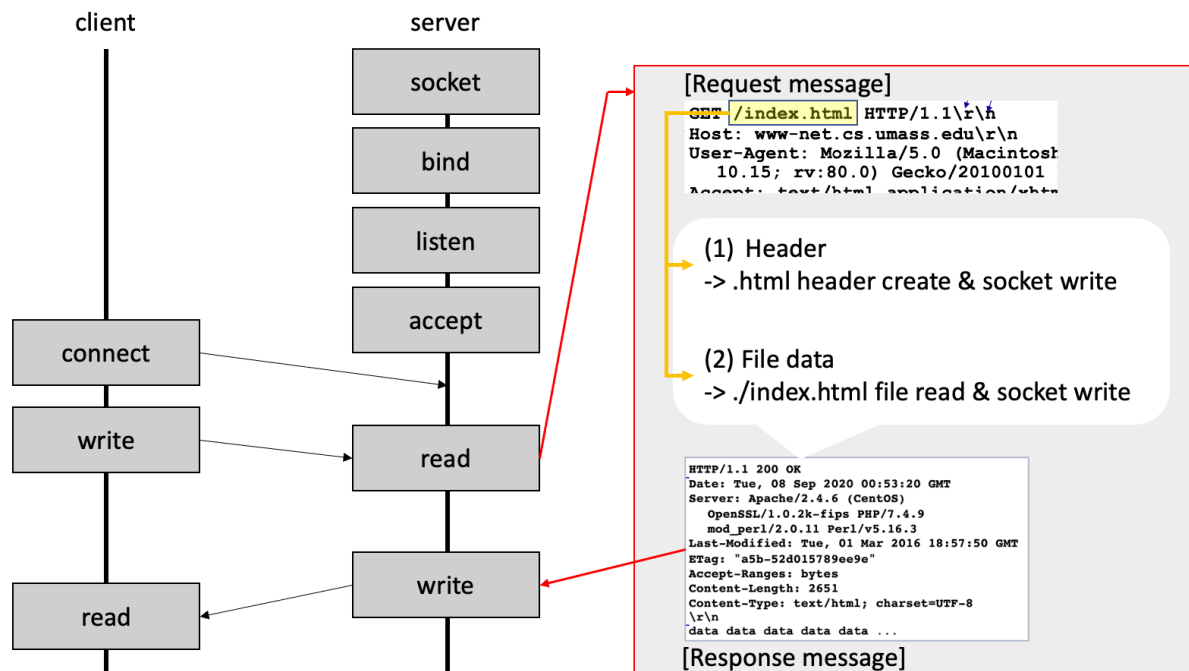


Project 1: Web Server

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1. Description



Create a socket and bind it. After waiting for the client, the client makes a connection request, and then creates a new socket for communication between the client and the server. If the response message sent by the client is a GET request, the file name is parsed and decoded. And depending on the type of file, create an http header and write it through a socket. Then After reading the file data, write the data in the socket. After the above situation, close the socket between the server and the client.

2. Difficulties

- URL encoding & decoding (percent-encoding)

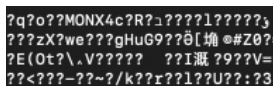
```
=====recieved : 한글 =====
fp is NULL
GET /%ED%95%9C%EA%B8%80 HTTP/1.1
```

Depending on the percentage encoding that represents the character in the URL, conversion is required if not ASCII characters. Therefore, if you type "한글" in the

URL, it becomes "%ED%95%9C%EA%B8%80". And a decoding process is required to use this as a file name.

```
void form_fileName(char * name)
{...
    else{ /* Processing ASCII characters */
        char first_char = tolower(name[i+1]); char second_char = tolower(name[i+2]);
        if(first_char <= '9'){first_char = first_char - '0';}
        else{first_char = first_char - 'a' + 10;}
        if(second_char <= '9'){second_char = second_char - '0';}
        else{second_char = second_char - 'a' + 10;}
        tmp_name[idx++] = (16 * first_char + second_char); i += 2;
    }
...}
```

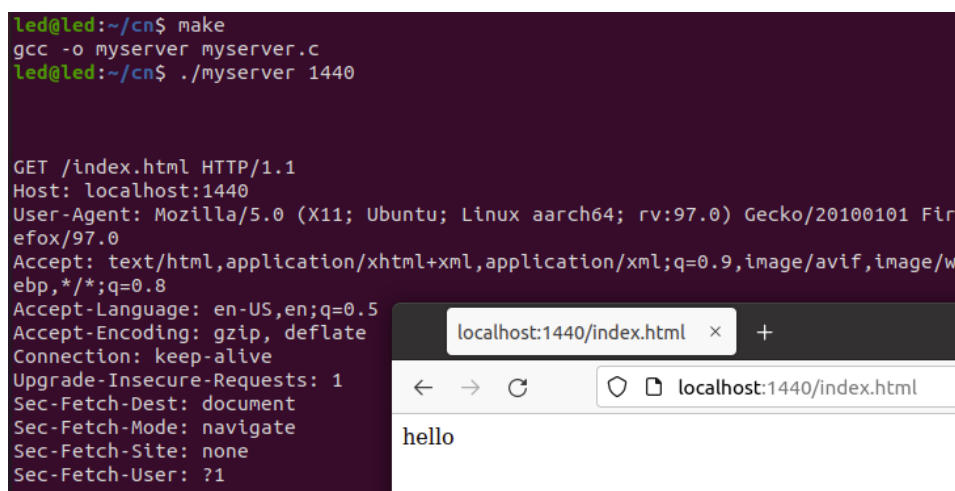
- binary file (.jpeg, .gif ...)



`read()` was used to read 'binary files' containing data encoded in binary format. At this time, if the response header and the read data are combined into `strcpy()`, the data is not sent in the correct format, so after sending the response header, the file data is read and sent separately from the header.

3. sample outputs

- Part A : Implement a "Web Server"



```
led@led:~/cn$ make
gcc -o myserver myserver.c
led@led:~/cn$ ./myserver 1440

GET /index.html HTTP/1.1
Host: localhost:1440
User-Agent: Mozilla/5.0 (X11; Ubuntu; Linux aarch64; rv:97.0) Gecko/20100101 Firefox/97.0
Accept: text/html,application/xhtml+xml,application/xml;q=0.9,image/avif,image/webp,*/*;q=0.8
Accept-Language: en-US,en;q=0.5
Accept-Encoding: gzip, deflate
Connection: keep-alive
Upgrade-Insecure-Requests: 1
Sec-Fetch-Dest: document
Sec-Fetch-Mode: navigate
Sec-Fetch-Site: none
Sec-Fetch-User: ?1

hello
```

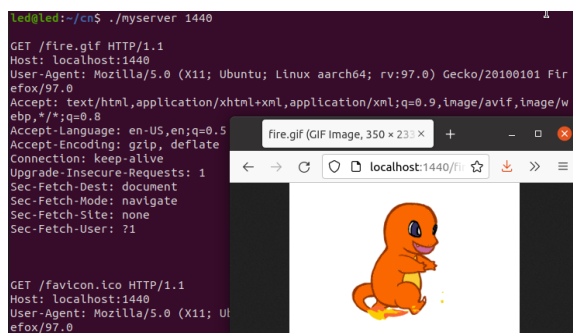
- GET : method definitions. The GET method means retrieve whatever
- Host : A legal Internet host domain name or IP address

information is identified by the Request-URI.

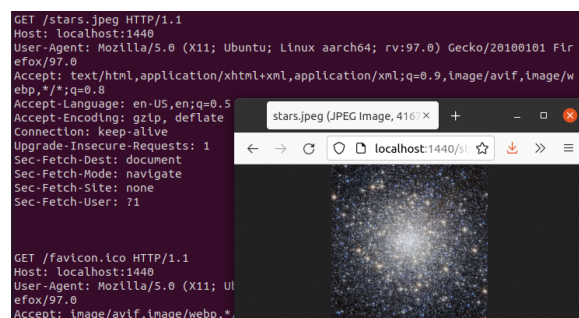
- User-Agent : contains information about the user agent originating the request.
- Upgrade-Insecure-Requests : It sends a signal to the server expressing the client's preference for an encrypted and authenticated response.

■ Part B

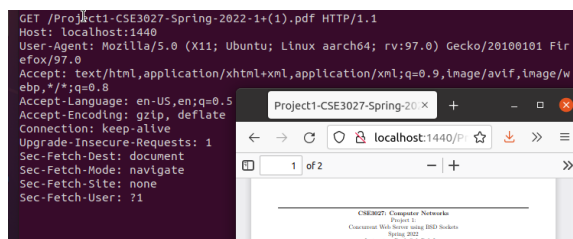
- Accept : indicate a list of media ranges which are acceptable as a response to the request.
- Connection : The Connection general header controls whether the network connection stays open after the current transaction finishes. → keep-alive : the connection is persistent and not closed



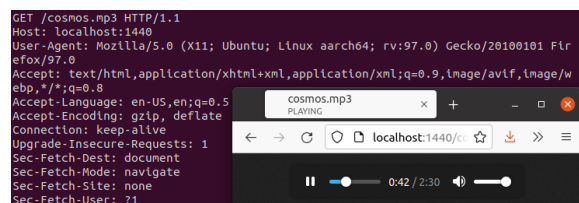
When requesting a gif file



When requesting a jpeg file



When requesting a pdf file



When requesting a mp3 file