Network devices

A Level

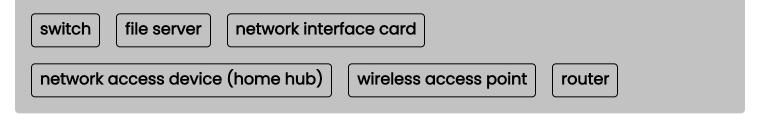


A network is a collection of interconnected computers and devices that communicate with each other to share information and resources. A range of different devices is used to create a network.

Match the correct name to the description for each of the following network devices.

Description	Device
Connects multiple computers or devices within a LAN and efficiently manages data traffic by forwarding data only to the intended recipient.	
Directs data between different computer networks, facilitating communication between devices within a local network and external networks, such as the internet.	
Enables a computer to connect to a network, providing the necessary interface for communication with other devices.	
Manages and connects various devices within a home network, providing features such as internet access, WiFi, and device communication.	
Provides centralised data storage and file-sharing services to multiple users and devices over a network.	
Allows WiFi-enabled devices to connect to a wired network using wireless communication.	

Items:







Bandwidth definition

A Level



In the context of computer networks, which of the following best defines the term **bandwidth**?

Choose one of the following options.

		The maximum spee	ed at which data	can be transmitted	l over a network
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) The number of	of devices	that can be	connected to	o a network
--	--	-----------------	------------	-------------	--------------	-------------

The geographical	area covered b	y a wireless	network
, ,		,	

(The	physical	width	of net	work	cables
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Network performance

A Level



Ethernet is a very common communication protocol for local area networks.

In a busy Ethernet netwo	ork,	are po	ssible. Thi	s will occur whe	en two or more	
devices attempt to		at the same ti	me. This c	an really slow c	down a network	
because communication	on must s	top, and the c	omputers	must wait a	amou	ınt
of time before attempti	ng to	agai	n.	\		
One solution is to use		Ethernet. In	this type c	of network,	are	
replaced by	, which	manage data	traffic by	forwarding dat	a only to the	
intended recipient.						
Items:						
fixed random switched	routers	collisions	hubs	communicat	switches	





Network performance



Transmission across shared network media has to contend with	. This is where
multiple signals are sent on the network at the same	. This is unavoidable on
any network of more than a couple of computers.	
If there is a collision the signals cannot reach their destination. D send must stop and wait for a	, •
Items:	
time collisions set interference random	





Wireless connection issues 2

A Level



Sanjit is working from home but has found that his WiFi connection is variable. Complete the following paragraph that describes some potential problems and their causes, by dragging and dropping the words from the list provided into the correct place to complete the text.

A good WI	reless connection need	as a strong	i nis co	an be attecte	a by the
,	of the device from t	the wireless access	s point. If this	is a problem	, Sanjit could
use a [, which will reb	oroadcast the wire	less signal.		
Another p	otential problem is	, which co	an be caused	d by other de	vices that
broadcast	t on the same	. If this is an iss	sue, Sanjit co	uld change t	he
so that the	ere is less contention.				·
If the conr	nection is still a probler ; this can sometime	, ,		the device u	ising a
interfer	rence cable rep	peater signal	distance	channel	frequency





IP addresses 1

A Level



IP addresses are used to identify devices connected to the internet.

IPv4 is the original addressing scheme; each IPv4 address is 32 bits. A newer addressing scheme, IPv6, uses 128-bit addresses.

	Which of the f	ollowing	addresses	is a vali	id IPv4	address?
--	----------------	----------	-----------	-----------	---------	----------

255.254.253.25	52
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	172.16.257.100
--	----------------

256.1.100.0	20
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IP addresses 2

A Level



IP addresses are used to identify devices connected to the internet.

Under which circumstances is it possible for a device on a local area network to have the same IP address as a device on a different local area network?

	When	the two	devices	are each	aiven a	non-routable	addrace
.)	wnen	เทษ เพอ	devices	are each	aiven a	non-roulable	adaress.

	Whon the	two dovices	are protected	hv a	firowall
)	vvnen me	TWO DEVICES	are profested	DV U	III 🖯 VV CIII

(When the two	devices use	different ne	etwork p	orotocols
---	--	--------------	-------------	--------------	----------	-----------

When the two devices will never communicate with e	each other
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IP addresses 3

A Level

An IP address is split into two parts. The first part is the network ID and the second part is the host ID.

If the length of the network ID is 24 bits, how many hosts can there be on the network?





Routers 1

A Level



The internet is a global network. It is estimated that there are over 750 million routers in use across the internet.

What is the role of a router?

It splits data into packets and attaches a packet header so the packet can be
routed.

It inspects a packet for the destination IP address and then routes the packet
towards its destination.

It allows wireless devices on a home network to connect to the internet so that
wireless messages can be routed.





Routers 2

A Level



Routing is the process of moving packets from one router to another from a source network to a destination network.

Consider the process of a webpage being sent from a web server to a web client (i.e., the browser that requested the page).

Put the following steps into order to describe the journey from the server to the client.

Available items

The destination IP address is inspected. It is not on the local network, so the packet is sent to the default gateway.

The packet is routed across the internet. At each stage, the destination IP address is inspected and the packet is sent on until it reaches the destination network.

The destination address of the client is added to each packet header.

At the destination network, the packets are directed to the client that made the request.

The HTML document (that represents the webpage) is split into packets.

The packets are reassembled and the page is displayed.



