Building a Simple Web Proxy

For the ease of your own life

A Brief History of HTTP

- Mar 1989 - "Information Management: A Proposal"
- Oct 1990 - "WorldWideWeb" coined
- Oct 1994 - W3C founded
- May 1996 - RFC 1945 (HTTP 1.0)
- June 1999 - RFC 2616 (HTTP 1.1)

Anatomy of HTTP 1.0

Web Client

Web Server

Connect: Request

GET / HTTP/1.0 Host: www.google.com CRLF

Response: Close

HTTP/1.0 200 OK Date: Sun, 27 May 2018 19:21:24 GMT Content-Type: text/html; CRLF GOOGLE

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GET / HTTP/1.0 Host: www.google.com CRLF

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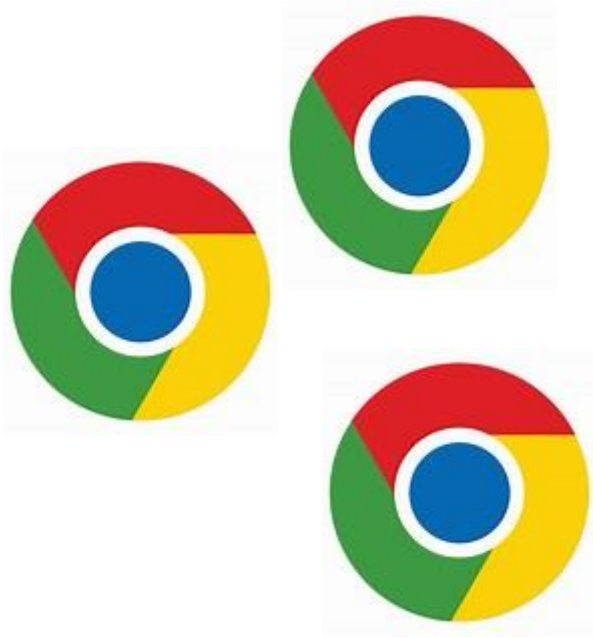
HTTP/1.0 200 OK Date: Sun, 27 May 2018 10:21:24 GMT Content-Type: text/html; CRLF GOOGLE

- Response Status: HTTP/1.0 200 OK
- Response Header: Date: Sun, 27 May 2018 10:21:24 GMT Content-Type: text/html;
- Response Delimiter: CRLF
- Response Body: <html><head> <title>Google</title>

HTTP 1.1 vs 1.0

- Additional Methods (PUT, DELETE, TRACE, CONNECT + GET, HEAD, POST)
- Additional Headers
- Transfer Coding (chunk encoding)
- Persistent Connections (content-length matters)
- Request Pipelining

Why Use a Proxy?



Caching

Content Filtering

Private Message

Building a Simple Web Proxy

- Forward client requests to the remote server and return response to the client
- Handle HTTP 1.0 (GET)
- Single-threaded, non-caching web proxy

- ./proxy

Handling Requests

- What you need from a client request: host, port, and URI path

  GET http://www.ncu.edu.cn:80/ HTTP/1.0

- What you send to a remote server:

  GET / HTTP/1.0 Host: www.ncu.edu.cn :80 (Additional headers, if any...)

- Check request line and header format

Handling Responses

Web Client

Parse Request: Host, Port, Path

PROXY

Forward Response to Client Including Errors

Web Server

Handling Errors

- Method != GET: Not Implemented (501)
- Unparseable request: Bad Request (400)
- Keep parsing simple: no need for regex
- Postel's law: Be liberal in what you accept, and conservative in what you send convert HTTP 1.1 request

  to HTTP 1.0 convert \r to \r\n etc...

Testing Your Proxy

- Telnet to your proxy and issue a request

```
./proxy 5000 > telnet localhost 5000
Trying 127.0.0.1...
Connected to localhost.localdomain (127.0.0.1).
Escape character is '^]'.
GET http://www.google.com/ HTTP/1.0
```

- Direct your browser to use your proxy
- Use the supplied proxy_tester.py

Proxy Guidance

- Assignment page
- RFC 1945 (HTTP 1.0)
- Google, wikipedia, Bing, man pages