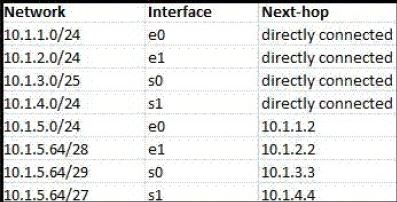
**Question 1:**



According to the routing table, where will the router send a packet destined for 10.1.5.65? Why?

Answer: The answer would be 10.1.3.3 as 10.1.5.64/29 is the longest-Prefix-Match to 10.1.5.65.

**Question 2:**

Classless Inter-domain Routing (CIDR) receives a packet with address 131.23.151.76. The router’s routing table has the following entries:

Prefix Output Interface Identifier

131.16.0.0/12 3

131.28.0.0/14 5

131.19.0.0/16 2

131.22.0.0/15 1

The identifier of the output interface on which this packet will be forwarded is \_\_\_\_\_\_. Why?

Answer: Output Interface Identifier of 1 as the binary values for 131.22.0.0/15 matched the most with 131.23.151.76

**Question 3:**

Consider the following routing table of a router.

| **PREFIX** | **NEXT HOP** |
| --- | --- |
| 192.24.0.0/18 | D |
| 192.24.12.0/22 | B |

Consider the following three IP addresses, what their next hop will be?

1. 192.24.6.0
2. 192.24.14.32
3. 192.24.54.0

Answer: D, B, D

**Question 4:**

Draw an TCP header. Capture packets using Wireshark and explain the fields for a particular TCP packet captured. Try to explain the purpose of each field.

|  |  |  |  |
| --- | --- | --- | --- |
| Source Port  443 | | | Destination Port  52552 |
| Sequence number  25  8034724 (raw) | | | |
| Acknowledgement number  1  3265556351 (raw) | | | |
| DO  20 bytes | RSV | Flags  0x011 | Window  501 |
| Checksum  0x6388 | | | Urgent Pointer  0 |
| Options | | | |

Source port: 16-bit fields that specifies the port number of the sender

Destination port: 16-bit fields that specifies the port number of the receiver

Sequence number: 32-bit fields that indicates how much data is sent during the TCP sessions

Acknowledgement number: 32-bit field used by the receiver to request the next TCP segment

DO: 4-bit data offset field, also known as the header length. Shows where the actual data begins

RSV: 3 bits for the reserved field

Flags: 9 bits field and is used to established connections, send data and terminate connections

Window: 16-bit window field show how many bytes the receiver is willing to receive

Checksum: 16 bits are used to check if the TCP header is okay or not

Urgent pointer: 16 bits are used to indicate where the data ends

Options: optional field and can be anywhere between 0 and 320 bits

**Question 5:**

Draw an UDP header. Capture packets using Wireshark and explain the fields for a particular UDP packet captured. Try to explain the purpose of each field.

|  |  |
| --- | --- |
| Source port  443 | Destination port  54972 |
| UDP Length  36 | UDP checksum  0x96e6 |
| Data  28 bytes | |

Source port: 2-byte long field to identify the port number of the source

Destination port: 2-byte long field to identify the port number of the destination port

UDP length: length of the UDP including the header and the data. 16 bits field

UDP checksum: Allows the receiving device to verify the integrity of the packet header and payload