

Glossary Lesson 2

2nd generation (2G)

Second generation of mobile telecommunications technology, which is notable because it introduces the use of digital signals instead of analog signals (1G) for mobile radio transmissions and enables the use of codecs for handling many more calls per radio frequency or bandwidth. See codecs.

3rd generation (3G)

Third generation mobile telecommunications technology for cell phones, tablet computers, and other devices that is based on the IMT-2000 standards for mobile communications. The data transfer rate is up to 5.8 Mbps upstream and 14.4 Mbps downstream.

4th generation (4G)

Fourth generation mobile telecommunications technology that is faster than 3G and is built on the IMT-Advanced standards. Data transfer rates are based on whether a device is used in a low (100 Mbps) or high (1Gbps) mobility situation.

American National Standards Institute (ANSI)

An organization that works to set standards for all types of products, including network equipment.

American Standard Code for Information Interchange (ASCII)

An 8-bit character-coding method consisting of 96 uppercase and lowercase characters and numbers, plus 32 nonprinting characters.

analog

A type of transmission that can vary continuously, as in a wave pattern with positive and negative voltage levels.

asynchronous communication

Communication that occurs in discrete units where the start of a unit is signaled by a start bit at the front and the end of the unit is signaled by a stop bit at the back.

beaconing

An error condition on a token ring network that indicates one or more nodes are not functioning.

broadcast frame

A frame sent to all nodes on a network.

broadcast packet

A packet sent to all nodes on a network.

broadcast storm

Saturation of network bandwidth caused by excessive traffic, as when a large number of computers or devices attempt to transmit simultaneously, or when computers or devices persist in transmitting repeatedly.

cableco

A cable TV company, such as Comcast or Time Warner.

carrier sense

The process of checking a communications medium, such as cable, for a voltage level, signal transition, or light, indicating the presence of a data-carrying signal.

Carrier Sense Multiple Access with Collision Detection (CSMA/CD)

A network transport control method used in Ethernet networks. It regulates transmission by sensing the presence of packet collisions.

circuit switching

A network communications technique that uses a dedicated channel to transmit information between two nodes.

codec

Method of coding and encoding a digital signal to enable loading a specific radio frequency or bandwidth with more individual radio transmissions (calls).

collision

A situation in which two or more packets are detected at the same time on an Ethernet network.

connection-oriented service

Type 2 operation services that occur between the LLC sublayer and the Network layer, providing several ways to ensure data is successfully received by the destination node.

connectionless service

Also known as Type 1 operation, services that occur between the LLC sublayer and the Network layer, but that provide no checks to make sure data accurately reaches the receiving node.

cyclic redundancy check (CRC)

An error detection method that calculates a value for the total size of the information fields contained in a frame. The value is inserted near the end of a frame by the Data Link layer on the sending node and checked by the Data Link layer on the receiving node to determine if a transmission error has occurred.

device address

Also called the physical or MAC address, the hexadecimal number permanently assigned to a network interface and used by the MAC sublayer within the Data Link layer, or Layer 2.

digital signal (DS)

A transmission method that has distinct signal levels to represent binary zeroes or ones, such as +5 volts and 0 volts.

discovery

A process used by routers that involves gathering information about how many nodes are on a network and where they are located.

electromagnetic interference (EMI)

Signal interference caused by magnetic force fields generated by electrical devices such as motors.

encapsulate

In the context of OSI layers, the process of wrapping the information in one layer inside the information within the next layer. In the context of protocols, the process of placing the information formatted for one protocol inside the information formatted for a different protocol, as is done in TCP/IP communications.

encryption

A process that scrambles data so that it cannot be read if intercepted by unauthorized users.

Ethernet

A transport system that uses the CSMA/CD access method for data transmission on a network. Ethernet typically is implemented in a bus or star-bus hybrid topology.

European Telecommunications Standards Institute (ETSI)

Organization that develops “globally applicable” radio and broadcast communications standards and Internet standards under the endorsement of the European Union.

Extended Binary Coded Decimal Interchange Code (EBCDIC)

A character-coding technique used mainly on IBM mainframe computers and consisting of an 8-bit coding method for a 256-character set of letters, numbers, and special characters.

Fiber Distributed Data Interface (FDDI)

A fiber-optic data transport method capable of a 100-Mbps transfer rate using a dual ring topology; largely supplanted today by faster Ethernet methods.

flow control

A process that ensures one device does not send information faster than it can be received by another device.

frame

A unit of data transmitted on a network that contains control and address information corresponding to the OSI Data Link layer, or Layer 2.

Frequency Division Multiple Access (FDMA)

A switching method that creates separate channels on one communication medium by establishing different frequencies for each channel.

full-duplex

The capacity to send and receive signals at the same time on the same medium.

half-duplex

The ability to send or receive signals on a medium, but not at the same time.

headend

On a cable TV WAN, a central receiving point for signals from various sources, including satellite, other major cable sources, and local television sources.

International Mobile Telecommunications-2000 (IMT-2000)

3G standards provided through the ITU that cover voice, mobile telephone, mobile video, mobile TV, Internet, and mobile data communications over mobile communications devices such as smartphones. See 3G.

International Mobile Telecommunications-Advanced (IMT-Advanced)

4G standards provided through the ITU that offer higher data transfer rates, higher quality of services, and better security than IMT-2000. See IMT-2000 and 4G.

International Organization for Standardization (ISO)

An international body that establishes communications and networking standards and that is particularly known for its contributions to network protocol standards.

International Telecommunication Union (ITU)

A United Nations agency that develops international communications standards; allocates international radio spectrums; and sets standards for modems, e-mail, mobile wireless communications, and digital telephone systems.

Internet Engineering Task Force (IETF)

An arm of the Internet Society (ISOC) that works on Internet-related technical issues. See Request for Comments (RFC).

logical link control (LLC)

A Data Link sublayer of the OSI model that initiates the communications link between nodes and ensures the link is not unintentionally broken.

MAC address

See device address.

media access control (MAC)

A Data Link sublayer that examines addressing information contained in a network frame and controls how devices share communications on the same network.

message switching

A switching method that sends data from point to point, with each intermediate node storing the data, waiting for a free transmission channel, and forwarding the data to the next point until the destination is reached.

multiple system operator (MSO)

A cable TV company that offers WAN or Internet services. See cableco.

multistation access unit (MAU)

A central hub that links token ring nodes into a topology that physically resembles a star, but in which frames are transmitted in a logical ring pattern.

Open Systems Interconnection (OSI) reference model

Developed by the ISO and ANSI, a model that provides a framework for networked hardware and software communications based on seven layers.

packet

A unit of data formatted for transmission over a network that contains control and other information that corresponds to the OSI Network layer, also called Layer 3.

packet radio

The process of transmitting a data-carrying packet over radio waves through short bursts.

packet switching

A data transmission technique that establishes a logical channel between two transmitting nodes, but uses several different paths of transmission to continually find the best routes to the destination.

peer protocol

Protocol used to enable an OSI layer on a sending node to communicate with the same layer on the receiving node.

physical address

See device address.

plain old telephone service (POTS)

Regular voice-grade telephone service.

port

See socket.

primitive

A command used to transfer information from one layer in an OSI stack to another layer, such as from the Physical layer to the Data Link layer.

protocol data unit (PDU)

The information transferred between layers in the same OSI stack.

public switched telephone network (PSTN)

Regular voice-grade telephone service.

radio frequency interference (RFI)

Signal interference caused by electrical devices that emit radio waves at the same frequency used by network signal transmissions.

redirector

A service used via the Application layer to recognize and access other computers.

regional bell operating companies (RBOCs)

A telecommunications company that provides telephone services to a designated region.

Request for Comments (RFC)

A document prepared and distributed by any individual or group as a way to further networking, Internet, and computer communications. RFCs help ensure that network standards and conventions are provided so one network can talk to another. Every RFC is assigned a number to distinguish it from other RFCs and to provide a way to track it. Each RFC is tracked and published by the Internet Engineering Task Force (IETF). See Internet Engineering Task Force (IETF).

Secure Sockets Layer (SSL)

A data encryption technique employed between a server and a client, such as between a client's browser and an Internet server.

service data unit (SDU)

A protocol data unit that has been transferred between OSI layers and then stripped of control information and transfer instructions.

simplex

The capacity for a signal to travel on a medium in only one direction.

socket

A value or means of identifying a service on a network node, such as socket or port 103 for standardized e-mail services in the TCP protocol.

Statistical Multiple Access

A switching method that allocates the communications resources according to what is needed for the task, such as providing more bandwidth for a video file and less for a small spreadsheet file.

synchronous communications

Communications of continuous bursts of data controlled by a clock signal that starts each burst.

T-carrier

A dedicated telephone line that can be used for data communications to connect two different locations for continuous point-to-point communications.

telco

A regional telephone company. See RBOC.

Time Division Multiple Access (TDMA)

A switching method that enables multiple devices to communicate over the same communications medium by creating time slots in which each device transmits.

token ring

An access method developed by IBM in the 1970s and which is still used on some networks. Variations of the technology are used for WANs. This transport method employs a physical star topology along with the logic of a ring topology. Although each node is connected to a central hub, the frame travels from node to node as though there were no starting or ending point.

trunk line

In a cable TV or telecommunications system, a high-capacity communications line that goes between two switches (often over several miles) or it is generally a main line that has multiple channels.

Unicode

A character coding standard that enables consistent coding of characters covering 93 scripts for most languages used throughout the world. Unicode enables data to be translated between different systems and languages while retaining the original data integrity.

virtual circuit

A logical communications path established by the OSI Network layer for sending and receiving data.

virtual LAN (VLAN)

A logical LAN that links together specific switches on a large LAN or on separate LANs so that the switches act as though they compose one unified logical or virtual LAN.