Exercises on Application Level Protocols
Solutions

Question : The HTTP protocol specifies

- the actions of various buttons on a web browser
- ⭐ the response header from a web server to a browser
- The way images are rendered on a browser window
- the type of browsers supported by the web server

Question: A socket is

- an IP and parallel/serial port combination on a host
- ⭐ Conceptual interface between applicaton and transport layer
- Software interface between client and server TCP layrs
- The software interface between client and server processes

Question: The purpose of a port number associated with an application is

- To enable the network layer routing
- ⭐ To uniquely identify the application for the transport layer
- For transport layer to connect to the remote machine's transport layer
- A purely programming construct with no real significance

Question pop3 protocol is based on (depends on):
Select all that apply

- IMAP
- SMTP
- ⭐ TCP
- UDP

Question: When you read mail using a web interface, (such as npmail.newpaltz.edu),you are possibly using
(Multiple Answers Possible)
- SMTP
- ⭐ POP3
- ⭐ HTTP
- ⭐ IMAP

Question: When you type in a URL such as http://www.newpaltz.edu in your browser, the name resolution of www.newpaltz.edu into the IP 137.140.1.18 is done by
(Multiple Answers Possible)
- ⭐ your browser
- the remote server application
- client (browser) TCP layer
- server TCP layer

I ssh'd from **my machine** to a **remote machine** and ran the command
netstat -an -P tcp
on that machine. The output is shown below. All the following questions pertain to this output.

Local Address	Remote Address	Swind	Send-Q	Rwind	Recv-Q	State
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.	*.*	0	0	49152	0	IDLE
.	*.*	0	0	49152	0	IDLE
*.22	*.*	0	0	49152	0	LISTEN
*.22	*.*	0	0	49152	0	LISTEN
*.21	*.*	0	0	49152	0	LISTEN
*.3852	*.*	0	0	49152	0	LISTEN
*.111	*.*	0	0	49152	0	LISTEN
.	*.*	0	0	49152	0	IDLE
*.37	*.*	0	0	49152	0	LISTEN
*.21	*.*	0	0	49152	0	LISTEN
*.23	*.*	0	0	49152	0	LISTEN
*.4045	*.*	0	0	49152	0	LISTEN
*.898	*.*	0	0	49152	0	LISTEN
*.9010	*.*	0	0	49152	0	LISTEN
*.32775	*.*	0	0	49152	0	LISTEN
*.32776	*.*	0	0	49152	0	LISTEN
*.32777	*.*	0	0	49152	0	LISTEN
*.6000	*.*	0	0	49152	0	LISTEN
137.140.1.116.41205	137.140.8.54.6000	49572	0	49040	0	ESTABLISHED
137.140.1.116.41206	137.140.8.54.6000	49100	0	49040	0	ESTABLISHED
137.140.1.116.41216	137.140.8.54.6000	49128	55	49288	0	ESTABLISHED
137.140.1.116.80	*.*	0	0	49152	0	LISTEN
137.140.1.116.80	137.140.29.62.1064	17520	0	49165	0	TIME_WAIT
137.140.1.116.80	136.1.1.33.27363	17520	0	48137	0	TIME_WAIT
137.140.1.116.56174	137.140.1.116.80	49152	0	49152	0	TIME_WAIT
137.140.1.116.56175	137.140.1.116.80	49152	0	49152	0	TIME_WAIT
137.140.1.116.22	137.140.8.105.54992	11040	0	49232	0	ESTABLISHED
137.140.1.116.80	137.140.51.46.1331	64777	0	48582	0	ESTABLISHED

Question: My machine's IP is

Answer: 137.140.8.105

There's only one connection to the ssh server on the remote machine - so it must be my ssh connection. Look at the penultimate row in the table above.

Question: The remote machine's IP is:

Answer: 137.140.1.116

Question: Is an SMTP server running on the remote host?

Answer: No (Nothing listening on port 25 used by SMTP)

Question: is there a web server running on the remote host?

Answer: Yes (A LISTEN process exists on port 80 of 137.140.1.116)

Question: Is someone on this machine surfing the web?

Answer: Yes

Look at the 2 socket pairs

137.140.1.116.56174 137.140.1.116.80 49152 0 49152 0 TIME_WAIT
137.140.1.116.56175 137.140.1.116.80 49152 0 49152 0 TIME_WAIT

This shows that someone on the remote host is connected to the same host's http server

Question: Who are looking at web pages on the remote host? Give IPs

Answer: 137.140.29.62; 136.1.1.33; 137.140.51.46; 137.140.1.116 - look at all ESTABLISHED connections to port 80 on 137.140.1.116