Homework 2
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Chapter 2

7. Assuming zero transmission time of the object itself, the transfer time is simply $2RTT_0 + RTT_1 + RTT_2 + \ldots + RTT_n$ since RTT_0 is done twice. Once for the actual webpage and once the connection request.

8. (a) There needs to be $2RTT_0$ for the html file and another $2RTT_0$ for each of the objects. This means a total of $18RTT_0 + RTT_1 + RTT_2 + \ldots + RTT_n$ time elapses.

   (b) $2RTT_0$ for the initial html file, then another for the first 5 objects, and one more for the remaining objects. $6RTT_0 + RTT_1 + RTT_2 + \ldots + RTT_n$

   (c) $2RTT_0$ for the initial transfer and RTT_0 for the rest of the objects, for a total of $3RTT_0 + RTT_1 + RTT_2 + \ldots + RTT_n$

Chapter 4

1. If routers are prone to failure, then a VC network is optimal. With a VC network, a connection must be made first, this will ensure that the router is present before sending information to it. With a datagram network would have to set up new paths, along with update routing tables for routers that fail.

9. (a)

Prefix Match	Interface
11100000 00	0
11100000 01000000	1
11100000 01000001	2
11100001	2
Otherwise	3

   (b) It matches on prefix to determine that the first address should go through interface 3, and the other two should go through 2.

10.

Destination Address Range	# of Addresses	Interface #
0000 0000 through 0100 0000	64	0
0100 0001 through 0101 1111	30	1
0110 0000 through 1011 1111	95	2
1100 0000 through 1111 1111	63	3

15. 128.119.40.130 can be assigned on a subnet with the prefix 128.119.40.128/26. Four equal subnets would be:
    128.119.40.64/28
    128.119.40.80/28
    128.119.40.96/28
    128.119.40.112/28

17. Payload per fragment is the MTU less 20 bytes for IP header, so $680 \frac{\text{bytes}}{\text{fragment}}$, therefore the number of fragments is $\lceil \frac{2400-20}{680} \rceil = 4$. Each fragment will have an identification number of 422, be 700 bytes (except the last which will be 360 bytes), and have an MF flag of 1 (except the last will have a flag of 0).