Xiangling Wu

110990426

xianwu

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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)

1. gaia.cs.umass.edu/cs453/index.html
2. 1.1
3. Persistent
4. gaia.cs.umass.edu
5. 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)

1. The server successfully found the document on 12:39:45, Tuesday, 07 Mar 2008.
2. 18:27:46, Saturday, 10 Dec 2005.
3. 3874
4. The first 5 bytes returned are: <!doc . The server did not agree to a persistent connection.

P7)

The total time is:

2RTT­0 + RTT1 + RTT2 + … + RTTn

P8)

1. 16RTT­0 + RTT1 + RTT2 + … + RTTn
2. 4RTT­0 + RTT1 + RTT2 + … + RTTn
3. 9RTT­0 + RTT1 + RTT2 + … + RTTn

P9)

1. 3 + (850000/15000000)/(1-16\*(850000/15000000)) = 3.61 sec
2. The access delay is:

(850000/15000000)/(1-0.4\*16\*(850000/15000000)) = 0.089 sec

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

0.4\*(3+0.089) + 0.6\*0 = 1.24 sec

P10)

For non-persistent HTTP:

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

3\*(200/150) = 4 sec

Time for transmitting the 1st object:

100000/150 = 666.67 sec

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

3\*(200/(150/10)) = 40 sec

Time for transmitting the following 10 objects in parallel:

100000/(150/10) = 6666.67 sec

Time for the access delay:

8\*10/(3\*10­8) = 2.4\*10-6 sec

The total time taken is:

(7737.34 + 2.4\*10-6) sec

For persistent HTTP:

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

3\*(200/150) = 4 sec

Time for transmitting the 1st object:

100000/150 = 666.67 sec

Time for requesting the following 10 objects:

10 \* (200/150) = 13.33 sec

Time for transmitting the following 10 objects in parallel:

10\*100000/150 = 6666.67 sec

Time for the access delay:

24\*10/(3\*10­8) = 7.2\*10-6 sec

The total time taken is:

(7350.67 + 7.2\*10-6) 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:

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