

Network Cabling: Media and Topologies

Introduction to Network Cabling Questions

1. What is TIA/EIA 568?

TIA/EIA 568 is a set of telecommunications standards from the Telecommunications Industry Association (TIA).

2. What is the difference between TIA 568A and TIA 568B.

The difference between TIA 568A and TIA 568B is the pin positions for the green in TIA 568A has been switched with orange pairs in TIA 568B.

3. What is the function of a patch panel?

The function of a patch panel is to serves as a sort of static switchboard, using cables to interconnect computers within the area of a local area network (LAN) and to the outside for connection to the Internet or WAN.

4. Add these terms to your vocabulary list, Cat 5, Cat 6, and plenum.

Multimode and Singlemode Fiber

1. For signaling, what type of technology does fiber optics employ?

It employ light for signaling.

2. Is fiber optic cable easy to tap?

No, fiber optic cable is very hard to tap. Because there are no Radio Frequency.

3. In what type of situation would you employ multimode fiber optic cable?

Multimode fiber optic cable is used in short range communication. Usually on a patch panel or in the data cage.

4. What would be a conventional light source for multimode fiber optic cable?

LED (light emitting diode).

5. In what situation would you employ single mode fiber optic cabling?

Single mode fiber optic cabling is used for long range communication. It can be up to 100 Kilometers.

6. What would be a conventional light source for single mode fiber optic cabling?

Laser beams.

UTP, STP and Coaxial Cabling

1. What type of cable do the terms 10base5, "Thicknet", RG-8, 10base2, and RG-58 describe?

This refers to types of Coaxial Cable.

2. What type of cabling uses conductor pairs that are twisted?

Twisted-Pair copper cabling.

3. What differentiates UTP from STP?

UTP (Unshielded Twisted Pair) has no shielding and STP (Shielding Twisted Pair) has additional shielding to protect against interference.

4. What is the most common form of Ethernet cabling for Local Area Networks?

UTP (Unshielded Twisted Pair) is most common form of Ethernet cabling for Local Area Networks.

Cable Categories

1. What is the EIA?

The EIA is the Electronic Industries Alliance and develops standards for the industry.

2. What is the TIA?

The TIA is Telecommunications Industry Association is deals with general standards, market analysis, trade shows, etc.

3. For what is Category 3 cable used?

Category 3 cable used for older network. It was designed to handle 10 Mbit/s Ethernet and 4 Mbit/s Ethernet.

4. Compare and contrast Cat5 and Cat5e cable.

Cat5 supports 100Mbps Ethernet. Cat5e is support up to 1 Gbps Ethernet.

5. In what situation would you want to employ Cat6 cable?

Employ Cat6 cable in for 10 Gbps Ethernet.

Crossover and Straight through Cables

1. What is an Ethernet straight through cable? When would you use it?

Ethernet straight through cable is the most common Ethernet cable used. The wire go straight through Pin for Pin. It used to connect workstation or PC to network devices.

2. What is the difference between a MDI and a MDIX interface?

MDI (Media Dependent Interface) is the network interface card. MDIX (Media Dependent Interface Crossover) is the network switch.

3. What is an Ethernet crossover cable? When would you use one?

Ethernet crossover cable is a cable crosses over some of the transmission/receiving pins on the cable. This cable typically use these cables when you are connecting either MDI to MDI or MDIX to MDIX.

4. If you were going to connect two CSU/DSUs, what type of cable would you use?

Crossover Cable.

Plenum and Non-Plenum Cabling

1. What is the disadvantage of using regular TWP copper cable in a ceiling plenum?

The disadvantage of using regular TWP copper cable in a ceiling plenum is highly flammable and release toxic fumes in a fire.

Converting Media

1. Why do you always need to provide power to the device when you convert from fiber to copper?

You always need to provide power to the device because the copper signals are electrical and require power to work.

2. Can a network signal from almost any type of media be converted to any other type of media?

Yes, a network signal from almost any type of media be converted to any other type of media.

Media Distance and speed Limitations

1. What type of cable does 10base5 networking use?

It use Coaxial cable RG-8U.

2. How far can you run on a single run of 10baseT?

100 Meters (328 feet)

3. How far can you run on a single run of 100baseTx?

100 Meters (328 feet)

4. Complete Table 1 by adding the missing cable attributes.

TIA Category	Ethernet Standard	Cable (Fiber) Type	Speed	Distance
NA	10 base5	Coaxial RG-8U	10 Mbps	500 meters
NA	10base2	Coaxial RG-58/U	10 Mbps	185 meters
Category 5	100base-TX	Twisted Cable Pair	100 Mbps	100 meters
Category 6	1000base-T	Twisted Cable Pair	1000 Mbps	100 meters
NA	1000base-SX	Multimode Fiber	1000 Mbps	200-550 meter
NA	1000base-LX	Singlemode Fiber	1000 Mbps	2 Kilometers

Chapter 3 Vocabulary

Cat 5 - is a twisted pair cable for carrying signals. This type of cable is used in structured cabling for computer networks such as Ethernet.

Cat 6 - is a standardized twisted pair cable for Gigabit Ethernet and other network physical layers that is backward compatible with the Category 5/5e and Category 3 cable standards.

Plenum – is cable that is laid in the plenum spaces of buildings. All materials intended for use on wire and cables to be placed in plenum spaces are designed to meet rigorous fire safety test standards.

American Standard Code for Information Interchange (ASCII) – is the most common format for text files in computers and on the Internet.

Analog transmission - is a transmission method of conveying voice, data, image, signal or video information using a continuous signal which varies in amplitude, phase, or some other property in proportion to that of a variable.

Bandwidth - is the bit-rate of available or consumed information capacity expressed typically in metric multiples of bits per second.

Interoperability - means the ability of health information systems to work together within and across organizational boundaries in order to advance the effective delivery of healthcare for individuals and communities.

Baud rate - Baud rate refers to the number of signal or symbol changes that occur per second. A symbol is one of several voltage, frequency, or phase changes.

Carrier wave - a high-frequency electromagnetic wave modulated in amplitude or frequency to convey a signal.

Channel - is a separate path through which signals can flow.

Circuit - is a path between two or more points along which an electrical current can be carried.

Circuit configuration -

Coaxial cable - is a type of cable that has an inner conductor surrounded by a tubular insulating layer, surrounded by a tubular conducting shield.

Codec - is a device or computer program capable of encoding or decoding a digital data stream or signal.

Coding scheme - The coding manual to mark the coding unit by choosing the manifest content which best demonstrate whether the material contains or does not contain the latent content to the research.

Customer premises equipment (CPE) - is any terminal and associated equipment located at a subscriber's premises and connected with a carrier's telecommunication channel at the demarcation point.

Digital subscriber line (DSL) - is a technology for bringing high- bandwidth information to homes and small businesses over ordinary copper telephone lines.

Digital transmission - is the physical transfer of data (a digital bit stream or a digitized analog signal) over a point-to-point or point-to-multipoint communication channel.

Fiber-optic cable - commonly used: single mode, multimode and plastic optical fiber (POF). Transparent glass or plastic fibers which allow light to be guided from one end to the other with minimal loss.

Frequency - is the number of complete cycles per second in alternating current direction.

Full-duplex transmission - data can be transmitted in both directions on a signal carrier at the same time.

Half-duplex transmission - that data can be transmitted in both directions on a signal carrier, but not at the same time.

Hertz (Hz) - is a unit of time which measures frequency.

Inverse multiplexing (IMUX) - is a device performing the opposite function of a multiplexer (MUX). Allows a data stream to be broken into multiple lower data rate communication links.

Local loop - is the physical link or circuit that connects from the demarcation point of the customer premises to the edge of the common carrier or telecommunications service provider's network.

logical circuit - A computer switching circuit that consists of a number of logic gates and performs logical operations on data.

Microwave transmission - is the transmission of information or energy by electromagnetic waves whose wavelengths are measured in small numbers of centimetre; these are called microwaves.

Modem - is a network hardware device that modulates one or more carrier wave signals to encode digital information for transmission and demodulates signals to decode the transmitted information

Multipoint circuit - are designed for data transmission that can link up to 12 outstations to a single central station. They are typically used to link computer sites.

Multiplexing - is a method by which multiple analog message signals or digital data streams are combined into one signal over a shared medium.

Parallel transmission - Transmitting several bits of data simultaneously using multiple lines (8, 16, 32, 64). The pathways between the CPU and memory are parallel, and they used to be parallel between the CPU and peripheral devices.

Physical circuit - a circuit is a model of computation in which input values proceed through a sequence of gates, each of which computes a function. Circuits of this kind provide a generalization of Boolean circuits and a mathematical model for digital logic circuits.

Plain old telephone service (POTS) - is voice-grade telephone service employing analog signal transmission over copper loops.

radio transmission - is the use of radio waves is to carry information, such as sound, by systematically modulating some property of electromagnetic energy waves transmitted through space, such as their amplitude, frequency, phase, or pulse width.

Satellite transmission - is an artificial satellite that relays and amplifies radio telecommunications signals via a transponder; it creates a communication channel between a source transmitter and a receiver(s) at different locations on Earth.

Serial transmission - is the process of sending data one bit at a time, sequentially, over a communication channel or computer bus.

Simplex transmission - is a one-way only communication standard that broadcasted information may only travel in one direction.

Switch - is a device that channels incoming data from any of multiple input ports to the specific output port that will take the data toward its intended destination.

Twisted pair cable (TWP) - A type of cable that consists of two independently insulated wires twisted around one another. The use of two wires twisted together helps to reduce crosstalk and electromagnetic induction.

Unicode - is a computing industry standard for the consistent encoding, representation, and handling of text expressed in most of the world's writing systems.

Voice over Internet Protocol (VoIP) - is a methodology and group of technologies for the delivery of voice communications and multimedia sessions over Internet Protocol (IP) networks, such as the Internet.

Wireless media - Transmission of waves take place in the electromagnetic (EM) spectrum. The carrier frequency of the data is expressed in cycles per second called hertz (Hz).