general categories of NPAs: 1) Geographic NPA—Associated with a defined geographic area; all telephone numbers bearing such an NPA are associated with services provided within that geographic area.

2) Non-Geographic NPA—Associated with a specialized telecommunications service, which may be provided across multiple geographic NPA areas; for example 800, 900, 700, 500 and 888. Also known as an area code. See also SAC.

service access point A logical address that allows a system to route data between a remote device and the appropriate communications support.

service advertising protocol A protocol developed by Novell so that devices attached to a network could advertise their functionality. For instance, a file server and print server advertise different functions. An SNMP agent can also advertiser itself using SAP's. All of the Compaq manageable repeaters and switches except the 50xx switches support SAP broadcasts.

service affecting This definition courtesy Steve Gladstone, author of the book, "Testing Computer Telephony Systems." These are major bugs that significantly impact the reliability or the functionality of computer telephony systems. Comprehensive testing must uncover all service affecting problems with the goal that no computer telephony system should be installed at a live customer installation without an acceptable workaround for the service affecting problem. The goal for transition of a product from one phase to the next is that no service affecting bugs remain, and that the bug rate for new bugs be at or approaching zero.

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