OCR Computer Science GCSE

1.3 - Computer networks, connections and protocols

Flashcards

What is a LAN?

What is a LAN?

Local Area Network - a network that covers a relatively small geographical area like a school or office.

What is a WAN?

What is a WAN?

Wide Area Network - covers a large geographical area, usually made up of several LANs connected together and under collective ownership.

Give one difference between a LAN and a WAN.

Give one difference between a LAN and a WAN.

LANs cover a small geographical area and are privately owned; WANs cover larger geographical areas and are often under collective ownership.

Name two factors that affect the performance of networks.

Name two factors that affect the performance of networks.

Bandwidth and the number of devices connected.

Define bandwidth.

Define bandwidth.

The maximum amount of data that can be transmitted over a network within a given time.

How does bandwidth affect the performance of networks?

How does bandwidth affect the performance of networks?

A higher bandwidth allows for faster data transfer and better overall performance. Insufficient bandwidth can lead to slow loading times.

How does the number of devices affect the performance of networks?

How does the number of devices affect the performance of networks?

As more users connect and access the network, the available bandwidth must be shared, potentially slowing down everyone's connection.

Describe the role of servers in a client-server network.

Describe the role of servers in a client-server network.

Control the network and provide services and resources to clients. They wait for requests from clients and then respond to them.

Describe the role of clients in a client-server network.

Describe the role of clients in a client-server network.

Clients are the computers that humans use on a network, such as phones and laptops. They send requests to servers and then wait for responses.

True or false: a central server controls a peer-to-peer network.

True or false: a central server controls a peer-to-peer network.

False. There is no central server controlling the network, so files and services are shared directly between devices.

Describe the role of wireless access points.

Describe the role of wireless access points.

Wireless access points use radio transceivers to allow devices to connect wirelessly to a network.

Describe the role of routers.

Describe the role of routers.

To connect two or more networks together.

Describe the role of switches.

Describe the role of switches.

Connects devices on a network, receiving data packets for all of the clients and sending them only to the correct device.

Describe the role of NICs (Network Interface Controllers/Cards).

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Hardware components inside devices that enable them to connect to networks, converting data into signals that can be transferred across a network.

Describe transmission media.

Describe transmission media.

The physical or wireless methods used to carry data around the network.

What is the internet?

What is the internet?

A network of computer networks.

What is the DNS (Domain Name System)?

What is the DNS (Domain Name System)?

A system made up of multiple Domain Name Servers that convert URLs into IP addresses that computers use to find and communicate with each other.

What is hosting?

What is hosting?

The process of storing a website's files on a server and making it accessible to users over the internet.

What does a web server do?

What does a web server do?

Stores and provides access to web pages.

What does a file server do?

What does a file server do?

Allows clients to store their files and retrieve them.

What does the cloud refer to?

What does the cloud refer to?

Using remote servers over the internet to store files or run software and services.

State two advantages of the cloud.

State two advantages of the cloud.

- Accessible from anywhere (with an internet connection).
- No need to manage or upgrade hardware.

State two disadvantages of the cloud.

State two disadvantages of the cloud.

- Requires an internet connection
- Data may be less secure (stored on third-party servers)

Describe the star topology.

Describe the star topology.

All devices connect to a central switch or hub.

Name one advantage of the star topology.

Name one advantage of the star topology.

Easy to add or remove devices.

Name two disadvantages of the star topology.

Name two disadvantages of the star topology.

Should the central hub/switch fail, all communication over the network is stopped. Expensive to install due to the amount of cable required.

Describe the mesh topology.

Describe the mesh topology.

Each device is connected directly to multiple other devices in the network.

Name two advantages of the mesh topology.

Name two advantages of the mesh topology.

- Data can always take an alternative route if one device or connection fails.
- Data can be transferred quickly and efficiently using the shortest path available.

Name one disadvantage of the mesh topology.

Name one disadvantage of the mesh topology.

Requires a lot of cabling and network ports, especially in a fully connected mesh (every device is connected to every other device on the network).

Name a wired mode of connection.

Name a wired mode of connection.

Ethernet.

Name two wireless modes of connection.

Name two wireless modes of connection.

Wi-Fi and Bluetooth.

What is the main difference between wired and wireless networks?

What is the main difference between wired and wireless networks?

Wired use cables; wireless uses radio signals.

State three advantages of a wired network.

State three advantages of a wired network.

Faster, more secure, doesn't suffer interference.

State two advantages of a wireless network.

State two advantages of a wireless network.

More convenient, as users can move freely with their devices.

Modern devices are more likely to be designed to connect wirelessly.

What is encryption?

What is encryption?

A method of converting data into a coded format so that only authorised users with the correct decryption key can understand it.

What is IP addressing?

What is IP addressing?

A system for uniquely identifying devices connected to a network.

What is the format of IPv4 addresses?

What is the format of IPv4 addresses?

IPv4 addresses are 32-bit numbers, typically written as four decimal numbers separated by dots (e.g., 192.168.1.1).

What is the format of IPv6 addresses?

What is the format of IPv6 addresses?

IPv6 addresses are 128-bit numbers, expressed as eight groups of four hexadecimal digits, separated by colons (e.g., 2001:0db8:85a3:0000:0000:8a2e:0370:7334).

What is a MAC address?

What is a MAC address?

A unique identifier, permanently assigned to a device's Network Interface Controller (NIC) during its manufacture.

What is the format of a MAC address?

What is the format of a MAC address?

A 12-digit hexadecimal number, typically displayed in pairs separated by colons or hyphens, like 00:1A:2B:3C:4D:5E.

What are standards?

What are standards?

Agreed guidelines that provide rules for areas of computing.

What is a communication protocol?

What is a communication protocol?

A set of rules for transferring data.

Describe HTTP (Hypertext Transfer Protocol).

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HTTP is the protocol used for transferring web pages and other content between web servers and browsers. It defines how web browsers request pages and how web servers respond with the requested content.

Describe HTTPS (Hypertext Transfer Protocol Secure).

Describe HTTPS (Hypertext Transfer Protocol Secure).

HTTPS is the secure version of HTTP that encrypts data being transferred between web browsers and servers. It protects sensitive information like passwords and credit card details from being intercepted by hackers.

Describe FTP (File Transfer Protocol).

Describe FTP (File Transfer Protocol).

FTP is used to transfer files between computers over a network, such as the internet. It allows users to upload or download files to and from a remote server, often used for managing files on websites.

Describe POP (Post Office Protocol).

Describe POP (Post Office Protocol).

POP allows users to access their emails stored on a remote email server. It downloads emails to the client and typically removes them from the server, allowing access to messages offline.

Describe IMAP (Internet Message Access Protocol).

Describe IMAP (Internet Message Access Protocol).

IMAP allows users to access and manage their emails stored on a remote email server. It enables emails to be read and organised from multiple devices whilst keeping them synchronised on the server.

Describe SMTP (Simple Mail Transfer Protocol).

Describe SMTP (Simple Mail Transfer Protocol).

SMTP is used for sending emails from one email server to another across the internet. It handles the delivery of outgoing emails from your email client to the recipient's email server.

Name two benefits of using layers.

Name two benefits of using layers.

- Each layer is self-contained, so it can be developed and updated independently.
- It makes troubleshooting easier, since problems can be identified in a specific layer.