CSEE W4119 Computer Networks

Homework 1

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1.

(a) d_{prop}=m/s (s)

(b) d_{trans}=L/R (s)

(c) delay=m/s + L/R (s)

(d) It just leaves Host A and it's at the start point of physical link.

(e) It has arrived at Host B.

(f) m = L/R * s = (100bits/28Kbps) * 25000m/s = 89.29m

2.

(a) 2RTTS*6=12RTTs

(b) 2RTs+2RTTs+2RTTs=6RTTs

2RTTs for index, 2RTTs for 1~4 images, RTTs for 5^{th} image

(c) 2RTTs+ 1RTT *5 = 7RTTs

2RTTs for index, 5RTTs for 5 images

(d) 2RTTs + 3RTTs = 5RTTs

2RTTs for index.html, 3RTTs for 5 images (pipelining).

3.

1001 server-side sockets are used, because server should have 1 socket to listen for incoming request, and arrange 1000 sockets to accept each connection.

1 port number, the only port number is bound with the listening socket.

4.

(a)

R = 1 Gb/s

d_{trans} = 1024B/1Gb s = (1024*8/1024/1024/1024)s ≈ 7.63 microsecond

distance = $2x10^8$ m/s * (130-7.63*2) microsecond ≈ 22948m

(b)

Average end to end delay measured was 142 microseconds,

so average number of packets queued in the router ≈ (142-130)/7.63 = 1.57