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PA4 -
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Link: https://github.com/CPTS360FA25/pa-4-JeffLepp.git

Summary of implementation of my proxy.

The Proxy follows the conventions of the instructions, and it's main pipeline is request parsing, header handling, forwarding request to target server, handling response. When parsing the request, I use Rio_readlineb(), and used https://csapp.cs.cmu.edu/2e/ch10-preview.pdf as an information source of these and related functions. This allows the extraction of the method, full URL, HTTP version, hostname, port, and the path. As to the methods, I've only implemented GET and rejected all other methods. Any malformed or unsupported requests in general are rejected immediately. In terms of the header, I disregard the proxy-irrelevant ones such as Connection, Proxy-Connection, and User-Agent. When forwarding, I connected using Open_clientfd(hostname, port0 and rewrote the request line as Get <path> HTTP/1.0 as per the requirements of the assignment. When Handling the response, I read it with a Rio_readlinb() loop, and I write each chunk directly back to the client. I then close the connection after forwarding. Other than this, I do not do caching, threadings, connect tunneling, or anything else that was mentioned not to do in the assignments.

While browsing using Firefox, you find some URLs can not be accessible using your proxy. Why?

Due to the way I implemented my proxy, it's constrained to HTTP/1.0, no HTTPS, GET only, no CONNECT method, and no persistent connections. Since modern websites use HTTPS over HTTP (Bing and Google in this case), my proxy is expected to fail in firefox especially when considering how redirects need TLS and the number of background requests like AJAX, POST, PUT, etc. However, there is a difference between how google and bing behave, as bing can return the main HTML homepage over http which the proxy understands. Google, however, is essentially purely HTTPS, meaning it requires a CONNECT tunnel that my proxy doesn't support.

Wiki works however because it is still available over plain HTTP which my proxy is designed for. Furthermore, it doesn't require POST, CONNECT, any sort of cookies or AJAX requests when displaying the homepage "http://www.wiki.com/". When considering how wiki would be building the site with my proxy, it is using a number of simple GETs and since it doesn't rely on persistent connections, it works with the connection closed, which my proxy forces.

The following are outputs from the console holding ./proxy 15214 and have been shortened:

WIKI: SUCCESS!
Accepted connection from (localhost, 34506)
 ================================== New Request
Request Line: GET http://detectportal.firefox.com/success.txt?ipv6 HTTP/1.1
Request - Method: GET, Hostname: detectportal.firefox.com, Port: 80, Path: /success.txt?ipv6

Host: detectportal.firefox.com
User-Agent: Mozilla/5.0 (X11; Linux x86_64; rv:121.0) Gecko/20100101 Firefox/121.0
Accept: */*
……
End of request headers
Accepted connection from (localhost, 52174)
  ================================= New Request
Accepted connection from (localhost, 58682)

BING: PARTIAL FAIL!
  ================================= New Request
Request Line: CONNECT push.services.mozilla.com:443 HTTP/1.1
Malformed request or unsupported method use
Accepted connection from (localhost, 47198)
  ================================= New Request
Request Line: GET http://www.bing.com/ HTTP/1.1
Request - Method: GET, Hostname: www.bing.com, Port: 80, Path: /
Host: www.bing.com
User-Agent: Mozilla/5.0 (X11; Linux x86_64; rv:121.0) Gecko/20100101 Firefox/121.0
Accept: text/html,application/xhtml+xml,application/xml;q=0.9,image/avif,image/webp,*/*;q=0.8
……..
Accepted connection from (localhost, 47212)
  ================================= New Request
Request Line: POST http://ocsp.digicert.com/ HTTP/1.1
Malformed request or unsupported method use
Accepted connection from (localhost, 34534)

GOOGLE: TOTAL FAIL!
  ================================= New Request
Request Line: POST http://o.pki.goog/wr2 HTTP/1.1
Malformed request or unsupported method use
Accepted connection from (localhost, 39712)