

IEEE Standard Glossary of Computer Networking Terminology

Circuits and Devices

Communications Technology

IEEE Computer Society

Sponsored by the
Standards Coordinating Committee

*Electromagnetics and
Radiation*

Energy and Power

Industrial Applications

*Signals and
Applications*

*Standards
Coordinating
Committees*

IEEE Std 610.7-1995



Published by the Institute of Electrical and Electronics Engineers, Inc., 345 East 47th Street, New York, NY 10017, USA.
June 30, 1995



Documents

Document Sharing Hub

IEEE Standard Glossary of Computer Networking Terminology

Sponsor

**Standards Coordinating Committee
of the
IEEE Computer Society**

Approved June 14, 1995

IEEE Standards Board

Abstract: Terms that pertain to data communications and networking, from the following areas, are defined: Data transmission, general communications, general networks, local area networks, network communications security, network errors, networking hardware, network management, network nodes, network signaling, open system architecture, packet, protocols, standards and standards organizations, telephony. The glossary is primarily a compilation of terms defined in individual IEEE standards, but also includes a number of common terms.

Keywords: computer glossary, computer networking, computer terminology

This standard is one of a number of information technology dictionaries developed by standards organizations accredited by the American National Standards Institute. These dictionaries are developed under the sponsorship of voluntary standards organizations, using a consensus-based process.

The Institute of Electrical and Electronics Engineers, Inc.
345 East 47th Street, New York, NY 10017-2394, USA

Copyright © 1995 by the Institute of Electrical and Electronics Engineers, Inc.
All rights reserved. Published 1995. Printed in the United States of America.

ISBN 1-55937-498-5

No part of this publication may be reproduced in any form, in an electronic retrieval system or otherwise, without the prior written permission of the publisher.

IEEE Standards documents are developed within the Technical Committees of the IEEE Societies and the Standards Coordinating Committees of the IEEE Standards Board. Members of the committees serve voluntarily and without compensation. They are not necessarily members of the Institute. The standards developed within IEEE represent a consensus of the broad expertise on the subject within the Institute as well as those activities outside of IEEE that have expressed an interest in participating in the development of the standard.

Use of an IEEE Standard is wholly voluntary. The existence of an IEEE Standard does not imply that there are no other ways to produce, test, measure, purchase, market, or provide other goods and services related to the scope of the IEEE Standard. Furthermore, the viewpoint expressed at the time a standard is approved and issued is subject to change brought about through developments in the state of the art and comments received from users of the standard. Every IEEE Standard is subjected to review at least every five years for revision or reaffirmation. When a document is more than five years old and has not been reaffirmed, it is reasonable to conclude that its contents, although still of some value, do not wholly reflect the present state of the art. Users are cautioned to check to determine that they have the latest edition of any IEEE Standard.

Comments for revision of IEEE Standards are welcome from any interested party, regardless of membership affiliation with IEEE. Suggestions for changes in documents should be in the form of a proposed change of text, together with appropriate supporting comments.

Interpretations: Occasionally questions may arise regarding the meaning of portions of standards as they relate to specific applications. When the need for interpretations is brought to the attention of IEEE, the Institute will initiate action to prepare appropriate responses. Since IEEE Standards represent a consensus of all concerned interests, it is important to ensure that any interpretation has also received the concurrence of a balance of interests. For this reason IEEE and the members of its technical committees are not able to provide an instant response to interpretation requests except in those cases where the matter has previously received formal consideration.

Comments on standards and requests for interpretations should be addressed to:

Secretary, IEEE Standards Board
445 Hoes Lane
P.O. Box 1331
Piscataway, NJ 08855-1331
USA

IEEE Standards documents may involve the use of patented technology. Their approval by the Institute of Electrical and Electronics Engineers does not mean that using such technology for the purpose of conforming to such standards is authorized by the patent owner. It is the obligation of the user of such technology to obtain all necessary permissions.

Introduction

(This introduction is not a part of IEEE Std 610.7-1995, IEEE Standard Glossary of Computer Networking Terminology.)

As the computer field continues to expand, new terms are being generated and new meanings are being adopted for existing terms. The IEEE Computer Dictionary project (the 610 computer glossary series of documents) was undertaken to document this vocabulary. Its purpose is to identify terms currently in use in the computer field and to establish standard definitions for these terms. The dictionary is intended to serve as a useful reference for those in the computer field and for those who come into contact with computers, either through their work or in their everyday lives.

The completed dictionary will contain terms from each of the following areas: computer networking, software engineering, mathematics of computing, theory of computation, computer applications, artificial intelligence, data management, image processing and pattern recognition, modeling and simulation, computer graphics, computer hardware, computer languages, and computer security and privacy. This glossary contains the terms related to computer networking.

Every effort has been made to use definitions from established standards in this dictionary. However, when existing standards were found to be incomplete, unclear, or inconsistent with other entries in the dictionary, new, revised, or composite definitions have been developed.

At the time this glossary was approved, the following people formed the steering committee of the computer dictionary working group:

Freny A. Katki, *Leader, Computer Networking Subgroup*

Other subgroup leaders were as follows:

Jack Aldridge
Anne K. Geraci
John B. Lane

Louise McMonegal
Bennett Meyer
Hugh L. Porteous
Jane Radatz

Fred Springsteel
Paul C. Wilson
Mary Yee

Other working group members who contributed to this glossary were as follows:

Lee E. Cashman
Kenny A. Chaffin
Mark G. Costello
Bruce Edward Coughran
Diana M. D'Angelo
Joel J. Forman
Regina Hansen
James C. Johnson

Gary Kessler
Howard Lichtman
James Kendall Massey
Mohammad Mirhakkak
Michael Morgillo
Dennis Nickle
Robert Radford

Sohja Shields
Ernest Stadler
Nick Stanley
Benjamin Stockton
Charlotte Wales
Richard Wilmer
John Young
Janus Z. Zalewski

The following persons were on the balloting committee:

Narses J. Colmenares
Mark Costello
Patrick Crane
Gordon Force
Anne K. Geraci
John A. Goetz
John W. Horch

Freny A. Katki
Judy Kerner
Gary C. Kessler
Thomas M. Kurihara
John B. Lane
Donald C. Loughry

Bennet Meyer
John E. Montague
Dennis E. Nickle
Mira Pauker
Jane Radatz
Norman Schneidewind
Janus Z. Zalewski

When the IEEE Standards Board approved this standard on June 14, 1995, it had the following membership:

E. G. “Al” Kiener, *Chair*

Donald C. Loughry, *Vice Chair*

Andrew G. Salem, *Secretary*

Gilles A. Baril
Clyde R. Camp
Joseph A. Cannatelli
Stephen L. Diamond
Harold E. Epstein
Donald C. Fleckenstein
Jay Forster*
Donald N. Heirman

Richard J. Holleman
Jim Isaak
Ben C. Johnson
Sonny Kasturi
Lorraine C. Kevra
Ivor N. Knight
Joseph L. Koepfinger*
D. N. “Jim” Logothetis
L. Bruce McClung

Marco W. Migliaro
Mary Lou Padgett
John W. Pope
Arthur K. Reilly
Gary S. Robinson
Ingo Rusch
Chee Kiow Tan
Leonard L. Tripp

*Member Emeritus

Also included are the following nonvoting IEEE Standards Board liaisons:

Satish K. Aggarwal
Richard B. Engelman
Robert E. Hebner
Chester C. Taylor

Stephen J. Huffman
IEEE Standards Project Editor

Contents

CLAUSE	PAGE
1. Overview.....	1
1.1 Scope.....	1
1.2 Glossary structure	2
2. References.....	2
3. Terms and definitions	3

IEEE Standard Glossary of Computer Networking Terminology

1. Overview

1.1 Scope

This glossary defines terms that pertain to data communications and computer networking. It is primarily a compilation of terms defined in individual IEEE Standards—but also contains a number of common terms. Terms from the following areas are included:

Data transmission
General communications
General networks
Local area networks
Network communications security
Network errors
Networking hardware
Network management
Network nodes
Network signaling
Open system architecture
Packet
Protocols
Standards and standards organizations
Telephony

To be included in this standard glossary, a networking term meets at least one of the following criteria:

- Term has no commercial connotations, that is, completely non-proprietary.
- Product or item is owned by the U.S. Government and therefore in public knowledge and domain. For example, central office, postal telephone and telegraph (PTT).
- Proprietary terms that are based on the name of an inventor or geographical origin. For example, Aloha network, Hamming code, Karn's algorithm, Manchester encoding.
- Interfaces and technologies that are recognized, but not necessarily recommended, by national or international standards committees. For example, fiber distributed data interface (FDDI), network interface definition language (NIDL).
- Names of networks, techniques, and protocols in common usage. For example, carrier sense multiple access with collision detection (CSMA/CD), file transfer protocol (FTP), high-level data link control (HDLC).
- Standards that are specifically relevant and widely accepted in the networking arena. For example, X.25.

Some terms are the names of commercial products. Many times such products are first developed by a known organization, and then the product name is accepted as a generic description of all products performing similar functions. For this reason, this glossary does not, in most cases, attempt to identify the owner or developer of a product. The reader should exercise caution in drawing inferences concerning ownership, trademark, and copyright of names.

The inclusion of a term in this glossary is intended to associate that term with the computer industry and to define and identify its commonly accepted usage. This inclusion does not imply a preference for any product, technology, or standard over one that has not been included.

Every effort has been made to define standard usage as of the balloting of this standard. If the reader knows of additional networking terms that should be included in this glossary, it is suggested that such comments be addressed to the IEEE Standards Board, as instructed in the Introduction.

1.2 Glossary structure

Entries in the glossary are arranged alphabetically. An entry may consist of a single word or a phrase. Phrases are given in their natural order rather than in reverse order. Blanks and numerals precede all other characters in alphabetizing. Hyphens and slashes are treated as blanks.

The following distinction is made between acronyms and abbreviations: An acronym is a combination of the first one (or few) letter(s) from two or more words in the term, put together to make a single term. An acronym does not have to be pronounceable. Generally, acronyms are capitalized. An abbreviation is a shortened version of a single word or anything that is not an acronym.

If a term has more than one definition, the definitions are numbered. The order of the definitions does not imply preference or frequency of use. In most cases, noun definitions are given first, followed by verb and adjective definitions as applicable. Examples and notes have been added to clarify selected definitions.

The following cross-references are used to show the relationship of a term to other terms in the glossary:

- a) *Contrast with:* Refers to a term with an opposite or substantially different meaning.
- b) *Syn:* Refers to a synonymous term.
- c) *See also:* Refers to a related term.
- d) *See:* Refers to a preferred term or to a term where the desired definition can be found.

The word “deprecated” indicates a term or definition whose use is discouraged because such use is obsolete, misleading, or ambiguous.

The following terms were proposed to be deleted for asymmetric compatibility:

kilo (k)
kilobits per second (kb/s)
megabits per second (Mb/s)

2. References

In those cases in which a definition is directly quoted from an existing dictionary or glossary, the following references shall apply:

IEEE Std 610.5-1990, IEEE Standard Glossary of Data Management Terminology (ANSI).¹

IEEE 610.10-1994, Standard Glossary of Computer Hardware Terminology.²

IEEE Std 610.12-1990, IEEE Standard Glossary of Software Engineering Terminology (ANSI).

IEEE Std 1084-1986 (W1993), IEEE Standard Glossary of Mathematics of Computing Terminology.³

ISO/IEC 2382, Information Technology—Vocabulary, Parts 1-25.⁴

ISO/IEC 8802-3 : 1993 [ANSI/IEEE Std 802.3, 1993 Edition], Information technology—Local and metropolitan area networks—Part 3: Carrier sense multiple access with collision detection (CSMA/CD) access method and physical layer specifications.⁵

ISO/IEC 8802-4 : 1990 [ANSI/IEEE Std 802.4, 1990 Edition], Information processing systems—Local area networks—Part 4: Token-passing bus access method and physical layer specifications.

ISO/IEC 8802-5 : 1992 [ANSI/IEEE Std 802.5, 1992 Edition], Information technology—Local and metropolitan area networks—Part 5: Token ring access method and physical layer specifications.

ISO/IEC 8802-6 : 1994 [ANSI/IEEE Std 802.6, 1994 Edition], Information technology—Telecommunications and information exchange between systems—Local and metropolitan area networks—Specific requirements—Part 6: Distributed Queue Dual Bus (DQDB) access method and physical layer specifications.

¹IEEE publications are available from the Institute of Electrical and Electronics Engineers.

²As this standard goes to press, IEEE Std 610.10-1994 is approved but not yet published. The draft standard is, however, available from the IEEE. Contact the IEEE Standards Department at 1 (908) 562-3800 for status information.

³IEEE Std 1084-1986 has been withdrawn; however, copies can be obtained from Global Engineering, 15 Inverness Way East, Englewood, CO 80112-5704, USA, tel. (303) 792-2181.

⁴ISO/IEC publications are available from the ISO Central Secretariat, Case Postale 56, 1 rue de Varembé, CH-1211, Genève 20, Switzerland/Suisse. ISO/IEC publications are also available in the United States from the Sales Department, American National Standards Institute, 11 West 42nd Street, 13th Floor, New York, NY 10036, USA.

⁵ISO/IEC [ANSI/IEEE] publications are available from the Institute of Electrical and Electronics Engineers.

3. Terms and definitions

3.1 abnormal preamble: A preamble that does not match the synchronization pattern resulting in a packet error.

3.2 AC: Acronym for **acoustic coupler**.

3.3 access: (1) Any means of establishing logical or physical communication with a computer or communications system. (2) Any means of obtaining the use of such a system. (3) Any actions that result in a flow of information involving such a system. (4) That part of a public network connecting the customer premises to the public network switching system (central office).

3.4 accounting management: In networking, a management function defined for collecting and processing of data to evaluate resource consumption.

3.5 accredited standards committee (ASC): A standards developing committee whose procedures have been determined to meet ANSI's requirements for fairness, openness, and other attributes necessary for developing a consensus position on a proposed ANSI standard relating to a specific technology area.

3.6 ACK: Abbreviation for **acknowledgment**.

3.7 acknowledgment (ACK): *See:* **acknowledgment of a message**.

3.8 acknowledgment of a message (ACK): A reply transmitted by a receiving station to inform the sending station that a message has arrived and the message is error-free. *Syn:* **acknowledgment**. *Contrast with:* **negative acknowledgment**.

3.9 acoustic coupler (AC): A modem that interconnects a communicating device with a telephone handset.

3.10 adaptive equalizer: An electronic device for maximizing the signal quality on a transmission channel by monitoring the signal and adjusting the equalization. *Syn:* **automatic equalizer**.

3.11 adaptive routing: A routing strategy that dynamically adjusts path selection based on current network parameters.

3.12 address error: An error that occurs when a node recognizes its own address in a packet's improper source or destination information.

3.13 address field: A sequence of bits that identifies the intended destination or receiver of a transmission. *Note:* May be single-source, single-destination, or multiple-destination address.

3.14 alignment error: An error that occurs when a packet is not a multiple of eight bits. *Note:* It is only applicable to specific protocols.

3.15 all-segments broadcast: The transmission of a frame to all interconnected segments of a local area network. *See also:* **all-stations broadcast**.

3.16 all-stations broadcast: The transmission of a frame to all stations on a given local area network segment. *See also:* **all-segments broadcast**.

3.17 ALOHA network: A telecommunication network that uses a multi-access contention protocol, first developed for use in Hawaii.

3.18 alternate hierarchical routing: A routing strategy in which the traffic is routed through the lowest available level of the network hierarchy. *Note:* It uses a tree like structure of five classes: class 1—regional center, class 2—sectional center, class 3—primary center, class 4—toll center, and class 5—end office. *Syn:* **alternative hierarchical routing**.

3.19 alternate routing: A routing strategy that assigns a secondary communications path to a destination when the primary path is busy or unavailable. *Syn:* **alternative routing**.

3.20 alternative hierarchical routing: *See:* **alternate hierarchical routing**.

3.21 alternative routing: *See:* **alternate routing**.

3.22 AM: Acronym for **amplitude modulation**.

3.23 American National Standards Institute (ANSI): An organization that establishes and maintains standards for the information processing industry within the United States. [IEEE Std 610.10-1994]⁶

⁶The numbers in brackets refer to the source document in the 610 series of computer glossary standards from which the definition was taken; a lower-case "a" after the number indicates that an editorial change was made in the definition for inclusion in this document.

3.24 amplitude: The strength or volume of a periodic signal, usually measured in decibels.

3.25 amplitude jitter: A short term instability in the amplitude of a transmission signal. *See also:* **phase jitter**.

3.26 amplitude modulation (AM): A modulation technique in which a data signal is sent onto a carrier at a fixed frequency by raising and lowering the amplitude of the carrier. *See also:* **pulse amplitude modulation**.

3.27 amplitude shift keying: A modulation technique that encodes data by transmitting a signal at two different amplitudes representing binary digit one and binary digit zero. *See also:* **binary phase shift keying; frequency shift keying**.

3.28 analog data: Data in the form of continuous numerical properties represented by physical variables. *Contrast with:* **digital data**. [IEEE Std 1084-1986a]

3.29 analog signal: A continuously changing signal. *Contrast with:* **digital signal**. *See also:* **digitize**.

3.30 ANSI: Acronym for **American National Standards Institute**.

3.31 ANSI Standard: A standard approved by the American National Standards Institute (ANSI). Examples of ANSI standards include programming languages (C, FORTRAN, or COBOL), media formats (Hollerith cards), and interface standards (SCSI interfaces, device drivers). [IEEE Std 610.10-1994]

3.32 answer: To respond to a calling station, either automatically, under program control, or manually, to establish a connection between stations.

3.33 application layer: The seventh and highest layer of the seven-layer OSI model providing the only interface between the user and the application program. *Note:* It hides from the user the physical distribution of processors, communications media, and data resources while maximizing the utility of those resources. *See also:* **client layer; data link layer; entity layer; logical link control sublayer; medium access control sublayer; network layer; physical layer; presentation layer; session layer; sublayer; transport layer**.

3.34 ARQ: Acronym for **automatic repeat request**.

3.35 ASC: Acronym for **Accredited Standards Committee**.

3.36 ASC T1: A standards committee accredited by the American National Standards Institute organization that recommends standards for telecommunication.

3.37 ASC X3: A standards committee accredited by the American National Standards Institute organization that recommends standards for computers and information processing systems.

3.38 asynchronous transfer mode (ATM): A LAN WAN communications architecture that switches or relays small fixed length (53 octets) packets called cells. *Note:* Each cell has a 5 octet header and 48 octets of data.

3.39 asynchronous receiver/transmitter: *See:* **universal asynchronous receiver/transmitter**.

3.40 asynchronous transmission: A transmission in which each information character, word, or block is individually synchronized, and the transmission is controlled by start and stop bits at the beginning and end of each character. *Syn:* **start-stop transmission**. *Contrast with:* **synchronous transmission**.

3.41 ATM: Acronym for **Asynchronous Transfer Mode**.

3.42 attachment unit interface (AUI): In a local area network, the interface between the medium attachment unit (MAU) and the data terminal equipment (DTE) within a data station. *Note:* The AUI carries encoded signals and provides for duplex data transmission. [ISO/IEC 8802-3 : 1993]

3.43 attachment unit interface (AUI) cable: A cable that connects a workstation to a transceiver. *Note:* This term is contextually specific to IEEE Std 802.3, clause 7. *See also:* **coaxial cable; drop cable; transceiver cable**.

3.44 attended operation: A central office that normally has maintenance staff on duty.

3.45 attenuation: A loss or decrease of signal power in a transmission, usually measured in decibels.

3.46 AUI: Acronym for **attachment unit interface**. *Note:* This term is contextually specific to IEEE Std 802.3, clause 7.

3.47 AUI cable: Abbreviation for **attachment unit interface cable**. *Note:* This term is contextually specific to IEEE Std 802.3, clause 7.

3.48 autoanswer: A capability of a terminal, modem, computer, or similar device to respond to an incoming call over the switched network, and to establish a data connection with a remote device without operator intervention. *See also:* **autodial**.

3.49 autodial: A capability of a terminal, modem, computer, or similar device to place a call over the switched network, and to establish a data connection without operator intervention. *See also:* **autoanswer**.

3.50 automatic equalizer: *See:* **adaptive equalizer**.

3.51 automatic repeat request (ARQ): A protocol that uses positive or negative acknowledgment with retransmission techniques to ensure reliability. *Note:* The sender automatically repeats the request if it does not receive an answer.

3.52 autonomous system: A collection of gateways and networks administered by one administrative entity.

3.53 b: Abbreviation for **bit**.

3.54 backbone network: A network designed to interconnect lower speed distribution channels, devices, or clusters of dispersed users.

3.55 backward supervision: The use of supervisory sequences from a secondary station or node to a primary station or node. *Contrast with:* **forward supervision**. [ISO/IEC 2382]

3.56 balanced (to ground): The state of impedance on a two-wire circuit when the impedance-to-ground of one wire is equal to the impedance-to-ground of the other wire. *Contrast with:* **unbalanced (to ground)**. *See also:* **balun**.

3.57 balun: In networking, a passive device with distributed electrical constants used to couple a balanced system or device to an unbalanced system or device. For example, a transformer used to connect balanced twisted-pair cables to unbalanced coaxial

cables. *Note:* Derived from “balance to unbalance” transformer.

3.58 bandwidth: The range of frequencies, expressed in hertz, that can pass over a given channel. *See also:* **pass band**.

3.59 barrel connector: A double-sided male coupling that interconnects two coaxial cables. *Contrast with:* **end connector**.

3.60 baseband coaxial system: A baseband system employing coaxial cables as a data transmission medium. At any point on the medium only one information signal at a time can be present without disruption. *Contrast with:* **baseband twisted-pair system**. [ISO/IEC 8802-3 : 1993a]

3.61 baseband signaling: The transmission of a signal at its original frequency, that is, not changed by modulation. *Note:* It can be an analog or a digital signal. *Contrast with:* **broadband signaling**.

3.62 baseband system: A system used for networking in which information is encoded, modulated, and impressed directly on the transmission medium. *Note:* Generally used for limited distance. *Contrast with:* **broadband system**. *See also:* **baseband coaxial system; baseband twisted-pair system**.

3.63 baseband twisted-pair system: A baseband system employing twisted-pair wiring cables as the transmission medium. *Contrast with:* **baseband coaxial system**.

3.64 baud: A unit of signaling speed, expressed as the number of times per second the signal can change the electrical state of the transmission line or other medium. *Note:* Depending on the encoding strategies, a signal event may represent a single bit, more, or less, than one bit. *Contrast with:* **bit rate; bits per second**. [IEEE Std 610.10-1994a]

3.65 baud rate: The rate of signal transitions per unit time, usually expressed in baud. *Note:* Often confused with bit rate. *Contrast with:* **bit rate; bits per second**. *See also:* **data signaling rate**. [IEEE Std 610.10-1994a]

3.66 Baudot code: A code for the transmission of data in which five data bits represent one character.

3.67 BCC: Acronym for **block check character**.

3.68 bend radius: The radial distance of any arc formed by a bent cable, measured to the geometric center of the cable. *See also:* **minimum bend radius**.

3.69 BERT: Acronym for **bit error rate testing**.

3.70 binary digit (bit): (1) A unit of information that can be represented by either a zero or a one. *See also:* **byte; word**. [IEEE Std 610.12-1990] (2) The fundamental unit of digital communication; information is transmitted over networks as streams of units as in (1).

3.71 binary phase shift keying (binary PSK) (BPSK): A form of modulation in which binary data are transmitted by changing the carrier phase by 180°. *See also:* **amplitude shift keying; frequency shift keying**. [ISO/IEC 8802-3 : 1993]

3.72 binary PSK: Abbreviation for **binary phase shift keying**.

3.73 bit (b): Acronym for **binary digit**. *See also:* **block; byte; clocking bit; overhead bit; start bit; stop bit**. [IEEE Std 1084-1986, IEEE Std 610.5-1990, IEEE Std 610.12-1990]

3.74 bit error rate testing (BERT): The process of testing a data transmission channel using some predictable bit pattern so that the bits can be compared before and after the transmission to detect errors. *See also:* **block error rate testing**.

3.75 bit rate (BR): The rate of data throughput on the medium in bits per second or hertz, whichever is more appropriate to the context. *Syn:* **bit transfer rate**. *Contrast with:* **baud rate**. [ISO/IEC 8802-3 : 1993a]

3.76 bit stream: A continuous stream of bits transmitted over a channel with no separators between the character groups. [IEEE Std 610.10-1994]

3.77 bit stuffing: A method to insert extra bits in a bit stream to achieve transparency throughout the bit stream.

3.78 bit transfer rate: *See:* **bit rate**.

3.79 bits per second (b/s), (bps): A unit of data transmission speed, expressed as the number of bits transmitted per second. *Note:* IEEE Std 260.1-1993 specifies b/s as the SI unit symbol for bits per second. *Contrast with:* **baud rate**.

3.80 black: Pertains to the parts of a computer or communications system in which data being transmitted or manipulated is encrypted. *Contrast with:* **red**.

3.81 BLERT: Acronym for **block error rate testing**.

3.82 block: (1) A group of contiguous storage locations, computer program statements, records, words, characters, or bits that are treated as a unit. [IEEE Std 610.12-1990, IEEE Std 610.5-1990] (2) To form a group as in (1). (3) A circuit assemblage that functions as a unit. For example, a logic block within a sequential circuit. [IEEE Std 610.10-1994]

3.83 block character: *See:* **end of transmission block character**.

3.84 block check character (BCC): In longitudinal redundancy checking and cyclic redundancy checking, a character that is transmitted by the sender after each message block and is compared with a character computed by the receiver to determine if the transmission was successful.

3.85 block error rate testing (BLERT): The process of testing a data transmission channel using groups of information arranged into transmission blocks in a given message for error checking. *See also:* **bit error rate testing**.

3.86 bps: Abbreviation for **bits per second**.

3.87 BPSK: Acronym for **binary phase shift keying**.

3.88 BR: Acronym for **bit rate**.

3.89 branch point: *See:* **node**.

3.90 bridge: In networking, a device that connects two systems using the similar or identical data link layer protocols. *Note:* Bridges are independent of the protocol of the network layer and above. *Contrast with:* **gateway**. *See also:* **brouter; learning bridge; mail bridge; router**.

3.91 broadband coaxial system: A broadband system employing coaxial cables as a data transmission medium.

3.92 broadband LAN: A local area network in which information is transmitted on modulated carriers, allowing coexisting of multiple simultaneous

services on a single physical medium by frequency division multiplexing. [ISO/IEC 8802-3 : 1993]

3.93 broadband signaling: The transmission of a signal in an analog form that may use frequency division multiplexing to allow multiple channels. *Contrast with:* **baseband signaling.**

3.94 broadband system: A system used for networking in which information is encoded, modulated onto a carrier, and pass band filtered or otherwise constrained to occupy only a limited frequency spectrum on the transmission medium. *Note:* Generally used for large amounts of voice, data, and video signals. *Contrast with:* **baseband system.**

3.95 broadcast: A technique that allows copies of a single packet from one node on a LAN to be passed to all possible nodes on a LAN. *Contrast with:* **multicast.**

3.96 broadcast address: A predefined address that denotes the set of all stations on a given local area network. *Notes:* 1) This allows a message to be "broadcast" to all users simultaneously. 2) For more information, see IEEE Std 802-1990.

3.97 router: A device that performs router and bridging functions. Also known as a routing bridge. *See also:* **bridge; gateway; router.**

3.98 burst error: In data communications, a series of consecutive errors in data transmission that tend to be grouped together, with a longer time interval separating multiple bursts.

3.99 burst mode: A mode of transmission by which a system can send a burst of data at higher speed for some period of time.

3.100 bus-ring topology: A topology where the stations are physically wired as a bus but logically act like a ring. Every station on the bus knows its logical predecessor and successor. Transmissions can be broadcast to all stations on the bus or addressed to another individual station. *Note:* This topology is employed in the IEEE Std 802.4 token bus. *See also:* **bus topology; loop topology; ring topology; star-bus topology; star-ring topology; star topology; tree topology.**

3.101 bus topology: A topology in which stations are attached to a common transmission medium,

known as a bus; data propagate the length of the medium and are received by all stations. *See also:* **bus-ring topology; loop topology; ring topology; star-bus topology; star-ring topology; star topology; tree topology.**

3.102 busy hour: An hour-long window during which the communication traffic load is at its maximum for a given 24-hour period.

3.103 byte: (1) A group of adjacent binary digits operated upon as a unit and usually shorter than a computer word. *Note:* Although most people refer to a byte as having 8 bits used for data representation, hardware designers may add one or more parity bits to be used for error detection and correction. *See also:* **octet.** [IEEE Std 610.12-1990a] (2) An element of computer storage that can hold a group of bits as in (1). *See also:* **bit; word.** [IEEE Std 610.12-1990]

3.104 C conditioning: A North American term for a type of conditioning that controls attenuation, distortion, and delay distortion, thus making transmission impairments of a circuit lie within specified limits. *See also:* **D conditioning.**

3.105 cable: An assembly of one or more conductors within an enveloping protective sheath, constructed to allow use of the conductors separately or in groups. *See also:* **attachment unit interface cable; coaxial cable; drop cable; optical cable; transceiver cable; trunk cable; twinaxial cable.**

3.106 call back: A security procedure that verifies the identity of a terminal accessing a computer system by terminating the original connection and then reestablishing it by placing a new call to the terminal.

3.107 carrier: (1) A continuous frequency capable of being modulated or impressed with a signal. *Syn:* **carrier wave.** (2) An alternating current that oscillates at a fixed frequency, used to transmit a signal.

3.108 carrier frequency: A unique frequency of a carrier that is used to carry data. *Note:* It is measured in cycles per second or hertz.

3.109 carrier sense: In a local area network, an ongoing activity of a data station to detect whether another station is transmitting. [ISO/IEC 8802-3 : 1993]

3.110 carrier sense multiple access with collision detection (CSMA/CD): A local area network access technique. When a station wants to gain access to the network, it listens for conflicting traffic and checks to see if the network is free. If the network is not free, it waits for a small amount of time and retries. *Note:* ISO/IEC 8802-3 : 1993 describes the CSMA/CD technique.

3.111 carrier system: A means for obtaining a number of channels over a single path, known as a carrier.

3.112 carrier wave: *See:* carrier.

3.113 CBEMA: Acronym for the **Computer and Business Equipment Manufacturers Association**.

3.114 CCITT: Acronym for **Consultative Committee on International Telegraphy and Telephony**.

3.115 CCITT Standard: A standard recommended by CCITT (Consultative Committee on International Telegraphy and Telephony). *Notes:* 1) CCITT recommendations are published by lettered series. For example, the X-series, for equipment and protocols used with computer networks. 2) CCITT Standards are now designated as ITU-T Standards. *See also:* **Consultative Committee on International Telegraphy and Telephony**.

3.116 CD: Acronym for **collision detection**.

3.117 cell: A packet with fixed length. *Notes:* 1) Each cell has a 5 octet header and 48 octets of data. 2) This definition is specific to asynchronous transfer mode (ATM). *See also:* **asynchronous transfer mode; cell relay**.

3.118 cell relay: A fast packet switching technology that provides a virtual circuit service for the transfer of cells. For example, asynchronous transfer mode is the most common type of cell relay. *See also:* **frame relay**.

3.119 cell switching: A technique used in data communications, in which messages are broken into fixed-size packets and forwarded to another party over the network. *Contrast with:* **packet switching**.

3.120 central office: A physical location where communications common carriers terminate cus-

tomers lines and locate the switching devices that interconnect these lines. *See also:* **end office**. *Syn:* **exchange; local central office; telephone exchange**.

3.121 centralized computer network: A computer network in which a central node provides all network control functions and services to other nodes. *Contrast with:* **decentralized computer network**. *See also:* **distributed computer network**.

3.122 centralized polling: A polling technique in which a single, central authority controls access to transmission medium. Each station is invited to transmit periodically according to a scheme or list. *Contrast with:* **distributed polling**.

3.123 channel: (1) A one-way path for transmission of signals between two or more points; for example, a data channel. *See also:* **circuit; line; link**. [IEEE Std 610.10-1994a] (2) In data transmission, either one-way path, providing transmission in one direction only, or two-way path, providing transmission in two directions. *Syn:* **path**. (3) A band of frequencies dedicated to a certain service transmitted on the broadband medium. [ISO/IEC 8802-3 : 1993]

3.124 channel bank: A device that multiplexes high-speed communication circuits into lower-speed communication channels; used primarily to digitize analog voice transmission.

3.125 channel path: The routing, switching, and line links between an input-output channel and some peripheral device. *Note:* There may be multiple channel paths between a channel and a device. [IEEE Std 610.10-1994]

3.126 channel service unit (CSU): A device that performs transmit and receive filtering, signal shaping, longitudinal balance, voltage isolation, equalization, and remote loopback testing in a digital communications environment. *See also:* **data service unit**. *Syn:* **digital modem**.

3.127 character: A letter, digit, or other symbol that is used to represent information. [IEEE Std 610.12-1990]

3.128 chatter: A condition that results when transceiver electronics fail to shut down and the transceiver floods the network with random signals. *Syn:* **transceiver chatter**.

3.129 check character: A character added to a group of characters to provide data redundancy to permit error detection and error correction.

3.130 checksum: A sum obtained by adding the digits in a numeral, or a group of numerals, usually without regard to meaning, position, or significance. This sum may be compared with a previously computed value to verify that no errors have occurred. [IEEE Std 1084-1986]

3.131 circuit: In networking, a means of communication of electrical or electronic signals between two points. *See also:* **channel; dial-up circuit; foreign exchange circuit; four-wire circuit; leased circuit; simplex circuit; telecommunication circuit; two-wire circuit.** *Syn:* **network.**

3.132 circuit-switched network: A switched network having the capability to switch lines in different configurations to establish a continuous pathway between the sender and the recipient.

3.133 circuit switching: In data communications, a method of communication in which a dedicated communications path is set up between two devices through one or more intermediate switching nodes. *See also:* **message switching; space-division switching; time-multiplexed switching.** *Syn:* **line switching.**

3.134 cladding: A layer that surrounds the glass core of an optical fiber.

3.135 client: In networking, a station or program requesting a service. *Contrast with:* **server.**

3.136 client layer: In the OSI model, refers to the data link and physical layers. *See also:* **application layer; data link layer; entity layer; logical link control sublayer; medium access control sublayer; network layer; physical layer; presentation layer; session layer; sublayer; transport layer.**

3.137 client-server: In a communications network, the client is the requesting device and the server is the supplying device. For example, the user interface could reside in the client workstation while the storage and retrieval functions could reside in the server database.

3.138 clocking bit: In asynchronous transmission, a bit that signals a synchronization event.

3.139 closed network: A network that prevents outside access by eliminating external connections and external entry or use. *Contrast with:* **open network.**

3.140 closed user group: A specified group of network users who are permitted communications among themselves but not with other network users.

3.141 coax: A colloquial reference to **coaxial cable.**

3.142 coaxial cable: A cable consisting of a central conductor and an outer, concentric conductor. *Contrast with:* **twinaxial cable.** *See also:* **AUI cable; core; drop cable; shield; transceiver cable; trunk cable.**

3.143 collision: (1) The condition when multiple packets/signals are observed simultaneously at a single point on the medium where the “listening” station is unable to function properly due to multiple signals being present. *See also:* **collision detect signal; collision detection; contention; forced collision.** (2) A condition that results from concurrent transmissions from multiple signal sources. [ISO/IEC 8802-3 : 1993]

3.144 collision detect signal: A signal provided by the physical layer to the data link layer, to indicate collision detection. *Note:* This term is contextually specific to IEEE Std 802.3.

3.145 collision detection (CD): The ability of a node to detect collision. *Note:* This term is contextually specific to IEEE Std 802.3.

3.146 collision enforcement: The emission of an encoded sequence by the transmitting node after a collision is detected, to ensure that all other transmitting nodes detect the collision. *Note:* This term is contextually specific to IEEE Std 802.3.

3.147 collision error: In networking, an indication that two or more nodes have attempted to transmit within the same time slot. *Note:* This term is contextually specific to IEEE Std 802.3.

3.148 collision presence (CP): The signal provided by the physical signaling sublayer to the physical medium attachment sublayer (within the data link layer) to indicate that multiple stations are contending for access to the transmission medium. [ISO/IEC 8802-3 : 1993]