COMP3331 Computer Networks and Applications
Lab Exercise 02: HTTP & Socket Programming

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Exercise 3: Using Wireshark to understand basic HTTP request/response messages (marked, include in your report)

Question 1: What is the status code and phrase returned from the server to the client browser?

- Status code : 200, returned phrase: OK

Question 2: When was the HTML file that the browser is retrieving last modified at the server? Does the response also contain a DATE header? How are these two fields different?

- Last modified: Tue, 23 Sep 2003 05:29:00 GMT. Yes it contains DATE header. DATE header shows when the http message was generated/sent, whereas last modified field shows when the cache is updated. This allows to reduce network traffic.

Question 3: Is the connection established between the browser and the server persistent or non-persistent? How can you infer this?

- The connection is server persistent.
  In HTTP/1.1 the connection is persistent by default unless you add the "Connection: close" header to the http request. In which case the server has to close the connection the requested object has been sent.
  (https://osqa-ask.wireshark.org/questions/5925/persistent-vs-non-persistent-connections)

Question 4: How many bytes of content are being returned to the browser?

- File Data: 73 bytes

Question 5: What is the data contained inside the HTTP response packet?

- <html>\n
  Congratulations. You've downloaded the file lab2-1.html!\n
  </html>\n

Exercise 4: Using Wireshark to understand the HTTP CONDITIONAL GET/response interaction

Question 1: Inspect the contents of the first HTTP GET request from the browser to the server. Do you see an “IF-MODIFIED-SINCE” line in the HTTP GET?

- No.

Question 2: Does the response indicate the last time that the requested file was modified?

- No. That is indicated by Last-Modified field.

Question 3: Now inspect the contents of the second HTTP GET request from the browser to the server. Do you see an “IF-MODIFIED-SINCE” and “IF-NONE-MATCH” lines in the HTTP GET? If so, what information is contained in these header lines?

- If-Modified-Since: Tue, 23 Sep 2003 05:35:00 GMT
  The If-Modified-Since request HTTP header makes the request conditional: the server will send back the requested resource, with a 200 status, only if it has been last modified after the given date.
  (https://developer.mozilla.org/en-US/docs/Web/HTTP/Headers/If-Modified-Since)

- If-None-Match: “1bfef-173-8f4ae900”
  The If-None-Match HTTP request header makes the request conditional. For GET and HEAD methods, the server will send back the requested resource, with a 200 status, only if it doesn't have an ETag matching the given ones. For other methods, the request will be processed only if the eventually existing resource’s ETag doesn't match any of the values listed.
  (https://developer.mozilla.org/en-US/docs/Web/HTTP/Headers/If-None-Match)

Question 4: What is the HTTP status code and phrase returned from the server in response to this second HTTP GET? Did the server explicitly return the contents of the file? Explain.

- Status code: 304, returned phase: Not Modified. No, the contents of the file were not returned. This is because since the content is not modified, it is not necessary to transfer the same content again. Instead of transferring the same data again , we can use cache.

Question 5: What is the value of the Etag field in the 2nd response message and how it is used? Has this value changed since the 1st response message was received?

- ETag: “1bfef-173-8f4ae900"\r\n (same as the 1st response message)
  It remains the same because the content of the file hasn’t changed.

Exercise 5: Ping Client

Sample output