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COMP429

L08: TCP: conn. mgmt.

*Due Friday 4/16/2021*

qanda

1. What field in the TCP header determines the length of the header?

**DO(Header Length) – It’s a 4 bit data offset field that indicates the length of the TCP header so that we know where the actual data begins**

1. What is the minimum and maximum number of bytes a TCP header can have.

**The mandatory TCP header is 20 bytes. The maximum TCP header size is 60 bytes.**

**If all of the bits in this field were “on,” the maximum value would be 15. Thus, a TCP header can be no larger than 60 bytes (15 × 32 bits = 480 bits = 60 bytes).**

1. It is not possible to have a 23 byte header, why not? What is used to pad the data?

**If it is not a multiple of 4 it is not possible to have a header. So for this problem 20 and 24 are multiples of 4 but 23 is not, so we must pad the data to reach 24 bytes. The 'options' field is variable length, and the padding field is used to bring packet header length to a multiple of 32 bits by adding** **enough zero bits. It is needed because of the varying length of the options field in the IP header.**

1. What is required for a TCP segment to be considered valid for a given connection?

**TCP Connection Establishment**

**•4 tuple (src/dstip/port)**

**•Pair of sockets define a connection**

**•Three phases of a connection:**

***•Setup***

***•Data transfer***

***•Teardown***

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1. You notice a TCP SYN packet with the same 4-tuple occurring at regular intervals in a packet capture. Those time interval since the first packet sent seems to be 2s, 4s, 8s, 16s, 32s, and 64s. What is this behavior called?

**Exponential Backoff.**

Use this [TCP Printout (Links to an external site.)](https://429.scrivnor.cikeys.com/TCP-packet.pdf) to answer the following questions:

1. The Ethernet header is 14 bytes, the IP header is 20 bytes, TCP header begins on the byte immediately after. Highlight the sequence numbers and acknowledgment numbers of each packet.
2. Draw a diagram, similar to Figure 13-1, and include the actual sequence/acknowledgment numbers of the exchange.
3. Add to your diagram, the TCP state each connection is in. See Figure 13-9 as a reference.