SEMESTER 1 Chapter 10   
Planning and Cabling a Network

V 4.0

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| 10.1.1 | What are routers primarily used for? | used to interconnect networks |
|  | What does each port on a router connect to? | Each port on a router connects to a different network and routes packets between the networks |
|  | What two things can a router break up to improve overall network performance? | Broadcast and collision domains |
| 10.1.1.2 | What does a hub do when it receives a signal? | regenerates it, and sends the signal over all ports |
|  | What is the main problem with using a hub? | It shares bandwidth between devices which can reduce performance of the LAN |
|  | What are some reasons that hubs are still used today? | Hubs are less expensive than switches. A hub is typically chosen as an intermediary device within a very small LAN, in a LAN that requires low throughput requirements, or when finances are limited. |
|  | What does a switch do when it receives a frame? | regenerates each bit of the frame on to the appropriate destination port |
|  | What is the advantage of using a switch vs. a hub? | A switch segments a network into multiple collision domains |
|  | How can a switch increase performance on a LAN? | a switch provides dedicated bandwidth on each port |
| 10.1.2 | What are some factors that need to be considered when selecting devices for a LAN? | Cost  Speed and Types of Ports/Interfaces  Expandability  Manageability  Additional Features and Services |
| 10.1.2.2 | What determines the cost of a switch? | Features and capacity |
|  | What are the factors of a switch’s capacity? | # of ports and speed of ports |
|  | What are other factors that affect the cost of the switch? | network management capabilities, embedded security technologies, and optional advanced switching technologies |
|  | Why would the cost of purchasing more than one switch sometimes be the better choice than one switch? | A few long cable runs instead of many long cable runs |
|  | Describe the process of using redundancy in a switched network. | Add a second or more switches between nodes so that there is not a single point of failure |
| 10.1.2.3 | What are the three questions you should ask when selecting a switch? | Just enough ports for today's needs?  A mixture of UTP speeds?  Both UTP and fiber ports? |
| 10.1.2.4 | What are the factors that need to be addressed when selecting a router? | Expandability  Media  Operating System Features |
|  | What is the difference between a fixed and modular router? | A modular router has expansion slots that can be changed for future expansion. Fixed can not be changed. |
|  | List the features and services that can be provided based on the operating system selected. | Security  Quality of Service (QoS)  Voice over IP (VoIP)  Routing multiple Layer 3 protocols  Special services such as Network Address Translation (NAT) and Dynamic Host Configuration Protocol (DHCP) |
| 10.2.1 | What are the four physical areas to consider when wiring a LAN? | Work area  Telecommunications room, also known as the distribution facility  Backbone cabling, also known as vertical cabling  Distribution cabling, also known as horizontal cabling |
|  | What is the total distance that a UTP cable can be per channel? | 100 meters |
|  | How long can a patch cable for interconnecting patch panels be? | 5 meters |
|  | How long can the cable be from the wall termination to the computer or phone? | 10 meters |
|  | What is horizontal cabling? | horizontal media runs from a patch panel in the telecommunications room to a wall jack in each work area |
|  | What is backbone cabling? | Backbones, or vertical cabling, are used for aggregated traffic, such as traffic to and from the Internet and access to corporate resources at a remote location. |
| 10.2.1.2 | What are the three types of media we study? | UTP (Category 5, 5e, 6, and 7)  Fiber-optics  Wireless |
|  | What factors need to be considered when selecting the media to use? | Cable length - Does the cable need to span across a room or from building to building?  Cost - Does the budget allow for using a more expensive media type?  Bandwidth - Does the technology used with the media provide adequate bandwidth?  Ease of installation - Does the implementation team have the ability to install the cable or is a vendor required?  Susceptible to EMI/RFI - Is the local environment going to interfere with the signal? |
| 10.2.1.3 | Define attenuation. | Attenuation is reduction of the strength of a signal as it moves down a media. |
|  | What is the major factor that affects attenuation in network cables? | Cable length |
|  | What two cost factors must be matched when selecting the media? | match the performance needs of the users with the cost of the equipment and cabling to achieve the best cost/performance ratio |
|  | Does a server need more or less bandwidth than a single user? | More |
| 10.2.1.4 | List in numeric order the easiest to most difficult media to install. | 1. wireless  2. UTP  3. Fiber Optic |
|  | What are the two forms of interference that can affect the network signals? | EMI- Electromagnetic Interference  RFI- Radio Frequency Interference |
| 10.2.2.1 | What are the EIA/TIA cable specifications for the ends of UTP cables? | 568A & 568B |
| 10.2.2.2 | Which pins are used for transmitting in a straight-through cable? | Pins 1 & 2 |
|  | Which pins are used for receiving in a straight-through cable? | Pins 3 & 6 |
|  | When do you use a straight-through cable? | When connecting unlike devices |
|  | When do you use a crossover cable? | When connecting like devices |
|  | Which connections use a straight-through cable? | Switch to a router Ethernet port  Computer to switch  Computer to hub |
| 10.2.2.3 | Describe the ends of a crossover cable. | The transmit of one end connects to the receive of the other end and vice-versa |
|  | Which connections are listed that require a crossover cable? | Switch to switch  Switch to hub  Hub to hub  Router to router Ethernet port connection  Computer to computer  Computer to a router Ethernet port |
| 10.2.2.4 | Can modern devices be set so that different types of cables are not necessary? | Yes |
| 10.2.3 | What are the two types of connectors for the router end of a serial connection? | DB-60 or a smart serial connector |
|  | What is the connector at the network end called? | Winchester 15 pin connector |
| 10.2.3.2 | Define a DCE. | Data Communications Equipment (DCE) - A device that supplies the clocking services to another device. Typically, this device is at the WAN access provider end of the link. |
|  | Define a DTE. | Data Circuit-Terminal Equipment (DTE) - A device that receives clocking services from another device and adjusts accordingly. Typically, this device is at the WAN customer or user end of the link. |
|  | Which end of the cable is responsible for supplying the clock rate? | DCE |
| 10.3.1 | Which end devices require an IP address? | User computers  Administrator computers  Servers  Other end devices such as printers, IP phones, and IP cameras |
|  | Which network devices require IP addresses? | Router LAN interfaces  Router WAN (serial) interfaces |
|  | Which network devices need IP addresses for management? | Switches  Wireless Access Points |
| 10.3.2 | What are the three reasons given to subnet a network? | Manage broadcast traffic  Different network requirements  Security |
|  | What two calculations are necessary after the requirements are determined? | A unique subnet and subnet mask for each physical segment  A range of usable host addresses for each subnet |
| 10.3.3 | What are the different types of hosts on a network? | General users  Special users  Network resources  Router LAN interfaces  Router WAN links  Management access |
| 10.4 | We will go over these in class. |  |
| 10.5.1 | What are router Ethernet connections used for? | Connecting to LAN |
|  | What are router Serial connections used for? | Connections between WANs |
|  | What is the router’s console interface used for? | It is used for the initial configuration of the router |
|  | What is the security concern involving the console port of a router? | with physical access to the router's console interface, an unauthorized person can interrupt or compromise network traffic |
|  | What is the auxiliary port of a router used for? | To remotely configure a router |
|  | What device is normally attached to the auxiliary port? | Modem |
| 10.5.2 | What software is used when configuring a router? | Terminal emulator |
|  | What type of cable is connected between the router console port and computer? | RJ-45 to DB-9 |
|  | What are the serial port connection settings required? | Bits per second: 9600 bps  Data bits: 8  Parity: None  Stop bits: 1  Flow control: None |
|  | What do you do to access the router if all connections are made properly? | Hit enter |