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CSE 310, HW 1

Ch. 1.5

P30)

The passengers and packages will be assigned numbers which identify each customers and their packages.

Ch. 2

P3)

For application layer, we need DNS protocol to know the IP address of requested host.

For transport layer, we need TCP as the underlying transport protocol of HTTP.

P4)

- a) gaia.cs.umass.edu/cs453/index.html
- b) 1.1
- c) Persistent
- d) gaia.cs.umass.edu
- e) The browser type is Mozilla 5.0 on Windows. The browser type is needed because the same Webpage may be treated differently depending on the browser type.

P5)

- a) The server successfully found the document on 12:39:45, Tuesday, 07 Mar

2008.

- b) 18:27:46, Saturday, 10 Dec 2005.
- c) 3874
- d) The first 5 bytes returned are: <!doc . The server did not agree to a persistent connection.

P7)

The total time is:

$$2RTT_0 + RTT_1 + RTT_2 + \dots + RTT_n$$

P8)

- a) $16RTT_0 + RTT_1 + RTT_2 + \dots + RTT_n$
- b) $4RTT_0 + RTT_1 + RTT_2 + \dots + RTT_n$
- c) $9RTT_0 + RTT_1 + RTT_2 + \dots + RTT_n$

P9)

a) $3 + (850000/15000000)/(1-16*(850000/15000000)) = 3.61 \text{ sec}$

b) The access delay is:

$$(850000/15000000)/(1-0.4*16*(850000/15000000)) = 0.089 \text{ sec}$$

The total respond time is (ignore the response time by cache):

$$0.4*(3+0.089) + 0.6*0 = 1.24 \text{ sec}$$

P10)

For non-persistent HTTP:

Time for the three-way handshaking of the 1st object:

$$3*(200/150) = 4 \text{ sec}$$

Time for transmitting the 1st object:

$$100000/150 = 666.67 \text{ sec}$$

Time for the three-way handshaking of the following 10 objects:

$$3*(200/(150/10)) = 40 \text{ sec}$$

Time for transmitting the following 10 objects in parallel:

$$100000/(150/10) = 6666.67 \text{ sec}$$

Time for the access delay:

$$8*10/(3*10^8) = 2.4*10^{-6} \text{ sec}$$

The total time taken is:

$$(7737.34 + 2.4*10^{-6}) \text{ sec}$$

For persistent HTTP:

Time for the three-way handshaking of the 1st object:

$$3*(200/150) = 4 \text{ sec}$$

Time for transmitting the 1st object:

$$100000/150 = 666.67 \text{ sec}$$

Time for requesting the following 10 objects:

$$10 * (200/150) = 13.33 \text{ sec}$$

Time for transmitting the following 10 objects in parallel:

$$10*100000/150 = 6666.67 \text{ sec}$$

Time for the access delay:

$$24*10/(3*10^8) = 7.2*10^{-6} \text{ sec}$$

The total time taken is:

$$(7350.67 + 7.2*10^{-6}) \text{ sec}$$

There is not significant differences between the performance of non-persistent and persistent HTTP.

P19)

a) The DNS servers answering are:

f.root-servers.net

l.edu-servers.net

nocnoc.stonybrook.edu

b) For google.com:

a.root-servers.net

b.gtld-servers.net

ns2.google.com

For yahoo.com:

a.root-servers.net

a.gtld-servers.net

ns1.yahoo.com.

For amazon.com:

h.root-servers.net

a.gtld-servers.net

pdns1.ultradns.net

P21)

Yes. We can use dig tool on the website, and see how long to receive a reply. If the time taken is extremely short, then it means that the IP address is already cached in the local DNS server, therefore we can infer that someone must have access the website recently.

P30)

Yes, the browser can be configured to open multiple simultaneous connections to a website. Advantages:

Data will be reliably transferred.

The response time will be shorter due to parallel connections.

Disadvantages:

Bandwidth will be exhausted, thus the downloading speed will be slower.