

Shawn Chumbar (schumbar@ucsc.edu)
Professor Christina Parsa
CMPE 150

Prelab 2

HTTP Questions

1. Choose 5 HTTP status codes and describe each one.

100 (Continue): The client should continue with its request.

101 (Switching Protocols): The server understands and is willing to comply with the client's request, via the Upgrade message header field for a change in the application protocol being used on this connection.

200 (OK): The request has succeeded. The information returned with the response is dependent on the method used in the request.

202 (Accepted): The request has been accepted for processing, but the processing has not been completed. The request might or might not eventually be acted upon, as it might be disallowed when processing actually takes place. There is no facility for re-sending a status code from an asynchronous operation.

404 (Not Found): The server has not found anything matching the Request-URI.

2. List the 8 HTTP 1.1 methods and explain what they do.

GET: The GET method is used to retrieve information from the given server using a given URI. Requests using GET only retrieve data and have no other effect on the data.

HEAD: Same as GET, but transfers the status line and header section only.

POST: A POST request is used to send data to the server, for example, customer information, file upload, etc. using HTML forms.

PUT: This replaces all current representations of the target resource with the uploaded content.

DELETE: Removes all current representation of the target resource given by URI.

CONNECT: Establishes a tunnel to the server identified by a given URI.

OPTIONS: Describes the communication options for the target resource.

TRACE: Performs a message loop-back test along the path to the target resource.

wget and telnet are two commonly known command line tools for testing and debugging. Answer the following questions by using Mininet VM's terminal or the Unix timeshare.

3. Use wget on example.com to view the last modified date of the webpage. What was the HTTP return status given and what command was used to do this?

(The command should not download the file! Hint: Look into the wget man page.)

The last modified date of the webpage was **Friday August 9, 2013 23:54:35 GMT**.

The HTTP status returned was **200 OK**.

The command that I used was **wget --spider -S example.com**.

4. Look up the telnet command. Use telnet to connect to towel.blinkenlights.nl .

What does this telnet server do?

Here is the command I used: **telnet towel.blinkenlights.nl**.

The telnet server plays Star Wars using ASCII characters.

DNS Questions

5. In your own words describe what a DNS resource record (RR) is. Now using the command line tool nslookup find the MX resource record of ucsc.edu . What does this resource record mean?

A DNS resource record is a unit of information entry in DNS zone files. They can be considered a basic element of host-name and IP information. They are also used to resolve all DNS queries. Resource records come in a fairly wide variety of types to provide extended name-resolution services.

The command I used was:

nslookup

> set q=mx

> ucsc.edu

The resource record that I found means that there are 5 email servers that can receive emails for the ucsc.edu email domain.

6. What does the command nslookup type=ns . do ? Explain its output. (Note: the . is part of the command!)

The command shows the various Root DNS servers. There are 13 DNS servers. The command also outputs the Internet Addresses of the servers, and also shows the AAAA address for servers A and B.

TCP Questions

1. How can multiple application services running on a single machine with a single IP address be uniquely identified?

Multiple application services that are running on a single machine can be identified by their port number. The IP Host of the machine is analogous to a zip code, and the port number of the application service is a house address. In this way, combining the IP Host and the port number will tell us which application service we are running.

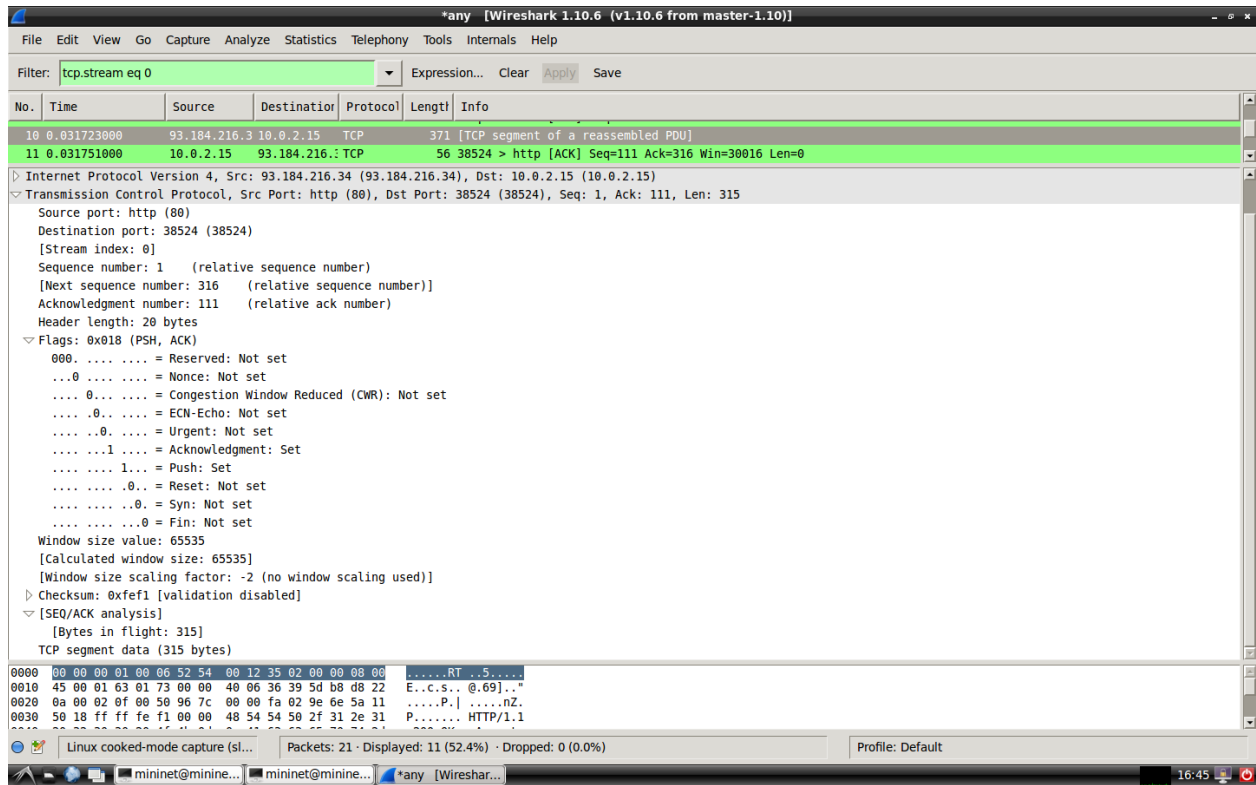
2. What is the purpose of the window mechanism in TCP?

The purpose of the window mechanism in TCP is to control the flow of information and to control any congestion that may arise.

3. What is an MTU? What happens when a packet is larger than the MTU?

MTU (maximum transmission unit) is the size of the largest protocol data unit (PDU) that can be communicated in a single network layer transaction. Larger MTU is associated with reduced overhead. When a packet is larger than the MTU, IP fragmentation occurs. **IP fragmentation** is a process that breaks packets into smaller pieces (fragments), so that the resulting pieces can pass through a link with a small maximum transmission unit (MTU) than the original packet size. The receiving host then reassembles the fragments.

4. Show (with a Wireshark screenshot) a packet containing a TCP segment, which is piggybacking an ACK.



Resources Used

1. <https://www.w3.org/Protocols/rfc2616/rfc2616-sec10.html>
2. https://www.tutorialspoint.com/http/http_methods.htm
3. <https://docs.microsoft.com/en-us/windows/desktop/dns/managing-dns-resource-records>
4. <https://activedirectorypro.com/use-nslookup-check-dns-records/>
5. https://en.wikipedia.org/wiki/Piggybacking_%28data_transmission%29
6. https://en.wikipedia.org/wiki/IP_fragmentation
7. https://www.bau.edu.jo/UserPortal/UserProfile/PostsAttach/10617_1870_1.pdf
8. <https://manuals.gfi.com/en/kerio/connect/content/server-configuration/mail-delivery-and-dns-records/what-is-an-mx-record-and-how-is-it-created-1210.html>