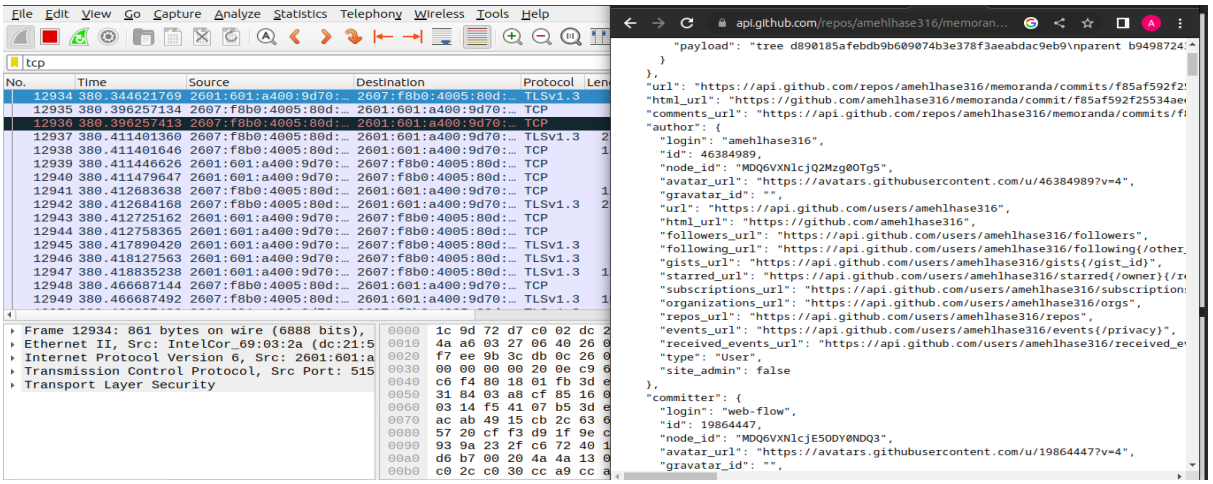
1. Understanding HTTP

https://api.github.com/repos/amehlhase316/memoranda/commits



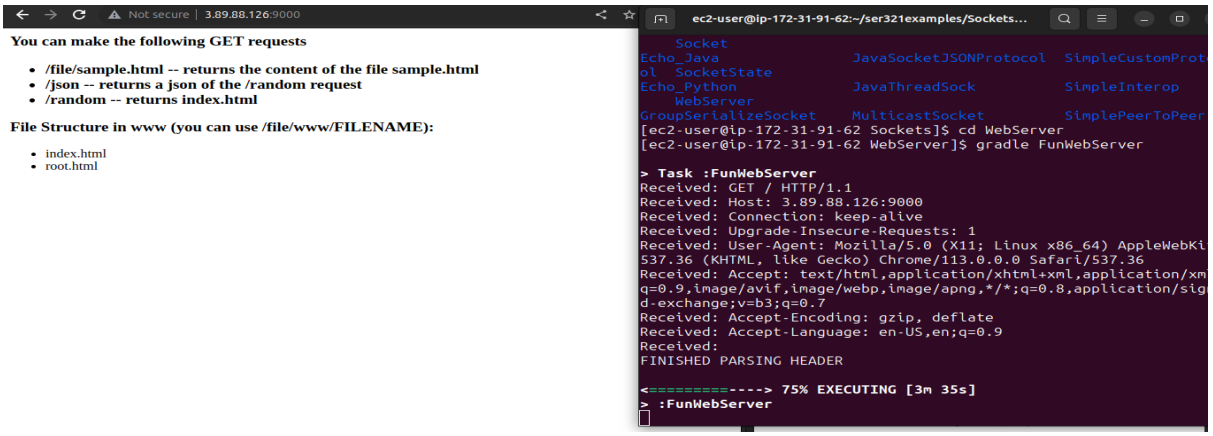
https://api.github.com/repos/amehlhase316/memoranda/commits/autocomplete?q=canis&per_page=100

1. API calls I used modified the given URL according to the statement asked in questions. The initial call specifying the repository name and its owner, followed by appending "/commits" to retrieve all the commits from the repository's default branch. The next api call I added autocomplete. Next I added“?per_page=100” which makes the call display 100 up to commits per page.

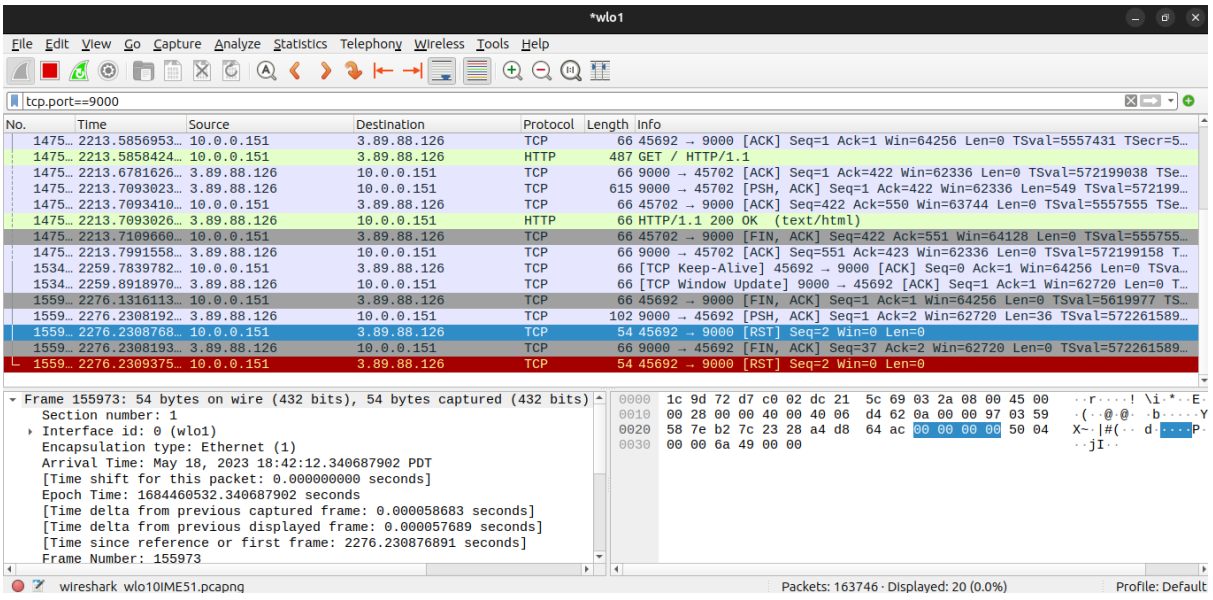
2. Stateless Protocol is a network protocol in which Client sends a request to the server and server response back as per the given state. In Stateful Protocol, if a client sends a request to the server then it expects some kind of response, in case of no response then it resends the request.

2. Setup your second system and run Server on it

2.2



2.3



1. tcp.port==9000, because it filters all the traffic going through port 9000.
2. On “http://3.89.88.126:9000/random” I can first see bread picture and then after clicking on Random street pictures come.

3. a. 200 OK
   b. 404 Not Found
   c. 400 Bad Request

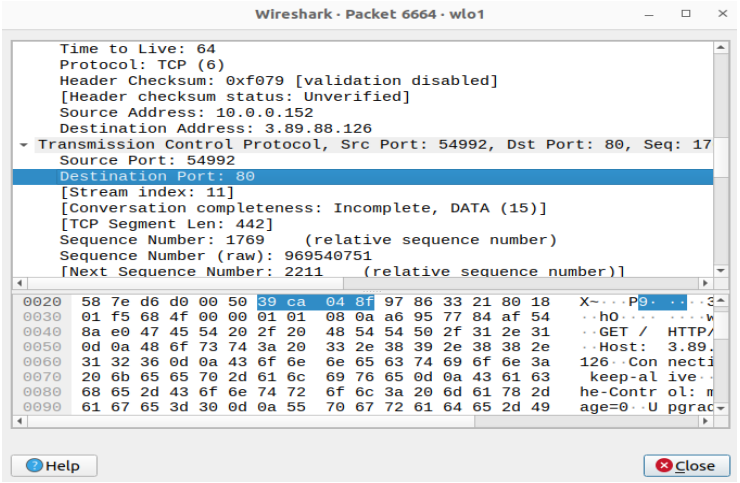
4. a. 200 OK - Everything is fine.

b. 404 Not Found - File does not exist.
c. 400 Bad Request - Request no recognized.

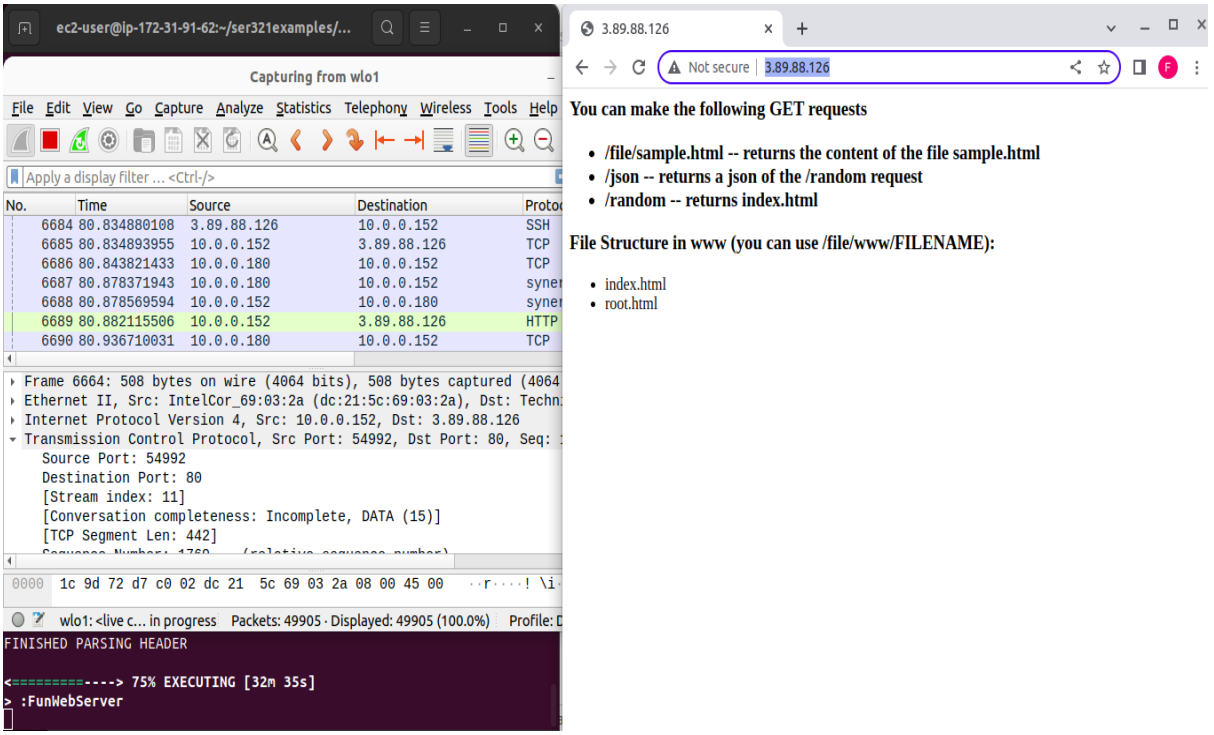
5. Yes, HTTP is not encrypted.
6. HTTPS is HTTP with encryption. HTTPS uses TLS (SSL) to encrypt normal HTTP requests and responses.
7. tcp.port == 80; Src port:9000;
8. Src port:9000, SMTP is for email service.

2.4 Setting up a “real” Web server

1. http://3.89.88.126/
2.



3. It is still HTTP, because there is no SSL certification.
4.



2.6.1

The multiple case did not have error handling. I check if the request contains “num1=” and “num2=” then check if the parameters are integers. Code 400 as Bad Request:

```
else if (request.contains("multiply?")) {
 // This multiplies two numbers, there is NO error handling, so when
 // wrong data is given this just crashes

 Map<String, String> query_pairs = new LinkedHashMap<String, String>();
 // extract path parameters
 query_pairs = splitQuery(request.replace("multiply?", ""));

 // TODO: Include error handling here with a correct error code and
 // a response that makes sense

 if (!query_pairs.containsKey("num1") || !query_pairs.containsKey("num2")) {
   builder.append("HTTP/1.1 400 Bad Request\n");
   builder.append("Content-Type: text/html; charset=utf-8\n");
   builder.append("\n");
   builder.append("Missing parameters: num1 and/or num2");
 } else {
   try {
     // extract required fields from parameters
     Integer num1 = Integer.parseInt(query_pairs.get("num1"));
     Integer num2 = Integer.parseInt(query_pairs.get("num2"));

     // do math
     Integer result = num1 * num2;

     // Generate response
     builder.append("HTTP/1.1 200 OK\n");
     builder.append("Content-Type: text/html; charset=utf-8\n");
     builder.append("\n");
     builder.append("Result is: " + result);
   } catch (NumberFormatException e) {
     // Handle invalid number format
     builder.append("HTTP/1.1 400 Bad Request\n");
     builder.append("Content-Type: text/html; charset=utf-8\n");
     builder.append("\n");
     builder.append("Invalid number format: num1 and num2 must be integers");
   }
 }
```