CS 27400 Homework 2

Spring 2016

HW 2.1 (10 points) Assume that you have registered a domain name myCoolDomain.com for your new company with an Internet domain registrar. Suppose you outsource your authoritative DNS to the company vdns.com. The company vdns.com provides with you two DNS servers: dns1.vdns.com (IP address 222.222.222.1) and dns2.vdns.com (IP address 222.222.222.2). You host your own email server myCoolDomain.com in your computer myserver.myCoolDomain.com (IP address 111.111.111.1). Your website ([www.myCooolDomainl.com](http://www.myCooolDomainl.com) is outsourced to the company [webhost.com](http://www.webserverhost.com) at its computer webserver1.webhost.com (IP address 123.123.111.1) Please answer the following questions:

1. What DNS records should the TLD com’s DNS servers store for your company?

(webhost.com, dns1.vdns.com, NS) (dns1.vdns.com, 222.222.222.1, A)

(webhost.com, dns2.vdns.com, NS) (dns2.vdns.com, 222.222.222.2, A)

1. What DNS records should the vdns.com’s DNS servers store for your company?

(webserver1.webhost.com, 123.123.111.1, A)

(myCoolDomain.com, myserver.myCoolDomain.com, MX)

1. What DNS records should the webhost.com’s DNS server store for your company?

(myCoolDomain1.com, 123.123.111.1, A)

HW 2.2 (10 points) True or false?

1. A user requests a Web page that consists of some text and three images. For this page, the client will send one request message and receive four response messages.

False

1. Two distinct Web page (for example, [www.mit.edu/research.html](http://www.mit.edu/research.html) and [www.mit.edu/students.html](http://www.mit.edu/students.html)) can be sent over the same persistent connection

True

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

False

1. The Date: header in the HTTP response message indicates when the object in the response was last modified

False

1. HTTP response message never have an empty message body

False

HW 2.3 (10 points) The Chapter 2 Problem P9 in the Sixth edition of the textbook.

a) 850,000 / 15,000,000 = .0567 seconds

Traffic intensity = 16requests/sec \* .0567 sec/request = .907

Average access delay = .0567 / 1 - .907 = .6 seconds

Total average response time : .6 sec + 3 sec = 3.6 seconds.

b) average access delay is .0567 sec / (1 - .4 \* .907) = .089 seconds

response time is approx. zero if the request is satisfied by the cache which happens 60% of the time. The average response time is 3.089 seconds for cache misses (40% of the time).

Therefore, the average response time is .6 \* 0 + .4 \* 3.089 = 1.24 seconds.

HW 2.4 (10 points) The Chapter 2 Problem P13 and P14 in the Sixth edition of the textbook.

P13. The MAIL FROM: is a message from the SMTP client that identifies the sender of the mail message to the SMTP server, whereas the From: is not an SMTP message. It is just a line in the body of the mail message.

P14. SMTP uses a line containing only a period to mark the end of a message body. HTTP uses “Content-Length header field” to indicate the length of a message body. No, HTTP cannot use the method of SMTP because HTTP could be binary data. SMTP body messages must be in 7-bit ASCII format.

|  |  |  |  |
| --- | --- | --- | --- |
|  | 10 | 100 | 1000 |
| 300 | 12800 | 85333.33 | 853333.33 |
| 700 | 12800 | 85333.33 | 853333.33 |
| 2000 | 12800 | 85333.33 | 853333.33 |

HW 2.5 (10 points) Consider distributing a file of F=15 x 109 bits to N peers. The server has an upload rate of us = 30 Mbps, and each peer has a download rate of di = 2 Mbps and an upload rate of u. For N = 10, 100, and 1000 and u = 300 Kbps, 700 Kbps, and 2 Mbps, prepare a chart giving the minimum distribution time for each of the combination of N and u for both client-server distribution and P2P distribution.

Client-Server:

Peer-to-Peer

|  |  |  |  |
| --- | --- | --- | --- |
|  | 10 | 100 | 1000 |
| 300 | 12800 | 43172.60 | 79264.63 |
| 700 | 86687.83 | 87174.57 | 87268.59 |
| 2000 | 87278.23 | 87278.81 | 87278.92 |