Introduction to Proxy

Brief Explanation for Project 2
Administrivia

Midterm is February 10th

Project 2 (HTTP Proxy):
- Released Wednesday, Jan 29th (yesterday)
- Due Monday, Feb 17th

Please let us know on Canvas or by email or in OH if you have any questions
Concept of Proxy

What is a proxy anyway?
A server that acts as an intermediary for requests from clients seeking resources from other servers.

-- Wikipedia
Why Proxies?

- Privacy
- Security
- Content Control
- Monitoring
- Caching and Load Balance
Network Diagram

- **Host**: GET google.com HTTP/1.1
- **Proxy**: Look into packets. Modify them if necessary
- **Server (google)**: GET google.com HTTP/1.1

HTTP/1.1 200 OK
Headers...
Body...
HTTP(s) REQUEST

What is a request made of?
HTTP GET REQUEST

- Used to request data from a specified resource.
- One of the most common HTTP method.

Format:

METHOD PATH HTTP_VERSION
[
    HEADER 1
    HEADER 2
    ...
    HEADER n
]

Send a GET request to www.washington.edu:

GET / HTTP/1.1
Host: www.washington.edu
Connection: close
<enter>
<enter>
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
<Response Body>
REQUEST DEMO
Proxy Setup on Firefox

Go to Preferences
  -> General
  -> Network Settings
  -> Manual proxy configuration
  -> set ‘port’ to be 12345 (whatever)
  -> check ‘use this proxy server for all protocols’
  -> click Ok
If you have netcat installed:

$ nc -l 12345

If you don’t, here is a one-liner in python:

$ 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'))"
Let's try return a webpage to the server with netcat (just a demo):

$ cat doo.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>

$ nc -l 12345 < doo.txt
PROXY DEMO
Your turn to create a proxy!