SOEN 387 WEB-BASED ENTERPRISE APPLICATIONS DESIGN

TUTORIAL – 3 HTTP, HTML, CSS, and Curl

- What is HTTP (Hyper-Text Transfer Protocol)?
- HTTP Request Structure from Client
- HTTP Response Structure from Web Server
- How to Check HTTP Request and Response on Chrome?
- HTTP Methods
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What is HTTP?

HTTP stands for <u>HyperText Transfer Protocol</u>. This is a basis for data communication in the internet. The data communication starts with a request sent from a client and ends with the response received from a web server.

- HTTP is the underlying protocol used by the World Wide Web.
- This protocol defines how messages are formatted and transmitted
- Tells what actions Web servers and browsers should take in response to various commands.

World Wide Web or Internet

HTTP Response

HTTP Request Structure from Client

A simple request message from a client computer consists of the following components:

- A request line to get a required resource, for example a request GET /home.htm is requesting a resource called /home.htm from the server.
- Headers (Example Accept-Language: EN).
- An empty line.
- Message body which is optional.
- All the lines should end with a carriage return and line feed.

```
GET /home.html HTTP/1.1
Host: xyz.com
Connection: Keep-Alive
User-Agent: Mozilla/4.0
Accept: image/gif, image/jpeg
```

(Empty body)

----- Blank line -----

Request Message

The empty line should only contains carriage return and line feed without any spaces.

HTTP Response Structure from Web Server

A simple response from the server contains the following components:

- HTTP Status Code (For example HTTP/1.1 301 Moved Permanently, means the requested resource was permanently moved and redirecting to some other resource).
- Headers (Example Content-Type: html)
- An empty line.
- A message body which is optional.

Response Message

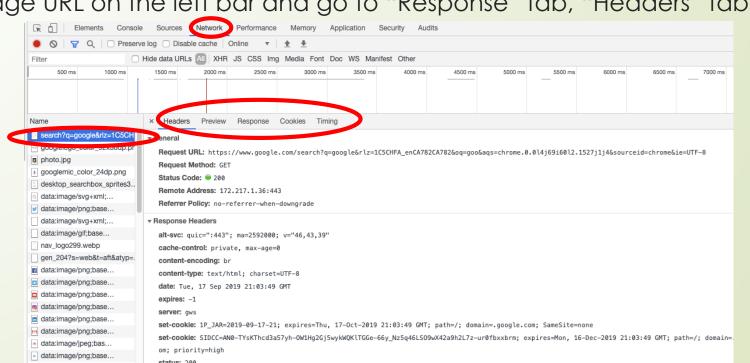
HTTP/1.1 200 OK
Date: ...
Server: Apache/2.0.45
Last-Modified: ...
Content-Length: 105
Content-Type: text/html
----- Blank line ----<html>
<head><title>My Home</title></head>
<body><h1>This is my Home Page</h1>
</body></html>

All the lines in the server response should end with a carriage return and line feed. Similar to request, the empty line in a response also should only have carriage return and line feed without any spaces.

How to Check HTTP Request and Response on Chrome?

- Open a webpage in Google Chrome and go to "View > Developer > Developer Tools" menu.
- You can also open the developer console by right clicking on the page and choose "Inspect" option.
- Go to "Network" tab and then reload the page. Now you will see the loading time for each single component on the page.

Click the page URL on the left bar and go to "Response" tab, "Headers" tab or "preview



tab"

HTTP Methods

GET

The GET method requests a representation of the specified resource. Requests using GETshould only retrieve data.

HEAD

The HEAD method asks for a response identical to that of a GET request, but without the response body.

POST

The POST method is used to submit an entity to the specified resource, often causing a change in state or side effects on the server.

PUT

The PUT method replaces all current representations of the target resource with the request payload.

DELETE

The DELETE method deletes the specified resource.

HTML

- HTML describes the structure of a Web page
- HTML consists of a series of elements which represented by tags,
- HTML tags label pieces of content such as "heading", "paragraph", "table", etc.
- Browsers do not display the HTML tags, but use them to render the content of the page

CSS

Cascading Style Sheets (CSS) is a stylesheet language used to describe the
presentation of a document written in HTML or XML (including XML dialects such as
SVG, MathML or XHTML). CSS describes how elements should be rendered on screen,
on paper, in speech, or on other media.

Hello World using CSS

CSS Image gallery

```
<head>
<style>
div.gallery {
margin: 5px;
 border: 1px solid #ccc;
float: left;
width: 180px;
div.gallery:hover{
border: 1px solid #777;
div.gallery img {
width: 100%:
 height: auto;
div.desc {
 padding: 15px;
 text-align: center;
</style>
</head>
```

<html>



Add a description of the image here



Add a description of the image here



Add a description of the image here



Add a description of the image here

text-align: center;

Expected Output

```
<div class="gallery">
  <a target="_blank" href="img_5terre.jpg">
    <img src="img_5terre.jpg" alt="Cinque Terre" width="600" height="400">
    </a>
  <div class="desc">Add a description of the image here</div>
  </div>
  </body>
  </html>
```

How to Use the Chrome Inspector to Edit Your Website CSS

- Select the Chrome menu at the top-right of your browser window, then select
 Tools > Developer Tools.
- Right-click on any page element and select Inspect Element.
- Click an element in the page or the html element for the corresponding CSS.
- Click on a property value to edit the value. If you're editing a property name,
 press Tab or Enter to edit the property value.

```
Facebook helps you connect and share with the
                                                                        <script>requireLazy(["bootstrapWebSession"],function(j){j(1568755492)})//
                                                                                                                                                                  img {
                                                                                                                                                                                        lGpEv0YK4Wo...3Wp8la5Kz:6
                                                                      ▼<div class=" li" id="u 0 e">
img.img 569×195 life
                                                                                                                                                                    border: ▶ 0;
                                                                        > <div class=" 3 s0 1toe 3 s1 3 s1 uiBoxGray noborder" data-testid="ax-navigation-
                                                                        menubar" id="u_0_f">...</div>
                                                                                                                                                                  img[Attributes Style] {
                                                                        ▶ <div id="pagelet_bluebar" data-referrer="pagelet_bluebar">...</div>
                                                                        ▼<div id="globalContainer" class="uiContextualLayerParent">
                                                                          ▼<div class="fb content clearfix " id="content" role="main">
                                                                             ▼<div class="gradient">
                                                                                                                                                                  Inherited from div._5iyy
                                                                               ▼ <div class="gradientContent">
                                                                                                                                                                  #facebook . -kb div
                                                                                                                                                                                       lGpEv0YK4Wo...Wp8lg5Kz:32
                                                                                 ▼<div class="clearfix">
                                                                                   ▼<div class="lfloat _ohe">
                                                                                                                                                                    font-family: inherit;
                                                                                    ▼<div class="_5iyy">
                                                                                       <div class="_5iyx">Facebook helps you connect and share with the people in
                                                                                                                                                                  Inherited from body.fbIndex...
                                                                                       vour life.</div>
                                                                                                                                                                  font-family: system-ui, -apple-system,
                                                                                           /g52wtTZ.png" alt width="569" height="195"> == 5
                                                                                                                                                                       BlinkMacSystemFont, 'SFNSText-
                                                                                      </div>
                                                                                                                                                                       Regular', sans-serif;
                                                                                    </div>
```

CURL

 cURL is a computer software project providing a library and command-line tool for transferring data using various protocols. The cURL project produces two products, libcurl and cURL. It was first released in 1997.

URL syntax, supporting DICT, FILE, FTP, FTPS, Gopher, HTTP, HTTPS, IMAP, IMAPS, LDAP, LDAPS, POP3, POP3S, RTMP, RTSP, SCP, SFTP, SMB, SMTP, SMTPS, Telnet and TFTP. curl supports SSL certificates, HTTP POST, HTTP PUT, FTP uploading, HTTP form based upload, proxies, HTTP/2, cookies, user+password authentication (Basic, Plain, Digest, CRAM-MD5, NTLM, Negotiate and Kerberos), file transfer resume, proxy tunneling and more.

CURL - How it looks like?

curl (get | post) [-v] (-h "k:v")* [-d inline-data] URL

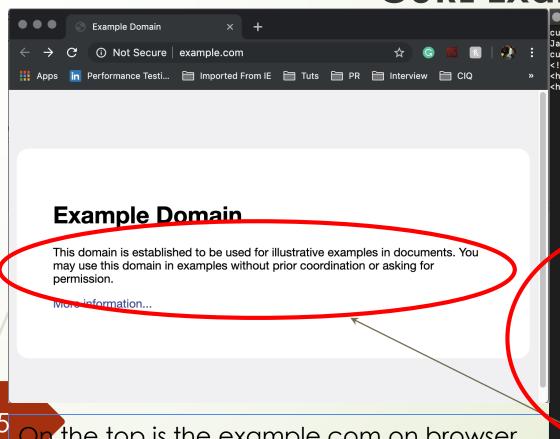
- 1. Option -v enables a verbose output from the command-line.
- 2. URL determines the targeted HTTP server. It could contain parameters of the HTTP operation. For example, the URL 'https://www.google.ca/?q=hello+world' includes the parameter q with "hello world" value.
- 3. To pass the headers value to your HTTP operation, you could use -h option. The latter means setting the header of the request in the format "key: value." Notice that; you can have multiple headers by having the -h option before each header parameter.
- 4. -d gives the user the possibility to associate the body of the HTTP Request with the inline data, meaning a set of characters for standard input.
- 6. get/post options are used to execute GET/POST requests respectively. post should have either -d or -f but not both. However, get option should not used with the options -d or -f.

CURL Commands

	curl command	Description	Example
	-i or include	Includes the response headers in the response.	curl —i http://www.ex- ample.com♂
	-d ordata	Includes data to post to the URL. The data needs to be url encoded . Data can also be passed in the request body.	curl -d "data-to-post" http://www.example.com 【
	-H or header	Submits the request header to the resource. Headers are common with REST API requests because the authorization is usually included in the header.	curl -H "key:12345" http://www.example.com ♂
	-X POST	Specifies the HTTP method to use with the request (in this example, POST). If you use -d in the request, curl automatically specifies a POST method. With GET requests, including the HTTP method is optional, because GET is the default method used.	curl -X POST -d "re- source-to-update" http://www.example.com
	@filename	Loads content from a file.	curl -X POST -d @mypet.json http://www.example.com

See the curl documentation for a comprehensive list of curl commands you can use.

CURL Examples



On the top is the example.com on browser.

Right side is the curl http://example.com from terminal

```
🏥 iashansingh — -bash — 105×53
curLast login: Sun Sep 15 18:24:17 on console
Jashans-MacBook-Pro:~ jashansingh$ curl http:// example.com
curl: (3) Bad URL
<!doctype html>
<html>
   <title>Example Domain</title>
   <meta charset="utf-8" />
   <meta http-equiv="Content-type" content="text/html; charset=utf-8" />
   <meta name="viewport" content="width=device-width, initial-scale=1" />
   <style type="text/css">
   body {
       background-color: #f0f0f2;
       margin: 0;
       font-family: "Open Sans", "Helvetica Neue", Helvetica, Arial, sans-serif;
       width: 600px;
       margin: 5em auto;
       padding: 50px;
       background-color: #fff;
       border-radius: 1em;
   a:link, a:visited {
       color: #38488f;
       text-decoration: none;
                                                       These properties can be
   @media (max-width: 700px) {
                                                       checked on Dev tools as
       body {
           background-color: #fff;
                                                       well
       div {
           width: auto;
           margin: 0 auto;
           border-radius: 0;
           padding: 1em;
   </style>
</head>
<body>
<div>
    <h1>Example Domain</h1>
   This domain is established to be used for illustrative examples in documents. You may use this
   domain in examples without prior coordination or asking for permission.
   <a href="http://www.iana.org/domains/example">More information...</a>
</div>
</body>
</html>
```

CURL Examples

```
httpbin.org/get?course=soen&assignment=1
  "args": {
    "assignment": "1",
    "course": "soen"
  },
  "headers": {
    "Accept": "text/html,application/xhtml+xml,application/xml;q=0.9,*/*;q=0.8",
    "Accept-Encoding": "gzip, deflate",
    "Accept-Language": "en-ca",
    "Cookie": " gauges unique=1; gauges unique year=1",
    "Host": "httpbin.org",
    "Upgrade-Insecure-Requests": "1",
    "User-Agent": "Mozilla/5.0 (Macintosh; Intel Mac OS X 10 14 6) AppleWebKit/605.1.15 (KHTML,
like Gecko) Version/13.0 Safari/605.1.15"
  },
  "origin": "45.42.74.230, 45.42.74.230",
  "url": "https://httpbin.org/get?course=soen&assignment=1"
```

```
igashansingh — -bash — 107×21

[Jashans-MacBook-Pro:~ jashansingh$ curl get http://httpbin.org/get?course=soen&assignment=1

[1] 30021

Jashans-MacBook-Pro:~ jashansingh$ curl: (6) Could not resolve host: get

{
    "args": {
        "course": "soen"
    },
    "headers": {
        "Accept": "*/*",
        "Host": "httpbin.org",
        "User-Agent": "curl/7.54.0"
    },
    "origin": "45.42.74.230, 45.42.74.230",
    "url": "https://httpbin.org/get?course=soen"
}
```

≡

CURL Exercise

Try the followings:

- 1. Verbose: Do Curl get with command -v on the previous example. Check your response and compare with normal get response.
- 2. Post with inline data.

E.g. curl post -d '{"Assignment": SOEN 387}' http://httpbin.org/post

 Write the content of the response into a text file.

E.g. curl -v
'http://httpbin.org/get?course=SOEN387
&assignment=1' -o DemoFile.txt

```
Desktop — -bash — 99×28
Jashans-MacBook-Pro:Desktop jashansingh$ curl post -d '{"Assignment": SOEN 387}' http://httpbin.org
curl: (6) Could not resolve host: post
  "data": "",
  "files": {},
    "{\"Assignment\": SOEN 387}": ""
   "headers": {
    "Accept": "*/*",
    "Content-Length": "24",
    "Content-Type": "application/x-www-form-urlencoded"
    "Host": "httpbin.org",
    "User-Agent": "curl/7.54.0"
  "json": null,
  "origin": "45.42.74.230, 45.42.74.230",
  "url": "https://httpbin.org/post"
 ashans-MacBook-Pro:Desktop jashansingh$
```

```
ashans-MacBook-Pro:Desktop jashansingh$ clear
ashans-MacBook-Pro:Desktop jashansingh$ curl -v 'http://httpbin.org/get?course=SOEN387&assignment=1' -o DemoFile.txt
           % Received % Xferd Average Speed Time Time Time Current
Dload Upload Total Spent Left Speed
                                                                                           Trying 3.222.220.121...
Connected to httpbin.org (3.222.220.121) port 80 (#0) GET /get?course=SOEN387&assignment=1 HTTP/1.1
 Host: httpbin.org
 User-Agent: curl/7.54.0
 Accept: */*
                                                                                              "assignment": "1",
"course": "SOEN387"
  ccess-Control-Allow-Credentials: true
 Access-Control-Allow-Origin: *
                                                                                             'headers": {
   "Accept": "*/*",
   "Host": "httpbin.org",
   "User-Agent": "curl/7.54.0"
 Content-Type: application/ison
 Date: Sun, 22 Sep 2019 21:18:04 GMT
 Referrer-Policy: no-referrer-when-downgrade
 X-Content-Type-Options: nosniff
X-Frame-Options: DENY
                                                                                          45.42.74.230",
"url": "https://httpbin.org/get?
 X-XSS-Protection: 1; mode=block
 Content-Length: 279
                                                                                           ourse=S0EN387&assignment=1
    279 100 279 0 0 2746 0 --:--:- 2762
Connection #0 to host httpbin.org left intact
Jashans-MacBook-Pro:Desktop jashansingh$ [
```