CSCI4760
Quiz for Chapter 2

Name: ---------- Student ID: ----------

1. [1.5 pts] True or false?

a. DNS lookups often involve a combination of recursive and iterative queries.

b. In BitTorrent, a peer's instantaneous download rate can never exceed its instantaneous upload rate.

c. With nonpersistent connections between browser and origin server, it is possible for a single TCP segment to carry two distinct HTTP request messages.

d. Email is a loss tolerant application

e. Text messaging is a loss tolerant application.

f. Interactive games are loss tolerant applications.

g. TCP guarantee minimum throughput

2. [0.5 pts] Imagine that you are trying to visit www.enterprise.com, but you don't remember the IP address the web-server is running on.

   Assume the following records are on the TLD DNS server:

- (www.enterprise.com, dns.enterprise.com, NS)
- (dns.enterprise.com, 146.54.18.237, A)

Assume the following records are on the enterprise.com DNS server:

- (www.enterprise.com, west3.enterprise.com, CNAME)
- (west3.enterprise.com, 142.81.17.206, A)
- (enterprise.com, mail.enterprise.com, MX)
- (mail.enterprise.com, 247.29.58.207, A)

a. Which type of DNS server holds a company DNS records?
b. To which DNS server does a host send their requests to?
c. What is the name of DNS server for enterprise.com?
d. What is the IP address of Mail server for enterprise.com.
e. What is the IP address of web server for enterprise.com?

3. [0.5 pts] Look at the scenario below, where Alice sends an email to Bob.

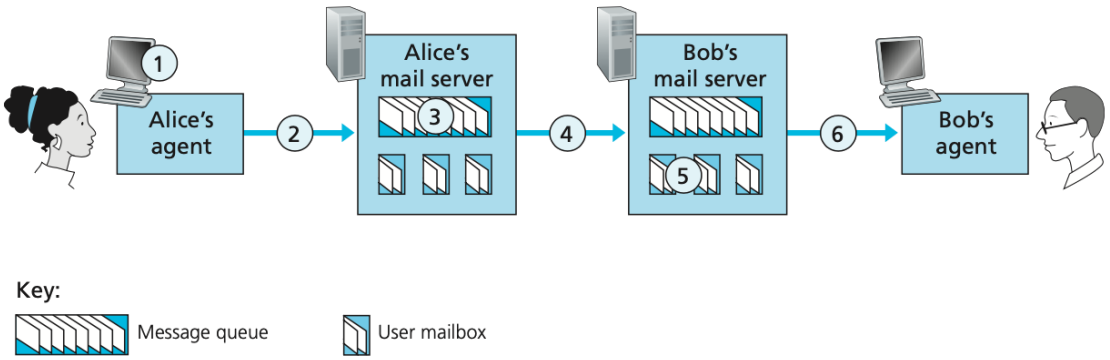
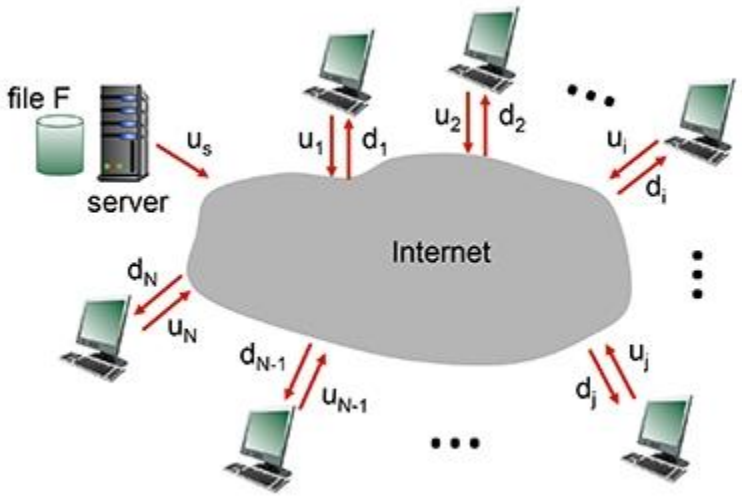


Figure 2.15 ♦ Alice sends a message to Bob

For the questions below, assume both Bob's and Alice's user agents use the HTTP protocol.

a. At point 2 in the diagram, what protocol is being used?
b. At point 4 in the diagram, what protocol is being used?
c. At point 6 in the diagram, what protocol is being used?

4. [0.75 pts] The problem is to distribute a file of size F = 5 Gbits to each of these 10 peers. Suppose the server has an upload rate of u = 66 Mbps, and that the 10 peers have upload rates of:
   u_1 = 26 Mbps, u_2 = 22 Mbps, u_3 = 13 Mbps, u_4 = 20 Mbps, u_5 = 23 Mbps, u_6 = 28 Mbps, u_7 = 10 Mbps, u_8 = 14 Mbps, u_9 = 30 Mbps, u_{10} = 14 Mbps,
   and download rates of:
   d_1 = 14 Mbps, d_2 = 26 Mbps, d_3 = 28 Mbps, d_4 = 38 Mbps, d_5 = 11 Mbps, d_6 = 28 Mbps, d_7 = 39 Mbps, d_8 = 28 Mbps, d_9 = 30 Mbps, d_{10} = 33 Mbps,



Answer the following questions:

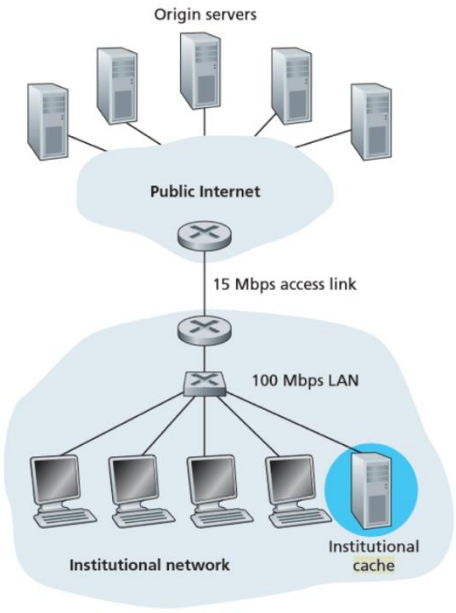
1. What is the minimum time needed to distribute this file from the central server to the 10 peers using the client-server model?
2. What is the minimum time needed to distribute this file using peer-to-peer download?

5. [0.25 pts] What is temporal redundancy on a video?

6. [0.25 pts] Explain bring home option in CDN?

7. [0.25 pts] What is the application of CDN?

8. [0.5 pts] In figure below, If the average request to browser is 2 Mbps and 60% of request satisfies at cache server and 40% satisfies at origin server. Suppose, RTT from institutional router to any origin server is 3 sec and LAN delay is 30 msec.
   a. Find total response time.
   b. What is the access link utilization?



9. [0.5 pts] Suppose the server-to-client HTTP RESPONSE message is the following:

HTTP/1.0 404 Not Found
Date: Mon, 05 Feb 2024 00:03:13 +0000
Server: Apache/2.2.3 (CentOS)
Content-Length: 327
Connection: Keep alive
Content-type: image/html

a. Was the server able to send the document successfully? Yes or No
b. How big is the document in bytes?
c. Is the connection persistent or nonpersistent?
d. What is the IP address of server?