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Data Communications - I

HOME WORK - II

Kiran Shettar

UML ID - 01605800

Problem - 4

(a) URL of the document requested by the browser `http://gaia.cs.umass.edu/cs453/index.htm`

HOST → Servers name

File name → File name.

(b) The browser is running the HTTP version of 1.1. i.e HTTP/1.1

It is indicated on the first line.

(c) Persistent connection is requested by the Server i.e Connection: keep-alive

(d) We cannot determine the IP address from the result that we got from the GET request.

(e) The browser MOZILLA/5.0 initiates this message.

The browser type is needed in the HTTP message request because to get the correct message from different versions of the browser.

Problem 5

- (a) We can observe "200 OK" which means that the server was successfully able to find the document

The reply was provided for the document at 12:39:45 GMT on Tue, 07 Mar 2008

- (b) The document was last modified on Sat, 10 DEC 2005 at 18:27:46 GMT.

- (c) For the given HTTP response, we should observe the content-length : 3874. Therefore the document returned by the server contains 3874 bytes.

- (d) First 5 bytes of the document being returned are: <!doc

The server agreed to a persistent connection. Because we can see "keep-alive".

Problem 7

Time taken for DNS lookup

$$RTT_1 + RTT_2 + \dots + RTT_n$$

Since RTT between local host & server is RTT_0 , time to establish TCP connection will be RTT_0 .

Time to request & receive the object:

$$= RTT_0 + \text{transmission time}$$

$$= RTT_0 + 0$$

$$= RTT_0$$

∴ The amount of time taken when the user clicks the link & the object is received back is:

* Time taken for DNS lookup + Time to establish TCP connection + Time to send request and receive object

$$\text{i.e. } (RTT_1 + RTT_2 + \dots + RTT_n) + RTT_0 + RTT_0$$

$$\Rightarrow 2RTT_0 + (RTT_1 + RTT_2 + \dots + RTT_n) //$$

Problem 8

(a) Non-persistent HTTP with no parallel TCP connections:

As we have seen in the above problem, time to receive an object by the client is $2RTT_0$.

(4)

Time to receive 8 objects from the client is

$$8 \times 2 RTT_0 = 16 RTT_0$$

\therefore The amount of time that elapses from when a user clicks the link until the file including 8 objects is received by the client is:

$$16 RTT_0 + 2 RTT_0 + (RTT_1 + RTT_2 + \dots + RTT_n)$$

$$\underline{18 RTT_0 + (RTT_1 + RTT_2 + \dots + RTT_n)}$$

(b) Non-persistent HTTP with the browser configured for 5 parallel connections:

$$2 RTT_0 + (RTT_1 + RTT_2 + \dots + RTT_n) + 2 \times 2 RTT_0$$

$$= 6 RTT_0 + (RTT_1 + RTT_2 + \dots + RTT_n) //$$

(c) Persistent HTTP:

As the browser uses Persistent HTTP with pipelining connection, all the objects are received in 1 round trip time.

\therefore Total time to receive 8 objects from the client = RTT_0

\therefore The amount of time taken from when a user clicks the link until the file including 8 objects is received by client is $3 RTT_0 + (RTT_1 + RTT_2 + \dots + RTT_n) //$

Problem 20

We can take a snapshot of the DNS caches in the local DNS servers. If more users are interested in a particular web server, it appears more frequently in the DNS cache. The DNS requests for that server are more frequently sent by users. Thus, it'll appear more frequently in the DNS cache.

Like this we can determine the Web Servers that are most popular among the users in my department.