

Midterm Content

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PAN, LAN, MAN, WAN

PAN

- Personal Area Network

Advantages

- Allows for easy communication between personal devices in close proximity
- Can be set up easily and quickly
- Uses wireless technology, which eliminates the need for wires

Disadvantages

- Limited range
- Not suitable for large-scale data transfer
- May experience interference from other devices

Examples

- Bluetooth
- USB

LAN

- Local Area Network

Advantages

- fast data transfer rates and high speed communication
- easy to set up and maintain
- Provides increased security compared to WAN

Disadvantages

- Limited to a small geographical area
- Limited scalability and may require significant infrastructure to accommodate growth
- May experience **congestion** and network performance issues with increased usage

congestion: the state of being overcrowded, especially with **excessive mass** or **traffic**

Examples

- Home network

MAN

- Metropolitan Area Network

Advantages

- Provides high-speed connectivity over a larger geographical area than LAN
- Can be used as an **ISP** for multiple customers

- offers higher data transfer rates than WAN in some cases

Disadvantages

- May have limited security compared to LAN
- May experience congestion and network performance issues with increased usage
- Can be expensive to set up and maintain

ISP: Internet Service Provider

Examples

- City-wide network

WAN

- Wide Area Network

Advantages

- Covers large geographical areas and can connect remote locations
- Provides connectivity to the internet
- offers remote access to resources and applications

Disadvantages

- Can be expensive to set up and maintain
- offers slower data transfer compared to LAN and MAN
- Have lower security compared to LANs

Examples

- Internet

Dynamic vs Static Web Pages

Static Web Pages

- web pages are returned by the server which are prebuilt source code files built using simple languages such as HTML, CSS, or JavaScript.
- web pages are returned by the server with no change therefore, static websites are fast.
- there is no interaction with databases. also, they are less costly as the host does not need to support server-side processing with different languages.

Dynamic Web Pages

- Web pages are returned by the server which is processed during runtime means they are not prebuilt web pages, but they are built during runtime according to the user's demand with the help of server-side scripting languages such as PHP, Node.js, ASP.NET and many more supported by the server.

Direct vs Indirect access to the Internet

Indirect Access

- This is the most common method used in home and office networks
- The user's computer is connected to a router, which is connected to a modem, which is connected to the ISP

Direct Access

- This is the most common method used when traveling
- The device is connected directly to the ISP's network via a wireless connection, 3G, 4G, or 5G

Software vs Hardware

Software

Definition: Software is a program or set of instructions which are to be executed by The CPU to do the intended task.

Tangibility: Software is intangible.

Categories: Programming Software, Application Software, Operating Systems.

Digital Transfer: Software can be transferred electronically.

Replacement: If software get damaged, it is reinstalled.

Programming: Software can be developed in machine language, assembly language, or high-level language.

Examples: Microsoft Word, Adobe Photoshop, etc.

Hardware

Definition: Hardware is a set of physical parts of computers which actually executes the instructions.

Tangibility: Hardware is tangible.

Categories: Input Devices, Output Devices, Storage Devices, Internal Components of CPU and motherboard.

Digital Transfer: Hardware can be only physically transferred.

Replacement: If hardware gets damaged, it is replaced.

Programming: Hardware understands only machine language.

Examples: Keyboard, Mouse, Monitor, etc.

Mac vs windows

Mac

Pros:

- Stability and reliability
- Aesthetic appeal
- User-friendly design
- Potential long-term savings
- Less prone to malware
- Strong resale value
- Seamless integration with other Apple products

Cons:

- High upfront price
- Software is less readily available
- Harder to fix

Windows

Pros:

- Affordability
- Hardware flexibility
- Customizability
- Widely available support and software
- More options for compatible accessories
- Easier to repair
- More common

Cons:

- Lower resale value
- More prone to viruses
- Some configurations are less stable and/or reliable