

Examples of Modems



Network Interface Card (NIC)

- NIC provides the physical interface between computer and cabling.
- It prepares data, sends data, and controls the flow of data.
- It can also receive and translate data into bytes for the CPU to understand.

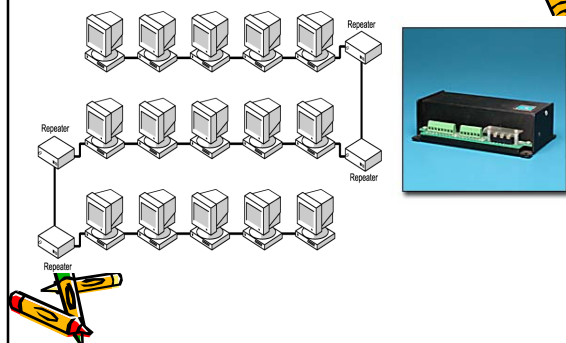
Repeaters

- Repeaters allow a cabling system to extend beyond its maximum allowed length by amplifying the network voltages so they travel farther.
- Repeaters are amplifiers and, as such, are very inexpensive.
- Repeaters can only be used to regenerate signals between similar network segments.

Repeaters

- The main disadvantage to repeaters is that they just amplify signals.
- These signals not only include the network signals, but any noise on the wire as well.
- Eventually, if you use enough repeaters, you could possibly drown out the signal with the amplified noise.
- For this reason, repeaters are used only as a temporary fix.

Repeaters



Hubs

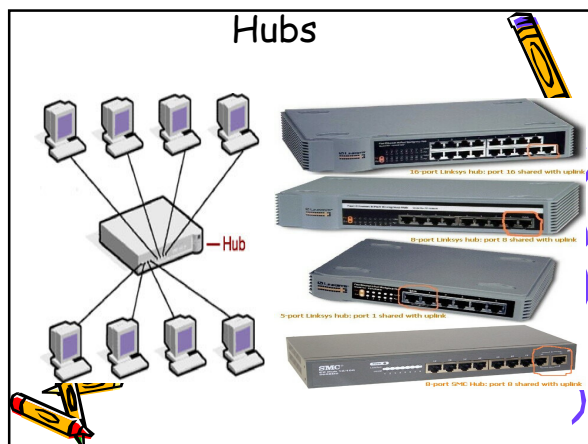
- Hubs are devices used to link several computers together.
- They repeat any signal that comes in on one port and copy it to the other ports (a process that is also called *broadcasting*).
- There are two types of hubs: active and passive.
- *Passive hubs* simply connect all ports together electrically and are usually not powered.

Hubs

- *Active hubs* use electronics to amplify and clean up the signal before it is broadcast to the other ports.
- In the category of active hubs, there is also a class called "intelligent" hubs, which are hubs that can be remotely managed on the network.



Hubs



Bridges

- They join similar topologies and are used to divide network segments.
- If it is aware of the destination address, it is able to forward packets; otherwise a bridge will forward the packets to all segments.
- They are more intelligent than repeaters but are unable to move data across multiple networks simultaneously.

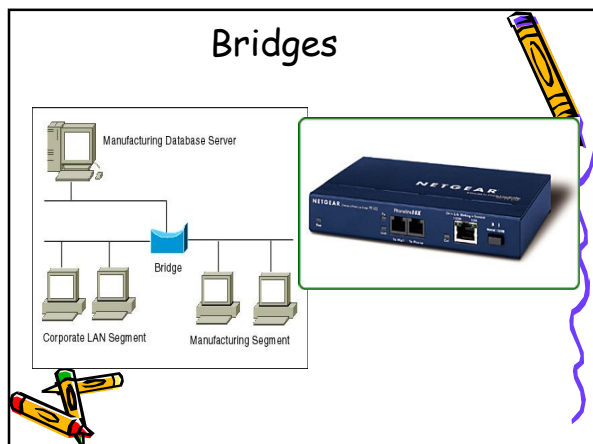


Bridges

- Unlike repeaters, bridges *can* filter out noise.
- The main disadvantage to bridges is that they can't connect dissimilar network types or perform intelligent path selection.
- For that function, you would need a router.



Bridges



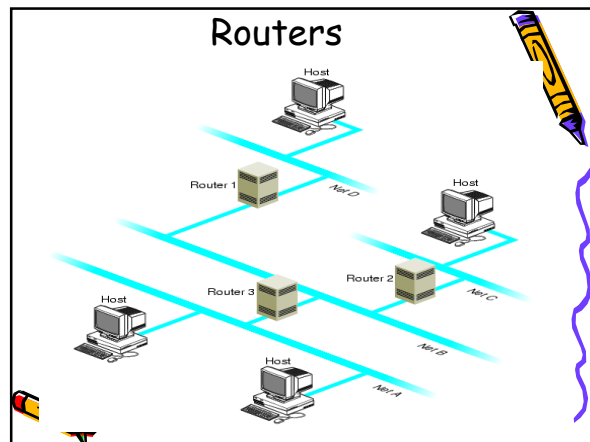
Routers

- Routers are highly intelligent devices that connect multiple network types and determine the best path for sending data.
- The advantage of using a router over a bridge is that routers can determine the best path that data can take to get to its destination.
- Like bridges, they can segment large networks and can filter out noise.



Routers

- However, they are slower than bridges because they are more intelligent devices; as such, they analyze every packet, causing packet-forwarding delays.
- Because of this intelligence, they are also more expensive.
- Routers are normally used to connect one LAN to another.
- Typically, when a WAN is set up, there will be at least two routers used.



Switch

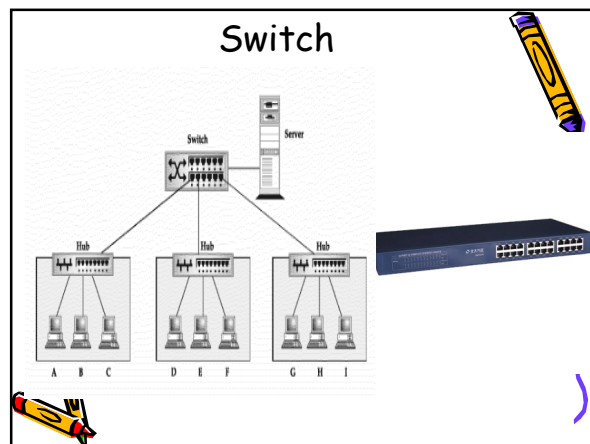
- A **network switch** is a computer networking device that connects network segments.
- Low-end network switches appear nearly identical to network hubs, but a switch contains more "intelligence" (and a slightly higher price tag) than a network hub.

Switch

- A **vital difference** between a hub and a **switch** is that all the nodes connected to a hub share the bandwidth among themselves, while a device connected to a switch port has the **full bandwidth** all to itself.

Switch

- For example, if 10 nodes are communicating using a hub on a 10-Mbps network, then each node may only get a portion of the 10 Mbps if other nodes on the hub want to communicate as well. .
- But with a switch, each node could possibly communicate at the full 10 Mbps.



Wireless network standards

- **Bluetooth (PAN)**
 - A wireless standard for transmission of data between devices over short ranges (less than 10 m)
- **Wi-Fi (LAN)**
 - A high-speed wireless local-area network enabling wireless access to the Internet for mobile, office and home users.

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Wireless network standards

- **WiMax (MAN)**
 - A long distance transmission standard that allows an access range up to 30 miles at speeds up to 75 Mbps.

World Wide Web

- **World Wide Web**
The most common technique for publishing information on the Internet. It is accessed through web browsers which display web pages of embedded graphics and HTML/XML-encoded text.

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World Wide Web

- **Web browsers** are software used to access the information on the WWW that is stored on **web servers**
- **HTTP, the hypertext transfer protocol** is a standard used to allow web browsers and servers to transfer requests for delivery of web pages and their embedded graphics.
- The technical name for web addresses is **uniform or universal resource locators (URLs)**.

Questions

