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# Networks Notes Review

1. **Define network.**

A network is a collection of independent computers that communicate with one another over a shared medium in order to share common resources (files, printers, scanners, etc.)

2. **What do the acronyms LAN and WAN mean? Define each.**

- A LAN(Local Area Network) is a network that is usually confined to a rather small geographic area, such as a regular building or a college campus.
- A WAN(Wide Area Network) is a large network that may span a larger area than a LAN from a city to the entire globe. A wide area network is usually a collection of LANs that are usually related in some way.

3. **Explain the difference between packet and circuit switching.**

- Packet switching is when information in a network is sent broken into small data packets. Each packet may travel a different route in the network to the destination and may arrive in any order to be reassembled at the destination.
- In contrast, circuit switching is when information in a network first establishes one route from the sender to the destination and is sent unbroken as a whole.

4. **Why did circuit switching become impractical?**

Circuit switching became impractical because as networks in the world are continuously growing, circuit switching has limits to handle larger network sizes. It wastes resources, requires larger bandwidth and may tie up a line with very little traffic.

5. **Your home network(if you have one), the school's network and the internet all use packet switching or circuit switching?**

They use packet switching.

6. **Name at least 4 distinguishing characteristics of a fileserver.**

A computer with:

- A fast CPU
- A large amount of RAM
- A big fast hard drive
- A fast network interface card

In terms of software, it contains the network operating system software, most data files, and some applications.

7. **Why is a switch better than a hub**

A hub broadcasts information from the sender to every device that is connected for an intended device to receive it. In contrast, a switch forwards information from the sender only to the unique device that was intended to receive it. A switch is much more efficient and secure.

8. **What is a router? How important is a router?**

A router is a piece of hardware that transmits data packets between networks. It separates the internet(a large WAN) from a LAN. It can also separate a LAN into seperate networks. A LAN is functional without a router but a router plays a very important role of allowing access to the internet.

9. **What is a firewall? How important is a firewall?**

A firewall is a hardware or software system designed to prevent unauthorized access or malicious traffic from entering a private network. A firewall is not essential in a network but can definitely provide extra security and protection.

10. **Does a firewall prevent viruses, malware and spyware from infecting devices within your network? Why or Why not? Explain.**

No, it cannot most of the time. One thing a firewall does not protect against is when users compromise their computer's security themselves allowing malware to enter the network. Computers are infected by viruses, malware and spyware often due to an action that allows the virus to enter the computer. A firewall would therefore be useless in this case then.

11. **What's a print server?**

A print server is a server that controls printing and allows various workstations access to various printers on the network. They can be either separate computers, special hardware devices or software.

12. **Explain how Ethernet works in general terms**

Ethernet is the most popular LAN technology in use today. It is popular because it has a good balance of speed, cost, and installation. The way it works is that it uses an access method called CSMA/CD. This is where each computer listens to the cable before sending anything through the network. If a node is transmitting on the cable, the computer will continuously try again when the line is clear. If the network is clear, the computer will transmit its data.

13. **What is a network topology? What topologies are used today?**

A network topology defines the shape of a network, they describe how the nodes (active devices connected to networks) are in touch with one another. Common topologies used today are the star topology and bus topology.

14. **At home if you set up a P2P LAN connecting two computers with a single Ethernet cable, what type of topology would it be?**

A bus topology because it is connected with a single cable.

15. **If you added an Internet, a switch and several additional devices to the network in the question above, what topology would you now change to?**

A star topology.

16. **Give 2 advantages and disadvantages of fibre over twisted pair.**

- Advantages:
    - Fibre optic cables transmit signals at vastly greater speeds than twisted pair.
    - Fibre optic cables insulate electricity and are not affected by electric/electro-magnetic interferences.
- Disadvantages:
    - Fibre optic cables are very difficult to install and modify without special training.
    - Fibre optic cables are difficult to splice, and are not flexible for risk of breaking the wire.

17. **Give 2 advantages and disadvantages of WIFI over twisted pair.**

- Advantages:
    - WIFI provides a sense of convenience where new devices can always be connected wirelessly and conveniently; with UTP cables, each new device requires a new cable connection.
    - With WIFI, wireless connections can occur in a matter of seconds, whereas wired connections often require a download.
- Disadvantages:
    - WIFI connections are less stable and strong, since wires are directly connected to the Internet.
    - WIFI is slower in terms of data transfer speed, as they do not have a direct physical connection to networks.

18. **What does UTP CAT 5e mean?**

The UTP CAT 5e (Unshielded Twisted Pair Category 5 Enhanced) is the most popular and best option of ethernet medium nowadays. It is made to transfer data at a speed of up to 1000 Mbps. The difference between the different categories of UTP is the tightness of the twisting of the copper wires.

19. **Define: P2P and client-server.**

- P2P: a network system that allows independent computers to share resources(files, hard drives, printers... ) found on other computers. There is no centralized management source and all computers are considered equal.
- Client-server: a network system that allows the network to centralize functions and applications in one or more file servers. The file servers usually store all data files and the NOS.

20. **Which is best: P2P or CS with regard to: setup, cost and security. (Answer each separately.)**

- Setup: P2P is better as the NOS is usually already in place.
- Cost: P2P is better as the initial expense is less (no need for a dedicated server)
- Security: Client-server is better as all resources and security are centrally controlled through the server.

21. **List at least 8 different "subsystems" that use the internet network.**

- World Wide Web (WWW)
- E-mail
- File Transfer Protocol (FTP)
- TELNET
- USENET newsgroups
- Chat and Instant Messaging
- Multi User Dimension MUDs
- VOIP (Voice over IP)
- Peer-to-Peer

22. **Who owes the internet?**

There is no president, chief operating officer, or single authority figure that owns and governs the Internet as a whole. There are some organizations that help direct the future of the internet such as:

- Internet SOCiety (ISOC)
- World Wide Web Consortium (W3C)

23. **What does W3C stand for and what do they do?**

W3C stands for World Wide Web Consortium. It was created so they can lead the World Wide Web to its full potential by developing common protocols. (www.w3.org)

24. **Why and when was the internet originally created?**

The internet was created to be a nationwide computer network that would continue to function even if a large portion of it were destroyed in a nuclear war or natural disaster. The internet was originally created in the 1960s.

25. **Give an example of each: IP address, domain name, URL.**

- IP address: 245.64.2.101
- Domain name: mmhs.ca
- URL: http://www.yrdsb.ca/schools/millikenmills.hs/Pages/default.aspx

26. **What is a DNS? How important is a DNS to a 'normal' user?**

A DNS is a Domain Name Server, it is important to a 'normal' user to send information across the internet. It maintains lookup tables of domain names and IP Addresses. A DNS converts the domain name into its official IP addresses so that packets of information can be sent over the Internet.

27. **Is it possible that the last sentence of an email message might arrive before the first sentence? Explain why or why not.**

Yes, because when an email is sent the system software divides the messages into packets each with the destination address and the order necessary to re-assemble. The packets (ex: first sentence, last sentence…) may arrive in different order from different routes to be re-assembled in the correct order before storing the complete email in the recipient's inbox.

**28. What does WWW stand for?**

WWW stands for World Wide Web.

**29. Who created the WWW?**

Tim Berners Lee created the WWW.

**30. What was the first browser called?**

The first browser was called Mosaic.

**31. What is HTML? What is HTML's greatest feature?**

HTML stands for Hypertext Markup Language, and it is a formatting language whose purpose is to link documents together. It's greatest feature is hyperlinking as it is not required to know the complete url of a webpage in order to use the internet anymore. When converted by web browsers, HTML text is turned into web pages.