

Concepts & Planning

Installation & Administration

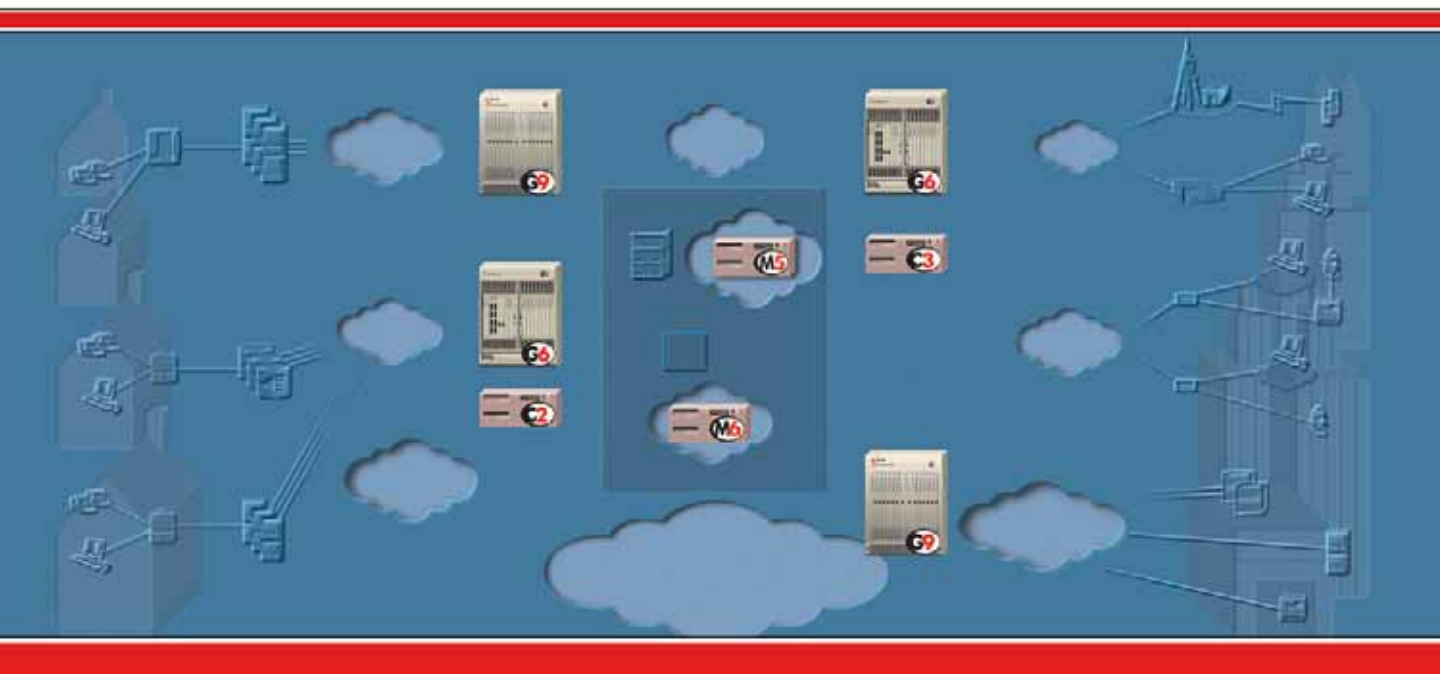
Operation

Maintenance & Troubleshooting



G6 Universal Media Gateway **GENBAND Glossary**

Defines terms that GENBAND uses to describe the G6 Gateway, the GenView EMS, and related equipment and services



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GENBAND Glossary

Symbols

10Base-T

An **ethernet** connection that delivers a nominal data transfer rate of 10 Mbps. 10Base-T requires Category 3 or better unshielded twisted-pair (UTP) cabling.

100Base-T

An **ethernet** connection that delivers a nominal data transfer rate of 100 Mbps. 100Base-T requires Category 5 or better unshielded twisted-pair (UTP) cabling.

1000Base-T

An **ethernet** connection that delivers a nominal data transfer rate of 1000 Mbps (1 Gbps). 1000Base-T requires Category 5 or better unshielded twisted-pair (UTP) cabling. *See also GbE*

2B1Q

Two binary, one quaternary. A line-encoding technique that uses four variations in amplitude and polarity per signaling element (baud) to represent two bits per baud. 2B1Q is the *de facto* standard for **SDSL** transport.

2G

Second generation.

3G

Third generation.

3GPP

3rd Generation Partnership Project (3GPP). A collaboration agreement between multiple telecommunications standards bodies (Organizational

Partners), including ARIB, CCSA, **ETSI**, ATIS, TTA, and TTC.

8xx

Toll-free numbers, which begin with area codes **8xx** in the **NANP**. *See also 9xx., NXX.*

9xx

In the **NANP**, this area code specifies Premium Services, which usually carry a fee for use. *See also 8xx, NXX.*

A/D

Analog-to-digital. Process in which analog information is converted into digital streams of data. *See also D/A.*

AAL

ATM adaptation layer. The AAL accepts data from different applications and presents it to the **ATM** layer in the form of the 48-byte payload

AAL1

ATM adaptation layer type 1. The AAL1 traffic type supports Class A traffic, which is connection-oriented constant bit rate (**CBR**) traffic between source and sink.

AAL2

ATM adaptation layer type 2. The AAL2 is typically used for connection-oriented services that support real-time variable bit rate information which is sensitive to delay. Applicable examples include compressed voice and video.

AAL5

ATM adaptation layer type 5. The AAL5 allows checksummed data blocks of up to 64 KB to be sent as a series of **ATM** cells. Typically used to transfer data protocols that tolerate delays. Applicable examples include **IP**, **ethernet**, and frame relay over **ATM**.

ABAM

22 AWG, 110Ω twisted-pair cable used in a **central office**.

ABCD bits

Signaling bits extracted from **DS1 ESF** frames. In the upstream direction from the **G6 Gateway** to a **Class 5 switch**, the ABCD bits convey the user supervisory state of an **IAD** voice port (on-hook or off-hook). In the downstream direction from a **Class 5 switch** to the **G6 Gateway**, the ABCD bits are used to indicate the network supervisory state of the **Class 5 switch** port (for example, idle or ringing). *See also DS1, ESF.*

ABR

Available bit rate. A service category defined by the **ATM Forum**. The ABR service category includes a minimum usable bandwidth (**MCR**) guarantee. Any additional bandwidth allocated to a connection is variable in time and depends on the network congestion state. ABR is used for connections that do not require timing relationships between the source and destination. ABR uses flow control to optimize traffic on the link with minimal data loss. *See also CBR, rt-VBR, UBR, VBR.*

AC

Automatic callback calling feature.

access

The ability to query and get responses relative to things such as device and/or system alarms, status, configuration information, and so forth. Access may also mean the ability to change configuration and state depending on user's security level and permission.

access network

An **ATM** or **IP** backbone network.

ACD

ATM concentration device. An ACD aggregates **ATM** traffic.

ACK

Acknowledgement. Notification sent from one network device to another to acknowledge some event, such as the receipt of a message.

ACL

Access control list (SIP). A network security feature that controls access to available services. An ACL defines IP addresses (hosts) and the services they are permitted to use.

ADM

Add-drop multiplexer. A device that can either insert or drop DS1, DS2, or DS3 channels or Sonet signals into or from a Sonet bitstream, without demultiplexing and remultiplexing.

administrative state

As used in relation to the G6 Gateway, indicates whether the SCM, ANM, or TPM cards are locked or unlocked. *See also* locked, Unicode.

ADPCM

Adaptive differential pulse code modulation. ADPCM is a compression algorithm that converts sound or analog information to binary information (a string of 0s and 1s) by taking frequent samples of the sound and giving the value of the sample in binary terms. ADPCM compresses the buffers before they are transmitted and decompresses them after they are received. It is used to transmit sound on long-distance fiber-optic lines and to store the sound along with text and images. G.721, G.726, and G.727 are Telcordia (and CCITT) standards for ADPCM. G.726 ADPCM calculates the difference between two consecutive voice samples in a 64kbps A-law or μ -law PCM signal and records the difference, therefore using less bandwidth. ADPCM uses an 8kHz sampling rate (8000 samples/second) and 4-bit encoding, resulting in the voice signal being carried over a 32kbps (8000 x 4) digital channel, instead of a 64Kbps channel. *See also* PCM.

ADSL

Asymmetric digital subscriber line. A high-speed copper wire link technology that connects an IAD or CPE to a DSLAM. *See also* DS3, HDSL, IDSL, SDSL, VoDSL.

AES

Advanced encryption standard. AES is a cryptographic algorithm approved in the PacketCable Security

specification (PKT-SP-SEC-I09-030728) for use by systems that implement the PacketCable protocols. The G6 Gateway Telephony Port Module 2 A (TPM2A) supports AES security in a G6 Gateway.

AGC

Automatic gain control. An electric circuit that provides a constant output in spite of a variable input level.

AIN

Advanced intelligent network. This term was initially used by Bell Communications Research (**Bellcore**) to describe a network that is capable of performing switching functions as opposed to only making end to end connections. Databases are used to store routing information in advanced intelligent networks. During the time frame in which this term originated, the **SS7 protocol** always controlled call-routing functions.

AIS

- 1) Alarm indication signal. A signal transmitted downstream informing that an upstream failure has been detected. Replaces the normal traffic signal when a maintenance alarm has been activated.
- 2) Announcement intercept subsystem.

ALCAP

Access link control application part. ALCAP is a transport network layer protocol used to set up, demand, and tear down transport bearers.

ALOM

Advanced lights out management. The ability for a system administrator to monitor and manage servers by remote control regardless of whether the machine is powered on. *Also*, the Sun Advanced Lights Out Manager.

ALT profile

Analog line termination profile. A set of voice encoding parameters used to apply voice encoding to analog transmission lines.

alternate mark inversion

See **AMI**.

AM

Accounting management (TMN functional area). A set of network management functions for measuring network service use, and determining its cost.

AMA

Automatic message accounting. A network system that measures, collects, and formats subscriber usage data. These systems typically provide output to upstream billing systems.

AMI

Alternate mark inversion. A line encoding scheme used in **T1 DS1** carrier systems where each binary mark (one) in the bitstream is the electrical inverse (opposite in polarity) but equal in amplitude to the previous binary mark (one) in the system. A logical one is transmitted as energy and a logical zero is not. AMI reduces the bandwidth by a factor of 2 and results in reduced signal loss. AMI requires the use of 8 Kbps of the 64 Kbps of each channel to maintain synchronization, which means results in only 56 Kbps available for data transmission. In a 24-channel **T1** circuit, this loss adds up to 192 Kbps. AMI is used with Dataphone digital service (DDS), the oldest data service still in use that uses 64 Kbps channels. **B8ZS** is the newer line encoding format, which does not require the 8 bits for synchronization. *See also* **B3ZS**, **B8ZS**, **HDB3**.

amplitude jitter

Any deviation of the peak value of a 1004 Hz signal from its nominal value. It is primarily caused by noise but can also be caused by jitter, gain hits, or single frequency interference.

amplitude tracking

Measures the deviation in 1004 Hz transmission path loss with changes in the input signal amplitude. The deviation is measured relative to loss with a 0 dBm0 input signal, and may be measured using a C-message filter.

AMR

Adaptive multi-rate. An adaptive speech codec that is widely used in **3G GSM** networks. AMR is the **ETSI** standard for **3G GSM** networks and is also mandatory for

wireless CDMA networks and is used in TDMA. AMR utilizes link adaptation and seamless switching to select from its 8 narrow-band bit rate modes based on link conditions in order to optimize voice quality and bandwidth usage in poor network conditions. AMR is specified in TS [26.071](#) of the 3GPP standards.

ANI

Automatic number identification.

Annex A

An ITU **G.729** Recommendation voice encoding scheme. Annex A produces 11.8 Kbps **CS-ACELP** speech encoding. **Annex B** provides the silence suppression scheme for **G.729** Annex A compression. **G.729** Annex A encoding compresses speech from 16-bit, 8-kHz (128Kbps) samples to 8 Kbps. Annex AB is suitable for wireless and network environments.

Annex B

An ITU **G.729** Recommendation voice encoding silence suppression scheme. Annex B is used along with **ANI** for silence suppression on **G.729** A encoded lines. Annex AB is suitable for wireless and network environments.

Annex AB

See **ANI** and **Annex B**.

Annex E

produces 11.8 Kbps **CS-ACELP** speech encoding.

ANM

Access Network Module. The term for a network interface card on a **G6 Gateway** that provides the access network (subscriber side) interface. The **G6 Gateway** supports several ANM types to provide **DS3**, **OC3**, **STM-1**, or **GbE**. The ANM is the interface between the **G6 Gateway** and an **ATM** or **IP** backbone. *See also* **SCM**, **TPM**.

ANM protection group

A pair of **ANM** modules used to provide redundancy within a network element. Each ANM protection group is comprised of an active **ANM** card and a standby **ANM**

module card. The standby card becomes active if the active card fails. *See also* **fault tolerance**, **protection group**.

ANSI

American National Standards Institute. Standards setting organization. *See also* **CLASS**, **DSP**, **ETSI**, **FCC**, **IEEE**, **ISO**, **IETF**, **OSF**, **Telcordia**.

API

Application programming interface.

APON

ATM passive optical network. A **PON** that is structured around **ATM** technologies. *See also* **FTTP**, **PON**.

application layer

The seventh layer of the open systems interconnection (**OSI**) framework of standards. The application layer contains functions for applications services such as file transfer, remote file access and virtual terminals. *See also* **data link layer**, **network layer**, **physical layer**, **presentation layer**, **session layer**, **transport layer**.

application server

A dedicated, high-performance computer on a data network that contains one or more programs shared by people on the network.

application services

Processes running on a Service Node that are application-oriented, such as Class 5 services.

APS

Automatic protection switching. A means of ensuring network resiliency, by automatically switching to a secondary channel when a primary channel fails or has an unacceptable error rate. The **G6 Gateway** supports unidirectional (receive path only), nonrevertive **APS** without autonegotiation for the **OC3** or **STM-1** facilities. Each receive channel of each port on the two **ANMs** in a protection group connects independently to its corresponding transmit port on the far-end device, which must be set for unidirectional, nonrevertive, no autonegotiation **APS**. The transmit ports also connect

independently and always transmit on both available Tx paths. Read the GR-253 standard for more detailed information.

AR

Automatic call return calling feature.

ARIB.

Association of Radio Industries and Businesses. For more information, go to www.arib.or.jp/english/index.html.

ARP

Address resolution **protocol**. A network **protocol** by which a logical **IP** address is correlated to the physical (**M23**) address of the target device. *See also* **ARP table**.

ARP table

A table containing the **IP** addresses and corresponding **M23** addresses of all devices in an **ethernet** network. *See also* **MAC address** address.

ASCII

American Standard Code for Information Interchange. Format for converting alphanumerics, punctuation, and control codes into digital form. *See also* **Unicode**.

associative memory

See **CAM**.

ATIS

Alliance for Telecommunications Industry Solutions. An organization based in the USA that is committed to rapidly developing and promoting technical and operations standards for the communications and related information technologies industry worldwide. For more information, go to www.atis.org. *See also* **ETSI**, **ITU**.

ATM

Asynchronous transfer mode. A connection-oriented (dedicated connection) technology used for high-speed packet switching and transmission on a digital signaling network. A cell is individually processed asynchronously and is queued before being multiplexed over the line. A 53-byte **ATM** packet (cell) comprises five overhead (octets)

bytes and 48 payload bytes. **ATM** is designed to intermix and prioritize voice, data, imaging, and video data for fast, cell-based networks. *See also* **packet-switching**, **ISDN**.

ATM edge device

A device that interconnects an **ATM**-based network with an **IP**-based or other network. In the context of the **G6 Gateway**, the edge device typically is an **ATM** router using a protocol such as a **gigabit Ethernet**. The **ATM** edge device connects the fast, packet-based **ATM** from the **ANM** cards in the **G6 Gateway** to a **CMTS** or other **IP**-based device on the **access network** side.

ATM Forum

International organization promoting standards-based implementation agreements for **ATM** technology. *See also* **ANSI**, **CLASS**, **DSP**, **ETSI**, **FCC**, **IEEE**, **IETF**, **ISO**, **ITU**, **OSF**, **Telcordia**.

ATM Forum profile

A set of voice encoding parameters developed by the **ATM Forum** used to apply voice encoding provisioning to **ATM** transmission lines.

ATM packet

See **cell**.

ATM Transit Connection

A cross-connection on a **G6 Gateway** between two **ATM** virtual channels or between two **ATM** virtual paths.

attenuation

Weakening or distorting of a transmitted signal as it travels from its point of origin. Attenuation is usually measured in decibels.

attenuation distortion

Measures the variations in loss at different frequencies across the voice frequency spectrum (200 Hz–3400 Hz). It is measured by subtracting the loss at 1004 Hz from the loss at the frequency of interest. Typically there will be more loss at the extremes of the frequency spectrum than at 1004 Hz.

AUCX

Audit connection (**MGCP** command). A command that can be executed from the command line of the **MGCP** call agent to request an audit connection.

AUEP

Audit endpoint (**MGCP** command). A command that can be executed from the command line of the **MGCP** call agent to create an audit endpoint.

automatic protection switching

Substitution of standby equipment or alternate channels if a service degradation occurs in order to ensure the availability and reliability of **DS3** service. The substitution (*protection switch*) occurs within a specific time interval to transfer a **DS3** channel to the protection system if a specific bit error rate (**BER**) is reached.

AWG

American wire gauge. A unit of measurement for wire diameters. Copper wire used for transmission in telephony applications are frequently in the 22 to 26 AWG range. Read the appendix of the *Hardware Installation Guide* for the appropriate wire gauges for power, grounding, and other cabling for a G6 Gateway.

B

B3ZS

Bipolar with three-zero substitution. An industry-standard line encoding/decoding conversion and error-checking process for T-carriers. B3ZS replaces all occurrences of three consecutive binary zeros in an **AMI** line code algorithm with a standard B3ZS code word containing a higher ones-density. That is, it inserts bipolar violations if the user data contains a string of 3 or more consecutive zeros. The receiving equipment then replaces that code word with the three zeros. B3ZS ensures that the data transmitted in a **T3 (DS3)** signal is accurate. *See also AMI, B8ZS, HDB3.*

B8ZS

Binary (or bipolar) 8-zero substitution. An industry-standard line encoding and decoding conversion and error-

checking process for T-carriers (T1 lines). B8ZS replaces all occurrences of eight consecutive binary zeros generated by an idle condition with a standard B8ZS code word consisting of two bipolar line violations (two successive ones of the same voltage) and two pulses, with the bit pattern 00011011, and resulting in a higher ones-density. (Ordinarily, when successive ones are transmitted, one has a positive voltage and the other has a negative voltage.) The receiving equipment interprets the bipolar violation as a timing mark, which keeps the transmitting and receiving devices synchronized, and replaces the B8ZS code word with the eight zeros. B8ZS does not use extra bits for synchronization as does AMI and can therefore utilize the full 64 Kbps of each channel for data. B8ZS is not compatible with AMI equipment. B8ZS accommodates the ones-density requirement for digital T-carrier facilities in the public network and continually validates the data transmitted in a T1 DS1 signal. *See also* AMI, B3ZS, HDB3.

backbone

Main cable from which transceiver cables are connected to computers, repeaters, and other network devices. When used in reference to telecommunications networks, a backbone is a larger transmission facility that carries smaller transmission lines. For example, a DS3 backbone facility can carry traffic for up to 28 DS1 lines.

bandwidth

The carrying capacity or size of a communications channel; usually expressed in hertz (cycles per second) for analog circuits and in bits per second (bps) for digital circuits.

Bc

Committed burst size. The maximum bits that a frame relay network provider agrees to transfer under normal network conditions during a time interval.

B-channel

Bearer channel. A logical digital communication channel for ISDN that carries digital data, video, and voice user service information. *See also* D-channel.

Be

Excess burst size. The maximum bits of uncommitted data in excess of committed burst size that a frame relay network attempts to deliver during a time interval.

BECN

Backward explicit congestion notification. Bit set by a frame relay network in frames traveling in the opposite direction of frames encountering a congested path.

bel

A unit of measurement used to express relative difference in power or intensity in electrical circuits or airborne sound waves equal to the common logarithm of the ratio of the two levels.

Bellcore

See Telcordia.

BER

Bit error rate. The ratio of received bits that contain errors to the total bits transmitted.

BERT

Bit error rate test. A test performed on T1 DS0 lines to measure the bit error rate. *See also BER.*

BHCA

Busy hour call attempts. The number of call attempts made during the busiest hour of the day.

BIP-8

Bit interleaved parity 8. In Sonet/SDH, a method used to monitor errors on a link.

B-ISDN

Broadband integrated services digital network. Communications standard designed to handle high-bandwidth applications operating at speeds above 1.54 Mbps, such as video. *See also DS3, E1, ISDN, T1, broadband.*

bit

A single unit of binary data used computer and digital communications encoding scheme. One bit can represent a value of zero or a one. *See also byte.*

bit-oriented signaling

Signaling in which control information is encoded in fields of one or more bits, oriented toward full-duplex link operation. Bit-oriented signaling uses less overhead, and is therefore more efficient than character (byte) oriented protocols.

BITS

Building integrated timing supply. A master clock (timing source) that supplies timing for all digital network transmission and switching equipment in a building. BITS provides a synchronized timing reference for the entire network, including providing timing for **CC** and network reference sources as well. *See also SSU.*

BLER

Block error rate. The ratio of the blocks in error received in a specified time period to the total number of blocks received in the same period.

BLES

Broadband loop emulation service. A signaling protocol developed by the **DSL Forum** used to control signaling between a voice gateway and IADs.

BLES proxy

An application running on a broadband gateway that relays packets between a client and a host. The **GENBAND G6 Gateway** functions as a proxy between an IP host and a Broadband Loop Emulation Service. *See also BLES, proxy.*

blue alarm or blue signal

See AIS.

blocked call

One of the parameters that define **GoS** (Grade of Service). It is defined as the failure to receive network resources after sending off-hook, and is characterized by the “fast busy” tone.

BNC

Bayonet connector. A connector developed by the military for use on coaxial cable. BNC connectors have a locking

mechanism to prevent accidental disconnection. The B in BNC refers to the center lead, which is shaped like a bayonet. The N and C refer to Neil and Concelman who are credited with the development of the connector.

BPON (Broadband PON)

A BPON is an APON that is modified to incorporate additional services such as broadcast video. *See also* APON.

BRA

Basic rate access. An ISDN service used in Canada that contains two B channels and one D channel. Equivalent to the BRI service used in the United States. *See also* BRI, ISDN, PRI.

BRI

Basic rate interface. An ISDN service used in the United States that comprises two B-channels and one D-channel (also referred to as $2B+D$). The B-channels each operate at 64 Kbps. The D-channel operates at 16 Kbps. This service supports a single voice line and a data line for SOHO or similar small business operations. Equivalent to the BRA service used in Canada. *See also* BRA, ISDN, PRI.

bridge

A data communication device that internetworks two or more network segments together (usually dissimilar in protocol) and exchanges data packets between them as appropriate. Bridges are considered as Layer 2 devices.

broadband

A high-speed transmission. Broadband generally provides a subscriber communications channel of 1 Mbps or faster. Broadband channels have a wide band of frequencies so that information can be multiplexed and sent over many different channels simultaneously. These channels are capable of carrying a greater volume of data than traditional voice band circuits, which are limited to 64Kbps in the 4000 Hz voice channel (based on PCM at 8000 samples per second and 8 bits per sample).

high-speed throughput (>1 Mbps) and multiple channels of data over a single communications medium using

frequency division multiplexing

broadband wireless

Radio communication services that operate in the 10 to 45 GHz frequency band. Common applications for broadband wireless services include **LAN/WAN** connectivity, high-speed data/Internet access, telecommuting services, video conferencing, basic telephony, and entertainment video.

broadcast

Stations broadcast data packet transmission on a shared media (that is, the common network). Other stations listen to these broadcasts, but receive only data packets addressed to them. *See also* **packet**.

byte

A unit of information consisting of a specified number of bits in a computer encoding scheme. Most older schemes such as **ASCII** define a byte as 8 bits. Many newer schemes such as **Unicode** define a byte as 16 bits. *See also* **bit**, **ASCII**, **octet**, **Unicode**.

C2 Controller

GENBAND S4™ Applications Server. *See also* **G6 Gateway**, **GenView EMS**, **S4 Applications Server**.

C4

See **Class 4 switch**.

C5

See **Class 5 switch**.

CA

Call agent. A software module or program used by media gateways to handle the signaling and call processing functions.

cable interface module

See **CIM**

cable modem

A modem that can provide high-speed data and voice service such as Internet access via cable-TV lines rather than via telephone lines. *See also* **DS3**, **ISDN**.

CAC

1) Connection admission control *also* call admission control. CAC is implemented at call setup or re-negotiation to determine whether or not to grant a new **VCC** the requested quality of service (**QoS**) without affecting the current grade of service to established connections. CAC provides a method of preventing congestion in an **ATM** network. CAC works on a per-call basis to measure end-to-end bandwidth and statistically multiplex bursty calls on a common link. CAC requires a set of parameters that describe the source traffic and a set of parameters that identify the required **QoS**. By contrast, conventional circuit-switched networks merely check the availability of circuits on the trunk of the desired route in order to decide whether or not to admit a call when a circuit setup request arrives. The **QoS** contract defines the traffic characteristics as specified by the traffic contract parameters. *See also* **QoS**.

2) Carrier access code.

CALEA

Communications Assistance for Law Enforcement Act. A congressional act intended to preserve the ability of law enforcement to conduct electronic surveillance in the face of rapid advances in telecommunications technology. The primary objectives of the CALEA are to preserve a narrowly-focused capability for law enforcement agencies to carry out properly authorized intercepts; to protect privacy in the face of increasingly-powerful technologies that have the potential to reveal personal and private information, and to avoid impeding the development of new communications services and technologies. CALEA requires telecommunications carriers in the United States to modify their equipment, facilities, and services to ensure that they are able to comply with authorized electronic surveillance.

call admission control

See **CAC**.

call cutoff

An unintentional, unexpected, and premature termination of an established telephone connection by reason other than an on-hook signal sent from the calling or called customer.

call delivery

Call delivery is the minimum probability that the call setup will be completed.

call reference value

See CRV.

CAM

Content addressable memory. Memory that is accessed by its contents, not on its memory address. Sometimes called **associative memory**.

carrier

- 1) A company that provides communications services.
- 2) A digital or analog signal used to carry voice or data information.

carrier class

Carrier class is a term that defines hardware able to meet the stringent requirements of incumbent carriers. These requirements include five nines availability, extended NEBS Level 3 certification, seamless network management integration, standards-based, **protocol agnostic**, and a long product life time, ensuring the carriers' return on investment.

CAS

Channel associated signaling. A signaling technique where signaling bits are carried within the individual voice channels. *See also CCS.*

CBR

Constant bit rate. An **ATM** service class defined by the **ATM Forum** for **ATM** networks. CBR fixed bandwidth is used for time-dependent, delay-intolerant connections that depend on stringent end-to-end traffic qualities (loss, delay, and jitter) to ensure undistorted delivery. CBR is used by connections that require a specific, guaranteed amount of

bandwidth to be available continuously throughout the duration of a connection. Cells are evenly spaced at the **PCR**, resulting in a constant bit rate. Voice, circuit emulation, and high-resolution video are typical CBR applications. **PCR** and **CDVT** characterize CBR traffic. *See also* **ABR**, **rt-VBR**, **UBR**, **VBR**.

CC

- 1) Composite clock. A clock source used in a telecommunications central office to provide timing for transmission equipment.
- 2) Continuity check. A method by which the G6 Gateway monitors a **VC** connection on the broadband access network. An **IAD** inserts **CC** cells into a connection so the **G6 Gateway** can differentiate between a connection failure and a period of low cell flow. A continuity check failure indicates that no **ATM** traffic or **CC** cells have been received by the G6 Gateway over a **VC** connection for a period of one second or more.

CCC

Call content connections.

CCITT

See **ITU**.

CCS

Common channel signaling. A signaling technique where multiple circuits share a common channel for signaling. Signaling can be in or out of band. *See also* **CAS**.

CCSA

China Communications Standards Association. A standards organization established to “adapt [to] the growing market [and] keep pace with global industry [in] accord with Chinese situations.” For more information, go to www.ccsa.org.cn/english. *See also* **ETSI**, **ITU**

CDC

Call data carrier.

CDR

Call detail record. A record generated for the purpose of customer billing in a telecommunications network.

CDV

Cell delay variation. End-to-end cell transfer delay variability (“jitter”) induced by buffering and cell scheduling. In CDV, cells of a given **ATM** connection may be delayed while cells of another **ATM** connection are being serviced by the (**ATM** connection) multiplexer. Similarly, some cells may be delayed while physical layer overhead or operation, administration, and maintenance (**OAM**) cells are inserted.

CDVT

Cell delay variation tolerance. An **ATM** service class for managing traffic that is specified when a connection is set up. In the switch node, some randomness may affect the inter-arrival time between consecutive cells of a connection. The upper bound is the cell delay variation tolerance.

cell

Basic data unit for **ATM** switching and transmission. Cells contain identifiers that specify the data stream to which they belong.

cell delay variation

See **CDV**.

cell delineation

An **ATM** term for the defining of **cell** boundaries at the originating endpoint in order that the receiving endpoint can reassemble all cells associated with a data payload that has been segmented. *See also* **LCD**.

cell error ratio

See **CER**.

cell loss priority

See **CLP**.

cell loss ratio

See **CLR**.

cell scrambling

An **ATM** encoding technique used to improve clock recovery in cases where all zeros or all ones are transmitted over a line.

cell transfer delay

See CTD.

CELP

Code excited linear prediction. An analog-to-digital voice encoding scheme.

Centrex

A local exchange carrier service providing central office based switching applications similar to those provided by an on-site private branch exchange (PBX). *See also PBX.*

central office

See CO.

CER

Cell error ratio. In ATM, the ratio of transmitted cells that have errors to the total cells sent in a transmission for a specific period of time.

CES

Circuit emulation service. The ATM Forum circuit emulation service supports the emulation of TDM circuits over ATM networks using the constant bit rate (CBR) QoS traffic class. *See also ATM Forum, QoS.*

CFBL

Call forwarding, busy line.

CFDA

Call forwarding, do not answer.

CFV

Call forwarding, variable.

channelized DS3**CIC**

Carrier (or country) identification code. A series of digits in the format 10-xxx transmitted to the telco network (whether by dialing or by switches), used to identify interexchange carriers who access equal-access exchanges.

CID

- 1) Channel identifier. Used to identify subscriber lines on an **IAD**.
- 2) Caller identification. A feature offered by local phone companies that sends the phone number (and often the name of the caller) down the phone line in a digital data packet between the first and second ring.

CIDCW

Caller identification on call waiting. *See also* **CID**.

CID Transit Connection

An **ATM** cross-connection on a G6 Gateway used to associate a **CID** from a local subscriber's **VCC** to an external **CID** located on another G6 Gateway.

CIM

Cable interface module. A GENBAND term for a card that provides the cabling interface for a transmission card (**ANM** or **TPM** card) in a G6 Gateway. A **CIM** plugs into the midplane through the rear of a G6 Gateway. Each **ANM** and **TPM** card requires a **CIM**.

circuit-switching

Circuit switching provides a physical path that is dedicated to a single connection between two end-points in a telephone network. Normal voice telephone service is circuit-switched.

CLASS

Custom local area signaling services. **CLASS** services include call forwarding, call waiting, caller identification, automatic callback, automatic recall, and selective call rejection.

Class 4 switch

A central office switch that provides an interface to a long distance trunk line. A Class 4 switch receives **toll calls** from the **Class 5 switch** or **softswitch**.

Class 5 office

The local **central office (CO)** that provides dial tone to subscribers.

Class 5 Services

Basic and enhanced phone services such as dial tone, call forwarding, call waiting, and so forth.

Class 5 switch

The circuit switch used to provide local telephone service. Most modern switches are digital. Many new Class 5 switches are **softswitches**. *See also* **LE switch** and **softswitch**.

CLEC

Competitive local exchange carrier. A company that competes with the currently established local telephone company by providing its own network and switching capabilities. The term CLEC describes new or potential competitors as distinct from established Local Exchange Carriers (**LECs**). The term arises from the Telecommunications Act of 1996, which was instituted to foster competition among long distance and local telephone service providers. *See also* **ILEC**, **LEC**, **RBOC**.

CLEI

Common language equipment identification. Usually pronounced as “CLEE-eye.” The CLEI is a standard code used to identify telecommunications equipment.

CLI

Command line interface. An interface that enables an operator to operate and manage a G6 Gateway by entering commands from a management console. *See also* **GUI**.

clipping

Occurs when part of a transmitted signal is dropped and does not reach the receiving portion on a connection. It can be caused by digital speech interpolation equipment and by an **echo canceller** or an echo suppressor. Clipping can have a major impact on both voice and voice-band data performance. Major performance problems causing modems to re-synchronize can occur if 0.5 ms or less of a signal is clipped. Voice performance is typically not significantly affected until 5 ms segments of speech are clipped.

CLP

Cell loss priority. A 1-bit field in an **ATM** cell header that determines which cells will be discarded first if the network becomes congested. (0 indicates high priority, 1 is low priority.) *See also* **CLP0+1**.

CLP0+1

Cell loss priority zero plus one. Refers to a cell loss priority value of zero or one. A threshold that means all cells should be dropped in a congested network. *See also* **CLP**.

CLR

Cell loss ratio. In **ATM**, the ratio of discarded **cells** (cells never received) to **cells** that are successfully transmitted.

CM

- 1) Configuration management (**TNM** functional area). The tracking, coordination, and administration of software and hardware related to telecommunication or information systems. Versions are controlled and tracked.
- 2) Cable modem.

CMIP

Common management information protocol. **OSI** network management protocol created by **ISO** for the monitoring and control of heterogeneous networks. *See also* **ISO**, **OSI**.

CMIS

Common management information service. **OSI** network management service interface created and standardized by **ISO** for the monitoring and control of heterogeneous networks. *See also* **ISO**, **OSI**.

CMISE

Common management information service element. The functionality provided by **CMIP** in transporting network management information.

CMR

Cell misinsertion rate. The ratio of cells received at an endpoint that were not originally transmitted by the source end in relation to the total number of cells properly transmitted.

CMTS

Cable modem termination system. A network device that enables the exchange of information between the **CPE** at a subscriber location and the **ATM edge device** in the access network side of a cable-based network that includes a **G6 Gateway**. The CMTS resides at the cable operator **POP** to terminate cable modem traffic from the customer-premise **CPE** (usually an **MTA**) into the service provider network. *See also CPE, IAD, MTA.*

CNAM

Calling name

CO

Central office. Local telephone company office to which all local loops in a given area connect and in which circuit switching of subscriber lines occurs. *See also LE, EO, PSTN.*

codec

Coder/decoder. A particular encoding and decoding technique, such as pulse code modulation (**PCM**) to transform analog signals into digital and digital signals back into analog. *See also PCM.*

code excited linear prediction

See CELP.

CO-IWF

Central office-interworking function.

command line interface

See CLI.

common channel signaling

See CCS.

common management information service element

See CMISE.

companding

A contraction of the words *compressing* and *expanding*. The process of reducing the bandwidth required for representation of an analog waveform for transmission by compressing, and then reconstructing (most of) the original waveform at the receiving end. In digital voice

(**PCM**), a nonlinear allocation of sampling intervals used to lower quantization error over a wider dynamic range of input signals.

composite clock

See CC.

configure

To design, arrange, set up, or shape something for a specific purpose or function. As used in relation to the **G6 Gateway**, to set the parameters and controls for a component of the platform to perform a specific task.

congestion

The state of a heavy traffic in a network in which traffic or resource overload results in the network not being able to guarantee the negotiated **QoS** to the established connections as well as to new connection requests. Congestion can result in loss of cells. Unpredictable statistical fluctuations of traffic flows, a network fault, or unrealistic **QoS**-to-oversubscription settings can cause congestion. *See also CAC, CLP, congestion control.*

congestion control

A method of planning for and controlling traffic in a network in order to minimize congestion effects and prevent loss of cells. **CAC**, usage parameter control, and network parameter control are typical methods of congestion control to avoid network overload. *See also CAC, CLP, congestion.*

connection admission control

See CAC.

connection-oriented protocol

Protocols in which a connection (a channel or a circuit) must be established between devices on a network. *See also X.25*

connectionless protocol

Protocols in which no connection, or channel, needs to be established between devices on a network *See also IP, ethernet.*

content addressable memory

See CAM.

converged service delivery

An application enabled by the G6 Gateway in which multiple voice and data services are aggregated onto a common **ATM** transport network. This application gives service providers the ability to deliver custom-tailored retail services to a wide range of small and medium enterprise customers over a common cost-effective facility.

CORBA

Common object request broker architecture. A standard for managing message traffic between application software and computer/software platforms. **CORBA** provides portability of software across platforms by enabling objects to communicate with one another regardless of the programming language they were written in.

CoS

Class of service. Indication of how an upper-layer **protocol** requires a lower-layer **protocol** to treat its messages. Subarea nodes use **CoS** to determine the optimal route to establish a given session.

COT

Customer-originated trace.

CPCS

Common part convergence sublayer. Responsible for preparing data for transport across the **ATM** network, including the creation of the 48-byte payload **cells** that are passed to the **ATM** layer. *See also A/D, ATM, SAR, SSCS.*

CPE

Customer premises equipment. Telecommunication equipment (telephones, **PBXs**, answering machines, and so on) physically located at a customer's premises. For **VoIP**, the **CPE** is generally called an **MTA**. *See also CO, MTA, PBX, POTS.*

CPERR

C-bit path parity error.

CP-IWF

Customer premise-Interworking function.

craft personnel

A term used in the telecommunications industry to describe personnel whose primary work duty can be subscriber telephone installation, outside plant service and repair, or inside plant service and repair.

craft terminal

A PC or laptop loaded with the system software, to allow human interaction with the **G6 Gateway** for purposes of installation, upgrading, troubleshooting, and repair.

CRC

Cyclic redundancy check. Process used to check the integrity of a block of data. The sending end calculates the CRC value, and puts it on the end of the block of data. The receiving end calculates the CRC value again, and compares it to the value that was sent. If the values do not match, the receiving end sends back a CRC error message.

CRCX

Create connection (**MGCP** command).

CRM

Cell rate margin: This is a measure of the difference between the effective bandwidth allocation and the allocation for sustainable rate in cells per second.

crosstalk

The presence of signals from other telephone connections on a circuit. Crosstalk can be either intelligible, when speech from other connections can be heard and understood, or unintelligible. Crosstalk is caused by inter-channel interference on the transmission system; such as energy coupling in **PCM** systems, electromagnetic coupling between wires, and use of a common battery source without sufficient decoupling between circuits. Crosstalk is difficult to measure; it requires correlating signals on different circuits or using human listeners to identify its presence. Trouble reports may be used to estimate the probability of crosstalk.

CRV

Call reference value. CRVs are used between the **G6 Gateway** and the host switch to identify the destination of a call when using **GR-303** interconnection. The CRV is the originating phone number.

CS-ACELP

Conjugate-structure algebraic-code-excited linear prediction. The voice encoding scheme utilized by the **G.726** Annex A and Annex E codecs.

CSC

Common signaling channel (a **GR-303** term). Used by the integrated digital terminal and remote digital terminal for call processing. *See also* **CA**, **GR-303**.

CSD

Converged services delivery.

CSMA/CD

Carrier sense multiple access with collision detection. A multi-access technique for a shared (broadcast) transmission medium in which a station listens before transmitting, then monitors its own transmission to detect a collision, and aborts its transmission if it detects a collision with another transmitting station.

CT

Conformance test. Testing to determine whether an implementation complies with the specifications of a standard and exhibits the behaviors mandated by that standard.

CTD

Cell transfer delay. In **ATM**, the elapsed time between a cell exit event at the source User-network interface (**UNI**) and the corresponding cell entry event at the destination **UNI** for a particular connection. *See also* **UNI**.

CW

Call waiting. A feature offered by public telephone companies that informs the subscriber when an incoming call has arrived while the subscriber is already on another call.

D/A

Digital-to-analog. Processes wherein digital streams are converted to analog streams.

DA

Destination address. A field which identifies the unique **MAC address** of the recipient.

DAS

Distinctive alerting service.

Data Aggregation

The concept of combining multiple **ATM** virtual channels into a single **ATM** virtual path to transport data across an **ATM** network.

data link layer

The second layer of the open systems interconnection (**OSI**) framework of standards. The data link layer is concerned with procedures and **protocols** for operating communications lines. *See also* **application layer, network layer, physical layer, presentation layer, session layer, transport layer.**

dB

Decibel. A unit of measurement used to express relative difference in power or intensity in electrical circuits or airborne sound waves equal to one-tenth the common logarithm of the ratio of the two levels.

DCE

1) Distributed computing environment. A vendor-neutral set of distributed computing technologies. DCE provides data security, controls data access, locates shared resources, and organizes widely-scattered users, services, and data.

2) Data communications equipment. The equipment used in T1, RS-232 and packet switching environments to provide an interface between the network and **DTE** devices. *See also* **DTE.**

D-channel

Data channel. A logical digital communication channel for ISDN that carries signals and data packets between the user and the network. *See also* B-channel.

DCN

- 1) Disconnect frame. Signal transmitted by the sender of a fax transmission to indicate the transmission is complete. No response is required.
- 2) Data communications network.

DCS

- 1) Digital cross-connect system. A time division multiplexing (TDM) device that switches lower rate channels from one TDM circuit to another. Also called a DACS (digital access and cross-connect system).
- 2) Distributed call signaling.

DDL

Derived data link. The DDL is carried on a T1. A channel of a Mode 1 interface group (IG).

decibel

See dB.

detection threshold

The power level and or frequency that when reached, triggers a response in a tone detector circuit. *See also* threshold.

DF

Delivery function.

DHCP

Dynamic host configuration protocol. Protocol enabling PCs and workstations to get temporary or permanent IP addresses from centrally-administered servers.

dial tone delay

The time period between a customer off-hook and the receipt of dial tone from the network.

dial tone removal

The time period between the recognition of the first address digit to the removal of the dial tone on the line.

DID

Direct inward dialing. A telecom feature that supports direct dialing from outside lines to extensions on a **PBX** system without the need to be connected by the **PBX** operator. Direct inward dialing can be used with multi frequency (**MF**) or dual tone multi frequency (**DTMF**) applications. This **G6 Gateway** currently does not support pulsed applications.

digital signal cross-connect frame

See DSX.

digital subscriber line.

A technology for bringing high-bandwidth information to homes and small businesses over ordinary copper telephone lines. DSL increases the bandwidth of twisted copper pair conductors. Standards for upstream and downstream bandwidth have been developed: **ADSL**, **VoDSL**, **HDSL**. These different standards work to trade bandwidth against distance and physical plant requirements to address a wider variety of applications.

See also ADPCM, DS3, DSLAM, HDSL, IDSL, ISDN, SDSL, T1, VoDSL.

direct inward dialing

See direct inward dialing.

direct memory address

See DMA.

distributed computing environment

See DCE.

DLC

Digital loop carrier. Network transmission equipment that derives multiple channels from a single four-wire channel or T1 bundle running from the central office (**CO**) to a remote site. *See also CO, EO.*

DLCX

Delete connection (**MGCP** command).

DMA

Direct memory access. DMA is supplied by a number of computer bus architectures to allow data to be sent directly from an attached device to the memory that is resident on the motherboard of the computer. The microprocessor is not involved with the data transfer, which means the speed of overall computer operations can be accelerated.

DN

- 1) Directory number. Number used to identify subscribers in a **Class 5 switch**.
- 2) Dialed number.

DND

Do not disturb calling feature.

DNS

Domain name server. System used in the Internet for translating host names into IP addresses.

DOCSIS

Data over cable system interface specification. A project led by the MCNS (Multimedia Cable Network Systems Partners Limited) with the objective of establishing transmission and signaling standards for cable modems and associated equipment.

DPC

Destination point code.

DQDB

Distributed queue dual bus. Data link layer communication **protocol** permitting multiple systems to interconnect using two unidirectional logical buses. *See also MAN.*

DQoS

Dynamic quality of service. *See also QoS.*

dropouts

Drops in the level of a signal of 12 dB or more for at least 4 msec. They are caused by protection switching events, radio fading, and conditions causing digital carrier systems to lose frame. Dropouts are critical for voice-band

data performance but, if severe enough, will also affect voice quality. Dropouts typically cause modems to lose synchronization and retrain.

DS0

Digital signal level 0 (64 Kbps). Equivalent to one digitized voice channel using PCM-encoding. *See also DS1, DS3, DSX, PCM.*

DS1

Digital signal level 1. Part of the digital signal (DS) hierarchy, the DS1 framing specification transmits digital signals at 1.544 Mbps on a T1 facility in the U.S, Canada, and Japan, or at 2.048 Mbps on an E1 facility in the rest of the world. A T1 DS1 line contains 24 DS0 channels and 1 framing bit per frame, and a E1 DS1 line contains 32 channels per frame. *See also DS3, E1, E3, T1, STS-1.*

DS2

Digital signal level 2. Part of the digital signal (DS) hierarchy, the DS2 framing specification transmits digital signals at 6.312 Mbps on a T2 facility in the U.S., or at 8.448 Mbps on an E2 facility in Europe.

DS3

Digital signal level 3. Part of the digital signal (DS) hierarchy, the DS3 framing specification transmits digital signals at 44.736 Mbps on a T3 facility in the U.S., or at 34.368 Mbps on an E3 facility in Europe. A single DS3 line carries 28 DS1 lines. DS3 is typically transported by coaxial cable. *See also DS1, DS2, E1, T1, STS-1.*
DSL.

DSCP

Differentiated services code point.

DSL Forum

International organization promoting acceptance of DS3 technology through technical and marketing channels. *See also ATM Forum, CLASS, ETSI, FCC, OSF.*

DSLAM

Digital subscriber line access multiplexer. Typically located in a telephone company central office (CO), a

DSLAM multiplexes/aggregates voice and data traffic from many customer **DS3s** onto a **DS3 ATM** backbone. The uplink data traffic is sent to an **ISP's IP Router** and the voice traffic is sent to a voice gateway, which connects to a **Class 5 switch**. A **DS3 Modem** or **IAD** at a customer's premises connects the customer's PCs and telephone to the **DS3**. *See also DS3.*

DSP

Digital signal processor. A computer chip designed to perform digitized speech or video processing. *See also D/A and A/D.*

DSU/CSU

Data service unit/channel service unit. Devices used to access digital data channels.

DSX

Digital signal cross-connect frame. A **DSX-1** panel is used to cross-connect **DS1** circuits to each other.

DTE

Data terminal equipment. A device used to communicate between the network and a **DCE** device. It is used in several contexts, including **T1**, **RS-232**, and in **X.25** packet switched networks. *See also DCE.*

DTM

Dynamic synchronous transfer mode. A network **protocol** for high speed networking developed for dynamic transport of integrated traffic.

DTMF

Dual tone, multi-frequency. The signaling method touch-tone phones use to communicate dialed digits (0-9) and special function characters (* and #) to a voice switch. *See also PBX.*

DWDM

Dense wavelength division multiplexing. A technology that gathers data from various sources together and places it all on one **optical fiber**, so that each signal can then be carried simultaneously on its own separate light wavelength. Using **DWDM**, up to 80 individual

wavelengths (channels) can be multiplexed into the lightstream. (Each channel carries a TDM signal.) *See also optical fiber, TDM.*

DXC

Digital cross connect. *See also DCS.*

E1

European wide-area digital transmission scheme that carries data at a rate of 2.048 Mbps using a DS1 framing specification. An E1 has thirty-two 64Kb channels. *See also DS3, E3, T1, STS-1.*

E3

Part of the digital signal (DS) hierarchy, E3 is a digital transmission scheme in Europe. E3 carries data at a rate of 34.368 Mbps using a DS3 framing specification. *See also DS1, E3, T1, STS-1. Contrast T3.*

EAEO/AT

Equal access end office/access tandem. The EAEO/AT provides a trunk tandem interconnection to the POP of interLATA carriers (IC) and international carriers (INC) inside the LATA.

EC

Echo cancellation. A method of cancelling unwanted signals echoed from the destination back to the source of a transmission.

echo canceller

Isolates and filters unwanted signals caused by echoes from the main transmitted signal. An echo canceller sends a signal on the return transmission path, which is equal and opposite to the echo signal.

echo return loss

See ERL.

EDD

See envelope delay distortion.

edge device

A device that interconnects networks of two different types, such as an ATM-based network with an IP-based network. *See also* ATM edge device.

EEPROM

Electrically erasable and programmable read-only memory. A read-only memory device that can be erased and reprogrammed.

EFCI

Explicit forward congestion indication. EFCI is an indication in the ATM cell header. A network element in an impending-congested state or a congested state may set EFCI so that this indication may be examined by the destination end-system. For example, the end-system may use this indication to implement a protocol that adaptively lowers the cell rate of the connection during congestion or impending congestion. A network element that is not in a congestion state or an impending congestion state will not modify the value of this indication. Impending congestion is the state when a network equipment is operating around its engineered capacity level.

egress traffic

As used in general telephony, traffic leaving a network device. As used in G6 Gateway documentation, traffic leaving the G6 Gateway.

electrostatic discharge

See ESD.

EMC

Electromagnetic compatibility. The ability of a transmission line or circuit to function in transmission facility without causing or receiving electrical interference from other circuits.

EML

Element management layer (TMN). A layer representing the management and monitoring of components, at their lowest level, in a telecommunications network.

EMS

Element management system. A software management tool used in telecommunications networks to manage network elements. *See also* NE, NMS, network element.

enhanced quality of service

A service class associated with an IP flow. Enhanced QoS provides procedures to bound end-to-end packet delay and delay variation (jitter) and end-to-end packet loss. *See also* QoS.

envelope delay distortion

Measures the difference in transit time of signals at different frequencies versus the transit time of a 1704 Hz tone in microseconds. Envelope delay distortion (EDD) causes distortion in a transmitted signal and can affect voice-band data performance. Most modems have adaptive equalizers to remove EDD and can handle high levels of EDD without performance problems; however, if there is a ripple in the EDD versus frequency curve, adaptive equalizers may have trouble removing EDD.

EO

End office. The telephone central office located in closest proximity to a particular subscriber. *See also* CO.

EOC

Embedded operations channel. A dedicated channel to handle overhead functions between the network and the line including loopback testing, CRC, error detection, and performance management. Sometimes referred to as an embedded overhead channel. An EOC enables flow-through provisioning to be performed.

Equal Access End Office/Access Tandem

See EAEO/AT.

EPD

Early packet discard. A mechanism used by some ATM switches for discarding a complete AAL5 frame when a threshold condition, such as imminent congestion, is met. *See also* congestion, AAL5.

EPLD

Erasable programmable logic device. A logic device that can be erased and then re-programmed.

EPON

Ethernet PON. A passive area network (**PON**) that is structured around **ethernet** technologies. *See also* **PON**.

equip

As used in relation to the **G6 Gateway**, to set up an **ANM** or **TPM** card to carry a specific type of voice traffic. *See also* **ANM**, **TPM**.

ERL

The primary source of talker echo is improper impedance matching at the 2-to-4 wire hybrids in the traditional analog access networks. The impact of talker echo on customer perception is a function of both return loss and delay. The listener echo is a double reflection of a transmitted signal at two different impedance mismatches in the connection. While in extreme cases it can degrade voice transmission performance, listener echo is primarily an issue for voice-band data.

ES

Electronic surveillance.

ESD

Electro-static discharge. What occurs when the static electricity that naturally builds up on your body discharges.

ESF

Extended super frame or extended superframe format, a **T1** framing method that uses 193-bit frames and sends 8,000 frames per second. *See also* **SF**.

ethernet

A local-area network (**LAN**) technology that connects networked devices and other systems within a building. Ethernet operates over twisted wire and coaxial cable, at speeds up to 1000 Mbps. *See also* **gigabit ethernet**, **LAN**, **WAN**.

ETSI

European Telecommunications Standards Institute. Organization created to propose telecommunications standards for Europe. For more information, go to www.etsi.org. *See also* **ATM Forum, CLASS, DSP, E1, FCC, OSF, TTA.**

EUT

Equipment under test. EUT is used to refer to the device being tested in a test environment.

Extended Superframe Format

See **ESF.**

FAP

Fuse alarm panel. The device used to display alarms and provide power and ringing voltage to equipment in a telephone equipment office.

fault tolerance

The ability of a network device to provide uninterrupted service regardless of software or hardware failures. A high degree of fault tolerance is achieved through the use of redundant software and hardware systems within a network device. *See also* **protection group, redundancy.**

FAX

- 1) Facsimile. An exact copy of a document.
- 2) A machine used to transmit and receive facsimile documents.
- 3) The act of sending a facsimile transmission.

FCAPS

Fault-management, configuration, accounting, performance, and security. These are the objectives of a network management system. *See also* **NMS.**

FCC

Federal Communications Commission. Agency that supervises, licenses, and controls electronic and electromagnetic transmission standards. *See also* **ATM Forum, CLASS, DSP, ETSI, OSF.**

FCM

Fan Control Module. This module uses three fans to provide forced-air convection to cool a G6 Gateway

FCS

Frame check sequence. Any mathematical formula that derives a numeric value based on the bit pattern of a transmitted block of information and uses that value at the receiving to determine the existence of any transmission errors.

FDM

Frequency division multiplexing. Technique in which the available transmission bandwidth of a circuit is divided by frequency into narrower bands, each used for a separate voice or data transmission channel. *See also* TDM.

FEBE

Far end block error. A maintenance signal transmitted in the PHY overhead, indicating that a bit error has been detected at the PHY layer at the far end of the link.

FELP

Far-end loop process. TR-08 terminology for loopback mode or loopback test.

FET

Field effect transistor. Small transistors used to control pixels in a thin film transistor display.

field programmable gate array

See FPGA.

flash

Also flash memory. Non-volatile memory (EEPROM) that can be erased and reprogrammed.

flow-through provisioning

A model for provisioning network elements where service requests from the business layer of the network management system (NMS) are transferred through software automation to all the network elements (NEs) that need to be configured. *See also* NMS.

FM

Fault management (TNM functional area). A network management function that receives fault information into a centralized management function.

FPGA

Field programmable gate array. A user-configurable logic device in the form of a microprocessor.

FQDN

Fully-qualified domain name. The full site name of an Internet computer system, rather than just its hostname.

framing

Also framing format. As used in telephony, a designated order of bits in a voice or data stream.

frequency distortion

See attenuation distortion.

frequency response

The measurement of the amount of electrical energy (usually in dB) is attenuated from input to output of a circuit or transmission line at specific frequencies.

frequency shift

Measures any frequency changes that occur when a signal is transmitted across a channel. It is typically measured using a 1004 Hz tone. Frequency shift has very little impact on voice or voice-band data performance; however, round-trip frequency shifts can affect the ability of an **echo canceller** to remain converged.

FRU

Field replaceable unit. A component or system that can be replaced at the customer's premise.

FSAN

Full Service Access Network. A forum of leading telecommunications services providers and equipment suppliers that drafted **broadband access network** recommendations. These recommendations were submitted to the recognized standards bodies for approval and publication. FSAN networks use the **ATM** switches commonly used by **ILECs**, which means that many features

of an FSAN network draw on the functions and capabilities of ATM equipment. *See also* **broadband, ATM.**

FT1

Fractional T1 (also called Frac T1) is bandwidth carried as part of a T1 circuit. A T1 can have several FT1 circuits. The bandwidth is allocated on 64Kb channel boundaries

FTTC

Fiber to the curb. An optical access network (OAN) that uses fiber for some part of the link from the OLT to the end-user. An O/E conversion occurs near the end-user. The terminal network segment of an FTTC network is most often twisted copper pairs or coaxial cable. The final (last mile) optical receiver in an FTTC network will be able to serve more than one customer. *See also* **FTTN, FTTP, OAN, ONU, OLT.**

FTTH

Fiber to the home. An optical access network (OAN) that contains the optical network unit (ONU) on or inside the customer's premises. The upgrade capacity of an FTTH network is greater than all other transmission media. *See also* **FTTP, FTTC, FTTN.**

FTTN

Fiber to the neighborhood. An optical access network installed to all curbs or buildings in a neighborhood. *See also* **FTTP, FTTC, FTTH.**

FTP

File transfer **protocol**. Protocol allowing transfer of text and files to and from another PC.

FTTP

Fiber to the Premises (includes fiber to the home, curb, and building). Technology that brings business and resident subscribers access to advanced high-speed **broadband** services, including all the evolving Internet, voice and video applications available, using a **PON**-based infrastructure. *See also* **PON, optical splitter**

FX

Foreign exchange. A subscriber line which originates from a local central office (class 5 office), but extends beyond the distance limit for a local loop.

FXO

Foreign exchange office. The central office end of a foreign exchange circuit.

FXS

Foreign exchange subscriber (foreign exchange station). The subscriber end of a foreign exchange circuit.

G

G.711

ITU G.711 Recommendation. *See* **PCM**.

G.726

ITU G.726 Recommendation. *See* **ADPCM**.

G.729

ITU G.729 Recommendation. Coding of speech at 8 Kbps using conjugate-structure algebraic-code-excited linear-prediction (CS-ACELP). The G6 Gateway currently supports **Annex AB** (primarily for wireless) or **Annex E** (primarily for VoIP) G.729 encoding. *See* **ANI**, **Annex B**, **Annex AB**, **Annex E**. *See also* **ADPCM**, **PCM**.

G6 Gateway

The GENBAND G6[®] Universal Media Gateway is a carrier-class gateway capable of delivering voice over **broadband** services in the existing and emerging network architectures. The *G6 Gateway* enables service providers to deliver toll quality, packetized voice services over a **broadband** network, enabling service providers to deliver multiple voice lines over a single **DS3**, cable, or **broadband** wireless connection. The G6 Gateway is based on a highly scalable and flexible platform that supports industry leading call capacity, as well as both **ATM** and **IP protocols**, and a 38.4 Gbps switch fabric expandable to 60 Gbps. *See also* **C2 Controller**, **G6 IPDT**, **GenView EMS**, **S4 Applications Server**.

G6 IPDT

A **G6 Gateway** used as an Internet protocol digital terminal.
See also IPDT.

gain

The difference between input power and output power.
 Used in reference to electrical circuits and acoustic volume. *See also dB.*

gain hits

Sudden changes in the level of a signal that last at least 4 msec. Gain hits are measured against a threshold which is typically between a 2 and 5 dB increase or decrease in the signal level from its nominal level. Gain hits typically are caused by protection switches. They do not have a major impact on voice performance, but can seriously impair voice-band data performance. The impact of a gain hit on performance is correlated with the duration and size of the hit. Gain hits as short as 4 ms that exceed 5 dB can cause errors in V.32 and higher-speed modems. Gain hits longer than 50 ms that exceed 3 dB can also cause modem errors and gain hits of 5 dB or more that exceed 100 ms can cause modems to retrain. Higher-speed modem performance such as 56 Kbps is seriously affected by gain hits.

gain slope

See attenuation distortion.

gateway

- 1) A device that performs an application layer conversion of information from one **protocol** stack to another.
- 2) An entity that translates between data and telephony networks, converting PSTN to packet networks and vice versa, providing real-time, two-way communication.
- 2) A router used by the **G6 Gateway** to communicate to an **EMS** host on another subnet.

Gb

Gigabit. One billion (1000 million) bits.

GbE

The gigabit ethernet **ANM**. *See gigabit ethernet.*

GbE2

The two-port **gigabit ethernet ANM**.

Gbps

Gigabits per second.

GB

Gigabyte. One billion (1000 million) bytes.

GCRA

Generic cell rate algorithm. An algorithm set forth by the **ATM Forum** to measure conformance for cells in relation to the traffic contract of the associated connection.

GenView EMS

A GENBAND graphical element management system (EMS) used to manage as many as 200 GENBAND products in a telecommunications network. The GenView™ Element Management System (EMS) facilitates configuration, provisioning, operation, management, and reporting for multiple **G6 Gateway** shelves. The GenView EMS provides flow-through provisioning, **OSS** integration, and extended **FCAPS** functionality. The GenView EMS can also simultaneously manage error reporting for **C2 Controllers**, and **S4 Applications Servers**. *See also C2 Controller, G6 Gateway, S4 Applications Server.*

GFC

Generic flow control. GFC is a field in the **ATM** header which can be used to provide local functions (for example, flow control). It has local significance only and the value encoded in the field is not carried end-to-end.

GFR

Guaranteed frame rate.

gigabit ethernet

Builds on top of the **ethernet** protocol, increasing speed tenfold over fast ethernet to 1000 Mbps, or 1 gigabit per second (Gbps). Gigabit ethernet allows **ethernet** to scale from 10/100 Mbps at the desktop to 100 Mbps up the riser to 1000 Mbps in the data center. *See also ethernet.*

GigE

See **gigabit ethernet**.

GSM

Global system for mobile.

EMS

C2™ Controller Element Management System (EMS). The OAM&P system for management of the C2 Controller. The EMS can manage the C2 Controller server and application services.

GoS

Grade of service. *See also* **blocked call**.

GR

Generic requirements. A set of **Telcordia** (formerly **Bellcore**) standards.

GR-303

A **Telcordia** (formerly **Bellcore**) GR-303-CORE IDLC Generic Interface requirement specification. GR-303 is a specification for a digital loop carrier (DLC) system that concentrates telephone traffic on a set of T1 circuits. By default, the interface between the **G6 Gateway** and a **Class 5 switch** is based on the GR-303 specification. *See also* **TR-08**.

GR-303 IG

A **GR-303** interface group, which consists of 1–28 **DS1** lines.

GSS API

Generic security service **API**.

GTT

Global title translation routing (**TCAP** query routing).

GUI

Graphical user interface. User environment that uses pictorial and textual representations of the input and output of applications and the data structure in which information is stored. *See also* **CLI**.

GW

See **gateway**.

H.248

The ITU-T recommendation for **MGCP**. H.248 is compliant with Signaling System R2, which is an international signaling system within international regions, for integrating international/national signaling. *See also* ITU-T.

hash algorithm

The G6 Gateway supports a variety of cryptography (hash) algorithms to create digital signatures (*message digests* or *hashes*) that **IPSec** uses to secure management packet data. The most typical algorithms available on a PC include the NSA-developed secure hashing algorithm 1 (SHA-1), which results in a 160-bit digital signature, and hashed message authentication codes with message digest 5 (HMAC-MD5), which results in a 128-bit digital signature. *See also* **IKE**, **IPSec**, **ISAKMP**, **Radius**, **SSH**, **telnet**.

HDB3

High-density bipolar 3. HDB3 is a zero-suppression line encoding method for **E1** circuits. HDB3 replaces strings of four zeros with sequences containing a bipolar violation in the fourth-bit position. Because this coding format precludes more than three zeros, it is referred to as HDB3. HDB3 is based on **B3ZS**. *See also* **AMI**, **B3ZS**, **B8ZS**.

HDLC

High-level data link control. Protocol specifying a data encapsulation method on synchronous serial links using frame characters and checksums.

HDSL

High-bit-rate digital subscriber line. One of four **DS3** technologies. *See also* **ADPCM**, **DSLAM**, **IDSL**, **ISDN**, **SDSL**, **VoDSL**.

headend

The end point of a **broadband** network. Usually refers to the termination equipment for cable in a neighborhood. *See also* **broadband**.

HEC

Header error control or header error check. An algorithm for checking and correcting an error in the 5-byte header of an **ATM** cell.

HFC

Hybrid fiber-coax. An outside plant distribution cabling concept employing both fiber optic and coaxial cable.

hot swappable

The ability of a component (such as a line card) to be added to or removed from a device without powering down the device. Hot-swappable components provide maximum up-time. *See also* **ANM**, **SCM**, **CIM**, or **TPM**.

HSD

High speed data



IAD

Integrated access device. A device that supports voice, data, and video streams over a single, high-capacity circuit.

IAM

Initial address message. A message sent in the forward direction as part of the call setup **protocol** in **SS7** systems. *See also* **SS7**

ICLID

Individual calling line identification.

ICMP

Internet control message **protocol**. A **protocol** that provides diagnostics functions and can send error packets to host computers in an **IP** network.

ICP

Integrated communications provider. Provides similar services as a **CLEC**, in addition to services a traditional **CLEC** may not offer. A **CLEC** often rents their equipment, while an **ICP** usually owns their equipment.

IDLC

Integrated digital loop carrier. Access equipment which extends central office (CO) services. *See also* **GR-303**.

idle channel noise

Added by A/D conversion of signals, digital processing equipment (such as **echo canceller**, digital loss pad, etc.), robbed bit signaling and other errors on digital facilities. The idle channel noise in the access portion of the network should not exceed 18dBmC (dB reference noise with C-channel weighting). *See also* **A/D, D/A, DSP**.

IDSL

ISDN digital subscriber line. *See also* **ADPCM, DSLAM, HDSL, ISDN, SDSL, VoDSL**.

IDT

1) Integrated digital terminal. The G6 Gateway is the IDT in a reverse gateway application. *See also* **RDT**.
2) Inter-DXC trunk.

IEEE

Institute of Electrical and Electronics Engineers. Technical society and standards-making body. *See also* **ATM Forum, CLASS, DSP, ETSI, FCC, IETF, OSF**.

IETF

Internet Engineering Task Force. Sets the technical standards that run the Internet. *See also* **ATM Forum, CLASS, DSP, ETSI, FCC, OSF**.

IG

Interface group. A bundle of **DS1** lines used to access an **RDT**. *See also* **IG**.

IKE

Internet key exchange. IKE is a standard for key management that facilitates setting up **IPSec** security. IKE negotiates the **IPSec** security associations (SAs) at connection time. IKE also supports setting a lifetime for SAs as well as dynamic encrypting keys and authentication of peers. *See also* **IPSec, ISAKMP, Radius, SSH, telnet**.

ILEC

Incumbent local exchange carrier. The telephone network company that has been in operation longest in a particular area. An ILEC can be a small, independent telephone company or an RBOC. *See also* CLEC.

ILMI

Integrated local management interface. Specification developed for incorporating network-management capabilities into the ATM UNI.

IMD

See intermodulation distortion.

impulse noise

A sudden and large increase in noise on a channel for a short duration of time. Impulse noise is measured as a count of the number of times a noise threshold is exceeded during a given time period. It is caused by protection switching, maintenance activities, electromechanical switching systems, digital transmission errors, and line encoding mismatches. Impulse noise sounds like clicking noises or static on voice connections. Impulse noise causes voice-band data performance problems, and in extreme circumstances can make it impossible to transmit voice-band data over a channel.

IMT

Intermachine trunk *or* intermachine trunking. A circuit connecting two automatic switching centers.

ingress traffic

In general telephony terms, ingress traffic refers to traffic entering the network. In the context of the **G6 Gateway**, ingress traffic is traffic entering a **G6 Gateway**.

integrated access device

See IAD.

integrated communications provider

See ICP.

integrated voice and data

A means by which voice and data travel over the same T1 line. In the **G6 Gateway**, when using AAL2 transport and

the voice lines are idle, the bandwidth allocated to voice may be used for data transmission. *See also* **T1**, **AAL2**.

interexchange carrier

See **IXC**.

interface

A logical grouping of V5.2 lines from the **LE switch**. GENBAND software and documentation uses the term *interface group* interchangeably with interfaces. *See also* **interface group**.

interface group

A logical grouping of lines from the telephony switch. GENBAND software and documentation uses the term *interface group* interchangeably to refer to the multiple interface groups that **GR-303** signaling supports, to **TR-08** trunk groups, to V5.2 interfaces, and to the single **T1CAS** groups.

intermodulation distortion

Measures non-linear harmonic distortions of a signal. It compares the power of harmonics of multiple tones to the power of the transmitted tones. It is measured for both the 2nd and 3rd harmonics of the transmitted tones. Intermodulation distortion (**IMD**) is caused by compression or clipping of a signal, and may have a major impact on voiceband data performance if not controlled properly.

IP

Internet **protocol**. A network layer **protocol** in the **TCP/IP** stack offering a connectionless internetwork service. **IP** facilitates information transfer between heterogeneous networks. *See also* **connectionless protocol**.

IPDT

Internet protocol digital terminal. The **G6 Gateway** can provide the **IPDT** function in an **LCS** architecture. *See also* **LCS**, **PacketCable**.

IP address

Internet protocol address. A unique 32 bit identifier for a specific computer or server on a network. *See also* **IP**, **subnet mask**.

IPCDN

Internet **protocol** over cable data network. A software application **protocol** used to deliver internet services in a cable network.

IPG

Internet **protocol** gateway. A device that performs an application layer conversion of information from an internet **protocol** stack to some other type of **protocol**, such as voice over **broadband**.

IPng

Internet **protocol**, next generation. Term used to describe the efforts to define the next generation of the Internet **protocol** (IP).

IPSec

IP security. IPSec provides transport layer (IP layer) security for **G6 Gateway** data (traffic). *See also* **IKE, ISAKMP, Radius, SSH, telnet**.

IPv4

Internet **protocol** version 4. A **protocol** for internet traffic developed in the late 1970s for the purpose of enhancing the functionality of ARPANET.

IPv6

Internet **protocol** version 6. Proposed Internet **protocol** (IP) designed to enhance the present **protocol**.

ISAKMP

Internet security association and key management protocol. ISAKMP is a cryptographic protocol used in IKE key exchange for **IPSec**. RFC 2408, Multipurpose Internet Mail Extensions (MIME) Part Four: Registration Procedures, defines ISAKMP.

ISDN

Integrated services digital network. Communications **protocol** permitting telephone networks to carry data, voice, and other source traffic. *See also* **B-ISDN, BRI, DS3, E1, PRI, T1**.

ISDNUP

Integrated services digital network user part. The software layer in an **SS7** network that defines the messages and **protocol** used in the establishment and tear down of voice and data calls over the public switched network telephone network (**PSTN**). *See also* **SS7**, **PSTN**.

ISO

International Standards Organization. Headquartered in Geneva, the ISO was founded in 1947 for the purpose of recommending standard methods for industries to manufacture and produce goods. The ISO establishes standards for all fields except electrical and electronic engineering. The United States is represented to the ISO by ANSI. The official name for the ISO is the International Organization for Standardization (or IOS), and it is known by both names throughout the world. *See also* **ITU-T**, **ANSI**.

ISP

Internet service provider. A company that provides Internet and worldwide web access services to private users and businesses.

ISUP

SS7 ISDN user part. The ISUP part of **SS7** is the communications protocol used to set up, manage, and release trunk circuits that carry voice and data on the **PSTN**. ISUP lines are **SIP PRI ISDN** standard bearer trunks. *See also* **MFO**, **MFT**.

ITU

International Telecommunications Union (formerly **CCITT**).

ITU-T

ITU Telecommunication Standardization Sector. International body that develops worldwide standards for telecommunications technologies. *See also* **ATM Forum**, **DSP**, **ETSI**, **FCC**, **Telcordia**, **ISO**.

IVR

Interactive voice response. A computer system capable of responding to input from touch tone phones with synthesized voice.

IXC

Interexchange carrier. A telephone company that provides long distance intra-LATA telephone service.

J

jitter

A measurement of variance in delay between the arrival and departure of a packet.

K

KB

Kilobytes.

Kb

Kilobits.

Kbps

Kilobits per second.

KDC

Key distribution center.

KTS

Key telephone system. A telephone on which pressing different buttons directly selects separate central office (CO) telephone lines, without going through a PBX switch. Generally has fewer lines, features, and functions than a telephone that switches through a PBX. Typically used in a small office requiring fewer than 50 telephone lines. *See also* CO, PBX, POTS.

L

LACP

Link aggregation control protocol.

LAG

See link aggregation group.

LAN

Local area network. A short-distance data communications network, typically located within a single building or a campus of buildings. *See also* ethernet, MAN, WAN.

LANE

Local area network emulation. Technology allowing an ATM network to function as a LAN backbone.

LAPD

Link-access protocol on the D-channel. A bit-oriented ISDN data link layer (layer 2 in the OSI reference model) protocol for the D-channel that ensures error free transmission of bits on the physical layer (layer 1). *See also* ISDN, B-ISDN.

LATA

Local access and transport area. Geographical areas that define territories for local exchange carriers. Intra-LATA service is handled by the LECs (local exchange carriers), and inter-LATA service is handled by the IXCs (interexchange carriers). *See also* LEC, IXC.

LB

Leaky bucket. An algorithm used for conformance checking of cell flows from a user or network. The leaking hole in the bucket applies to the sustained rate at which cells can be accommodated, while the bucket depth applies to the tolerance to cell bursting over a given time period. *See also* leaky bucket algorithm.

LBO

Line build out. A value of capacitance and resistance that can be applied to a transmission line to compensate for poor frequency response.

LBR

Low-bit rate. Operating at speeds of less than 2,400 bits per second (bps).

LC connector

The fiber optic connector used with the G6 Gateway to provide GbE connectivity on a GbE ANM card.

LCD

Loss of cell delineation. A failure in the cell delineation process.

LCFO

Loop current feed open. A GR-303 switch sends an LCFO to signal a **network disconnect**. The switch sends an LCF about 600 ms later. It then sends the GR-303 TMC DISCONNECT message to tear down a call. In normal scenarios, this occurs on terminating calls to trigger key systems and voice machines to hang up the line.

LCS

Line control signaling. LCS refers to the **PacketCable™** LCS specification (*PacketCable Line Control Signaling System Architecture Technical Report, PKT-TR-ARCH-LCS-V01-010730*) or an application architecture based on the specification. The objective of the LCS architecture is to allow a public switched telephone network (**PSTN**) Class 5 local digital switch (**LDS**) to perform as much call processing as possible, while providing IP-based transport in the local access cable network. This is accomplished through an Internet protocol digital terminal (**IPDT**) using a **GR-303** interface between **PacketCable** and the **PSTN LDS**. The LCS architecture typically uses the **IPDT** for access to the **PSTN** and **LDSs** for call control, announcements, and billing. *See also* **IPDT**, **PSTN**, **PacketCable**.

LDAP

Lightweight directory access protocol.

LD-CELP

Low delay code excited linear production.

LDS

Local digital switch or local digital services. Term used by long distance companies to describe services provided by local phone companies. *See also* **Class 5 switch**, **GR-303**.

leaky bucket algorithm

An algorithm designed to monitor the flow of cells to verify that they conform to the stated traffic contract for the associated connection. *See also* **LB**.

lease time

Lease time represents the maximum amount of time the client can use the assigned **IP** address.

LE

The local central office (end office) that provides dial tone to subscribers. *See also* **CO**.

LE switch

The circuit switch used to provide local telephone service. Most modern switches are digital.

LEC

Local exchange carrier. A local telephone company. *See also* **CLEC** and **ILEC**.

LEN

Length.

LES

Loop emulation service. An **ATM Forum** standard that provides the same services as a **POTS** subscriber loop. *See also* **BLES**.

LI

Length indicator.

LIDB

Line information data base.

line profile

See **ALT profile**.

line type

As used in relation to the **G6 Gateway**, **DS1** or **DS3** parameter that identifies the framing format.

link aggregation group

As used in relation to the **G6 Gateway**, comprised of two GbE ports, one each on the two GbE2 modules in a GbE2 PG, with the same port number.

listener echo

See **echo return loss**.

LIU

Line interface unit.

LNP

Local number portability. A feature that enables subscribers to retain phone numbers when changing service providers.

local access

Not dependent on a network to access a physical device or system. Instead, access is through a direct connection to a port (RS232, ethernet, V.35, etc.) on the device or system.

local exchange office

See LE.

local exchange switch

See LE switch.

locked

As used in relation to the **G6 Gateway**, one of two possible administrative states for a **TPM** or **ANM** card. The locked state is equivalent to an out of service condition. *See also administrative state, locked.*

LOF

Loss of frame. An alarm generated on **TDM** framing circuits to indicate loss of frames during reception.

long distance back haul

The ability to route and or aggregate long distance calls to remote inter-exchange carriers.

LOS

Loss of signal. An alarm generated on **TDM** framing circuits to indicate a signal loss during reception.

loopback

The act of sending a received signal back to its source. This is typically achieved by shorting the receive input port of a four-wire circuit to the transmit output of the same circuit.

loopback test

A test performed on transmission lines or transmission equipment by sending a test tone or pattern to a remote transmission facility and verifying a return signal. The

signal is bounced or *looped* back from the input ports of the far end.

LRN

Location routing number. A 10-digit LRN identifier for a switch that supports the **portable number** feature. *See also* **portable number, ported number**.

LSB

Least significant bit. The bit within a byte having the least weight when used in mathematical calculations.

LSP

Local service provider.

LVPECL

Low voltage positive-referenced emitter coupled logic.

M23

A **multiplexing** scheme that allows for channelization of **T3 (DS3)** lines with 28 **DS1s**. *See also* **T3, DS1, multiplexing**.

MAC

Media access control. The lowest level of a network architecture. The MAC layer controls access to the physical media such as fiber, copper wire or cable.

MAC address

Media access control address. A unique 48-bit number that identifies a specific hardware element on a network. It functions at Layer 2 (the Datalink layer) of the OSI model. Each port in a **gateway** has a unique MAC address. *See also* **gateway, MAC**.

MAE

Metropolitan area exchange.

MAN

Metropolitan area network. Network that spans a metropolitan area. *See also* **DQDB, ethernet, LAN, WAN**.

management station

A term used to indicate a PC or Solaris workstation from which management access to a **G6 Gateway** is possible via a client session to the **GenView EMS** server. The management station requires the **GenView EMS** client software.

management console

A term used to indicate a PC or other device from which management access to a **G6 Gateway** is possible via the **CLI** in a **telnet** or **SSH** session.

master subscriber

A main number to which subordinate **DID** subscribers are billed.

Mb

Megabits.

MB

Megabytes.

Mbps

Megabits per second.

MBS

Maximum burst size. An **ATM** traffic parameter defined by the **ATM Forum**. **MBS** is the maximum number of consecutive cells that can be sent at the peak cell rate (**PCR**). The burst tolerance is conveyed through the **MBS**, which is coded as a number of cells. *See also SCR.*

MCDV

Maximum cell delay variance. The maximum two-point **CDV** objective across a link or node for the specified service category.

MCLR

Maximum cell loss ratio. The maximum ratio of the number of cells that do not make it across the link or node to the total number of cells arriving at the link or node.

MCR

Minimum cell rate. An **ATM** traffic parameter defined by the **ATM Forum**. The **MCR** is the minimum average rate at which a cell can be transmitted on a **VCC**.

MCSN

Monitoring cell sequence number.

MCTD

Maximum cell transfer delay. The sum of the fixed delay component across the link or node and **MCDV**. *See also* **MCDV**.

MDCX

Modify connection (**MGCP** command).

MDF

Main distribution frame.

media gateway

The media processing entity in a **VoIP** architecture. The **G6 Gateway** acts as the media gateway. *See also* **media gateway controller**, **MEGACO/H.248**, **ITU-TSG-16**, **MGCP**. *See also* **trunking gateway**.

media gateway controller

See **MGC**.

MEGACO/H.248, ITU-TSG-16

Media gateway control protocol. A proposed IETF/ITU-T protocol standard (IETF RFC 3015 and ITU-T H.248, resulting from the **MGCP** RFC 2805 requirements), developed by the Megaco Working Group in close cooperation with ITU-T Study Group 16. The **MEGACO** standard defines the requirements for the interface between the **media gateway controller** and the **media gateway** in a **VoIP** gateway convergent voice and data architecture. **MEGACO** solutions emphasize carrier-class redundancy, scalability, and reliability requirements. *See also* **media gateway**, **MGC**, **MGCP**, **VoIP**.

MF

Multi-frequency.

MFO

Multi-frequency (MF) feature group D (FGD) operator services signaling (**OSS**). **MFO** lines are operator services trunks that support operator access to **EAE0/AT** for busy line verification and barge in and **CLEC** subscriber access through a **LEC** access tandem. *See also* **MFT**, **ISUP**.

MFT

MF feature group D (FGD) terminating protocol. MFT lines are E911 trunks that support subscriber access to an E911 Tandem and **CLEC** subscriber access through a **LEC** access Tandem. *See also* **MFO**, **ISUP**.

MG

See media gateway.

MGC

Media gateway controller. A device that is used for call control in a **VoIP** architecture. In a **TGCP VoIP** configuration that uses a softswitch, the MGC is a separate device from the **G6 Gateway**, which acts as the **MG** or **TG** and does not provide the call control functions. The MGCs synchronize with each other to send coherent commands to the **MGs** (**TGs**) under their control. In a derived-voice **VoIP** configuration that uses a **Class 5 switch** or **LE switch**, the **G6 Gateway** acts as the **MG** and also provides the MGC call control functions. *See also* **media gateway**, **MEGACO/H.248**, **ITU-TSG-16**, **MGCP**.

MGCP

Media gateway control protocol. An **IETF** informational requirements document for the interface between the **MGC** and the **media gateway** in a **VoIP** gateway convergent voice and data architecture. *See also* **media gateway**, **MGC**, **MEGACO/H.248**, **ITU-TSG-16**.

MHz

Megahertz. One million cycles per second.

MIB

Management information base. A database of network control and performance information (such as error counts and on/off information) used by **SNMP** and **RMON** management protocols. The MIB is stored on a network element. A network management system (**NMS**) or element management system (**EMS**) manages a network element by storing values into and/or retrieving values from objects in the network element's MIB. *See also* **NMS**, **EMS**.

midplane

A backplane that is typically located in the middle of a chassis so that modules can be plugged into both sides of it.

MIS

Management information services. The common name given to a department in a corporation or government agency that handles data processing functions.

MPLS

Multiprotocol label switching. A **protocol** that adds a switching tag to packets.

MPOA

Multiprotocol over **ATM**. A set of specifications allowing the construction of scalable enterprise-wide **LAN** internetworks that seamlessly interwork **ATM** with **LAN** protocols. *See also* **ATM**, **LAN**.

ms

- 1) Milliseconds. One thousandth of a second.
- 2) Media server.

MSO

Multiple service operator. A cable service provider that also provides other services such as data and/or voice telephony.

MTA

- 1) Message transfer agent. An **OSI** application process used to store and forward messages.
- 2) Media (or multimedia) terminal adapter. A **CPE** adapter that provides the physical interface at the customer premises for connection of **VoIP** telephony and **broadband** data services. The MTA ports are the far-end endpoints on the access network side of a **VoIP** network that includes a **G6 Gateway**. The MTA usually connects to a **CMTS** and then on to the **G6 Gateway** through an **ATM edge device**. *See also* **IAD**, **CMTS**, **CPE**.

MTBF

Mean time before failure. Length of time a user may reasonably expect a device or system to work before a fault occurs.

MTIA

Maximum time interval error.

MTP

Message transfer part. A portion of the **SS7** protocol that provides basic routing for signaling messages between two signaling nodes.

MTP3

Message transfer **protocol 3**.

MTTR

Mean time to repair. Length of time a user may reasonably expect that after which a device will be returned to service following a failure.

MTU

Maximum transmission unit. Largest possible unit of data that can be sent on a physical medium using a given protocol.

multicast

Broadcast of messages from one source to many destinations, typically a selected group of users on a **LAN**, **WAN**, or the Internet. *See also LAN, WAN.*

multiplexing

Sending multiple signals on a transmission medium at the same time in the form of a single, complex signal. Separate signals are recovered at the receiving end. Analog signals are usually multiplexed using frequency-division multiplexing (**FDM**), in which the transmission bandwidth is divided into subchannels of different frequencies, each carrying a signal at the same time in parallel. Digital signals are commonly multiplexed using time-division multiplexing (**TDM**), and the multiple signals are carried over the same channel in alternating time slots. For **optical fiber** networks, multiple signals are often transmitted together as independent wavelengths of light in a

multiplexed signal by using dense wavelength division multiplexing (**DWDM**). *See also* **TDM**, **DWDM**, **FDM**, **MUX**.

multi-wink

The method by which an incoming register-sender indicates readiness to receive pulses from the calling office. Indication is by a timed off-hook or wink signal of 140 milliseconds duration maximum. *See also* **wink start**.

MUX

Multiplex or multiplexor. Electronic equipment allowing two or more signals to pass over one circuit. *See also* **multiplexing**.

NAK

Negative acknowledgement. An **ASCII** control character that indicates a package was received with errors in the check digits. **NAK** characters are sent from the receiving computer to the sending computer to request retransmission of the packet.

NANP

North American Number Plan. The numbering plan for North America that defines the format for public telephone numbers.

NAPS

Network access points. Point of access into the Internet used by **ISPs** and providers of regional and local subnets.

NCS

Network-based call signaling.

NE

Network element. As used in telephony, a network transmission device located in the transmission path between the subscriber and the local **central office**.

NEBS

Network Equipment - Building System. A **Telcordia** (formerly, **Bellcore**) comprehensive set of telecommunications performance, quality, environmental, and safety requirements. **NEBS** standards include such

diverse requirements as fire containability and extinguishability; ability to withstand earthquake, thermal, and mechanical shock; operating temperature ranges; and resistance to electro-static discharge (**ESD**).

NEC

National Electrical Code. A nationally recognized safety standard for the design, construction, and maintenance of electrical circuits. Formerly known as ANSI/NFPA 70. The NEC standard was created by the NEC Committee of the American National Standards Institute (**ANSI**). The NEC standard has been adopted as law by the majority of states in U.S. *See also* **ANSI**.

network disconnect

An indication that the far-end party has disconnected. The switch sends an open switch interval which results in an **LCFO** signal being applied to the line. *See also* **LCFO**.

network element

See **NE**.

network layer

The third level of the open systems interconnection (**OSI**) framework of standards. The network layer determines how data is transferred between computers. *See also* **application layer**, **data link layer**, **physical layer**, **presentation layer**, **session layer**, **transport layer**.

NFAS

Non-facility associated signaling. **ISDN NFAS** allows a single D channel to control multiple **PRI** interfaces, thus freeing one B channel on each interface to carry other traffic. If a backup D channel is configured, a hard failure results in a switchover to the backup D channel so that no calls are dropped.

NIC

Network interface card. A device that provides the logical and physical interface needed to connect a piece of equipment to a data communications network.

NID

Network interface device. A device that performs functions such as **protocol** conversion to and from a network.

NIM

Network interface module. Electronic circuitry that connects a system (such as a PC) to the telephone network.

NMS

Network management system. The top level software management tool used in a telecommunications network to manage all elements in the system. The NMS has a network-wide view and is capable of managing **EMS** systems as well as network elements. *See also EMS, NE.*

NNI

Network-to-network interface. An **ATM Forum** specification that defines an interoperability standard for the interface between two **ATM** networks within the public carrier network. *See also UNI.*

NOC

Network operations center. Responsible for daily maintenance and operation of a network.

NOS

Network operating system. Software for a network that runs in a file server and controls access to files and other resources from multiple users.

NOTE

Network office terminating equipment.

NPC

Network parameter control. Set of actions taken by the network to monitor and control (“police”) ingress traffic on an **ATM NNI** (typically on a B-ICI).

nrt-VBR

Non-real time variable bit rate. Applications that require a guarantee of **QoS** but where time-sensitivity is not of primary importance, such as such as LAN-to-LAN connection, can use nrt-VBR. *See also QoS, LAN.*

NSN

National significant number.

NTFY

Notify (**MGCP** command).

number pooling

The ability to share an NPA-**NXX** among several facilities-based carriers within the same rate center with the intent of prolonging the life of an NPA by reducing the demand for new **NXX**es.

NXX

A three-digit code used to identify a central office exchange. However, in a portable environment, the last four-digits or the seven-digit telephone number may not always reside in the central office exchange to which the **NXX** was originally assigned. *See also 8xx, 9xx.*

O

OAM

Operations, administration, and maintenance. Also called OA&M. Refers to the specifics of managing a system or network. *See also OAM&P.*

OAM&P

Operations, administration, maintenance, and provisioning. *See also OAM, provisioning.*

OC3

Optical carrier level 3. A 155.52 Mbps optical (fiber optic) **Sonet** signal used by the **G6 Gateway** for **access network** transmission.

OC3c

Optical carrier level 3 concatenated (payload). A 155.52 Mbps optical (fiber optic) **Sonet** signal used by the **G6 Gateway** for **access network** transmission. *See also STM-1, Sonet.*

OC12

Optical carrier 12 (622.08 Mbps). *See also OC3, OC3c.*

octet

A unit of information consisting of a eight bits used in network encoding schemes. For example, **TCP** defines its streams of data in terms of octets, rather than bytes.

OCXO

Oven-controlled crystal oscillator.

O/E

Optical to electrical. A point or device through which an optical signal can be converted to an electrical signal. *See also O/E/O.*

O/E/O

Optical to electrical to optical. A point or device through which an optical signal is converted to an electrical signal and back again to an optical signal. This is often done to enable processing, which can only be done electrically at an intermediate point within the optical network. *See also O/E.*

ohm

A unit of measurement used to express the amount of resistance to current flow in an electrical circuit.

ONR

Operator notification report.

OOR

Out of range.

OOS

Out of service. A major alarm generated on **TDM** framing circuits to indicate an out of service condition on the line.

OAN

Optical access network. An **access network** that is made up of optical transmission links instead of copper links that use twisted-pair or coaxial cables. *See also PON, OLT, ONU, FTTP.*

optical fiber

The medium as well as the technology that is associated with transmitting information as light pulses along a glass or plastic fiber (also known as fiber optic). Optical fiber

carries a considerably higher volume of information than conventional copper wire and is usually not subject to electromagnetic interference; thus, it does not need to retransmit signals. Most long-distance telephone lines are now made of optical fiber.

OLT

Optical line termination. An OLT provides the network-side interface of the **OAN**, and is connected to one or more **ONUs**. *See also* **OAN, ONU, FTTP**.

ONT

Optical network termination. *See also* **ONU**.

ONU

Optical network unit. An ONU provides the user interface for the **OAN**. Additional devices can be connected to the ONU at the user premises. The ONU is the terminal element of the access network. More than one ONU can be connected to the same **OLT** using passive devices. *See also* **PON, FTTP**.

optical splitter

A passive optical component that contains at least three ports and can split or combine optical signal power. In a **PON**, the splitter is bi-directional, coupling one **OLT** to multiple **ONUs**. The signal power from the **OLT** is split among the **ONUs**, and the signal strength of the **OLT** at each **ONU** is diminished accordingly. The signals from the **ONUs** are aggregated by the splitter and have to be multiplexed to prevent interference. *See also* **PON, FTTP, ONU, OLT**.

OS

Operating system. A program which manages the operations of a computer.

OSF

Open Software Foundation. An industry organization that sets standards of interoperability, scalability, portability, and usability for technological innovations in distributed computing. *See also* **ATM Forum, CLASS, DSP, ETSI, FCC**.

OSI

Open systems interconnection. Framework of standards for communication that organizes the communications process into seven different categories sequenced based on their relation to the user. *See also* **application layer, data link layer, network layer, physical layer, presentation layer, session layer, transport layer.**

OSMINE

Operations Systems Modifications for Integration of Network Elements. A standard for integrating network elements with **Telcordia** developed operating systems.

OSP

Open settlement protocol.

OSS

(1) Operations support system. Support for services such as ordering, service provisioning, billing, maintenance, and repair that directly support the daily operation of the telecommunications infrastructure. A part of back-office billing.

(2) Operator services signaling. A signaling protocol that supplies information necessary for operators (today, this does not always involve an actual operator) to process calls. Examples are call rating and charge recording functions, operator assistance functions, coin control and collection functions, automatic or manual identification of calling line number, and verification of the busy/idle condition of subscriber lines.

overhead

In the communications industry, all additional data that is not part of the user transmitted data. Overhead typically includes call routing and error checking information.

PAM

Pulse-amplitude modulation. The outcome of a sampled analog signal.

packet

Logical grouping of data (in binary form) organized for transmission. The three principle elements of a packet are:

- 1) the header, which contains control information
- 2) the text, or the data to be transmitted
- 3) the trailer, containing error detection and correction bits. *See also* cell.

PacketCable

The PacketCable specification is an initiative of CableLabs that is intended to provide cable industry support for Internet-based voice and video products over cable systems. The PacketCable architecture supports end-to-end IP telephony using call management servers (CMSs) for call control and interdomain signaling; media gateway controllers (MGCs), media gateways, and signaling gateways for access to the PSTN; audio servers and record keeping servers (RKSs) for network announcements and event management and billing information. *See also* IPDT, LCS.

packet-switching

With packet-switching, all network users are able to share the same paths simultaneously, and the specific route a data unit uses can be changed as conditions change. A particular message is divided into packets, which contain units with a certain number of bytes. Both the network addresses of the sender and of the destination are provided in the packet. Each node in the network checks the packet to learn its destination, and where to send it next. Packets that are contained in the same message can take different routes and may not arrive at the destination in the same order that they were sent. However, at the destination the packets in the message are then reassembled into the original message. *See also* ATM.

parameter control

A form of congestion control that protects the network resources from malicious or unintentional actions that affect the QoS of established connections. Usage parameter control (UPC) is performed at the user-network interface. Network parameter control (NPC) is performed at the network-network interface. UPC includes checking the validity of VPI and VCI values, monitoring the network

traffic from all active **VP** and **VC** connections to ensure that the agreed upon parameters are not violated, and monitoring the total volume of the accepted traffic on the access link. The **access network** determines parameter control actions, such as: discarding cells that violate the negotiated traffic parameters, releasing a noncompliant connection, or tagging the cells and letting them through if they do not cause harm to the network. *See also NPC, VP, VC, QoS.*

partial dial timing

Defined as the interval between each information digit from a customer's line, until the network has determined that the digit string is incomplete.

passive

An element in an **access network** that requires no electrical power to operate. An example would be an **optical splitter**. *See also access network, FTTP, PON.*

payload

The portion of a data **packet** or **ATM cell** that contains user data as opposed to overhead data.

PBX

Private branch exchange. A digital or analog telephone switch located on a business' premises that provides private telephone service to the business' employees. Typically, also connects via **trunk** lines to a public network Central Office switch for **PSTN** access.

PC

Point code (**TCAP** query routing). *See also PC + SSN, SSN, TCAP.*

PC + SSN

Point code + subsystem number routing (**TCAP** query routing). *See also PC, SSN, TCAP.*

PCI

Peripheral component interconnect. A local bus designed by Intel for the PC. Transfers data between the CPU and peripherals at up to 132 MB/s.

PCM

Pulse code modulation. A method of converting an analog signal to a digital signal. G.711 is the **Telcordia** (and **CCITT**) standard for PCM. PCM uses an 8kHz sampling rate (8000 samples/second) and 8-bit encoding, resulting in the voice signal being carried over a 64kbps (8000 x 8) digital channel. Different encoding schemes minimize line signal changes and reduce data loss. *See also ADPCM.*

PCR

Peak cell rate. An **ATM** traffic parameter defined by the **ATM Forum**. The PCR is the maximum instantaneous rate at which a **cell** can be transmitted on a **VCC** or **VPC** during a measurement time interval.

PDU

Protocol data unit. **OSI** term for a **packet**. A PDU is a message of a given **protocol** comprising payload and **protocol-specific** control information. *See also packet.*

phase jitter

A measure of the unwanted angular modulation of a signal. It is caused by noise or the actual modulation of the signal by another unwanted signal (such as power hum), and it displaces the zero crossings of a signal. It is measured in terms of peak-to-peak deviations of a 1004 Hz. tone from its nominal zero crossings. It is measured in a particular frequency band (20–300 Hz and either 4–300 Hz or 2–300 Hz). Phase jitter impacts voice-band data performance and can make modems more susceptible to other impairments, including noise.

phase hits

A sudden change in the phase of a signal lasting at least 4 msec. Phase hits are measured using a threshold, which indicates how much the phase of the signal has changed with respect to its nominal phase. Phase hits are caused by protection switching and slips or other synchronization errors. Phase hits have little impact on voice performance, but can seriously impair voice-band data performance. The amount that phase hits affect performance is correlated to the duration and magnitude of the hit. Short phase hits (4ms) exceeding 20° can cause errors in V.32 and higher speed modems using error correction. Slips, which appear

as phase hits with a magnitude near 45° when a 1004 Hz tone is being transmitted, usually forces modems to retrain.

PHY

Physical layer. *See also* **physical layer**.

physical layer

Physical layer. The first layer of the open systems interconnection (**OSI**) framework of standards. The physical layer deals with the physical means of sending data over lines. *See also* **application layer**, **data link layer**, **network layer**, **presentation layer**, **session layer**, **transport layer**.

PIC

Primary interexchange (inter-LATA) carrier.

PIC code

A code that identifies a **PIC**.

PID

Process ID.

PLCP

Physical layer convergence **protocol**. Specification that maps **ATM** cells into physical media.

PLL

Phased locked loop. A mechanism whereby timing information is transferred within a data stream and the receiver derives the signal elements timing by locking its local clock source to the received timing information.

PM

Performance management (**TMN** functional area).

PNNI

- 1) Private network-network interface. A routing **protocol** for **ATM** that allows for the exchange of routing information between **ATM** switches. *See also* **ATM**.
- 2) Private Network Node Interface.

POCT

Power on confidence test.

Point-to-MultiPoint

In an optical access network (OAN), point-to-multipoint describes an architecture in which an OLT is optically linked to multiple ONUs using only a passive process. There are no active devices (although a passive device of some sort is required at the branching point). *See also* PON, Point-to-Point.

Point-to-Point

In an optical access network (OAN), point-to-point describes an architecture in which every optical link moves from one point to another; there is no optical branching. *See also* Point-to-MultiPoint.

PON

Passive optical network. An OAN in which each OLT is connected with more than one ONU by using passive intermediate devices. In PONs, optical splitters serve as the intermediate devices. *See also* OAN, ONU, OLT, optical splitter, FTTP.

POP

Point of presence. The IXC equivalent of a local phone company's central office (CO).

POR

Power on reset.

port

As used in relation to the G6 Gateway, a port is an interface between a transmission module and a carrier transmission line.

portable number

Numbers within an exchange that have portable capabilities. Assigned to the designated default switch (portable exchange), these numbers have not yet been ported to another LSP. Portable numbers typically are all numbers in an NXX where portability is allowed. *See also* LRN, ported number.

ported number

A portable number that has already been assigned to a switch at another LSP. *See also* LRN, portable number.

PoS

Packet over **Sonet**. A high-speed means of transmitting data over a **Sonet** fiber optic transmission system through a direct fiber connection to a data switch or router.

post dial delay

The amount of time a caller shall wait after entering or dialing the last digit of a telephone number before hearing a valid audible network response. Requirements for post dial delay differ depending on whether it is an on-net or off-net call, whether **LNP** database lookup is required, and whether calling name is to be delivered.

post pick-up delay

The interval between the customer picking up the phone and receiving the first voice packet. Too much post pick-up delay causes what is known as the “clipped hello”.

POTS

Plain old telephone service. The type of voice telephone service provided by local exchange carriers and supported by **IADs** that are compatible with the G6 Gateway. **POTS** generally refers to two-wire, loop-start phone lines. *See also* **KB**, **PSTN**

PPD

Partial packet discard. Discarding cells associated with an **AAL5** encoded **IP** packet.

PPP

Point-to-point **protocol**. It provides router-to-router and host-to-network connections over synchronous and asynchronous circuits.

PRD

Product requirements document. A document used by the product management department to define the requirements for a specific product or suite of products.

presentation layer

The sixth layer of the open systems interconnection (**OSI**) framework of standards. The presentation layer provides transparent communications services by masking the differences between dissimilar systems. *See also*

application layer, data link layer, network layer, physical layer, session layer, transport layer, OSI.

PRI

Primary rate interface. The **ISDN** equivalent of a **T1** circuit. Signaling is carried out-of-band in the data channel, rather than in-band in the channels as in a **T1**. *See also* **BRA, BRI, ISDN, T1**.

priority control

A means of prioritizing cells to be discarded during network congestion. *See also* **CLP**.

protection group

A pair of transmission modules or system controller modules used to provide redundancy within a network element. Each protection group is comprised of an active device and a standby device. The standby device becomes active if the active device fails.

protocol

A set of rules that govern the format for message and signalling information sent between computers and people within a network.

provisioning

A broad term that involves the configuration of specific cards and ports on the **G6 Gateway** as well as the management of such service enhancement features as interface groups, line profiles, traffic descriptors, and customer premise equipment (**CPE**) profiles.

provisioning data

All data necessary to provision a **G6 Gateway**. Provisioning data is contained in a series of database tables on the **SCM** card in a **G6 Gateway**. *See also* **provisioning, SCM**.

proxy

An application running on a gateway that relays packets between a client and a host.

pseudowire emulation

See **PWE**.

PSQM

Perceptual speech quality measurement.

PSTN

Public switched telephone network. The network that is usually considered the incumbent telephone system. It is Public because it has open-access requirements. It is considered switched because it sets up calls with dedicated connections or circuits (in contrast to IP networks, for example, which are connectionless). *See also* POTS.

PUC

Public Utilities Commission. A state body charged with regulating phone companies. Sometimes referred to as the Public Service Commission.

pulse code modulation

See PCM.

PVC

Permanent virtual circuit. A virtual circuit that provides the equivalent of a dedicated private-line service between two end systems over a packet-switched network. *See also* SVC.

PVP

Permanent virtual path. Permanent virtual paths are used to create ATM transit connections (cross-connections) through a G6 Gateway. PVPs are an association between any two ATM virtual paths that terminate on a G6 Gateway. *See also* ATM.

PWE

Pseudo wire emulation. PWE emulates a point-to-point connection between pairs of provider edge routers to emulate traditional communications links over IP- or MPLS-enabled IP packet switched networks (PSN). Existing network transport services migrated to PSNs use these resulting pseudo wires to emulate the essential properties of traditional communications links over the PSN and thereby to provide converged services over the core network. A pseudo wire provides a single service, perceived by its user as an unshared link or circuit of the chosen service. The G6 Gateway supports PWE3 DS1

services using either IP or MPLS-based packetization over structured or unstructured circuits.

PWE3

Pseudo wire emulation edge-to-edge.

Q

QD

Queuing delay. Queuing delay refers to the delay imposed on a cell by its having to be buffered because of unavailability of resources to pass the cell onto the next network function or element. This buffering could be a result of oversubscription of a physical link, or due to a connection of higher priority or tighter service constraints getting the resource of the physical link.

QoS

Quality of service. The capability of a network to offer a specific level of service availability. QoS levels can range from best-effort to dedicated bandwidth. The QoS is an accurate reflection of the network's capacity, transmission quality, and service availability. *See also* **DPC**.

R

RBOC

Regional bell operating company. One of the four holding companies created to provide local exchange telephone service upon the breakup of AT&T in 1984. Also called a regional holding company (RHC).

RDI

Remote defect indication. A signal transmitted by the endpoint of an **ATM VCC** or **VPC** to indicate to the other end of the connection that it has received an Alarm Indication Signal (**AIS**) from an upstream node indicating a link failure. *See also* **VCC**, **VPC**.

RDT

Remote digital terminal. A network element located remotely from a central office. RDTs are capable of terminating up to 28 **T1** lines on a **Class 5 switch**. In the **CPE** direction, RDTs are used to provide **DS3** service.

Radius

Remote authentication dial-in user service. Radius (often listed as RADIUS) authentication provides centralized authentication, authorization, and accounting for remote network access to the **G6 Gateway** from the **GenView EMS** server (via a EMS client) or from a CLI session. For additional security, access to the CLI only through an **SSH** session and turn off **telnet**. *See also* **IPSec**, **SSH**, **telnet**.

redundancy

Having one or more backup systems available in case the main system fails. The power supply, cooling system, system controller module, and **ANM** cards are all designed to provide redundancy on a **G6 Gateway**. *See also* **fault tolerance**, **protection group**.

remote

Not at the same location where a particular device or system physically is located. This term typically refers to access from a remote location and implies that there is a physical connection via a network.

RC

Replication coordinator.

RFI

Request for information. A notification to service or equipment vendors, of intent to purchase services or equipment.

RFP

Request for proposal. A buyer's written definition of services or equipment required, sent to one or several vendors. Usually contains extensive and specific details (specifications) for the services or equipment required.

RHC

Regional holding company. *See also* **RBOC**.

RIP

Routing information **protocol**. An algorithm and **protocol** used to discover the topology of a data network for the purpose of routing packets within the network.

RKS

Record keeping service. A centralized collection point for billing events. A mediation layer between call signaling and back-office accounting and reconciliation activities.

RM

Resource management. The management of critical resources in an **ATM** network.

RMA

Return material authorization. A code number provided by the seller, as a prerequisite to returning a product for repair, replacement, or refund.

robbed bit signaling

The signaling method used for superframe (**SF**) and extended super frame (**ESF**) **DS1** links, which robs the eighth bit of every channel once every 6 frames (frames 6 and 12 in **SF** and frames 6, 12, 18, and 24 in **ESF**) in order to convey signaling information to the far end. In a 24-frame (**ESF**) sequence, these stolen bits form a 4-bit codeword, commonly called the “**ABCD bits**,” for each channel every 3 milliseconds. In a 12-frame **SF** sequence, the stolen bits form a 2-bit, **AB**, codeword for each timeslot. *See also* **ABCD bits**.

router

A device that interconnects networks and passes (routes) data from devices on one network to devices on another network.

routing table

A list of known routes to destination networks in a router.

RQNT

Notification request (**MGCP** command).

RSC

Regional switching center or remote switching center.

RSIP

Restart in progress (**MGCP** command).

RT

Remote terminal. Local loop terminates at remote terminal intermediate points closer to the service user to improve service reliability.

RTCP

Real-time control **protocol**. Protocol that monitors the **QoS** of an **IPv6 RTP** connection and conveys information about the on-going session. *See also QoS.*

RTOS

Realtime operating system. Any operating system where interrupts are guaranteed to be handled within a certain specified maximum time, thereby making it suitable for control of hardware in embedded systems and other time-critical applications.

RTP

- 1) Real-time **protocol**.
- 2) Routing table protocol. VINES routing **protocol** based on RTP. Distributes network topology information and aids VINES servers in finding neighboring clients, servers, and routers. Uses delay as a routing metric.
- 3) Rapid transport protocol. Provides pacing and error recovery for APPN data as it crosses the APPN network. With RTP, error recovery and flow control are done end-to-end rather than at every node. RTP prevents congestion rather than reacts to it.
- 4) Real-time transport protocol. One of the **IPv6 protocols**. RTP is designed to provide end-to-end network transport functions for applications transmitting real-time data, such as audio, video, or simulation data, over multicast or unicast network services. RTP provides services such as payload type identification, sequence numbering, timestamping, and delivery monitoring to real-time applications.

RTT

Round trip time. A measure of response time for a network ping measured in milliseconds (ms). The RTT, which is primarily used for network troubleshooting, is related to packet length and the distance between the sites plus the delay at each hop along the path between the sites. RTT is

roughly calculated by $\text{distance} / (0.6 * c) + \text{hops} * \text{delay}$
 where c is the velocity of light.

rt-VBR

Real-time variable bit rate. An **ATM service category** used for critical data in cases where traffic is *bursty*. The amount of data, hence the transmission rate, varies with time. The rt-VBR category is intended for applications that require tightly-constrained delay and delay variation and require timing and control information to ensure the integrity of the data stream. Typical applications include compressed voice, audio, and video. **PCR**, **SCR**, **CDVT**, and **MBS** characterize rt-VBR traffic. *See also* **ABR**, **CBR**, **UBR**, **VBR**.

RU

Rack unit. Describes the vertical dimension of an available area for installing rack-mounted telecommunications equipment. One rack unit equals a height of 1.75 inches (4.45 cm). Racks used in telco facilities have an inside width of 23 inches, while those used in data facilities have an inside width of 19 inches.

Rx

Receive.

S

S4 Applications Server

GENBAND S4™ Applications Server. *See also* **C2 Controller**, **G6 Gateway**, **GenView EMS**.

SA

Source address. The address from which the message or data originated.

SAAL

Signaling **ATM** adaptation layer. Transports messages over the **ATM** layer. *See also* **ATM**.

SAC

Serial **ATM** crossover.

sampling

As used in telephony, a technique that involves measuring the amplitude of an analog signal at regular intervals to construct an equivalent digital signal.

sampling rate

As used in telephony, the frequency at which an analog signal is sampled for the purpose of converting it to a digital format. Analog voice circuits are typically sampled at a rate of 8,000 times per second.

SA

Security association.

SAP

Service access point. The interface point at which communicating networks or entities within a network communicate. Each physical port on a gateway has an SAP.

SAR

Segmentation and reassembly. One of the two sublayers of the **A/D CPCS** responsible for dividing and reassembling the **PDU**s passed from the **CS**. *See also* **A/D**, **CPCS**, **PDU**.

SC connector

The fiber optic connector used with the **G6 Gateway** to provide **OC3** connectivity. Each **OC3 ANM** port uses one **SC** connector for **Tx** and one for **Rx**.

SCA

Selective call acceptance.

SCCP

Signaling connection control port.

SCF

Selective call forwarding.

SCM

System Controller Module. A card in a **G6 Gateway** that performs overall control functions, switching, and manages the flow of information among the system modules. It resides in slot 9 of a **G6 Gateway**. A second

SCM (in slot 10) provides redundancy for the shelf. *See also ANM, CIM, SCM-CI, SCM1, SCM2, TPM.*

SCM1

System Controller Module 1. The first-generation SCM is compatible with **G6 Gateway System Software** releases 9.x and earlier. *See SCM.*

SCM2

System Controller Module 2. The second-generation SCM2 is compatible with **G6 Gateway System Software** releases 10.x and later. The SCM2 supports a full complement of 12 active and 2 standby **STS-1** modules. *See SCM.*

SCM-CI

SCM Cable Interface. This interface is integrated into a **G6 Gateway** chassis in slots 9 & 10 to provide redundant power, management and clocking.

SCP

Service control point.

SCR

- 1) Sustainable cell rate. An **ATM** traffic parameter defined by the **ATM Forum**. The SCR is the average rate at which cells can be transmitted on a **VCC** or **VP** during a measurement time interval. *See also VCC, VP.*
- 2) Selective call rejection.

SES

Severely errored seconds. A unit used to specify the error performance of T carrier systems. This indicates a second containing ten or more errors, usually expressed as SES per hour, day, or week. This method gives a better indication of the distribution of bit errors than a simple Bit Error Rate (**BER**).

SDH

Synchronous digital hierarchy. **ITU-T** standard defining a set of rate and format standards that are transmitted using optical signals over fiber. Analogous to the **ANSI Sonet** standard in North America. Designed to be compatible with **Sonet** at **OC3c** and higher speeds. *See also E1, ETSI.*

SDP

Session description **protocol**. Intended for the description of multimedia sessions over IP-based networks.

SDSL

Symmetric digital subscriber line. *See also* ADPCM, HDSL, IDSL, VoDSL.

SEC

Severely errored second. An error message that indicates more errored bits were received in a one second interval than allowed by the network.

SECB

Severely errored cell block ratio.

secret key

The cryptographic key used in a symmetric key algorithm, which results in the secrecy of the encrypted data depending solely upon keeping the key a secret. Also known as a symmetric key.

service access point

See SAP.

service category

In ATM transmission, a service category is a service designed to support a specific ATM transmission environment. Currently there are five categories as follows: CBR, rt-VBR, nrt-VBR, UBR, and ABR. *See also* ATM.

service provider

A company that provides phone service to **subscribers**.

service provisioning

As used in relation to the **G6 Gateway**, the act of configuring G6 Gateways, cards, or ports so they can be placed into service. *See also* provisioning.

session layer

The fifth layer of the open systems interconnection (OSI) framework of standards. The session layer controls the use of the basic communications facility provided by the transport layer. *See also* application layer, data link layer,

network layer, physical layer, presentation layer, transport layer.

SF

See superframe.

SGCP

Simple gateway control protocol.

shaping

See traffic shaping.

single point of failure

A failure of a single active element in the access network that results in multiple customers being left without service.

single frequency interference

Refers to output signals appearing at frequencies other than the input signal. With a 0 dBm0 input signal at any frequency between 0 Hz and 12KHz, the output at any other frequency between 0 and 12KHz shall be less than -28dBm0. With a 0 dBm0 input signal at any frequency between 1004Hz and 1020Hz, the output at any other frequency between 0 and 4 KHz shall be less than -40dBm0.

SIP

Session initiated **protocol**. A signaling **protocol** used to create and control session between two or more parties in a voice over IP (**VoIP**) network.

SIT

Special information tones. Tones sent within a telephone network to identify machine generated messages.

SLIP

Serial line internet **protocol**. Protocol used to run **IP** over serial lines such as telephone circuits. *See also IP.*

SM

Security management (**TMN** functional area). A standard set by the International Standards Organization (**ISO**) to protect a network from invalid access.

SMDS

Switched multimegabit data service. Connectionless high-speed data transmission service intended for application in a metropolitan area network (**MAN**).

SML

Service management layer (**TMN**). The network layer that provisions and administers data about network services. *See also* **TMN**.

SMP

Symmetric multi-processing.

SN

Service node. A network system containing functions that enable flexible information interactions between an end user and the network.

SNMP

Simple network management **protocol**. A high-level network management **protocol** used in **TCP/IP** networks. *See also* **MIB**, **EMS**, **NMS**.

SNOB

Sequence number oscillating bit.

softswitch

A software platform that emulates all the functions of a traditional telecommunication switch in a modular distributed fashion. A typical softswitch can handle signaling, admission and screening, and routing and connection control across disparate transport networks such as **IP**, **ATM**, **TDM**, and frame relay.

SoftSwitch Consortium

Organization for coordination of internetworking technologies in the field of Internet-based, realtime, interactive communications and applications.

SOHO

Small office / home office.

Sonet

Synchronous optical network. The American National Standards Institute (**ANSI**) standard that defines a set of

fiber optic transmission rates, ranging from 54 Mbps (STS-1 or OC1) to 13.27 Gbps (STS = 256 and/or OC-256). This wide range of transmission rates allows a single fiber optic cable the flexibility to transport many digital signals with different capacities, originating from equipment of different vendors. Analogous to the ITU-T SDH standard. *See also ANSI.*

SPD

Security policy database.

SRS

Schlumberger subscriber response system.

SRTS

Synchronous residual time stamp. A clock recovery technique wherein signals between source timing and a network reference timing signal are transmitted to allow reconstruction of the source timing at the destination.

SS7

Signaling system 7. Standard CCS system used with B-ISDN and ISDN. *See also B-ISDN, CCS, ISDN.*

SSADT

Service specific assured data transport sublayer.

SSCF

Service specific coordination function.

SSCOP

Service specific connection oriented protocol.

SSCS

Service specific convergence sublayer. Offers assured data transmission. One of the two sublayers of any A/D. *See also A/D, CPCS, SAR.*

SSH

Secure shell protocol. SSH provides application layer security for a CLI session on the G6 Gateway. Generally when using SSH, it is good practice to lock out access via a telnet session. *See also IPSec, Radius, telnet.*

SSN

Subsystem number routing (TCAP query routing). *See also* PC, PC + SSN, TCAP.

SSP

Service switching point.

SSSAR

Service-specific segmentation and reassembly ISDN sub-layer. *See also* ISDN, B-ISDN, SSTED.

SSTED

Service-specific transmission error detection ISDN sub-layer. *See also* ISDN, B-ISDN, SSSAR.

SSU

Synchronization supply unit. A master clock (timing source) located within a local exchange that supplies a common timing reference for all digital network transmission and switching equipment in the building. *See also* BITS.

star codes

Codes that a **subscriber** can dial to access features and services such as call forwarding and **DND**. Also known as vertical service codes.

static routing

A data path (route) manually programmed into the router by a network administrator.

STM

Synchronous transfer mode. **B-ISDN** communications method that transmits a group of different data streams synchronized to a single reference clock. *See also* B-ISDN.

STM-1

Synchronous transport module-1. The basic ITU-T SDH transmission rate of 155.52 Mbps is compatible with the Sonet OC3 signal. *See also* OC3.

STM-3

Synchronous transport module-3.

STM-4c

Synchronous transport module-4, concatenated (payload). The ITU-T SDH transmission rate of 622.08 Mbit/s (compatible with the **Sonet OC12** signal).

STP

Signal transfer point.

streaming

The process of downloading video and audio while the user is watching and listening simultaneously.

STS-1

Synchronous transport signal level 1. An electrical carrier signal. The G6 Gateway STS-1 TPM is channelized into two channelized DS3s, which each support 28 T1s. The DS3s connections from the STS-1 can connect directly to a switch that supports channelized DS3. The DS3s can also connect through an M13 multiplexer/demultiplexer, which separates each into 28 physical T1 connections. The STS-1 bandwidth for DS3 transmissions is 44.736 Mbps. STS-1 can also be converted directly to or from **Sonet's** optical signal (OC-1) or multiplexed/demultiplexed into/from a higher speed **Sonet** electrical signal (STS-n). The STS-1 bandwidth for **Sonet** transmissions is 51.840 Mbps. *See also DS3, E1, E3, T1.*

subnet mask

A 32-bit address mask that indicates the network and host portion of an IP address. A subnet mask address is sometimes referred to as a net mask address. For example, the subnet mask of 255.255.000.000 identifies that the first two bytes of an IP address belong to the network, and the last two bytes refer to the device (representing a standard class B subnet mask). *See also IP, IP address.*

subscriber

The end-user on the voice connection.

superframe

Superframe. A T1 framing method that uses 193-bit Frames, 12 frames per superframe, and sends 8,000 frames per second. *See also ESF.*

SVC

Switched virtual circuit. A connection or circuit that is dynamically established on demand (virtual) and is torn down when transmission is complete. The end system sets up the SVC. *See also* PVC.

SVCC

Switched virtual channel connection. A switched VCC is one which is established and taken down dynamically through control signalling. A virtual channel connection (VCC) is an ATM connection where switching is performed on the VPI/VCI fields of each cell. *See also* VCC.

SVPC

Switched virtual path connection. A switched virtual path connection is one which is established and taken down dynamically through control signalling.

switch

In a telecommunications network, a switch channels incoming data from multiple ports to the specific port that will send the data to its intended destination. **Circuit-switched** telephone networks (traditional networks) use one or more switches to set up a dedicated connection for a call exchange between two or more parties. An **ethernet** local area network (LAN) uses a switch to determine from the physical device address attached to each incoming message frame which output port must be used to forward the message. A wide area **packet-switching** network such as the internet uses the switch to determine from the **IP address** in each packet which output port should be used to send the packet on to the next segment of its path to the intended destination. *See also* Ethernet, packet-switching, circuit-switching.

symmetric key

See secret key.

T1

Transmission link 1. Part of the digital signal (DS) hierarchy, T1 is the wide-area digital transmission scheme

in North America. T1 carries twenty-four 64Kb channels at a rate of 1.544 Mbps. *See also* **DS3**, **E1**, **ISDN**.

T1CAS

T1 channel associated signaling. Channel associated signaling uses inband signaling, that is, the signaling information is carried on the same channel as the voice band. When analog lines are terminated and converted into a digital line (**DS0**), the analog signaling information for each line is converted to digital information (A B bits) and embedded in the channel along with the digitized voice. T1 CAS lines are often referred to as channelized T1 lines. *See also* **T1**, **DS0**.

T3

Transmission link 3. Part of the digital signal (DS) hierarchy, T3 is a digital transmission scheme in North America. T3 carries data at a rate of 44.736 Mbps. *See also* **DS1**, **DS3**, **T1**, **STS-1**. *Contrast* **E3**.

talker echo

See **ERL**.

TBOS

Telemetry byte-oriented signaling. Transmits alarm, status, and control points between network element (**NE**) and operating system (**OS**).

TC

Traffic contract. An agreement between the user and the network regarding the expected **QoS** that the network is to provide that user; the set of traffic parameters with which the **ATM** network user is expected to comply. *See also* **QoS**, **ATM**.

TCA

Threshold crossing alerts. Notifies a transmitting source that its transmitted signal has dropped below a pre-defined level.

TCAP

Transaction capabilities application part. An **SS7** layer that provides a signaling function for network data bases.

TCAP TR-1188

TCAP TR-1188 compliance provides the name of the caller (calling name services, caller ID) to a **PBX** or other **CPE**.

TCID

Test case identifier. A number assigned to a specific step or series of steps in a test plan.

TCP

Transmission control **protocol**. Connection-oriented transport layer **protocol** that provides reliable full-duplex data transmission.

TCP/IP

Transmission control **protocol**/Internet **protocol**. Networking **protocol** providing communication across interconnected networks and computers with diverse hardware architectures and operating systems.

TDM

Time-division multiplexing. A technique for transmitting multiple data, voice, and/or video signals simultaneously, by quickly interleaving a piece of each signal, one after another. *See also* **GR-303**, **multiplexing**.

Telcordia

A telecommunications company. Formerly **Bellcore**, the company was created during the divestiture of the Bell System in 1984 to serve as a center for technological expertise and innovation. Later renamed **Telcordia**.

telnet

A telecommunications network **protocol**. Protocol allowing the user to connect to computers on the Internet or to any computer on their local network. *See also* **IPSec**, **Radius**, **SSH**.

threshold

- 1) The upper or lower limit of an electrical value such as voltage, current, or wattage that triggers a response in a particular circuit when exceeded.
- 2) The upper or lower limit of a condition which, if exceeded results in a dramatic change in condition. As used in relation to the **G6 Gateway**, thresholds are often

used to trigger responses such as alarms when measuring the **QoS** of traffic parameters. *See also* **QoS**.

TFTP

Trivial file transfer **protocol** is a **UDP**-based version of **FTP**, which allows the transfer of files from one computer to another over a network. It has no built-in security. *See also* **FTP**.

TG

See **trunking gateway, media gateway**.

TGCP

Trunking gateway control **protocol**.

time division multiplexing

See **TDM, multiplexing**.

time slot

In **TDM**, the portion of the data stream allocated to carry payload data. One time slot on a **T1** transmission line contains 64Kb of data per second. *See also* **TDM, T1**.

TL1

Transaction language 1 (**Telcordia**). A man-to-machine communications language.

TM

Traffic management. The set of actions taken by the network to handle congestion.

TMC

Timeslot management channel (**GR-303**). A dedicated channel for sending control messages, used to set up and tear down calls in a **T1** frame. In a **GR-303** interface group(**GR-303 IG**), the primary TMC is usually channel 24 of the first **DS1**. *See also* **GR-303**.

TMN

The telecommunications management network standard is an ITU-T model for transporting and processing **OAM&P** information for a telecommunications network. *See also* **OAM&P**.

TNM

Total network management. *See also* EMS, NMS.

ToD

Time of day.

toll calls

Generally, this term refers to long-distance calls for which a subscriber has traditionally paid an extra fee, or *toll*, in addition to a monthly or other periodic service charge.

Many VoIP plans charge a flat rate regardless of whether a call is local or long distance.

ToS

Type of service.

TPM

Telephony Port Module. A card in a G6 Gateway that provides high-speed telephony functions within the gateway. It can connect to a Class 5 switch or a local exchange switch by GR-303, TR-08, T1CAS or V5.x interfaces. TPMs can be in slots 3-8 and 11-18 in the G6 Gateway. One spare TPM can provide redundancy for all the TPM cards in the shelf. *See also* ANM, CIM, SCM.

TR

Technical requirements/Technical reference (Telcordia). Published standards for products, new technologies, services, or interfaces.

TR-08

The Telcordia (Bellcore) Technical Reference TR-TSY-000008 (TR-08), *Digital Interface Between the SLC-96 Digital Loop Carrier System and a Local Digital Switch*. This North American open IDLC interface standard, describes the interface between a local digital switch (LDS) and a remote digital terminal (RDT). TR-08 defines three modes of operation: Mode I, Mode II, and Mode III. Mode I serves up to 96 voice frequency lines multiplexed onto four DS1 signals (96 DS0 channels). Hence, Mode I provides one DS0 for each subscriber line attached to the RDT (no concentration is provided).

Mode II serves up to 96 voice frequency lines multiplexed onto two DS1 signals. The 96 lines are partitioned into two

48-line shelf groups. Each group of 48 lines competes for the 24 **DS0** time slots in a single **DS1** yielding a 2:1 remote line concentration. Remote line concentration saves transmission capacity between the central office and a **DLC** remote terminal and it saves switching interface equipment. However, Mode II's restricted access and concentration scheme cause service problems in moderate and heavy telephone traffic environments. But rural environments could exploit Mode II savings. Carriers who lease feeder capacity (fiber optic lines, or T lines) may also be interested in Mode II.

Mode III serves up to 48 coin and D4 type special service circuits. Today Mode III operation supports limited deployment of older generation coin phones, and party lines. Most modern **DLC** products provide support for data, **DDS**, and other circuits outside the **TR-08** interface rendering Mode III obsolete.

traffic shaping

Traffic shaping delays cells within the limits of an **ATM** connection to actively alter the traffic characteristics of a stream of cells on a **VP** or **VCC**, thereby reducing the peak cell rate, limiting the burst length, or reducing the cell delay variation. *See also* **CLP**.

transport layer

The fourth layer of the open systems interconnection (**OSI**) framework of standards. The transport layer defines the rules for information exchange and manages end-to-end delivery of information within and between networks. *See also* **application layer**, **data link layer**, **network layer**, **physical layer**, **presentation layer**, **session layer**, **OSI**.

trunk

A transmission line that connects two central office switches, or that connects a central office switch to a **PBX**. *See also* **PBX**.

trunk group

A logical grouping of **TR-08** lines from the Class switch. **GENBAND** software and documentation uses the term *interface group* interchangeably with trunk group. *See also* **interface group**.

trunking gateway

A network element that provides bearer and signaling trunk circuit access to a VoIP network. The **G6 Gateway** functions as a trunking gateway in a VoIP configuration and interfaces to a softswitch in the PSTN and a separate MGC. The **G6 Gateway** provides support for SS7 ISUP lines (trunks), MFO lines (trunks), and MFT lines (trunks). *See also media gateway.*

TSGR

Transport system generic requirements.

TTA

Telecommunications Technology Association of Korea. For more information, go to www.tta.or.kr/English/new/main/index.htm. *See also ETSI, ITU*

TTC

Telecommunication Technology Committee. For more information, go to www.etsi.org. *See also ETSI, ITU.*

Tthist

History timeout value.

TTL

Time to live. Field in an IP header that indicates how long a packet is considered valid. *See also packet.*

Ttlongtran

Long transmission timeout value (following provisional response).

Tx

Transmit.

UBR

Unspecified bit rate. A QoS traffic class defined by the ATM Forum for ATM networks. UBR allows any amount of data up to a specified maximum to be sent across the network. UBR is delivered only when there is available bandwidth in the network. This is enforced by setting the CLP bit. PCR and CDVT characterize UBR traffic. MCR further characterizes UBR+ traffic. UBR is often used for file and

message transfer. UBR does not provide any service guarantees. *See also* **ABR**, **CBR**, **rt-VBR**, **VBR**.

UDP

User datagram **protocol**. A stateless transport layer **protocol** for data transfer that exchanges datagrams without acknowledgements or guaranteed delivery, requiring that error processing and retransmission be handled by higher layer protocols. UDP is part of the **TCP/IP** suite of protocols. *See also* **TCP/IP**.

UGS

Unsolicited grants service.

UI

User interface. *See also* **CLI**, **GUI**.

UID

User identification (login id).

UL

Underwriters Laboratories. A privately owned company in the United States that creates safety standards for electrical equipment. Underwriters Laboratories provides certification of equipment (for a fee) for equipment that meets the UL standards.

UMTS

Universal mobile telecommunications system. An **ETSI** name for a **3G** technology that offers services to mobile computer and phone users anywhere in the world. Based on the **GSM** communication standard, UMTS is the planned standard for mobile users around the world. UMTS, fully implemented, gives computer and phone users access to the Internet as they travel. They have the same capabilities even when they roam, through both terrestrial wireless (**UTRA** or **UTRAN**) and satellite transmissions.

UNE

Unbundled network element. Physical and functional elements of the network, for example, circuit-switching ports, interoffice transmission facilities, signaling databases, and more.

UNI

User-to-network interface. **ATM Forum** specification that defines an interoperability standard for the interface between an **ATM**-based product in a private network and the **ATM** switches located within the public carrier network. *See also* **NNI**.

Unicode

Unicode is a new and alternate way to set up binary codes for text or script characters. It is a system for “the interchange, processing, and display of the written texts of the diverse languages of the modern world.” Unicode supports many texts in a number of languages, including historical and classical books. The Unicode standard has 34,168 distinct coded characters that are derived from at least 24 supported language scripts (covering most of the principal languages on the globe). The work is ongoing to provide additional language support. *See also* **ASCII**.

unlocked

As used in relation to the **G6 Gateway**, one of two possible administrative states for a **TPM** or **ANM** card. The unlocked state is equivalent to an in service condition. *See also* **administrative state**, **locked**.

UPC

Usage parameter control. Set of actions taken by the network to monitor and control **ingress traffic** on an **ATM UNI**. Its main purpose is to protect network resources from malicious as well as unintentional misbehavior, which can affect the **QoS** of other already established connections, by detecting violations of negotiated parameters and taking appropriate actions.

UPS

Uninterruptible power supply. A power supply specially designed to provide continuous power even during times of public utility power outages.

USOC

Universal service-order codes.

UTP

Unshielded twisted pair. Unshielded wires twisted to minimize crosstalk with other pairs of wires in the same cable.

UTRA

UMTS terrestrial radio access. *Also*, universal terrestrial radio access.

UTRAN

UMTS terrestrial radio access network. *Also*, universal terrestrial radio access network.

V

V5.x

ETSI standards governing the transmission of data over analog transmission facilities.

VAD

Voice activation detection. VAD is a technique for saving bandwidth in **ATM** transmission facilities by suppressing voice transmission during silent intervals. *See also* **ATM**.

VBR

Variable bit rate. A **QoS** traffic class defined by the **ATM Forum for ATM networks**. In VBR connections, the average timing relationship between samples is fixed at the sustainable cell rate (**SCR**). VBR allows short-term rate variations as defined by the peak cell rate (**PCR**) and the maximum burst size (**MBS**). *See also* **ABR**, **CBR**, **rt-VBR**, **UBR**.

VBR-nrt

Variable Bit Rate - non-real time. Used by applications which produce traffic of varying bit rates, which produce varying throughput rates which are able to tolerate delay (email, for example).

VC

Virtual circuit. In **packet-switching** switching, network facilities that appear to be an actual end-to-end circuit. Virtual circuits allow multiple users to share switches and transmission facilities, while temporarily or permanently

appearing to each user as a private, dedicated circuit. *See also VCI, VCC.*

VCC

Virtual channel connection. A connection of two points in an ATM network. *See also VCI, VC.*

VCI

Virtual channel identifier. A unique numeric identifier for the virtual channel connection (VCC) carrying a specific stream of cells between specific network devices during a specific session. The VCI is contained in a 16-bit field in the ATM cell header. *See also VCC, VP.*

vertical service codes

See star codes.

virtual channel connection

See VCC.

virtual circuit identifier

See VCI.

virtual local area network

See VLAN.

virtual path

See VP.

virtual path identifier

See VPI.

VLAN

Virtual local area network. A VLANs comprises devices on different physical LAN segments that can communicate with each other as if they were all on the same physical LAN segment. That is, a VLAN is independent of physical location. More important, a VLAN excludes all traffic on other VLANs. In the G6 Gateway, VLANs provide two major benefits: an additional layer of security, and in-band management on the GbE ANM. Using VLANs allows segmentation of traffic across the GbE ANM.

VoATM

Voice over asynchronous transfer mode. *See also ATM.*

VoB

Voice over broadband. Technology used to transmit voice over broadband. *See also VoBroadband.*

VoBroadband

Voice over broadband. The unique GENBAND hardware and software approach of integrating native **IP** and **ATM** within a single gateway platform. *See also broadband.*

VoCoder

A contraction of the words voice and encoder. Typically a single chip that provides voice encoding functions for voice transmission equipment.

VoDSL

Technology used to transmit voice over the **DS3** physical layer **protocol** over a copper pair. *See also ADPCM, DSLAM, HDSL, IDSL, ISDN, SDSL, T1.*

voice activation detection

See VAD.

VoIP

Voice over internet **protocol (IP)**. Technology used to transmit voice over a network using the Internet Protocol (**IP**). *See also IP.*

VP

Virtual path. A group of **VCs**. VPs can be used as a network resource-management tool for traffic control. Grouping several **VCs** together into a VP simplifies **CAC** and **parameter control** by enabling traffic management for an entire VP. Combining traffic types that require different **QoS** levels into different VPs also facilitates **priority control**. VPs also facilitate message distribution. *See also VC, VCC, VCI, VP, VPI.*

VP shaping

The process of aggregating multiple voice channels into a single, **CBR** or **rt-VBR** shaped VP connection for transport through an **ATM** access network to and from a remote **DSLAM**. *See also VP, rt-VBR, DSLAM.*

VPC

Virtual path connection. An end-to-end **ATM** connection capable of carrying one or more **VCCs**. Can be a *user VPC* (UNI-to-UNI) or *network VPC* (network node-to-network node). In a VPC, switching is performed on the VPI field only of each cell. *See also VC, VCC, VCI, VP, VPI.*

VPI

Virtual path identifier. The VPI identifies a virtual path connection (**VP**) on a link. A **VPI**, along with unique virtual channel identifiers (**VCIs**), identifies the virtual channel connections (**VCCs**) associated with a **VP**. The VPI is contained in a 12 bit field in the **ATM cell** header on a network-node interface (**NNI**), or a 8 bit field in the **ATM cell** header on a user-network interface (**UNI**). A **VPI** has only local significance to the link on which it is assigned. *See also VC, VCC, VCI, VP, VPC.*

VPL

Virtual path link. A collection of AAL2 virtual channels originating on a G6 Gateway that are logically associated with a particular constant bit rate (**CBR**) or real-time variable bit rate (**rt-VBR**) virtual path endpoint. This feature is used to aggregate multiple voice channels into a single, **CBR** or **rt-VBR** shaped **VP** connection for transport through an **ATM** access network to and from a remote **DSLAM**. *See also rt-VBR, CBR, VP, DSLAM.*

VPN

Virtual private network. An apparently private communications network that actually uses a public network for its **WAN** backbone. **VPN protocols** in network nodes keep the data from different **VPNs** separate from one other.

W

WAN

Wide area network. A network that provides communication between telephones, PCs, and other equipment in geographically diverse locations using long-distance network facilities. *See also ethernet, LAN, MAN.*

WBM

Web-based management.

WFQ

Weighted fair queuing. Separates voice and data traffic into multiple queues, based on traffic class definitions, so that all traffic is guaranteed a portion of a network's total available **bandwidth**. If one queue is not using all of its allocated **bandwidth**, WFQ temporarily allocates the unused **bandwidth** to other voice and data traffic queues.

wink start

A signaling method that uses a timed interval (100 to 300 ms) by devices receiving **DTMF** to indicate to the sending device that it is ready to receive digits. *See also multi-wink.*

WLL

Wireless local loop. A wireless connection of a telephone in a home or office to a fixed telephone network.

WSF

Workstation function (part of the **TMN** functional block). *See also TMN.*

X

X.25

Recommendation X.25 (a network **protocol**). An internationally-accepted standard governing the operation of packet-switched networks. The X.25 standard defines setup times, how data streams are assembled into **packets**, and how packets are controlled, routed, and protected as they move across the network.

X