**CS 372 Introduction to Computer Networks**

**Self-Check for Week #3 Solutions are posted**

1. A client’s browser sends an HTTP request to a website. The website responds with a handshake, and sets up a TCP connection. The connection setup takes 2 seconds, including the RTT. The browser then sends the request for the website’s index file. The index file references 6 additional objects, which are to be requested/downloaded by the client’s browser. How many requests (including the initial request) must be sent by the browser …
   1. with non-persistent HTTP ? - *12*
   2. with persistent HTTP ? - *2*
   3. Assuming that all other conditions are equal, which type of HTTP takes longer to complete the entire transfer? How much longer?

Persistent. *6 \* (sent + response)time*

1. An internet server, x.y.z.com, provides standard web services, and also provides standard mail services. Either service may be accessed via *telnet*. Show the *telnet* commands to access this server’s
   1. web services. - *telnet x.y.z.com 80*
   2. mail services. - *telnet x.y.z.com 25*
2. Why does the HTTP request message require an extra \r\n at the end of the header section?

*To break up the header and the message*

1. What are the major trade-offs implied by the use of cookies?

Provides authorization, recommendations, local storage of settings. Permits sites to learn a lot about the user, a lot of information is not held privately nor encoded

1. A client in a network with a proxy server requests a 3MiB file from an internet server, x.y.z.com. The network’s proxy server has a 1.54Mbps connection to x.y.z.com. The average response time between the network’s proxy server and the internet origin server (including RTT) is 2 seconds for a small “header-only” HTTP request/response. The file requested by the client is currently in the proxy server cache, but the proxy server relays the client’s request to the internet server with “if-modified since”. Assume that transmissions between the proxy and the origin servers are stream (not packets) at full bandwidth, with negligible propagation delay. How much time is saved if the file has not been modified?

*2 seconds*

1. Why does FTP open two connections for a file transfer?

*One to control the connection, one to actually transfer information across the connection*

1. What’s the difference between the POP3 and IMAP email protocols (from a user’s point of view)?

*POP3 requires messages to be stored locally if user wants to re-read. IMAP is stored on the server*

1. Why are separate protocols required for sending email and receiving email?

*Email is a push/pull system. Sending pushes the message to a host, receiving pulls the message from a host*

1. How many unique network interface hardware addresses are possible?

16 ^ 12 = 2.81 \* 10 ^ 14

1. How many unique 32-bit IP addresses are possible?

2 ^ 32 = 4,294,967,296

1. The dotted-decimal form of 32-bit internet addresses is composed of 4 decimal numbers, separated by periods. What is range of possible values for each of the four decimal numbers?

0 - 255

1. What organization manages the .org TLD?

Public internet registry

1. Suppose that we send a DNS request with ID # 46921.
   1. What is the little-endian representation (hexadecimal)?

B749

* 1. What is the big-endian representation (hexadecimal)?

947B

* 1. Which representation is required for network communication?

Little endian