

Spencer Whitehead  
1001837401

Program should be able to be run through powershell by simply typing "py {path to server.py}" which should open the server. The server can then be connected to through the browser on port 8080. The main page can be accessed through "localhost:8080/index.html". If the user tries to request /index1.html, they should be given a 301 request and are redirected back to /index.html. If the user tries to request any other page they should be given a 404 error.

One known limitation is I can only get the server to connect through Microsoft Edge. I initially tried through Firefox but was getting issues with the SSL certificates. It may work through Chrome but it hasn't been tested.

Another issue is that the 301 response doesn't seem to be picked up by wireshark when it sends a redirect. It will pick it up if the "Location:" field is excluded, but when it's fully implemented wireshark seems to just skip over it and show the requests after the user is redirected. It can still be proven to be sent, as the browser redirects and will show that it received the request if you go to the inspect menu and look at the network info, so that is how the 301 info will be shown in this writeup instead of through wireshark.

One more issue which I can't seem to replicate is that sometimes there's a redirecting issue when using the localhost ip, where it adds the entire ip as a redirect when requesting /index1.html. If this occurs, it can be fixed by using 127.0.0.1 instead of localhost.

The following screenshot shows wireshark's feed after a user goes to /index.html, /doesntexist.html, then /index1.html:

http						
No.	Time	Source	Destination	Protocol	Length	Info
88	5.981593	127.0.0.1	127.0.0.1	HTTP	763	GET /index.html HTTP/1.1
95	6.002564	127.0.0.1	127.0.0.1	HTTP	44	HTTP/1.1 200 OK
99	6.014111	127.0.0.1	127.0.0.1	HTTP	685	GET /guy.jpg HTTP/1.1
104	6.023206	127.0.0.1	127.0.0.1	HTTP	44	HTTP/1.1 200 OK (JPEG JFIF image)
111	6.042122	127.0.0.1	127.0.0.1	HTTP	689	GET /favicon.ico HTTP/1.1
115	6.055979	127.0.0.1	127.0.0.1	HTTP	44	HTTP/1.1 404
410	24.647175	127.0.0.1	127.0.0.1	HTTP	726	GET /doesntexist.html HTTP/1.1
414	24.650628	127.0.0.1	127.0.0.1	HTTP	44	HTTP/1.1 404
482	32.869839	127.0.0.1	127.0.0.1	HTTP	721	GET /index1.html HTTP/1.1
496	32.878952	127.0.0.1	127.0.0.1	HTTP	720	GET /index.html HTTP/1.1
500	32.887990	127.0.0.1	127.0.0.1	HTTP	44	HTTP/1.1 200 OK
504	32.901843	127.0.0.1	127.0.0.1	HTTP	642	GET /guy.jpg HTTP/1.1
509	32.908228	127.0.0.1	127.0.0.1	HTTP	44	HTTP/1.1 200 OK (JPEG JFIF image)

Example of http 200 response:

<pre> &gt; Frame 95: 44 bytes on wire (352 bits), 44 bytes captured (352 bits) on interface \Device\NPF_{loopback}, id 0 &gt; Null/Loopback &gt; Internet Protocol Version 4, Src: 127.0.0.1, Dst: 127.0.0.1 &gt; Transmission Control Protocol, Src Port: 8080, Dst Port: 65360, Seq: 435, Ack: 720, Len: 0 &gt; [2 Reassembled TCP Segments (434 bytes): #93(434), #95(0)] ▼ Hypertext Transfer Protocol   &gt; HTTP/1.1 200 OK\r\n   &gt; Content-Type: text/html\r\n   \r\n   [HTTP response 1/1]   [Time since request: 0.020971000 seconds]   [Request in frame: 88]   [Request URI: http://127.0.0.1:8080/index.html]   File Data: 390 bytes   ▼ Data (390 bytes)     Data: 3c21444f43545950452068746d6c3e0d0a3c68746d6c206c616e673d22656e223e0d0a0d...     [Length: 390] </pre>	<pre> 0000 48 54 54 50 2f 31 2e 31 20 32 30 30 20 4f 4b 0d HTTP/1.1 200 OK 0010 0a 43 6f 6e 74 65 6e 74 20 54 79 70 65 3a 20 74 .Content Type: t 0020 65 78 74 2f 68 74 6d 6c 0d 0a 0d 0a 3c 21 44 4f ext/html ....&lt; 0030 43 54 59 50 45 20 68 74 6d 6c 3e 0d 0a 3c 68 74 CTYP HTML&gt;&lt;ht 0040 6d 6c 20 6c 61 6e 67 3d 22 65 6e 22 3e 0d 0a 0d ml lang= "en"&gt;... 0050 0a 3c 68 65 61 64 3e 0d 0a 20 20 20 20 3c 6d 65 .&lt;head&gt; . .&lt;me 0060 74 61 20 63 68 61 72 73 65 74 3d 22 55 54 46 2d ta chars et="UTF- 0070 38 22 3e 0d 0a 20 20 20 20 3c 6d 65 74 61 20 68 8"&gt; . .&lt;meta h 0080 74 74 70 2d 65 71 75 69 76 3d 22 58 2d 55 41 2d ttp-equiv="X-UA- 0090 43 6f 6d 70 61 74 69 62 6c 65 22 20 63 6f 6e 74 Compatib le" cont 00a0 65 6e 74 3d 22 49 45 3d 65 64 67 65 22 3e 0d 0a ent="IE= edge"&gt;.. 00b0 20 20 20 20 3c 6d 65 74 61 20 6e 61 6d 65 3d 22 .&lt;met a name=" 00c0 76 69 65 77 70 6f 72 74 22 20 63 6f 6e 74 65 6e viewport " conten 00d0 74 3d 22 77 69 64 74 68 3d 64 65 76 69 63 65 2d t="width =device- 00e0 77 69 64 74 68 2c 20 69 6e 69 74 69 61 6c 2d 73 width, i nitial-s 00f0 63 61 6c 65 3d 31 2e 30 22 3e 0d 0a 20 20 20 20 cale=1.0 "&gt;.. 0100 3c 74 69 74 6c 65 3e 50 61 67 65 3c 2f 74 69 74 &lt;title&gt;P age&lt;/tit 0110 6c 65 3e 0d 0a 3c 2f 68 65 61 64 3e 0d 0a 0d 0a le&gt;.&lt;/h ead&gt;... 0120 3c 62 6f 64 79 3e 0d 0a 20 20 20 3c 68 31 3e .&lt;body&gt;..&lt;h1&gt; 0130 0d 0a 20 20 20 20 20 20 20 20 68 65 72 65 20 68 . here h 0140 65 20 63 6f 6d 65 73 0d 0a 20 20 20 20 3c 2f 68 e comes. .&lt;/h 0150 31 3e 0d 0a 20 20 20 20 3c 69 6d 67 20 73 72 63 1&gt;..&lt;img src 0160 3d 22 67 75 79 2e 6a 70 67 22 20 61 6c 74 3d 22 ="guy.jpg" alt=" 0170 67 75 79 22 3e 0d 0a 20 20 20 3c 68 32 3e 0d .&lt;h2&gt; 0180 0a 20 20 20 20 20 20 20 20 68 65 72 65 20 68 65 . here he 0190 20 69 73 0d 0a 20 20 20 20 3c 2f 68 32 3e 0d 0a is..&lt;/h2&gt;.. 01a0 3c 2f 62 6f 64 79 3e 0d 0a 0d 0a 3c 2f 68 74 6d &lt;/body&gt;..&lt;/htm 01b0 6c 3e 1&gt; </pre>
-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

## Example of http 404 response:

<pre> &gt; Frame 414: 44 bytes on wire (352 bits), 44 bytes captured (352 bits) on interface \Device\NPF_{loopback}, id 0 &gt; Null/Loopback &gt; Internet Protocol Version 4, Src: 127.0.0.1, Dst: 127.0.0.1 &gt; Transmission Control Protocol, Src Port: 8080, Dst Port: 65400, Seq: 42, Ack: 683, Len: 0 &gt; [2 Reassembled TCP Segments (41 bytes): #412(41), #414(0)] ▼ Hypertext Transfer Protocol   &gt; HTTP/1.1 404\r\n   \r\n   [HTTP response 1/1]   [Time since request: 0.003453000 seconds]   [Request in frame: 410]   [Request URI: http://127.0.0.1:8080/doesntexist.html]   File Data: 25 bytes   ▼ Data (25 bytes)     Data: 4572726f72203430343a2066696c65206e6f7420666f756e64     [Length: 25] </pre>	<pre> 0000 48 54 54 50 2f 31 2e 31 20 34 30 34 0d 0a 0d 0a HTTP/1.1 404.... 0010 45 72 72 6f 72 20 34 30 34 3a 20 66 69 6c 65 20 Error 404: file 0020 6e 6f 74 20 66 6f 75 6e 64 not found </pre>
------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

## Example of 301 request, received through the browser:

Elements Console Sources **Network** Performance Memory » + 3 ⚙️ 🔍 ⋮

☐ Preserve log ☐ Disable cache No throttling ⌵ 📶 ⬆️ ⬇️ ⚙️

Filter ☐ Invert ☐ Hide data URLs **All** Fetch/XHR JS CSS Img Media Font Doc WS Wasm Manifest Other

☐ Has blocked cookies ☐ Blocked Requests ☐ 3rd-party requests

10 ms 20 ms 30 ms 40 ms 50 ms 60 ms 70 ms 80 ms 90 ms 100 ms 110 ms

Name × **Headers** Preview Response Initiator Timing

index1.html  
index.html  
guy.jpg

**Request URL:** http://127.0.0.1:8080/index1.html  
**Request Method:** GET  
**Status Code:** 🟡 301 Moved Permanently  
**Remote Address:** 127.0.0.1:8080  
**Referrer Policy:** strict-origin-when-cross-origin

▼ **Response Headers** View source  
**Location:** /index.html

▼ **Request Headers** View source  
**Accept:** text/html,application/xhtml+xml,application/xml;q=0.9,image/webp,image/apng,\*/\*;q=0.8,application/signed-exchange;v=b3;q=0.7  
**Accept-Encoding:** gzip, deflate, br  
**Accept-Language:** en-US,en;q=0.9  
**Connection:** keep-alive  
**Host:** 127.0.0.1:8080  
**sec-ch-ua:** "Chromium";v="110", "Not A(Brand";v="24", "Microsoft Edge";v="110"  
**sec-ch-ua-mobile:** ?0  
**sec-ch-ua-platform:** "Windows"  
**Sec-Fetch-Dest:** document  
**Sec-Fetch-Mode:** navigate  
**Sec-Fetch-Site:** none  
**Sec-Fetch-User:** ?1  
**Upgrade-Insecure-Requests:** 1  
**User-Agent:** Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/110.0.0.0

3 requests 121 kb