Homework 6

Yuji Shimojo

CMIS 435

Instructor: Michael Tarquinio

November 29, 2015

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1) Compare and contrast TCP and UDP.

Although both TCP and UDP are layer 4 protocols, the biggest difference between them is whether connection oriented or connectionless. Because TCP is a connection oriented protocol, TCP communications go through procedures for connection establishment before data transfer, so that its segment header includes meta-information for that. For this reason, the size of a TCP segment header is 20 bytes. On the other hand, UDP is a connectionless protocol. The size of a UDP segment header is only 8 bytes because the header has just a source port number and a destination port number basically. For the different characteristics, TCP offers more accurate and stable communications in contrast to UDP which achieves rapid transmission of data.

2) Since TCP is a connection oriented protocol what would you expect to see in the TCP packet header that you would not see in a UDP header?

For UDP is connectionless , you wouldn't see an acknowledgement and control bits such as SYN, ACK, and FIN for connection establishment in a UDP packet header as like TCP's one. Also it doesn't include a 32-bit sequence number, which a TCP packet header has, to memorize the correct order of segments.

3) What mechanism in TCP allows a user to run multiple browser windows to different web sites over the same TCP transport layer?

Each communication application such as web browser is connected to a specific TCP port by using socket libraries of operating systems when they establish a TCP connection. At this time, the destination port is usually used a well-known port such as HTTP which has port number 80. Meanwhile, source port number is allocated a more than 1024 unique number

randomly. When you run multiple processes of the same application, each process has a different source port number and transmits and receives data separately. That's why you can run multiple web browser windows to different web sites.