# Understanding Ethernet Communication - Glossary

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**10Base2 –** Ethernet specification for thin coaxial cable, transmits signals at 10 Mbps (megabits per second). Maximum distance of 185 meters per segment. (Obsolete)

**10Base5 –** Ethernet specification for thick cable. Transmits signals at 10 Mbps (megabits per second). Maximum distance of 500 meters per segment. (Obsolete)

**10BaseF –** Ethernet specification for Fiber Optic cable. Transmits signals at 10 Mbps (megabits per second). Maximum distance 1.2 miles.

**10BaseT –** Ethernet specification for unshielded twisted pair cable (category 3, 4, or 5) that is used to transmit data at 10 Mbps (megabits per second). Maximum distance of 100 meters per segment.

**ATM - Asynchronous Transfer Mode –** Cell switching technology designed to support voice, data, and video using a common cell format for LAN's and WAN's.

**Apple Talk –** Proprietary suite of protocols designed by Apple, Inc. for networking computers.

**AUI Connector –** Attachment Unit Interface – 15 pin connector found on Ethernet cards that is used to attach coaxial, fiber optic or twisted pair cable.

**Backbone –** a cable to which multiple nodes or workstations are attached.

**Bit –** digit in the binary numbering system. Its value can be 0 or 1. In an 8-bit character scheme it takes 8 bits to make a byte (character) of data.

**BNC connector - Bayonet-Neill-Concelman –** Standard connector used to connect coaxial cable.

**Bridge –** device that connects and passes packets between two network segments that use the same communication protocol.

**Bus Topology –** see Linear Bus

**Cable –** copper wire or optical fiber wrapped in a protective cover – part of the physical layer of a network.

**Client/Server –** Networking system where a centralized file server provides services to other workstations (clients) on the network. Services can include network management, centralized data storage, program storage etc.

**CSMA/CA – Carrier Sense Multiple Access/ Collision Avoidance** is a network access method in which each device signals its intent to transmit before it actually does so. This prevents other devices from sending information, thereby preventing collisions of signals between two or more devices. This is used in Local Talk networks.

**CSMA/CD – Carrier Sense Multiple Access /Collision Detection** is a network access method in which devices check the channel for availability prior to transmitting. If no signal is detected the device can transmit. If two devices transmit at the same time, a collision occurs and both devices are notified. They then wait a random amount of time before retransmitting. This is the method used by Ethernet.

**Coaxial Cable –** cable with a single copper conductor in center, surrounded by a layer of flexible insulation, which is then covered by woven copper braid or metallic foil. There are two types of coaxial thicknet and thinnet. Coaxial must be grounded properly or electrical noise and interference are an issue.

**Concentrator –** hardware that acts as a central connection point for cables from workstations and servers on the network. Typically a concentrator amplifies the electrical signal it receives, allowing the transmission to go a greater distance.

**Ethernet –** a network protocol that uses CSMA/CD and is run over a variety of cable types (typically unshielded twisted pair) at 10 Mbps. (megabits per second).

**Fast Ethernet –** network protocol that supports transmission speeds of 100 Mbps using category 5 twisted pair or fiber optic cables.

**Fiber Optic Cable –** a cable consisting of a central core made of glass or plastic fibers, surrounded by a plastic coating for cushioning, and a Kevlar layer to add strength. Then an outer insulating layer of Teflon or PVC is added. Fiber optic cable transmits over longer distances and is capable of greater speeds than twisted pair and coaxial.

**File Server –** a computer on a network that contains stores network software and other software shared by the computers on the network.

**FTP – File Transfer Protocol –** used to transfer files on the Internet.

**Gigabit Ethernet –** A term describing technologies for transmitting Ethernet frames at a rate of a gigabit per second.

**Gigabyte GB –** one billion bytes of information. One thousand megabytes.

**Understanding Ethernet Communication - Glossary**

**HTTP - Hyper Text Transfer Protocol –** Internet based protocol for sending and receiving web pages.

**Hub –** a hardware device for connecting multiple twisted pair or fiber optic Ethernet devices together to form a single network segment.

**Intranet –** network internal to an organization that uses Internet protocols.

**Internet –** global network of LAN networks used to exchange information using TCP/IP protocol.

**IP/IPX –** part of the Network layer that routes data from one computer to another. IP and IPX are the most common protocols.

**LAN – Local Area Network –** a network connecting computers in a relatively small area such as a building.

**Linear Bus –** a network topology in which each node attaches directly to a common cable (backbone).

**Local Talk –** network protocol originated by Apple Computers for Macintosh Computers.

**MAC Address – Media Access Control –** the unique physical address assigned to every network device (computer, printer, interface card, etc.) The MAC address for a device cannot be changed.

**MAN – Metropolitan Area Network –** a network connecting computers over a large area such as a campus or city. MANs usually interconnect a number of LANs .

**Modem –** A device that modulates and demodulates an analog carrier signal to encode digital information.

**Multiplexer –** A device that selects analog or digital input signals and forwards into a single signal.

**Network Modem –** a modem connected to a Local Area Network (LAN) that is accessible from any workstation on the network.

**Network Interface Card – NIC –** board that provides network communication capabilities to and from a computer.

**Network Layer –** the Network Layer refers to OSI Layer 3. This layer is responsible for routing data from one computer to another IP and IPX are the most common network layer protocols.

**Network Operating System - NOS –** Operating system designed to pass information and communicate between more than one computer, ex. Windows, Apple Share, Novell, NetWare.

**Node/Node Devices –** any device attached to a network, such as servers, workstations, printers.

**OSI Reference Model – Open Systems Interconnection –** Reference model defines seven layers of networking protocols. Because of the close relationship between the layers they are typically treated as 4 layers.  Application/Presentation/Session; Transport; Network; Data Link/Physical.

**Physical Topology –** The physical layout of the network – the arrangement of cables and how the computers/nodes are connected.

**Ports –** connection point for a cable.

**Protocol –** a formal description of rules and conventions that governs how devices on a network exchange information.

**RAM – Random Access Memory –** the working memory of a computer where data and programs are temporarily stored while the computer is on.

**Repeater –** a device used in a network to strengthen a signal as it is passed along a network cable.

**RJ-45 –** standard connectors used for unshielded twisted-pair cable. RJ-45 resembles telephone-style connector. RJ stands for Registered Jack alluding to telephone industry origin.

**Router –** device that passes information between connected networks. It selects the best path and translates the information from one network to another. It is similar to a bridge, but with more capability.

**SCSI - Small Computer Serial Interface –** interface controller that allows several peripherals to be connected to the same port on a computer.

**Segment –** a section of cable on a network. In Ethernet networks there are two types of segments, a trunk segment and a link segment. Trunk segments have more than one node attached, where as link segments connect a computer to an interconnecting device such as a repeater or concentrator, it links two interconnecting devices together.

**Speed of Data Transfer –** rate that information travels through a network. Typically measured in megabits per second (Mbps).

**Star Topology –** network configuration where each node in the network is linked directly to a central switch or concentrator.

## Understanding Ethernet Communication - Glossary

**STP – Shielded Twisted Pair –** like UTP Unshielded Twisted Pair, STP has four pair of wires twisted with varying number of twists to reduce interference. To further shield the cable from interference each pair is also shielded with foil, and all four pair are wrapped in a metallic braid or foil.

**Switch –** a hub that sends packets of information to designated ports only, rather than all computers on the network.

**Transport Layer –** the Transport Layer is layer 4 of the OSI Reference Model for networking protocols. The Transport layer is tasked to efficiently transport data packets on the network. TCP is the most popular protocol for transport.

**TCP/SPX –** TCP is the most common protocol for Transport and is paired with IP protocol for network communication. SPX paired with IPX is also common.

**Terminator –** a resistor (50 ohms) used on thin Ethernet cables (10Base2) to terminate cable end points.

**Thicknet –** thick coaxial cable has a protective plastic cover to keep moisture away from center conductor. Generally used for special purpose installations, or as backbone in linear bus network.

**Thinnet –** thin coaxial was used in Ethernets however issues with improper grounding have almost eliminated its use for Ethernet networks.

**Token –** packet that carries data between each computer on a ring topology. The token stops at each node on the network to collect or deliver data, then moves on to the next in a circular pattern.

**Token Ring –** network protocol where computers are connected so signal travels around the network in a circle/ring, with an electronic "token" moving around the ring carrying data from computer to computer.

**Topology –** the physical topology of a network is the configuration of cables, computers and peripherals. The logical topology is the method used to pass information in a network. Logical topologies are also known as Protocols.

**Transceiver –** Transmitter/Receiver – a device that receives and sends signals over a medium. In networks it is commonly used to allow a connection between two different types of cable connectors.

**Tree Topology –** LAN topology that is a cross between a linear bus and a star topology. It contains a backbone similar to the bus topology, however rather than individual nodes branching from the backbone there are stars attached to the backbone.

**Twisted Pair –** cabling that consists of four pair of wires, each pair is twisted with varying number of twists to reduce interference. Available shielded (STP) and unshielded (UTP).

**USB – Universal Serial Bus Port –** a hardware interface for peripherals such as a keyboard, mouse, scanner etc.

**UTP – Unshielded Twisted Pair -** has eight wires twisted in pairs with varying number of twists. More susceptible to electrical noise and shorter distance between signal boosts compared to other networking media.

**WAN – Wide Area Network –** a network that covers very large areas geographically including states, countries, world.

**Workgroup –** a collection of workstations and servers on a LAN that setup to communicate and exchange information with each other.

**Workstation –** computer connected to a network.

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