The Transport Layer

Total points 4

1. What ordering of TCP flags makes up the Three-way Handshake? **1 / 1 point**

- ○ SYN, ACK, SYN, ACK
- ○ SYN, ACK, FIN
- ◉ SYN, SYN/ACK, ACK
- ○ FIN, FIN/ACK, ACK

Correct
Great work! The computer that wants to establish a connection sends a packet with the SYN flag set. Then, the server responds with a packet with both the SYN and ACK flags set. Finally, the original computer sends a packet with just the ACK flag set.

2. Transport layer protocols, like TCP and UDP, introduce the concept of a port. How many bits is a port field? **1 / 1 point**

- ○ 4 bits
- ○ 8 bits
- ◉ 16 bits
- ○ 32 bits

Correct
Nice job! A TCP or UDP port is a 16-bit number, meaning there are theoretically 65,535 possible values it can have.

3. Please select all valid TCP control flags. **1 / 1 point**

- [x] ACK

Correct
Nice job! ACK is short for acknowledged and means that the data was received.

- [ ] LISTEN
- [ ] WAIT
- [x] RST

Correct
You got it! RST is used to reset a connection if something has gone wrong.

- [ ] CLOSE
- [x] URG

Correct
You nailed it!

4. A device that blocks traffic that meets certain criteria is know as a _____. **1 / 1 point**

- (•) Firewall
- ( ) Router
- ( ) Switch
- ( ) Hub

Correct
That's right! A firewall is used to block certain defined types of traffic.

The Application Layer

Total points 3

1. Unlike our five-layer model, the OSI network model adds two more layers on top of the Application Layer. Select examples of these new layers below. **1 / 1 point**

- [x] The presentation layer

Correct
Great work! The presentation layer might handle things like compression or encryption.

- [ ] The encryption layer
- [ ] The interconnection layer
- [ ] The compression layer
- [x] The session layer

Correct
Nice job! The session layer handles delivery of data from the transport layer to applications themselves.

2. An example of something that operates at the application layer is: **1 / 1 point**

- (•) A web browser
- ( ) UDP
- ( ) A router
- ( ) TCP

Correct
Wohoo! Web browsers and server operate at the application layer.

3. What's the standard number for a TTL field? **1 / 1 point**

- ○ 8
- ○ 16
- ○ 32
- ◉ 64

Correct
Awesome! While this value can be set to anything from 0 to 255, 64 is the recommended standard.

1. Question **1 / 1 point**

Ports 1024-49151 are known as _____ ports.

- ○ system
- ◉ registered
- ○ destination
- ○ source

Expand

Correct
Yep! Registered ports are used by less common applications.

2. Question **1 / 1 point**

The instantiation of an endpoint in a potential TCP connection is known as a _____.

- ◉ socket
- ○ port
- ○ sequence number
- ○ TCP segment

Expand

Correct
Well done! A socket connects the networking stack of an operating system to applications.

3. Question

1 / 1 point

HTTP is an example of a(n) _____ layer protocol.

- transport
- data-link
- application
- network

Expand

Correct
Right on! There are lots of application layer protocols, but HTTP is one of the most common ones.

4. Question

1 / 1 point

Application layer data lives in the ____ section of the transport layer protocol.

- data payload
- header
- footer
- flags

Expand

Correct
Awesome! The payload section of one layer contains the content of the layer above it.

5. Question

1 / 1 point

How many bits are used to direct traffic to specific services running on a networked computer?

- 12
- 32
- 16
- 8

Expand

Correct
Great work! A port is a 16-bit number that's used to direct traffic to specific services running on a networked computer.

6. Question

1 / 1 point

A network has the ability to direct traffic toward all of the receiving services. What provides this ability in the transport layer?

- (●) Multiplexing
- ( ) Demultiplexing
- ( ) Socket address
- ( ) File Transfer

Expand

Correct
Right on! Multiplexing in the transport layer means that nodes on a network have the ability to direct traffic toward many different receiving services.

7. Question

1 / 1 point

A Transmission Control Protocol (TCP) connection is in working order and both sides can send each other data. What is the TCP socket state?

- (●) ESTABLISHED
- ( ) SYN_RECEIVED
- ( ) SYN_SENT
- ( ) LISTEN

Expand

Correct
Woohoo! The ESTABLISHED state means that the TCP connection is in working order and both sides are free to send each other data.

8. Question

1 / 1 point

Which field in a Transmission Control Protocol (TCP) header is chosen from ephemeral ports?

- Acknowledgement number
- Sequence number
- Destination port
- Source port

Expand

Correct
Awesome! A source port is a high-numbered port chosen from a special section of ports known as ephemeral ports.

9. Question

1 / 1 point

How many bits are reserved for the Transmission Control Protocol (TCP) flags?

- 10
- 8
- 6
- 4

Expand

Correct
You got it! 6 bits are reserved for the 6 TCP control flags.

10. Question

1 / 1 point

How many bits are in the checksum field in a Transmission Control Protocol (TCP) header?

- 16
- 12
- 8
- 4

Expand

Correct
Great work! The checksum field is a 16-bit field and is used to make sure no data was lost or corrupted during transmission.

11. Question

1 / 1 point

In what order will the Transmission Control Protocol (TCP) generally send all segments?

- Random
- Prioritized
- Sequential
- Largest to smallest

Expand

Correct
You nailed it! TCP will generally send all segments in sequential order.

12. Question

1 / 1 point

How many Transmission Control Protocol (TCP) control flags are there?

- 5
- 8
- 6
- 7

Expand

Correct
You got it! There are 6 TCP control flags.

13. Question

0 / 1 point

You are sending a very small amount of information that you need the listening program to respond to immediately. Which Transmission Control Protocol (TCP) flag will be used?

- URG
- PSH
- ACK
- RST

Expand

Incorrect
Not quite. Please review the videos in "The Transport and Application Layers" module for a refresher.

14. Question

1 / 1 point

Which Transmission Control Protocol (TCP) flag is used to make sure the receiving end knows how to examine the sequence number field?

- PSH
- SYN
- URG
- ACK

Expand

Correct
Well done! The SYN flag is used to make sure the receiving end knows how to examine the sequence number field.