Hyper Text Transfer Protocol

ICS4U - Mr. Emmell

History

- First implemented in 1990
- Standardized as HTTP 1.0 in 1996
- Standardized as HTTP 2.0 in 2015
- HTTP 3.0 has been proposed but not formally standardized yet
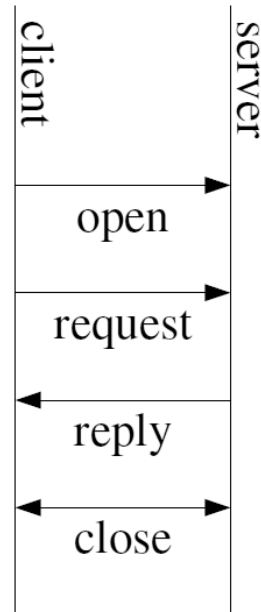 - Draft proposal in 2020
  - Already widely adopted

HTTP Protocol Summary

A typical HTTP transaction:

– Client (browser) open connection to server

– Client sends request to server

– Server processes request

– Server replies to client

– Client and server sever connection

Variants

– Connection stays open

– A proxy sits between client and server

The HTTP Request

REQUEST
GET / HTTP/1.1
Host: wcss.emmell.org
Connection: keep-alive
User-Agent: Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, ...
Accept: text/html,application/xhtml+xml,application/xml;q=0.9,image/avif,image/webp
Accept-Encoding: gzip, deflate, br
Accept-Language: en-CA,en-GB;q=0.9,en-US;q=0.8,en;q=0.7
Cookie: _ga=GA1.2.1143630916.1618837235; _gid=GA1.2.1225828957.1618837235
If-None-Match: "ed5-5c0448eb6f9c5-gzip"
If-Modified-Since: Sun, 18 Apr 2021 19:52:48 GMT

Main HTTP Request Types

- GET
    - Get (retrieve) a document
- HEAD
    - Same as GET, but only retrieve header
- PUT
    - Put information on the server
- POST
    - Send information to the server
- OPTIONS
    - get information about the server

The HTTP Response

Request includes a header and optional body

RESPONSE HEADER
HTTP/1.1 200 OK
Date: Mon, 19 Apr 2021 16:07:31 GMT
Server: Apache/2.4.41 (Ubuntu)
Last-Modified: Sun, 18 Apr 2021 19:52:48 GMT
ETag: "ed5-5c0448eb6f9c5-gzip"
Accept-Ranges: bytes
Vary: Accept-Encoding
Content-Encoding: gzip
Content-Length: 1357
Keep-Alive: timeout=5, max=100
Connection: Keep-Alive
Content-Type: text/html

RESPONSE DATA
<!DOCTYPE HTML>………….

Common Response Codes

• 200 OK

  – Success

• 404 Not Found

  – The specified document does not exist

• 403 Forbidden

  – The specified document exists, but can not be accessed

• 301 & 302 Document Moved

  – The document is at the new (specified) location

• 4** Error

  – Any 4** message indicates an error has occured

Summary

The basic HTTP transaction is a simple request from the client followed by a reply from the server

• Both requests and replies have a header followed by an optional body

• 200 indicates a success

• 4xx indicates an error

• We will see more complicated transactions and header fields later on