

Prelab 2 - HTTP, DNS, and TCP:

1)[10 pts] Choose 5 HTTP status codes and describe each

Listed below are 5 HTTP status codes that I've seen

After reviewing the 5 sections I've understood that the first number of the status code correlates to 5 different repercussions

- 1 informal**
- 2 success**
- 3 redirection**
- 4 client error**
- 5 server error**

Below are the five HTTP status codes that I found to be interesting or that I have seen before.

- 1. 100- This code notifies the client to continue sending information from their request**
- 2. 200 - ok is a successful acknowledgement that the client's request has been processed**
- 3. 305- use proxy, is when the server notifies the client that the request must be accessed through a proxy**
- 4. 404- not found(temporary or permanent) is when the server can't find anything matching the clients request.**
- 5. 503- service unavailable, is when the server is unable to process the clients request due to overloading or being down(ie: maintains or server offline).**

2) [10 pts] List the 8 HTTP 1.1 methods and explain what they do.

Listed below are the eight methods with there explanations:

- 1. GET-**The GET method requests a representation of the specified resource. Requests using GET should only retrieve data.
- 2. HEAD-**The HEAD method asks for a response identical to that of a GET request, but without the response body.
- 3. POST-**The POST method is used to submit an entity to the specified resource, often causing a change in state or side effects on the server.
- 4. PUT-**The PUT method replaces all current representations of the target resource with the request payload.
- 5. DELETE-**The DELETE method deletes the specified resource.
- 6. CONNECT-**The CONNECT method establishes a tunnel to the server identified by the target resource.
- 7. OPTIONS-**The OPTIONS method is used to describe the communication options for the target resource.
- 8. TRACE-**The TRACE method performs a message loop-back test along the path to the target resource.

3) [10 pts] 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 http return status given was 302 found and 200 ok.

The command used was `wget --server-response --spider example.com`

Note: options listed below

1. `--server-response` : prints the server response
2. `--spider` : does not download the file.

4) [10 pts] Look up the `telnet` command. Use `telnet` to connect to `towel.blinkenlights.nl`. What does this `telnet` server do?

After issuing the command (`Telnet towel.blinkenlights.nl`) the star wars episode IV A new hope the movie in terminal graphics began to play. I ended the `telnet` connection by `crtl+] and then entered quit.`

5) [10 pts] 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?

Briefly explained: a DNS is basically a phone book that has a list of all the names(domain names ie `google.com`, `netflix.com`) and numbers(ip address `10.0.01`) that the client requests usually through an application. Because people don't remember the IP addresses DNS is a way to map domain names to physical ip addresses .

`Nslookup`- is a DNS tool used to locate the ip address of the clients requested name
MX - Mail exchange

The resource record is the mail information within the `ucsc` domain.

6. [10 pts] What does the command `nslookup -type=ns .` do? Explain its output. (Note: the `.` is part of the command!)

This command provides a list of non authoritative root servers that serve the DNS zone that the lab is associated to.

```
File Edit Tabs Help
mininet@mininet-vm:~$ nslookup -type=ns .
Server:      192.168.1.254
Address:     192.168.1.254#53

Non-authoritative answer:
.           nameserver = g.root-servers.net.
.           nameserver = i.root-servers.net.
.           nameserver = m.root-servers.net.
.           nameserver = k.root-servers.net.
.           nameserver = l.root-servers.net.
.           nameserver = d.root-servers.net.
.           nameserver = b.root-servers.net.
.           nameserver = f.root-servers.net.
.           nameserver = h.root-servers.net.
.           nameserver = a.root-servers.net.
.           nameserver = j.root-servers.net.
.           nameserver = e.root-servers.net.
.           nameserver = c.root-servers.net.

Authoritative answers can be found from:

mininet@mininet-vm:~$
```

7) [5 pts] How can multiple application services running on a single machine with a single IP address be uniquely identified?

Ports are an application endpoint used for communication

Ports are used to uniquely identify application running on a single machine

8)[10 pts] What is the purpose of the window mechanism in TCP?

Windowing is a method of ever increasing transmission size till failure(a feedback loop) to maximize the communication between two host.

Windowing is a method to control data so the receiving host does not fall behind. So the maximum amount of data before an acknowledgement is received.

9)[10 pts] What is an MTU? What happens when a packet is larger than the MTU?

MTU is the maximum transmission unit that can be sent. If the packet is larger than the MTU then fragmentation occurs. It breaks the data down into smaller pieces so there won't be a MTU violation.

10)[15 pts] Show (with a Wireshark screenshot) a packet containing a TCP segment, which is piggybacking an ACK.

The screenshot shows the Wireshark interface with a packet capture list. The selected packet is packet 10, which is a TCP segment. The packet details pane shows the following information:

- Frame 10: 62 bytes on wire (496 bits), 62 bytes captured (496 bits) on interface 0
- Linux cooked capture
- Internet Protocol Version 4, Src: 94.142.241.111 (94.142.241.111), Dst: 10.0.2.15 (10.0.2.15)
- Transmission Control Protocol, Src Port: telnet (23), Dst Port: 60564 (60564), Seq: 1, Ack: 28, Len: 6
- Telnet

The packet bytes pane shows the raw data of the packet, which is a Telnet segment. The data is displayed in hexadecimal and ASCII format.

```
0000 00 00 00 01 00 06 52 54 00 12 35 02 00 00 00 00 .....RT...5....
0010 45 00 00 2e 0c c9 00 00 40 06 11 f5 5e 8e f1 6f E.....@..^..0
0020 0a 00 02 0f 00 17 ec 94 04 2c 5c 02 51 be 49 5d .....\\0.I]
0030 50 10 ff ff ad 03 00 00 1b 5b 40 1b 5b 4a P.....[M.]
```