# End of Unit Quiz – Unit 1.5 Network topologies, protocols and layers

1. Draw the links between four workstations using a full mesh network topology.

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1. You are setting up a new network using a Star network topology. Draw the Star network topology using two workstations, a server and a switch.

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1. What are **two** reasons why you may have chosen to use a Star network topology?

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1. What are **two** disadvantages of using a Star network topology instead of a Mesh network toplogy?

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1. What is the definition of ‘protocol’?

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1. What does the term **POP** stand for?

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1. What is the protocol that is used to transmit data between different networks?

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1. What is the difference between **HTTP** and **HTTPS**?

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1. Data is transmitted across a network in packets. What are **three** items that each data packet will contain?

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1. Draw three lines to match the protocol to the characteristic.

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| HTTP |  | Used to retrieve emails |
| IMAP |  | Used by web browsers to communicate with web servers. |
| SMTP |  | Used to send emails. |

1. Protocols are divided into layers. Why are layers used?

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1. Packet switching is used to send data on the internet. How does packet switching work?

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1. What is the difference between an IP address and a MAC address?

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1. What difference us a user likely to experience when upgrading from a b series router to an n series router?

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1. Explain the reason behind your answer to question 14.

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1. Devices may have either a static or dynamic IP address. What is the difference between a static and dynamic IP address?

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1. Convert the following 6 byte number into hexadecimal.

10100110:11000001:10010000:00010010:10011110:00110110

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1. List the following steps which detail the encryption process in the correct order:
* Client requests HTTPS session
* Encrypted session key is sent to the server
* The session key is decrypted with the private key
* Session encrypted with session key
* Client creates session key
* Certificate sent to client from the server

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1. What does the acronym **FTP** stand for?

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* 1. What does the acronym **POP3** stand for?

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* 1. What is the purpose of **POP3**?

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1. Fill in the table below with either true or false.

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| **Statement** | **True / False** |
| A peer-to-peer network has one central controlling computer. |  |
| Peer-to-peer networks are easier to set up than client-server networks. |  |
| Peer-to-peer networks allow individual devices to share files between each other. |  |
| Peer-to-peer networks are commonly used in large organisations. |  |
| It is easier to implement security procedures throughout a client server network than a peer to peer network. |  |

**Answers**

1. Draw the links between four workstations using a full mesh network topology.

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| All workstations must be connected to each other.  |

1. You are setting up a new network using a Star network topology. Draw the Star network topology using two workstations, a server and a switch.

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| WorkstationSwitchWorkstationServer |

1. What are **two** reasons why you may have chosen to use a Star network topology?

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| * They are very reliable.
* If one connection fails it does not affect the rest of the network.
* It is relatively easy to add additional devices onto the network.
* It is relatively fast as each device has its own connection to the switch / server.
* There are few data collisions.
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1. What are **two** disadvantages of using a Star network topology instead of a Mesh network topology?

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| * There is a high level of dependence on one single, central device.
* If the central device fails the whole network will fail.
* The use of a switch or router could increase the cost of the whole network.
* The performance of the network will be dependent upon the specification of the central device / switch.
* The number of additional devices that can be added to the network could be restricted by the central device / switch.
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1. What is the definition of ‘protocol’?

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| A set of rules that govern how devices communicate. |

1. What does the term **POP** stand for?

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| Post office protocol. |

1. What is the protocol that is used to transmit data between different networks?

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| Transmission Control Protocol / Internet Protocol. TCP/IP. |

1. What is the difference between **HTTP** and **HTTPS**?

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| HTTP transmits data over the internet in a unsecure format whereas HTTPS uses encryption so that any data that is intercepted is meaningless. |

1. Data is transmitted across a network in packets. What are **three** items that each data packet will contain?

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| * Network address source
* Network address destination
* Packet number / sequence
* Error detection codes
* Payload
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1. Draw three lines to match the protocol to the characteristic.

|  |  |  |
| --- | --- | --- |
| HTTP |  | Used to retrieve emails |
| IMAP |  | Used by web browsers to communicate with web servers. |
| SMTP |  | Used to send emails. |

1. Protocols are divided into layers. Why are layers used?

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| * Network communication components are standardised which helps to ensure that different types of hardware and software are able to communicate.
* Through separating the overall network communication processes it makes troubleshooting easier should an error occur.
* To ensure that if changes are made in one layer they do not affect any other layers
* Through dividing overall network communication into smaller, individual components it makes the software development process more straightforward.
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1. Packet switching is used to send data on the internet. How does packet switching work?

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| * Data is split into individual packets
* Each packet is given a packet number which shows the numerical order of the packet
* The router reads the packet and sends it on to the next location
* The receiving device will read the packet number and reassemble the data in the correct order
* As the device reassembles the data from the packets if a packet is missing it will send an error message to the sending device requesting that the packet is resent
* The sending device will resend the packet
* Once all of the packet are received and reassembled the receiving device will calculate the checksum to ensure that none of the data has become corrupted
* A confirmation message will be send from the receiving device to the sending device.
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1. What is the difference between an IP address and a MAC address?

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| A MAC address is permanently assigned to a device on the network whereas an IP address may change when the device joins a different network. |

1. What difference us a user likely to experience when upgrading from a b series router to an n series router?

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| The user is likely to experience faster data transmission (accept a faster network speed). |

1. Explain the reason behind your answer to question 14.

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| The 5GHz frequency offers additional bandwidth over the 2.4GHz frequency. The 5GHz frequency is capable of carrying more non-overlapping channels which will result in less interference. |

1. Devices may have either a static or dynamic IP address. What is the difference between a static and dynamic IP address?

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| A static IP address never changes, whereas a dynamic IP address may change when you log on to a network or change networks. |

1. Convert the following 6 byte number into hexadecimal.

10100110:11000001:10010000:00010010:10011110:00110110

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| A6:C1:90:12:9E:36 |

1. List the following steps which detail the encryption process in the correct order:
* Client requests HTTPS session
* Encrypted session key is sent to the server
* The session key is decrypted with the private key
* Session encrypted with session key
* Client creates session key
* Certificate sent to client from the server

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| * Client requests HTTPS session
* Certificate sent to client from the server
* Client creates session key
* Encrypted session key is sent to the server
* The session key is decrypted with the private key
* Session encrypted with session key
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1. What does the acronym **FTP** stand for?

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| File Transfer Protocol. |

* 1. What does the acronym **POP3** stand for?

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| Post Office Protocol version 3. |

* 1. What is the purpose of **POP3**?

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| To retrieve emails, only award the mark for retrieve (or similar). The protocol cannot be used to send emails. |

1. Fill in the table below with either true or false.

|  |  |
| --- | --- |
| **Statement** | **True / False** |
| A peer-to-peer network has one central controlling computer. | False |
| Peer-to-peer networks are easier to set up than client-server networks. | True |
| Peer-to-peer networks allow individual devices to share files between each other. | True |
| Peer-to-peer networks are commonly used in large organisations. | False |
| It is easier to implement security procedures throughout a client server network than a peer to peer network. | True |

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