

P20. Suppose you can access the caches in the local DNS servers of your department. Can you propose a way to roughly determine the Web servers (outside your department) that are most popular among the users in your department? Explain.

We can take a snapshot of the DNS caches in the local DNS servers on a regular basis. The most popular Web server is the one that occurs most frequently in DNS caches. This is because when there are more users interested in a Web server, DNS requests for that server are sent more frequently. As a result, that Web server will show more frequently in DNS caches.

P22. Consider distributing a file of $F = 20$ Gbits to N peers. The server has an upload rate of $u_s = 30$ Mbps, and each peer has a download rate of $d_i = 2$ Mbps and an upload rate of u . For $N = 10, 100$, and $1,000$ and $u = 300$ Kbps, 700 Kbps, and 2 Mbps, prepare a chart giving the minimum distribution time for each of the combinations of N and u for both clientserver distribution and P2P distribution.

$$F = 20 \text{ Gbits} = 20 * 2^{10} \text{ Mbits}$$

Client to server:

	$N = 10$	$N = 100$	$N = 1000$
$u = 300\text{Kbps}$	$10 * 2^{10} \text{ sec}$	$200/3 * 2^{10} \text{ sec}$	$2000/3 * 2^{10} \text{ sec}$
$u = 700\text{Kbps}$	$10 * 2^{10} \text{ sec}$	$200/3 * 2^{10} \text{ sec}$	$2000/3 * 2^{10} \text{ sec}$
$u = 2\text{Mbps}$	$10 * 2^{10} \text{ sec}$	$200/3 * 2^{10} \text{ sec}$	$2000/3 * 2^{10} \text{ sec}$

P2P:

	$N = 10$	$N = 100$	$N = 1000$
$u = 300\text{Kbps}$	$10 * 2^{10} \text{ sec}$	$2000/33 * 2^{10} \text{ sec}$	$20000/33 * 2^{10} \text{ sec}$
$u = 700\text{Kbps}$	$10 * 2^{10} \text{ sec}$	$2000/37 * 2^{10} \text{ sec}$	$20000/37 * 2^{10} \text{ sec}$
$u = 2\text{Mbps}$	$10 * 2^{10} \text{ sec}$	$40 * 2^{10} \text{ sec}$	$400 * 2^{10} \text{ sec}$

P28. Install and compile the Python programs TCPClient and UDPClient on one host and TCPServer and UDPServer on another host.

a. Suppose you run TCPClient before you run TCPServer. What happens? Why?

If you run TCPClient before TCPServer there will be no connection because there was no handshake to confirm the connection.

P30. Can you configure your browser to open multiple simultaneous connections to a Web site? What are the advantages and disadvantages of having a large number of simultaneous TCP connections?

Yes, I can open multiple simultaneous connections to a web site at a time. This would allow you to download files faster. Disadvantage is now you are hogging bandwidth which effects the other users/people requesting and could affect download speed

P31. We have seen that Internet TCP sockets treat the data being sent as a byte stream but UDP sockets recognize message boundaries. What are one advantage and one disadvantage of byte-oriented API versus having the API explicitly recognize and preserve application-defined message boundaries?

Advantage: Applications that read/write byte streams, such as http, smtp, ssh, or telnet, have no notion of message boundaries so a byte stream protocol makes the most sense.

Disadvantage: Protocols that send a sequence of distinct messages would need a way to distinguish the end of one message and the start of the next one. Since TCP does not have a way to indicate message boundaries, the application needs to create its own mechanism for identifying them.

P32. What is the Apache Web server? How much does it cost? What functionality does it currently have? You may want to look at Wikipedia to answer this question.

The Apache webserver is a famous web server software in the world.

This software developed by group of volunteer programmers in the world and released at the year, 1995.

The cost of 'Apache webserver' is free as an open-source HTTP server. It is used by free to download.

The functionality of apache webserver is used for the HTTP protocol to send requests and responses from client to servers and vice versa.

The Apache webserver have a great modular architecture future. It is used to one to add or replace the existing features to extend the features easily.