Homework 2

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1) UDP has fewer RTTs. With TCP you have to make a connection with the server for requests and replies.

2) Web caching brings content closer to the user by letting it be stored on that user’s LAN. Instead of having to go into the wider internet to get commonly referenced data, they can merely get it from the local network. Web caching reduces traffic on all objects, even those not cached, because it reduces the total traffic on the links to those objects.

3) The user has a unique cookie number that stores data about them. This e-commerce site would have this user’s cookie ID number tied to a function that returns their shopping history whenever they visit this site.

4) Download and delete erases your messages from your server once you collect them. For mobile users who want access to their emails and attachments, the download-and-keep method allows them to get those emails from other computers or devices, downloading the same emails multiple times across multiple machines.

5) Transport and application-layer protocols beyond HTTP? So, the methods in HTTP that are requesting data is HTTP’s GET method. In order to get the IP address of the server it wants to talk to, it needs to initiate a DNS request (which runs on UDP). After it gets the IP address, it initiates a TCP connection with the server. So, overall UDP and TCP for DNS and HTTP respectively.

6)

The time for parallel downloads will be approximately 7400 + (8\*One way propagation delay) seconds.

This is found by the time it takes to receive the first object, (3\*250/150) + 100000/150, plus the time it takes to receive the remaining objects now that bandwidth has been split amongst the objects, (3\*200/15) + 100000/15 seconds (not considering propagation delay).

Similarly, the time for persistent HTTP will also be approximately 7300 + (24\*Propagation delay) seconds. This can be shown as (3\*250/150) + 100000/150 + (200/150 + 10\*100000/150) seconds for the base (ie non-propagation delay transport time). If propagation delay for these ten objects is 10/300\*10^6, then each instance of propagation delay has a virtually negligible impact on the speed of either method.

So, a) yes, as it is not significantly different to persistent HTTP, and b) there are no real benefits between either method given this example.

7) Minimum distribution time is the maximum of {NF/us OR F/dmin} for client server. For P2P it is maximum of {F/us, F/di, NF/(us+∑ui)}.

