3.

transport layer: UDP, TCP

application layer: DNS, HTTP

7.

receive IP from DNS takes $\sum_{i=1}^{n} RTT_i$

setup TCP connection and object transmission takes $2RTT_0$

so in total: $2 * RTT_0 + \sum_{i=1}^{n} RTT_i$

23.

a) server sends to each clients with the exactly same rate $\frac{u_s}{N}$, in total, the whole amount is NF, the total speed is u_s, thus the time turns out to be NF/u_s.

b) server sends to each clients with the exactly same rate d_{min}, with respect to each client, the time is F/d_{min}.

c) with respect to the server, the total transmission size is NF, and the maximum transmission rate is $min\{u_s, Nd_{min}\}$, thus the minimum transmission time is given by $max\{NF/u_s, F/d_{min}\}$.

25.

N nodes and $\binom{N}{2}$ edges.

31.

a) the client cannot setup a TCP connection.

b) it works fine.

c) the client will send a connection request to the inappropriate port that the server does not listen on, thus no TCP connection will be set up.