Chapter 7: Sample Questions, Problems and Solutions
Bölüm 7: Örnek Sorular, Problemler ve Çözümleri

Örnek Sorular (Sample Questions):

- What is DNS?
- What is the DNS name space?
- What is resource record?
- What is resolver?
- What is user agent?
- What is message transfer agent?
- What is MIME (The Multipurpose Internet Mail Extensions)?
- What is SMTP (The Simple Mail Transfer Protocol)?
- What is POP3 (Post Office Protocol Version 3)?
- What is IMAP (Internet Message Access Protocol)?
- What is the browser? Give examples.
- What is hypertext?
- What is hyperlink?
- List the steps processed at the client side?
- List the steps processed at the server side?
- What is URLs (Uniform Resource Locators)?
- What is browser plug-in?

Örnek Problemler ve Çözümleri (Sample Problems and Solutions):

(Chapter 7, Problem 5)

DNS uses UDP instead of TCP. If a DNS packet is lost, there is no automatic recovery. Does this cause a problem and if so how is it solved?

ANS:
DNS is idempotent. Operations can be repeated without harm. When a process makes a DNS request, it starts a timer. If the timer expires, it just makes the request again. No harm is done.

(Chapter 7, Problem 7)

Can a machine with a single DNS name have multiple IP addresses? How could this occur?

ANS:
Yes. Remember that an IP address consist of a network number and a host number. If a machine has two Ethernet card, it can be on two separate networks, and if so, it needs two IP addresses.

(Chapter 7, Problem 16)

Suppose that you want to send an MP3 file to a friend, but your friend ISP limits the amount of incoming mail to 1 MB and the MP3 file is 4MB. Is there a way to handle this situation by using RFC822 and MIME?

ANS:
Yes, use the message / external-body subtype and just send the URL of the file instead of the actual file.

(Chapter 7, Problem 23)

When web pages are sent out, they are prefixed by MIME headers. Why?

ANS:
The browser has to be able to know whether the page is text, audio, video, or something else. The MIME headers provide this information.

(Chapter 7, Problem 29)

Imagine that someone in the CS Department at Stanford has just written a new program that he wants to distribute by FTP. He puts the program in the FTP directory ftp/pub/freebies/newprogram.c. What is the URL for this program likely to be?

ANS: The URL is probably
   ftp://www.cs.stanford.edu/ftp/pub/freebies/newprog.c

(Chapter 7, Problem 33-1)

How do you make the string "ACM" be a hyperlink to http://www.acm.org?

ANS:
It would be ACM

(Chapter 7, Problem 33-2)

How do you make an image clickable in HTML? Give an example.

ANS:
A hyperlink consists of and .
In between them is the clickable text.
It is possible to put an image here.
For example,
** <img src=http://www.abcd.com/im/im2> .**

(Chapter 7, Problem 35)

Design a form that requests the user to type in two numbers. When the user clicks on the submit button, the server returns their sum. Write the server side as a PHP script.
  Solution: The page that displays the form looks like this:
  <html>
  <head><title> Adder</title></head>
  <body>
  <form action="action.php" method="post">
  <p>Please enter the first number:<input type ="text" name="first"></p>
  <p>Please enter the second number:<input type ="text" name="second"></p>
  <input type="submit">
  </form>
  </body>
  </html>

  The PHP script that does the processing looks like this

  <html>
  <head><title> Addition</title></head>
  <body>
  The sum is <?PHP echo $first + $second;?>
  </body>
  </html>

(Chapter 7, Problem 45)

A compact disc holds 650 MB of data. Is compression used for audio CDs? Explain your reasoning. Hint: there is room for 3714 sec of audio on a 650 MB disc .

ANS:
Audio needs 1.4 Mbps, which is 175 KB/sec. On a 650-MB device, there is room for 3714 sec of audio, which is just over an hour. CDs are never more than an hour long, so there is no need for compression and it is not used.

(Chapter 7, Problem 48)

An audio streaming server has one-way distance of 50 msec with a media player. It outputs at 1Mbps. If the media player has a 1-MB buffer, what can you say about the position of the low-water mark and the high-water mark?

ANS:
It takes 50 msec to get a pause command to the server, in which time 6250 bytes will arrive, so the low-water mark should be way above 6350, probably, 50.000 to be safe. Similarly, the high-water mark should be at least 6250 bytes from the top, but, say 50.000 would be safer.

(Chapter 7, Problem 51)

What is the bit rate for transmitting uncompressed 800x600 pixel color frames with 8 bits/pixel at 40 frame/sec?
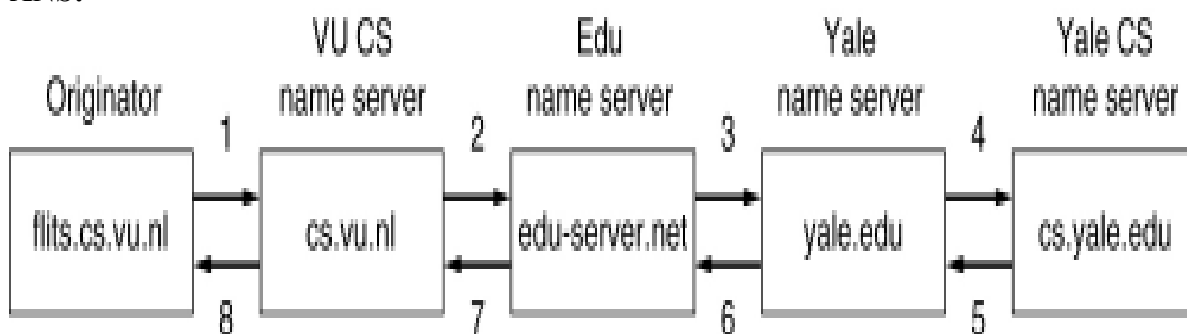
ANS:
The number of bits/sec is just 800x600x40x8 or 153.6 Mbps.

(Chapter 7.1.3)

What is a resolver and how it looks up a remote name? Give example.

ANS:

(Chapter 7.2.3)

What are MIME, SMTP, POP3 and IMAP? Give a short definition for each.

ANS:
MIME – The Multipurpose Internet Mail Extentions
SMTP – The Simple Mail Transfer Protocol
POP3 – Post Office Protocol Version 3
IMAP – Internet Message Access Protocol

(Chapter 7.3.1)

List the steps that occur at the client and server sides when http://www.itu.org/home/index.html is selected.

ANS:
At the client side:
  a) **Browser determines the URL**
  b) **Browser asks DNS for IP address of www.itu.org**
  c) **DNS replies with 156.106.192.32**
  d) **Browser makes a TCP connection to port 80 on 156.106.192.32**
  e) **It then sends over a request asking for file /home/index.html**
  f) **www.itu.org server sends the file /home/index.html**
  g) **TCP connection is released**
  h) **Browser displays all the text in /home/index.html**
  i) **Browser fetches and displays all images in this file**
At the server side:
  a) **Accept a TCP connection from a client (a browser).**
  b) **Get the name of the file requested.**
  c) **Get the file (from disk).**
  d) **Return the file to the client.**
  e) **Release the TCP connection**

(Chapter 7.4)

What are RTSP, JPEG and MPEG? Give a short definition for each.

ANS:
RTSP – Real Time Streaming Protocol
JPEG – Joint Photographic Experts Group
MPEG - Motion Picture Experts Group

(Chapter 7)

List the steps that occur at the client and server sides when http://www.itu.org/home/index.html is selected. Assume that IP address of www.itu.org is 156.106.192.32.

ANS:

At the client side:
   j) **Browser determines the URL**
   k) **Browser asks DNS for IP address of www.itu.org**
   l) **DNS replies with 156.106.192.32**
   m) **Browser makes a TCP connection to port 80 on 156.106.192.32**
   n) **It then sends over a request asking for file /home/index.html**
   o) **www.itu.org server sends the file /home/index.html**
   p) **TCP connection is released**
   q) **Browser displays all the text in /home/index.html**
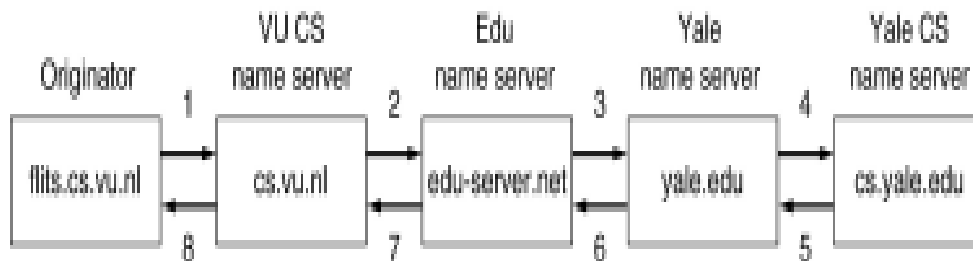   r) **Browser fetches and displays all images in this file**

At the server side:
   f) **Accept a TCP connection from a client (a browser).**
   g) **Get the name of the file requested.**
   h) **Get the file (from disk).**
   i) **Return the file to the client.**
   j) **Release the TCP connection**
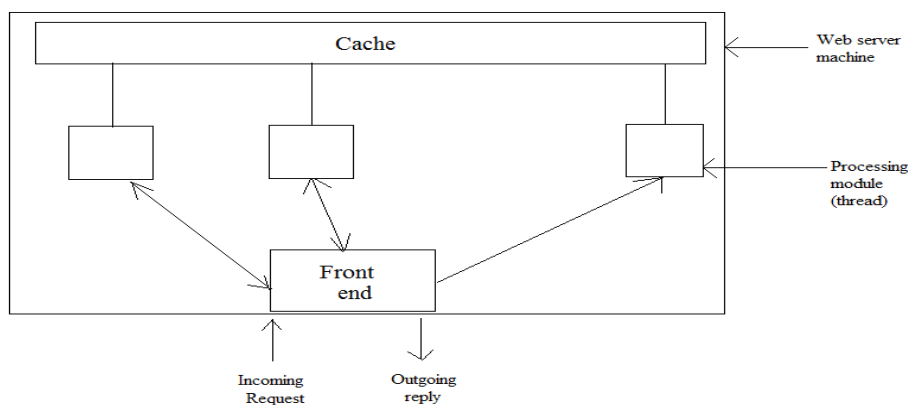

(Chapter 7, pp.587)

What is a resolver and how it looks up a remote name? Give example.

ANS:

(Chapter 7, Problem)

A multithreaded web server is organized as in following figure

It takes 500 nanosecond to accept a request and check the cache. Half the time the file is found in the cache and returned immediately. The block for 9 msec while its disk request is queued and processed. How many modules should the server have to keep the CPU busy all the time (assuming the disk is not a bottleneck)?

ANS:

If a module gets two requests, one will be a cache hit and one will be a cache miss on average. The total CPU time consumed is 1 msec, and the total wait time is 9 msec. This gives a 10% CPU utilization, so with 10 modules the CPU is kept busy.