Intro to Project 3: Http Proxy

CSE 461 - Section 8

Admin

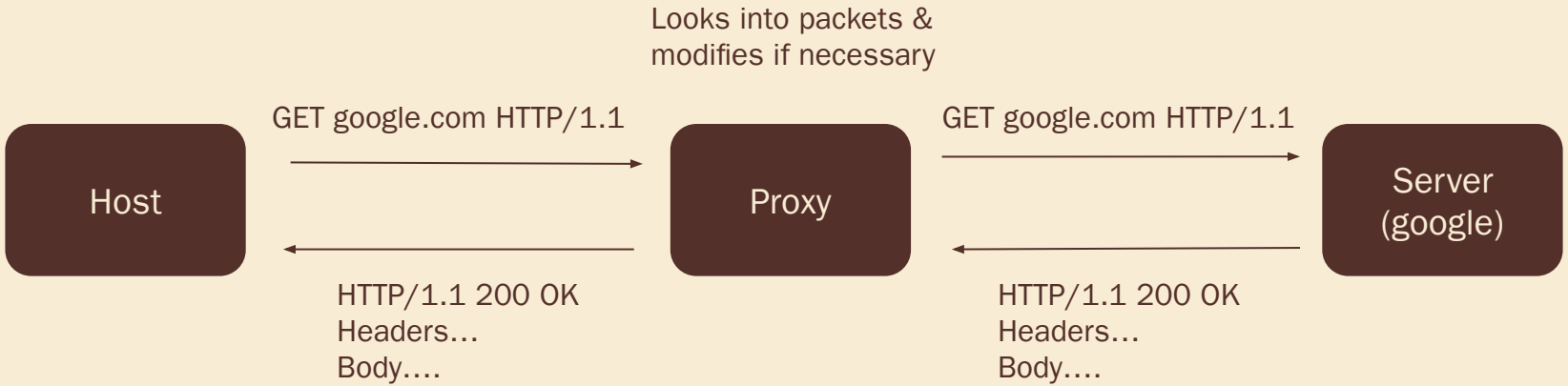
- Project 3 was released yesterday and is due Dec. 9th
- Assignment 4 is due next week (Wednesday Nov. 25th)
- Midterm grades released earlier this week

What's a proxy?

Web Proxies

- **Definition:** A server that acts as an intermediary for requests from clients seeking resources from other servers (Wikipedia)
  - HTTP proxies **do not** encrypt traffic, this is the main difference from VPNs
  - Can cache previously fetched data to speed up requests
- **Examples:**
  - TOR or other applications for somewhat anonymous internet access
  - Web content monitoring and filtering (e.g. company or school network)

Network Diagram



HTTP Request

HTTP GET Requests

- One of the most common types of HTTP requests
- Used to request data from a specified source

For your project, you will also want to use CONNECT requests!

Request Format:

```
METHOD PATH HTTP_VERSION
[
  HEADER 1
  HEADER 2
  …
  HEADER n
]
<enter>
<enter>
```

Response Format:

```
METHOD STATUS_CODE DESC
[
  HEADER 1
  HEADER 2
  …
  HEADER n
]
<Response Body>
```

Example - www.washington.edu

Request from host (you):

```
GET / HTTP/1.1
  Host: www.washington.edu
  Connect: close
<enter>
<enter>
```

Response from www.washington.edu:

```
HTTP/1.1 200 OK
Date: Thu, 14 Nov 2019 18:36:27 GMT Server: Apache/2.2.24
(Unix) mod_ssl/2.2.24 OpenSSL/1.0.1e-fips
PHP/7.2.11 mod_pubcookie/3.3.4a mod_uwa/3.2.1
Last-Modified: Thu, 14 Nov 2019 16:27:16 GMT
ETag: "180152-eb50-59750f455e100"
Accept-Ranges: bytes
Content-Length: 60240 Vary: Accept-Encoding,User-Agent
Content-Type: text/html
```

Request Demo

Proxy Setup on Firefox

- Go to: **Preferences / General / Network Settings / Settings / Manual proxy configuration**
- Set **port** to be 12345 (anything is fine), then check ‘use this proxy server for all protocols’ and click Ok
- This tells Firefox to load web “pages” from input on port 12345.
    - If you don’t have Firefox yet, it might be helpful to download it for testing your code for this project.

See what's in the request

If you have netcat installed:

```
$ nc -l 12345
```

This step tells the computer to listen for connections and packets on the port from the previous step, and allows us to provide input via terminal.

Otherwise here's a Python one-liner:

```
$ python3 -c "import socket, sys ; sock =
socket.socket(socket.AF_INET, socket.SOCK_STREAM) ;
sock.bind(('localhost', 12345)) ; sock.listen(1) ;
connection, client_address = sock.accept() ;
print(connection.recv(512).decode('utf-8'))"
```

Create a "fake" response from the server

```
$ nc -l 12345 < example.txt
```

Now you can visit localhost:12345 in your browser!

You should see the Example Domain page from the response rendered in Firefox.

example.txt:

```
HTTP/1.1 200 OK
Cache-Control: max-age=604800
Content-Type: text/html; charset=UTF-8
Date: Thu, 14 Nov 2019 20:30:15 GMT
Server: ECS (sec/96ED)
Vary: Accept-Encoding
X-Cache: HIT
Content-Length: 1256

<!doctype html>
<html>
<head>
 <title>Example Domain</title>
 <meta charset="utf-8" />
 <meta http-equiv="Content-type" content="text/html; charset=utf-8" />
 <meta name="viewport" content="width=device-width, initial-scale=1" />
</head>
<body>
<div>
 <h1>Example Domain</h1>
 <p>This domain is for use in illustrative examples in documents. You
may use this
 domain in literature without prior coordination or asking for
permission.</p>
 <p><a href="https://www.iana.org/domains/example">More
information...</a></p>
</div>
</body>
</html>
```

Proxy Demo