Network Programming Phase1 httpclient

Learn diary

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To fulfill the requirements in the assignment:

1. Differentiate the put or get function by using different arguments.
2. Recognize and save the host name, port number and route information separately in the argument string.
3. Resolve the host name to IP address and it must support both IPv4 and IPv6.
4. Establish a TCP connection to the indicated port on certain host.
5. Send the request message to the host through socket. The request message should follow the standard http put or get header format strictly, and plus a Iam header due to request in this assignment.
6. Receive and read the response message and do save or other operation.
7. Kill the program process when everything was done.

Problems and solutions during programming:

1. How to differentiate the put or get function?

In this assignment I use different argument structure to differentiate these two functions:

use ./httpclient hostname:portnumber/<route>

to get a file from the server, and save it to a file with the same file name on the server

and use ./httpclient hostname:portnumber/<route> <localfile route>

to put a local file to the server, the filename on the server is indicated in the route information of server.

when argument count is 2, then do the get operation, when argument count is 3, then do the put operation.

2. How to recognize the host name, port number, route information and filename in the argument string?

I did a function to search for ':' and '/' in the string, and save different part in the string to separate char arrays.

3. How to resolve the host name to IP address and setup a TCP connection?

Functions like getaddrinfo and connect can be used to realize the function in the program, and the example code also helped me a lot.

4. The server didn't understand my request.

I used wireshark to capture the packets sent by my program, and found that the request message I sent is not located in the same packet, thus the server do not understand part of my request .

To solve this problem, I used a function sprintf to print the formatted request message in a single char string, and then send the string at one time. Problem solved.

5. I can create the file on server by using HTTP put, but there is no content in the file.

I checked the request format and asked teacher for help, and find that the content type and content length header is missing.

To solve this problem, I added the content type header, and used stat function to calculate the size of the file and added the content length header to the request message. Problem solved.

6. When doing the get operation, how to remove the header and only keep the content in the saved file?

In this assignment, I used strstr function to find the first "\r\n\r\n" string in the received buffer, and start to write the content in the buffer after this string to the local file.

7. When getting file from the server, the program was blocked and didn't exit unless I press Ctrl C.

I try to read the program again carefully, and find that the program is blocked by the read function, the loop didn't quit because it's waiting for new content in the socket.

To solve the problem, I used strstr function to find the first string "Content Length:" in the received buffer, and get the content length value in this header. After that, I used stat function to calculate the file length of local file in every loop, by comparing the content length in the header and the file length of local file, if the lengths are equal, then all content is received, break the loop. Problem solved.

Function test:

features work	features don't work
Get a text file from the server and save the file in the local disk	Only work for plain text -tested putting a jpg image to the server, but need to modify the content type header in the program
Put a file on local disk to the server	No HTTP rendering
Iam header works -found the logger on the server shows Iam: leosplan	
Tested it's working for standard URLs and other HTTP servers	
Large file test successfully -put and get a 520KB file successfully	
valgrind test passed -no leaked memory -no errors in memory operation	