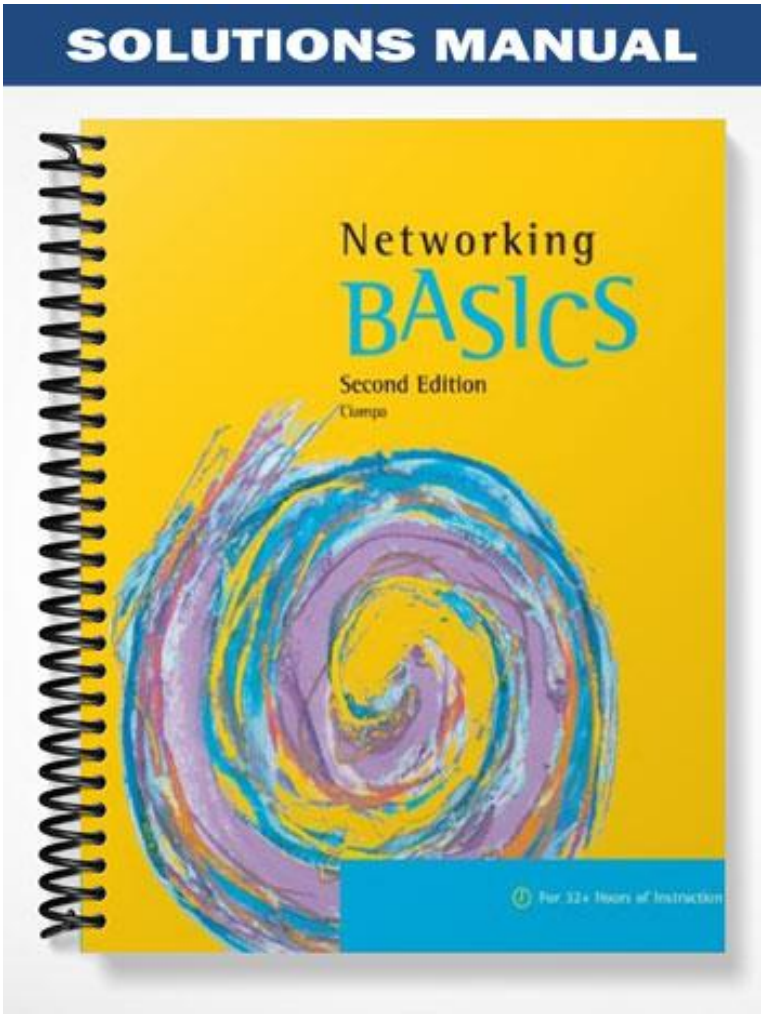
SOLUTIONS MANUAL



LESSON 2—NETWORK MEDIA

Vocabulary Review

Analog: A continuous mode of transmission.
Attenuation: The loss of signal power.
Baseband signaling: A signaling technique that sends one data signal across the network media.
BNC connectors: The connectors used on the ends of a thin coaxial cable.
BNC T connectors: The connectors used on a thin coaxial cable that permit a device to connect to the media.
Broadband signaling: A signaling technique that divides a cable into several different channels.
Bus: Internal pathways along which data moves in a computer.
Circuit switched network: A network that creates a dedicated and direct physical connection between the sender and the receiver.
Cladding: The part of the fiber optic cable that surrounds the core.
Coaxial cable: A cable that has a single copper wire at its center and is surrounded by insulation and shielding.
Core: A very thin strand of glass at the center of a fiber optic cable.
Diffused transmission: Wireless infrared transmission that relies on reflected light.
Digital: A format made up of short impulses of off and on.
Direct sequence spread spectrum (DSSS): A technique that uses an expanded redundant code to transmit each data bit.
Directed transmission: Wireless infrared transmissions that require an emitter and a detector be aimed directly at one another.
Electromagnetic interference (EMI): Interference caused by a variety of sources, such as cellular phones, appliances, and fluorescent lights.
Expansion slots: Internal computer slots designed to add additional hardware to a computer.
Far end crosstalk (FEXT): Interference from another data signal that is picked up by adjacent wires at the far end of the wires.
Fiber optic cables: Cable that have a thin cylinder of glass at their center and send light impulses.
Frequency hopping spread spectrum (FHSS): A technique that uses a range of frequencies and changes frequencies during a transmission.
Interference: The intrusion of a strong external signal that interferes with the signal being transmitted.
Media Access Control (MAC): A unique number that is burned into a NIC.
Micron: Approximately 1/25,000 of an inch or one millionth of a meter.
Modem: A device that converts a computer's digital signal so it can travel over an analog connection; it also converts the analog signal back to a digital format.
Multimode: Fiber optic cables that are used to support many simultaneous light transmissions that flash at different angles.
Near end crosstalk (NEXT): Interference from another data signal that is picked up by adjacent wires.
Network interface card (NIC): A hardware device used to connect a personal computer to network media.
Noise: The intrusion of a strong external signal that interferes with the signal being transmitted.
Packet: Smaller unit of the data to be transmitted across a packet switched network.
Packet switched networks: Networks that break a data transmission into smaller units and transmit each unit individually.
Parallel: Data traveling side by side inside a computer.
Peripheral Component Interface (PCI): The standard bus for personal computers.
Radio frequency: Wireless transmission that uses radio waves to send signals.
Radio frequency interference (RFI): Interference caused by broadcast signals from a radio or television transmitter.
RJ-45: Connectors used on the ends of twisted pair cables.
Serial: Data traveling one bit after the other.
Shielded twisted pair (STP): Twisted pair cabling that has a foil shielding on the inside of the jacket to reduce interference.
Single mode: Fiber optic cables that are used when the data must be transmitted over long distances.

Spread spectrum: A technique that spreads a narrow signal over a broader portion of the radio frequency band.
Straight tip (ST): A connector that locks onto the jack when twisted.
Straight connection (SC): A connector that simply pushes into the jack.
Switch: A device located at the telephone company's central office that performs switching. Also known as a switching hub, a device that knows which segment goes to which network device.
Switching: Moving a signal from one wire or frequency to another.
Thin coaxial cable: A copper cable that is one-quarter of an inch in diameter, has a single copper wire at its center, and is surrounded by a layer of insulation.
Transceiver (transmitter/receiver): A small chip on the NIC that sends and receives data.
Twisted pair cable: A cable consisting of several pairs of insulated copper wires that are twisted around each other.
Unshielded twisted pair (UTP): Twisted pair cabling that does not have any shielding.
Wireless infrared: Wireless transmissions that use infrared light.

Review Questions

True/False

1. T
2. F
3. T
4. F
5. F

Fill in the Blank

1. Circuit
2. packets
3. time
4. packet
5. Baseband

Written Questions

1. Computer data networks use baseband signaling instead of broadband for several reasons. Baseband transmission uses a digital signal, the same type found within the computer itself. Using baseband signaling does not require any type of conversion. Also, baseband allows signals to move in two directions: data can be both sent as well as received.
2. As data travels, it meets resistance, which causes the signal to gradually weaken. This loss of signal power is known as attenuation. Attenuation is measured by the decrease in decibels (db) over a specific distance. For example, if the maximum attenuation rating for a type of cable is 22db/100m, that means that it loses 22 decibels as it travels 100 meters.
3. Radio frequency interference (RFI) refers to interference that is caused by broadcast signals from a radio or television transmitter. Electromagnetic interference (EMI) may be caused by a variety of sources. A motor or another source of intense electrical activity can create an electromagnetic signal that interferes with a data signal. EMI can also be caused by cellular phones, citizen's band and police radios, small office or household appliances, fluorescent lights, and loose electrical connections.
4. The reason for twisting the wires is that it reduces interference. By twisting the wires, less of the surface of the wire is exposed to the source of the interference. Most twisted pair cable for computer networks has six twists per inch.
5. A fiber optic cable consists of a very thin strand of glass called the core, about as thick as a human hair, at its center. Surrounding the core is a glass tube known as the cladding. The core and cladding are protected by a jacket. When classifying fiber optic cable, it is typical to state the diameter of the core by the diameter of the cladding. The diameter is measured in microns, each of which is about 1/25,000 of an inch or one millionth of a meter. Fiber optic cables transmit signals by “flashes” or impulses of light. A “1” is transmitted by an impulse of light flashing on, while transmitting a zero is accomplished by the light being off.