EE201A - Homework 2

Design of a test sequence for the Embedded Webserver

The first phase of the project introduced a TCP/IP protocol stack annex webserver. The test sequence for the protocol stack was very simple - and actually did not trigger any real TCP or HTTP functionality. Indeed, the test sequence contained just a few ICMP-request messages which are intercepted very early during the processing of a packet.

An aspect as important to a design itself is the test sequence used to check if such a design works. In this homework, we will design a sequence of packets which will make the embedded webserver display the main html page.

We make the following assumptions:

***>** We are working on an Ethernet network. Thus, the lowest level of packets to process are Ethernet packets.

***>** We are connecting to the embedded webserver from a computer with the following address: IP 128.97.0.1, Ethernet AA:BB:CC:AA:BB:CC

***>** The embedded webserver has the following address: IP 128.97.88.190, Ethernet 00:BD:3B:33:05:71

***>** We will access the main html page through a sequence of standard TCP/IP packets, including ARP processing, setting up a TCP connection, and opening the main page of the HTTP server

For this phase of the project, you only need to work on standard C code running on a workstation. You can start from the package available at the project homepage. This set of files is slightly different from the ones in Homework 1, in particular: the content of the web server pages is different, and packets are provided to the webserver through a file.

The file packets.txt contains the list of packets read in by the webserver. As the simulation runs, all packets received and send out are printed out on-screen. The file format of packets.txt is an ASCII format that can be changed easily. Here is an example of a ping (ICMP) packet. Packets are delimited by round braces, and individual bytes are expressed in hexadecimal. Pound signs (‘#’) can be used for comments.

```
# example ping packet
(
00 10 67 00 b9 76         # src mac
00 00 39 16 20 9d         # dst mac
08 00                     # protocol = IP
45 00                     # 20-byte IP v4, diffserv 0
00 3c                     # length
9a 7d                     # identification
00 00                     # flags
```

```
20                          # TTL
01                          # ICMP
ba ea                       # header chk
04 29 68 11                 # src IP
80 61 58 be                 # dst IP
08                          # ping request
00                          # ping code
49 5c                       # checksum
03 00                       # identifier
01 00                       # seq number
61 62 63 64 65 66 67 68     # data
69 6a 6b 6c 6d 6e 6f 70
71 72 73 74 75 76 77 61
62 63 64 65 66 67 68 69
)
```

You have to design a series of packets which will display the main page of the web server. This sequence of steps includes (a) ARP resolution (b) Opening a TCP connection to port 80 of the webserver using SYN-SYNACK-ACK and (c) retrieving the web page by means of an HTTP ‘GET /’ command. When you provide the correct sequence of packets, the webserver will print the main page in html format on the console. The page contains a secret phrase. Can you extract this phrase ?

What to turn in

***>** Deadline: Thursday April 17, 2003, 12 noon at Marilyn’s desk.

***>** 1 page containing your name, and contact E-mail and the secret phrase. In addition, also provide a link to your EE201A project webpage and post the solution packets.txt on this page.

***>** Good Luck, use the Class Bulletin Board for any questions!