

1. (Problem 4-4) Suppose a TCP message that contains 2048 bytes of data and 20 bytes of TCP header is passed to IP for delivery across two networks of the Internet. The first network uses 16-byte headers and has an MTU of 1500 bytes; the second uses 8-byte headers with an MTU of 512 bytes. Recall that each network's MTU gives the size of the largest link-layer frame (including layers 2 and 3 headers and layer-3 payload) that can be carried in the link layer. Give the sizes and offsets of the sequence of IP fragments delivered to the network layer at the destination host. Assume all IP headers are 20 bytes.
2. (Problem 4-8) What's the maximum bandwidth at which an IP host can send 576-byte packets without having the `Ident` field wrap around within 60 seconds? Suppose IP's maximum segment lifetime (MSL) is 60 sec, that is, delayed packets can arrive up to 60 sec late but no later. What might happen if this bandwidth were exceeded?
3. (Problem 4-13) Suppose hosts A and B have been assigned the same IP address on the same Ethernet, on which ARP is used. B starts up after A. What will happen to A's existing connections? Explain how "self-ARP" (querying the network on start-up for one's own IP address) might help with this problem.
4. (Problem 4-15) Refer to the network below, give global distance-vector tables for (1) initial distances stored at each node (global view) and (2) final distances stored at each node (global view) when
  - a. Each node knows only the distances to its immediate neighbors.
  - b. Each node has reported the information it had in the preceding step to its immediate neighbors.
  - c. Step (b) happens a second time.

**A global view distance-vector table for a 6-node graph**

Information stored at node	Distance to reach node					
	A	B	C	D	E	F
A	0	$\infty$	1	1	$\infty$	$\infty$
B						
C						
D						
E						

5. (Problem 4-17) Refer to the network below, show how the link-state algorithm builds the routing table for node D.

