

Tutorial 9: Transport Layer

- Q1. With reference to Figure 2, express in your own words the meaning of the output labelled A, B, C and D. (201409 TAR UC, Main) (4 marks)

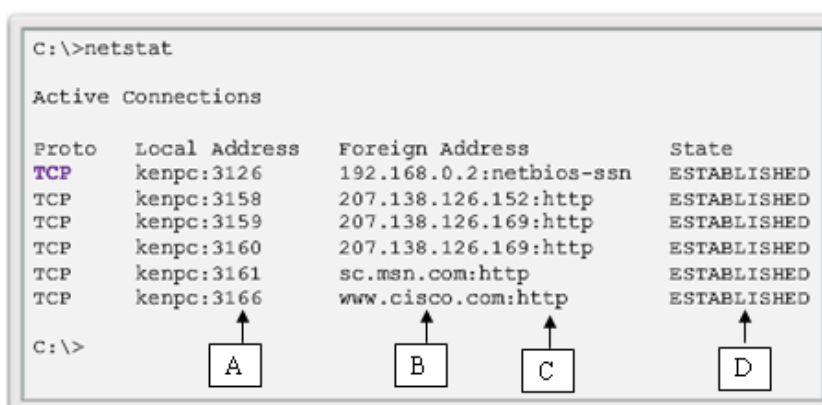


Figure 2: TCP connections running on a networked host

- Q2. Figure 1 is showing an output by using a command prompt of a host.

Active Connections			
Proto	Local Address	Foreign Address	State
X	127.0.0.1:49160	Sas-FoongCK:49161	ESTABLISHED
X	127.0.0.1:49161	Sas-FoongCK:49160	ESTABLISHED
X	127.0.0.1:49162	Sas-FoongCK:49163	ESTABLISHED
X	127.0.0.1:49163	Sas-FoongCK:49162	ESTABLISHED
X	127.0.0.1:49170	Sas-FoongCK:49171	ESTABLISHED
X	127.0.0.1:49171	Sas-FoongCK:49170	ESTABLISHED

Figure 1: Connection status of a host

- (i) What is the command that can be used to have an output of Figure 1? (201705 TAR UC, resit) (2 marks)
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- (ii) What is the protocol name that is labelled as X in Figure 1? (201705 TAR UC, resit) (1 mark)
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Q3. During a connection establishment, TCP0 opens a connection using an initial sequence number (ISN) of 4918. The other party, TCP1, opens the connection with an ISN of 24463. In data transfer phase, the TCP0 sends only one segment with data size of 1000 bytes. Then it sends a FIN segment to close the connection.

- (i) Draw a three-way handshake diagram to show the values of sequence number and acknowledgment number for the three Transmission Control Protocol (TCP) segments during the connection establishment. (201703 TAR UC, resit) (8 marks)

- (ii) TCP provides mechanisms for flow control. List and explain the field in TCP header that uses for flow control. (201703 TAR UC, resit) (5 marks)

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Q4. A video conferencing software allows two or more participants at different remote sites to engage in a live conference by using computer networks to transmit audio, video and text data. In addition, some video conferencing software allows users to communicate, share and collaborate on files.

- (i) In your opinion, what transport layer protocol is suitable to be used by a video conferencing software. (1 mark)

- (ii) Justify your answer by explaining your choice of transport layer protocol in Q3 (b) (i).

(3 marks)

- (iii) Examine how each of the video conferencing software is able to identify a conversation between each other with respect to a transport layer protocol. (6 marks)

- (iv) If a participant would like to send an e-mail to the other participants during the video conference, what transport layer protocol would be suitable for sending the e-mail?

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- (v) Justify your answer by explaining your choice of transport layer protocol in Q3 (b) (iv).

- (vi) Discuss the **THREE (3)** basic operations provided by the transport layer protocol in Q3 (b) (iv). (6 marks)
