Homework 2

Part I. **Problems** of **Chapter 2** in the textbook.

P1, P9

Part II. Additional problems.

II.1 Consider an HTTP client that wants to retrieve a web document at a given URL (for example, http://www.cs.nthu.edu.tw). The IP address of the HTTP server is initially unknown and therefore the HTTP client needs to get the corresponding IP address by using DNS lookup.

(a) What transport-layer protocol does DNS lookup need (in this scenario)?

(b) What transport-layer protocol does HTTP service need?

II.2 Suppose within your web browser you click on a link to obtain a webpage. The IP address for the associated URL is not cached in your local host, so a DNS lookup is necessary to obtain the IP address.

- Suppose that n DNS servers are visited before your host receives the IP address from DNS. The successive visits incur round-trip times of RTT_1, RTT_2, …, RTT_n, respectively.
- Suppose that the round-trip time between the local host and the HTTP server (associated with the URL) is RTT_0.
- Suppose that the base HTML file of the webpage references 8 objects on the same server.

Neglecting the transmission times of the base HTML file and the objects, how much time elapses with

(a) Non-persistent HTTP with no parallel TCP connections?

(b) Non-persistent HTTP with the browser configured for 5 parallel TCP connections?

(c) Persistent HTTP with pipelining?

(d) Persistent HTTP without pipelining (and without parallel connections)?

II.3 Establish a HTTP connection to www.cs.nthu.edu.tw/

(a) What is the status code of the response message?

(b) What does the HTTP response message mean?