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System Network 2

Project 1

Setup and compilation

- Download and unzip the submission from eLearning on a Linux box in the multi-platform lab.
- The submission includes:
    - makefile
    - 404.html
    - 500.html
    - index.html
    - InsaneCoding-MemoryManagement.html
    - client.c
    - server.c
    - Protocol_Document.docx
    - Protocol_Document.pdf
    - /images/404s_are_bad_mkay.jpg
    - /images/404-y-u-no-200.png
    - /images/500-internal-server-error.jpg
    - /images/back_into_the_void_you_go.gif
    - /images/background.jpg
    - /images/cage.png
    - /images/favicon.ico
    - /images/floppydudepolice.gif
    - /images/giphy2.gif

- /images/giphy3.gif
- /images/server-hamster.gif
- /screenshots/browser_404.jpg
- /screenshots/browser_success.jpg
- /screenshots/browser_success_stage2.jpg
- /screenshots/client_404.png
- /screenshots/client_success.png
- /screenshots/server_starting.png

- Environment: This program has been tested on a Linux virtual machine, as well as the multi-platform lab, and will run there.
- Compilation: This program includes a makefile. At the command line in Linux, type make. The program produces an executable entitled client and server
- Protocols: Server: This program follows the HTTP 1.1 protocol. The server listens for valid HTTP GET requests, and returns a HTTP response. The server returns fully valid response headers, along with proper 200/400/500 response codes. The server is multi-threaded and can handle a very large server load without issue. All crutial system calls, such as reads, writes, memory allocation, and socket binding are all properly checked for errors, and any errors are handled appropriately.
- Protocols: Client: The client, like the server, also follows proper HTTP 1.1 protocol. The client, upon being executed with a valid IP address and port number of a HTTP server, will prompt the user for a file to request from the server. The client then constructs a valid HTTP GET request with the requested file and sends it to the server. The client then waits for the response from the server, and displays the response to the console. Any failed system calls or server errors are properly handled and displayed to console. When the user wishes to exit the client, they may do so by entering 'cancel' without quotes.

Running the program. Issue the command `./server`. It takes only one command line argument `<port number>`. Then open another terminal and issue the command `./client`. It takes 2 arguments `<the host name/address>` e.g localhost, a valid range 60001-60099 `<port number>`.

(Note: The provided html pages will not display correctly if you do not go through the server and client)

User input: Type in the path of the html file

Output: All output goes to the console. Output will be similar to this:

On success(server)

```
Server commence


Readying...


Waiting and listening for client request...


GET /images/back_into_the_void_you_go.gif HTTP/1.1
Host: localhost:60001
Connection: keep-alive
Accept: image/webp,image/*,*/*;q=0.8
User-Agent: Mozilla/5.0 (X11; Linux x86_64)
AppleWebKit/537.36 (KHTML, like Gecko) Chrome/48.0.2564.97
Safari/537.36
Referer: http://localhost:60001/index.html
Accept-Encoding: gzip, deflate, sdch
Accept-Language: en-US,en;q=0.8



HTTP/1.1 200 OK
Content-Length: 990411
Content-Type: image/gif


GIF89a
```

On success(client)

```
HTTP/1.1 200 OK
Content-Length: 1438
```

```
Content-Type: text/html
```

(Note: the requested html page is displayed)

On fail (client)(due to connection loss to server)

```
Failed connection
```

(Note: above message is displayed)

On fail (client)(requested page not found)

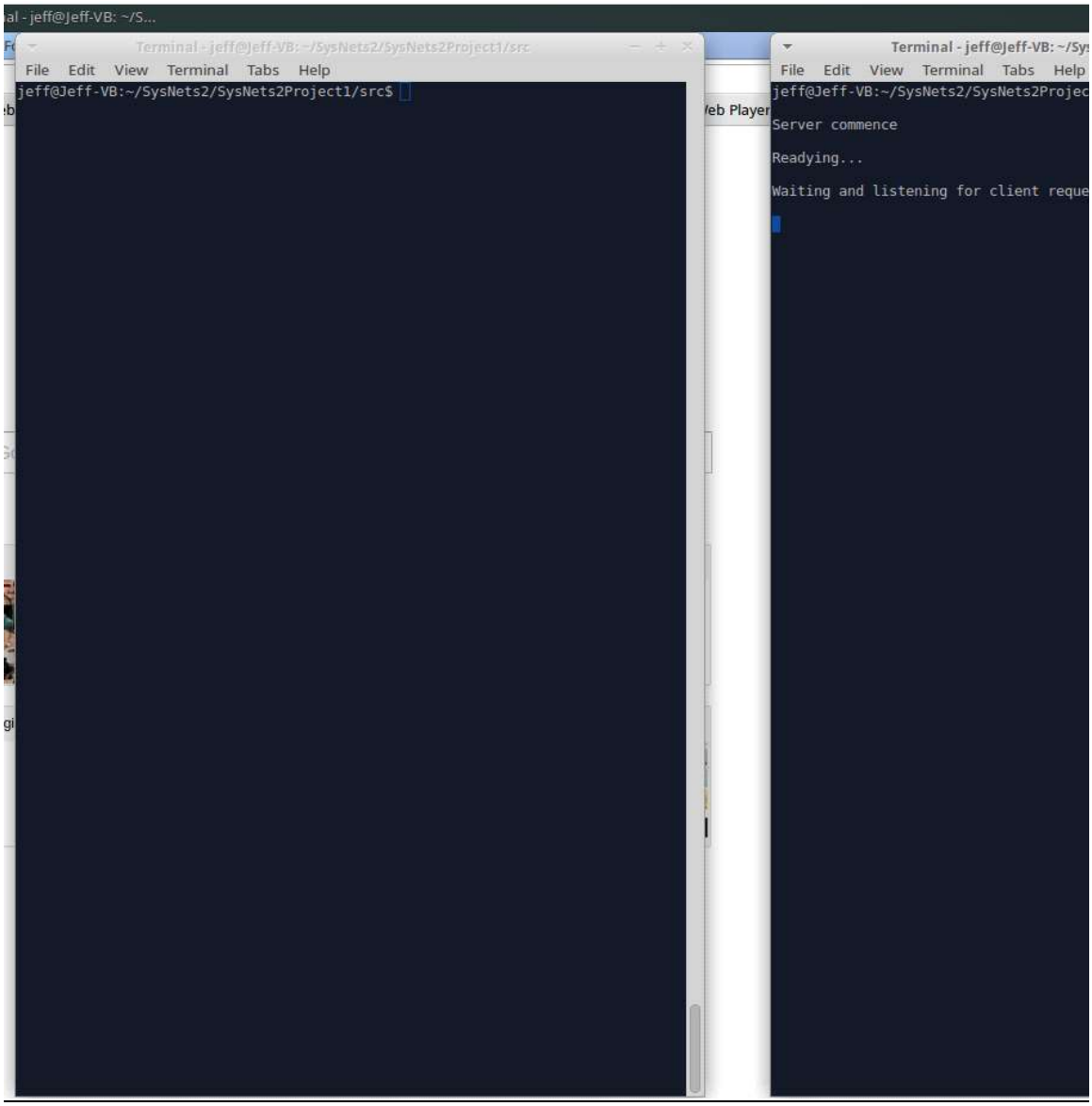
```
HTTP/1.1 404 Not Found
Content-Length: 1403
Content-Type: text/html
```

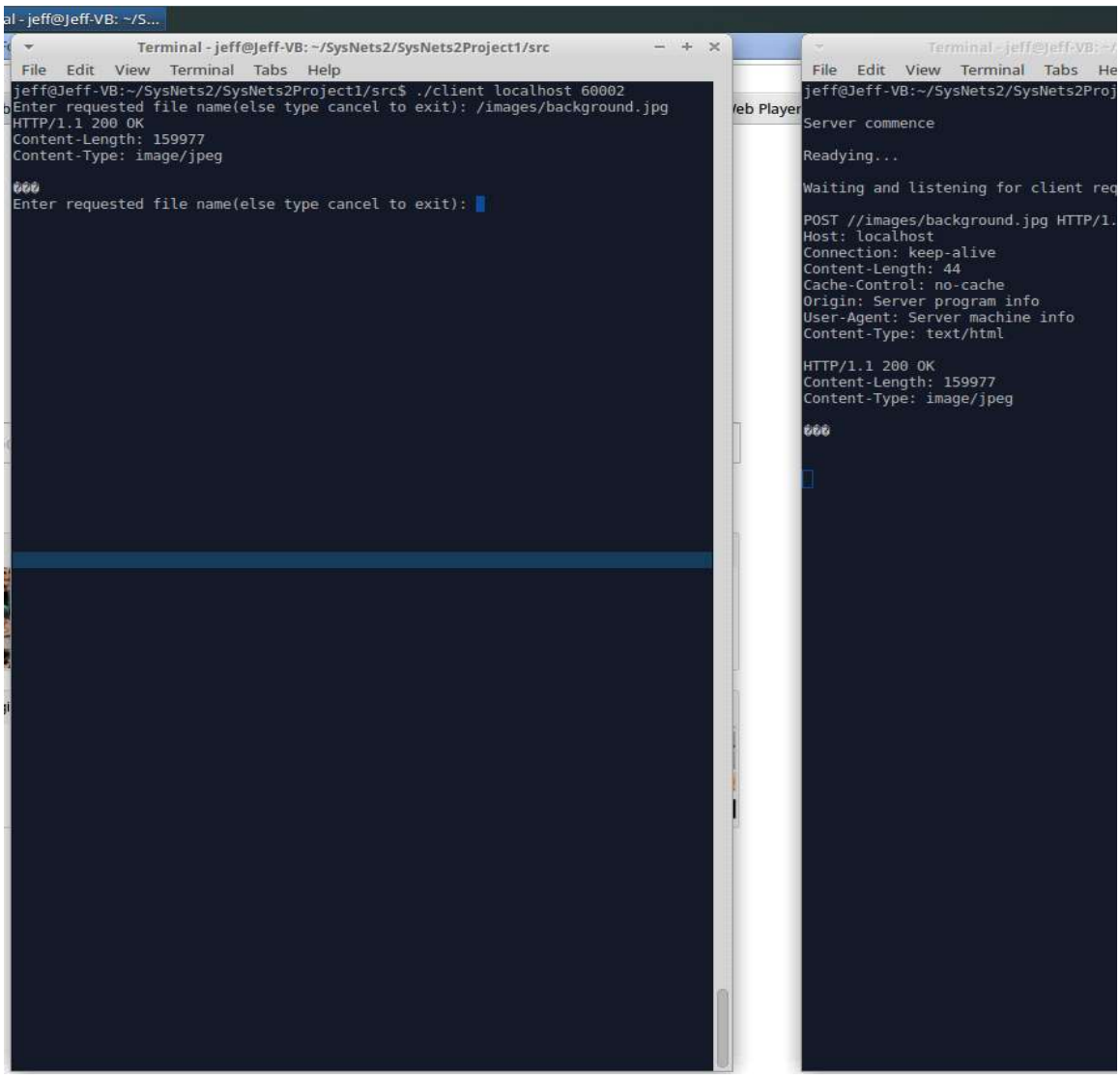
(Note: 404 error page is display)

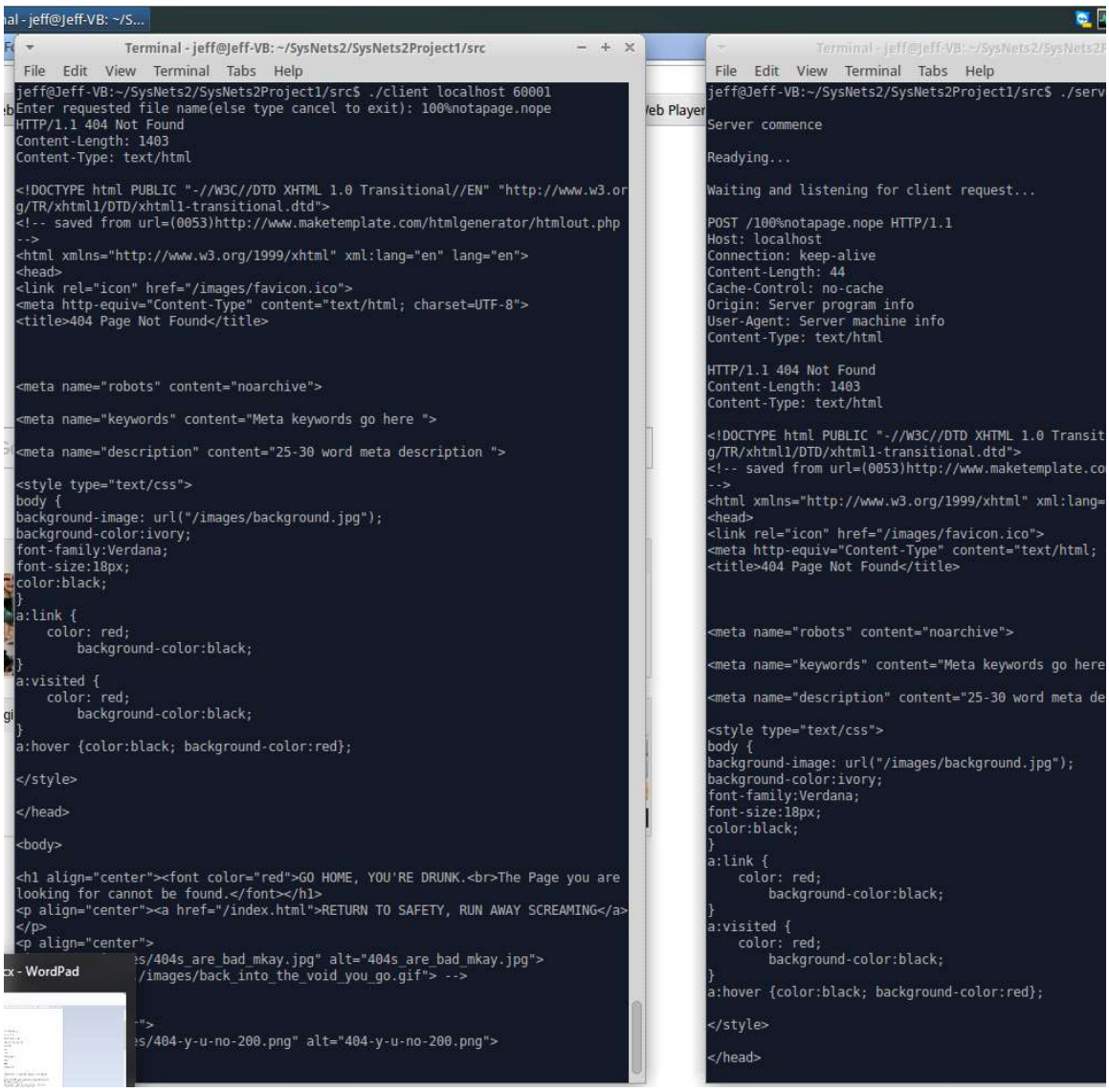
On fail (client)(internal server error)

```
HTTP/1.1 500 Internal Server Error
Content-Length: 1396
Content-Type: text/html
```

(Note: 500 error page is display)


Terminal - jeff@Jeff-VB: ~/SysNets2/SysNets2Project1/src
File Edit View Terminal Tabs Help
jeff@Jeff-VB:~/SysNets2/SysNets2Project1/src$
Terminal - jeff@Jeff-VB: ~/Sys
File Edit View Terminal Tabs Help
jeff@Jeff-VB:~/SysNets2/SysNets2Projec
Server commence
Readying...
Waiting and listening for client reque


Terminal - jeff@Jeff-VB: ~/SysNets2/SysNets2Project1/src
File Edit View Terminal Tabs Help
jeff@Jeff-VB:~/SysNets2/SysNets2Project1/src$ ./client localhost 60002
Enter requested file name(else type cancel to exit): /images/background.jpg
HTTP/1.1 200 OK
Content-Length: 159977
Content-Type: image/jpeg
Enter requested file name(else type cancel to exit):
File Edit View Terminal Tabs
Server commence
Readying...
Waiting and listening for client
POST //images/background.jpg HTTP/1.
Host: localhost
Connection: keep-alive
Content-Length: 44
Cache-Control: no-cache
Origin: Server program info
User-Agent: Server machine info
Content-Type: text/html
HTTP/1.1 200 OK
Content-Length: 159977
Content-Type: image/jpeg


Terminal - jeff@Jeff-VB: ~/SysNets2/SysNets2Project1/src
File Edit View Terminal Tabs Help
jeff@Jeff-VB:~/SysNets2/SysNets2Project1/src$ ./client localhost 60001
Enter requested file name(else type cancel to exit): 100%notapage.nope
HTTP/1.1 404 Not Found
Content-Length: 1403
Content-Type: text/html
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN" "http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">
<!-- saved from url=(0053)http://www.maketemplate.com/htmlgenerator/htmlout.php -->
<html xmlns="http://www.w3.org/1999/xhtml" xml:lang="en" lang="en">
<head>
<link rel="icon" href="/images/favicon.ico">
<meta http-equiv="Content-Type" content="text/html; charset=UTF-8">
<title>404 Page Not Found</title>
<meta name="robots" content="noarchive">
<meta name="keywords" content="Meta keywords go here ">
<meta name="description" content="25-30 word meta description ">
<style type="text/css">
body {
background-image: url("/images/background.jpg");
background-color:ivory;
font-family:Verdana;
font-size:18px;
color:black;
}
a:link {
color: red;
background-color:black;
}
a:visited {
color: red;
background-color:black;
}
a:hover {color:black; background-color:red};
</style>
</head>
<body>
<h1 align="center">GO HOME, YOU'RE DRUNK.
The Page you are looking for cannot be found.</h1>
RETURN TO SAFETY, RUN AWAY SCREAMING

WordPad
Terminal - jeff@Jeff-VB: ~/SysNets2/SysNets2Project1/src
File Edit View Terminal Tabs Help
jeff@Jeff-VB:~/SysNets2/SysNets2Project1/src$ ./serv
Server commence
Readying...
Waiting and listening for client request...
POST /100%notapage.nope HTTP/1.1
Host: localhost
Connection: keep-alive
Content-Length: 44
Cache-Control: no-cache
Origin: Server program info
User-Agent: Server machine info
Content-Type: text/html
HTTP/1.1 404 Not Found
Content-Length: 1403
Content-Type: text/html
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transit
g/TR/xhtml1/DTD/xhtml1-transitional.dtd">
<!-- saved from url=(0053)http://www.maketemplate.co
-->
<html xmlns="http://www.w3.org/1999/xhtml" xml:lang=
<head>
<link rel="icon" href="/images/favicon.ico">
<meta http-equiv="Content-Type" content="text/html;
<title>404 Page Not Found</title>
<meta name="robots" content="noarchive">
<meta name="keywords" content="Meta keywords go here
<meta name="description" content="25-30 word meta de
<style type="text/css">
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background-color:ivory;
font-family:Verdana;
font-size:18px;
color:black;
}
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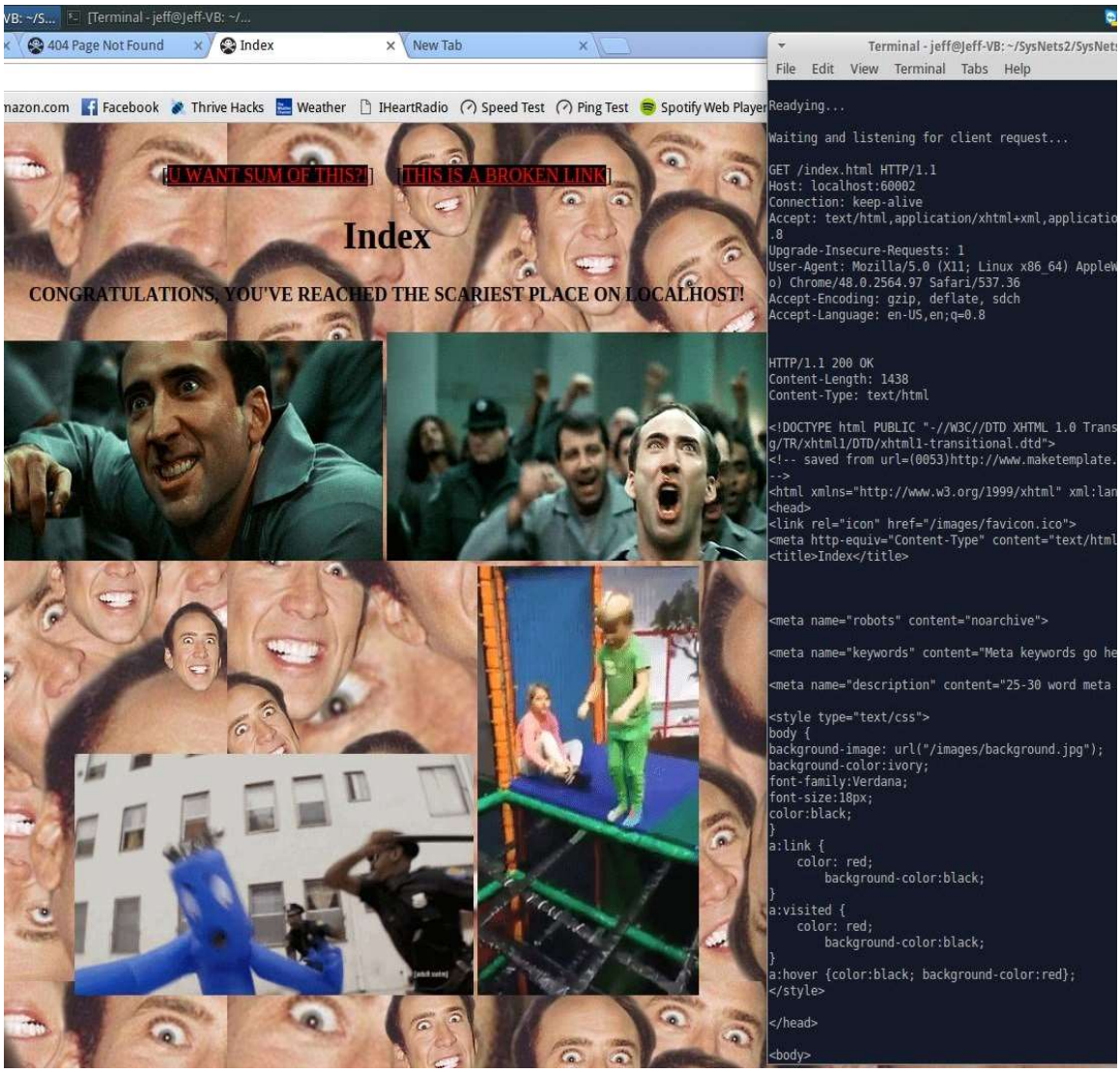
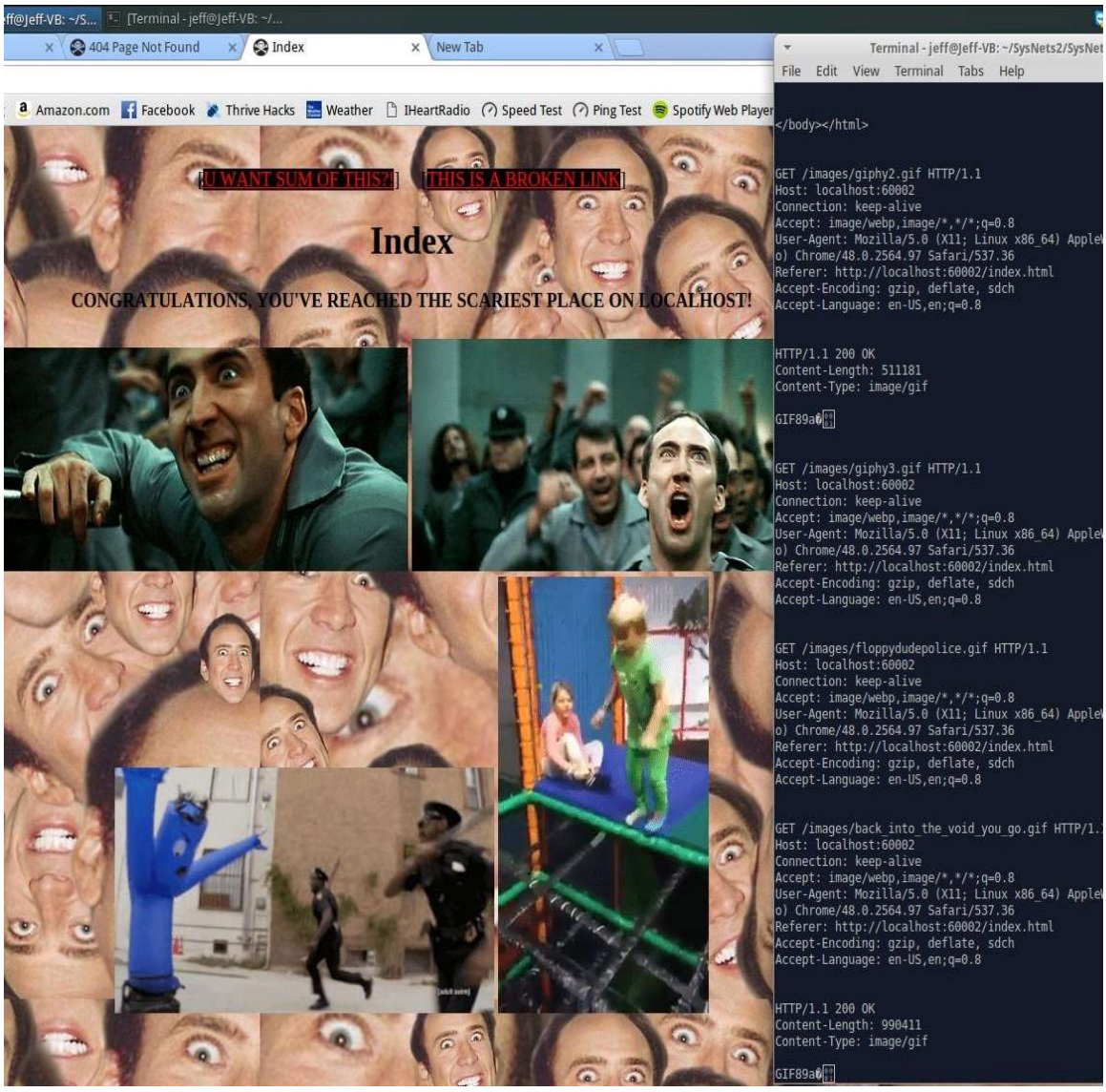
color: red;
background-color:black;
}
a:visited {
color: red;
background-color:black;
}
a:hover {color:black; background-color:red};
</style>
</head>


404 Page Not Found
Index
New Tab
Facebook
Thrive Hacks
Weather
IHeartRadio
Speed Test
Ping Test
Spotify Web Player
[U WANT SUM OF THIS?]
[THIS IS A BROKEN LINK]
Index
CONGRATULATIONS, YOU'VE REACHED THE SCARIEST PLACE ON LOCALHOST!
Terminal - jeff@Jeff-VB: ~/SysNets2/SysNets
File Edit View Terminal Tabs Help
Readying...
Waiting and listening for client request...
GET /index.html HTTP/1.1
Host: localhost:60002
Connection: keep-alive
HTTP/1.1 200 OK
Content-Length: 1438
Content-Type: text/html
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Trans
<!-- saved from url=(0053)http://www.maketemplate.
<html xmlns="http://www.w3.org/1999/xhtml" xml:lan
<head>
<link rel="icon" href="/images/favicon.ico">
<meta http-equiv="Content-Type" content="text/html
<title>Index</title>
<meta name="robots" content="noarchive">
<meta name="keywords" content="Meta keywords go he
<meta name="description" content="25-30 word meta
<style type="text/css">
body {
background-image: url("/images/background.jpg");
background-color:ivory;
font-family:Verdana;
font-size:18px;
color:black;
}
a:link {
color: red;
background-color:black;
}
a:visited {
color: red;
background-color:black;
}
a:hover {color:black; background-color:red};
</style>
</head>
<body>


404 Page Not Found
Index
New Tab
Amazon.com
Facebook
Thrive Hacks
Weather
IHeartRadio
Speed Test
Ping Test
Spotify Web Player
[U WANT SUM OF THIS?]
[THIS IS A BROKEN LINK]
Index
CONGRATULATIONS, YOU'VE REACHED THE SCARIEST PLACE ON LOCALHOST!
Terminal - jeff@Jeff-VB: ~/SysNets2/SysNet
File Edit View Terminal Tabs Help
</body></html>
GET /images/giphy2.gif HTTP/1.1
Host: localhost:60002
Connection: keep-alive
Accept: image/webp,image/*,*/*;q=0.8
User-Agent: Mozilla/5.0 (X11; Linux x86_64) Apple
o) Chrome/48.0.2564.97 Safari/537.36
Referer: http://localhost:60002/index.html
Accept-Encoding: gzip, deflate, sdch
Accept-Language: en-US,en;q=0.8
HTTP/1.1 200 OK
Content-Length: 511181
Content-Type: image/gif
GIF89a
GET /images/giphy3.gif HTTP/1.1
Host: localhost:60002
Connection: keep-alive
Accept: image/webp,image/*,*/*;q=0.8
User-Agent: Mozilla/5.0 (X11; Linux x86_64) Apple
o) Chrome/48.0.2564.97 Safari/537.36
Referer: http://localhost:60002/index.html
Accept-Encoding: gzip, deflate, sdch
Accept-Language: en-US,en;q=0.8
GET /images/floppydudepolice.gif HTTP/1.1
Host: localhost:60002
Connection: keep-alive
Accept: image/webp,image/*,*/*;q=0.8
User-Agent: Mozilla/5.0 (X11; Linux x86_64) Apple
o) Chrome/48.0.2564.97 Safari/537.36
Referer: http://localhost:60002/index.html
Accept-Encoding: gzip, deflate, sdch
Accept-Language: en-US,en;q=0.8
GET /images/back_into_the_void_you_go.gif HTTP/1.
Host: localhost:60002
Connection: keep-alive
Accept: image/webp,image/*,*/*;q=0.8
User-Agent: Mozilla/5.0 (X11; Linux x86_64) Apple
o) Chrome/48.0.2564.97 Safari/537.36
Referer: http://localhost:60002/index.html
Accept-Encoding: gzip, deflate, sdch
Accept-Language: en-US,en;q=0.8
HTTP/1.1 200 OK
Content-Length: 990411
Content-Type: image/gif
GIF89a


404 Page Not Found
404 Page Not Found
New Tab
Amazon.com
Facebook
Thrive Hacks
Weather
IHeartRadio
Speed Test
Ping Test
Spotify Web Player
GO HOME, YOU'RE DRUNK.
The Page you are looking for cannot be found.
RETURN TO SAFETY, RUN AWAY SCREAMING
404s are bad, m'kay.
Maybe you should think about what you've done on the homepage.
YU NO
200?!
The page cannot be found
HTTP 404 - File not found
Internet Explorer
Terminal - jeff@Jeff-VB: ~/SysNets2/SysNets
File Edit View Terminal Tabs Help
jeff@Jeff-VB:~/SysNets2/SysNets2Project1/src$ ./se
Server commence
Readying...
Waiting and listening for client request...
GET /lolnotapage.html HTTP/1.1
Host: localhost:60002
Connection: keep-alive
Accept: text/html,application/xhtml+xml,applicatio
.8
Upgrade-Insecure-Requests: 1
User-Agent: Mozilla/5.0 (X11; Linux x86_64) AppleW
o) Chrome/48.0.2564.97 Safari/537.36
Referer: http://localhost:60002/index.html
Accept-Encoding: gzip, deflate, sdch
Accept-Language: en-US,en;q=0.8
HTTP/1.1 404 Not Found
Content-Length: 1403
Content-Type: text/html
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Trans
g/TR/xhtml1/DTD/xhtml1-transitional.dtd">
<!-- saved from url=(0053)http://www.maketemplate.
-->
<html xmlns="http://www.w3.org/1999/xhtml" xml:lan
<head>
<link rel="icon" href="/images/favicon.ico">
<meta http-equiv="Content-Type" content="text/html
<title>404 Page Not Found</title>
<meta name="robots" content="noarchive">
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<meta name="description" content="25-30 word meta
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font-family:Verdana;
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}
a:link {
color: red;
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a:visited {
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a:hover {color:black; background-color:red};