ECE 358 Assignment 4

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2. During the first hop, the MTU is 1000 bytes, but the initial packet is 20 + 1800 = 1820 bytes. Therefore, after fragmentation, f_1 will have 20 bytes of header and 976 bytes of payload since the offset has to be a multiple of 8 while maximizing the total packet size to less than 1000 bytes. Similarly, f_2 will have a header of 20 bytes and payload of the remaining 1800 - 976 = 824 bytes (offset of 122).

   Afterwards, f_1 undergoes fragmentation again with MTU of 500 bytes. The first part, $f_1.1$ will have 20 bytes for the header and 480 bytes for payload. The second part, $f_1.2$ will have 20 bytes for the header and 480 bytes for payload (offset of 60). The third part, $f_1.3$ will have 20 bytes for the header and 976 - 480 - 480 = 16 bytes for the payload (offset of 120).

   In conclusion, the final fragments received at the destination in order of offset is:

   - First fragment: ID = abcd, More fragments = 1, Fragment offset = 0, Total length = 500 bytes (480 bytes of payload)
   - Second fragment: ID = abcd, More fragments = 1, Fragment offset = 60, Total length = 500 bytes (480 bytes of payload)
   - Third fragment: ID = abcd, More fragments = 1, Fragment offset = 120, Total length = 36 bytes (16 bytes of payload)
   - Fourth fragment: ID = abcd, More fragments = 0, Fragment offset = 122, Total length = 844 bytes (824 bytes of payload)

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