Övningsuppgifter Lab 1

1.

$$d_{propagation} = \frac{d\,[m]}{s\,[m/sec]} = \frac{4800 \cdot 10^3\,[m]}{3 \cdot 10^8\,[m/sec]} = 0.016\,[sec]$$

$$d_{transmission} = \frac{L\,[bits]}{R\,[bps]} = \frac{10^6\,[bits]}{64 \cdot 10^3\,[bps]} = 15.625\,[sec]$$

8*10^6 bits
1*10^6 bits/sec
2*10^5 km/s propagation delay
1000*10^3(m)

transmission = 8*10^6 / 1*10^6 = 8 sec
propagation = 1000 * 10^3(m) / 2*10^8 (m/s) = 0,005sec
Total = 8 + 0,005 = 8,005 seconds

2.
2 Kbytes = 2*8 * 10^3 = 16*10 ^ 3bits
10Mbps = 10 * 10^6
Propagation delay = 20ms
Transmission delay = 16*10^3 / 10*10^6 = 0.0016
Total = 0.0016 + 0.020 = 0.0216 seconds = 21.6 ms

3a
1Mbps, because it is the slowest part between the hosts which will limit the capacity.

b. Bandwidth * delay = bandwidth delay product
(1*10^6) * (5 * 10 ^-3) + (10*10^6) * (10*10^-3) + (1*10^6) * (5 * 10 ^-3) = 110.000 bits = 13750 Bytes = 13.4KBytes

c. If the link between the routers would increase to 1Gbps the bandwidth delay product between the routers would increase to 10.000.000 bits instead of 100.000 bits. This would make the total bandwidth delay product to increase to 10.010.000 bits = 1,25MBytes

4. It is possible because of cookies. Cookies is a small set of data sent by the server to the client, and then stored by the web browser. The web browser then sends this data back to the server to keep track of the current state.

5. A domain name is a name that identifies a website. The name is created to make it easier for humans to remember, instead of remembering a specific ip-address for each website. The domain name is mapped to an ip-address.
An email is a unique identifier for each person to establish communication. The email address consists of two parts, the local part and the domain name. The part before “@” is the local part where each individual got their own address, and the part after where it identifies the domain name for the service provider.

6. Because HTTP uses TCP and establishes a connection for each request and response. This means that any requests do not rely on the previous requests. Since TCP is reliable and includes error detection it does not need any mechanism for retransmission.

7. Because the mail first goes through the mail server depending on which mail server the client uses. The mail server checks for spam or viruses, or if the recipient's inbox is full and then the server can store the email.

8. No it is not true. The use of “www” goes back in time where it was used to indicate that the web server was a part of the internet “world wide web”. It does not matter if “www” is used or not, it's a matter of preference. It is a default subdomain that has been standardized over the internet.