How the Web Works

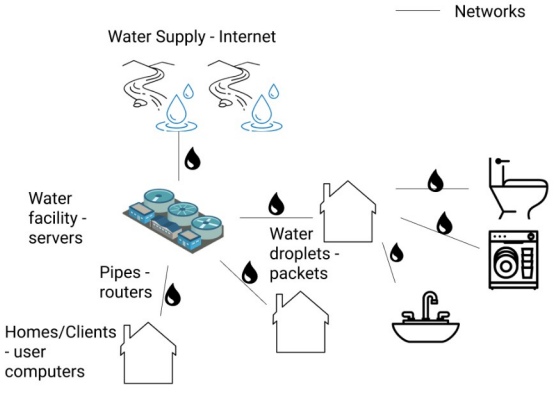
In this lab, you'll be working with a partner to explore a little more about the internet, the web, requests, responses and more. You'll be reading and writing about concepts as well as practicing some of the commands that we saw during the lecture earlier.

Topic 1: The Internet and the World Wide Web

1. What is the internet? (hint: here): worldwide network of networks. This is the technical infrastructure that makes the Web possible. Large network of computers which communicate together - think of the internet as a wire.
2. What is the world wide web? (hint: here): not the same as ther internet – the WWW is an interconnected system of public webpages that are available through the internet. Web is the service built on top of the infrastructure (internet).
3. Partner One: read this page on how the internet works, Partner Two: read this page on how the world wide web works. When you're done reading, come back together and and answer the following questions
    - 3.a What are networks? 2 or more things that commincate with eachother.
    - 3.b What are servers? Connected directly to the internet. They are computers that store webpages, sites, apps, data.
    - 3.c What are routers? Computer tha makes sure that a message sent from a given computer arrives at the right destination computer.
    - 3.d What are packets? Small snip of data.
4. Come up with a metaphor for the internet and the web, you can do a single one if you think of one that puts them together or two separate ones (feel free to use one you've heard today or read about if you can't think of a new one, but spend at least 10 minutes trying to think of something different before you resort to that)

    World water supply – Internet
    The houses that are supplied with the water – Web
    Wells – Networks
    Water Storage – Servers
    Pipes – Router
    Water doplets – Packets
    Plumbers – Software Engineers

5. Draw out a diagram of the infrastructure of the internet and how a request and response travel using your metaphor (like the map and letters we saw during the lecture). Insert the drawing into this document (can be a picture of a physical drawing, a Google Drawing, a Figma drawing, etc)



Topic 2: IP Addresses and Domains

1. What is the difference between an IP address and a domain name? Domain name is the user-friendly name/key that will link to the IP address
2. What's devmountain.com's IP address? (Hint: use 'ping' in the terminal) `104.22.12.35`
3. Try to access devmountain.com by its IP address. It shouldn't work because we have our sites protected by a service called CloudFlare. Why might it be important to not let users access your site directly at the IP address?
4. How do our browsers know the IP address of a website when we type in its domain name? (If you need a refresher, go read this comic linked in the handout from this lecture) This is what the DNS does. They match the domain names to the IP address and then connect to the IP address.

Topic 3: How a web page loads into a browser

The steps of how a web page is requested and sent are in the table below. However, **they are out of order**. Unscramble them and explain your thinking/reasoning in the second two columns of the table.

Steps Scrambled	Steps in Correct Order	Why did you put this step in this position?
Example: Here is an example step	*Here is an example step*	*- I put this step first because ____* *- I put this step before/after ____ because ____*
Request reaches app server	Step 2	After the request is made, it travels to the server and is recieved
HTML processing finishes	Step 4	This happens after the HTML is processed
App code finishes execution	Step 5	Based on waterfall method this should happen before the page renders
Initial request (link clicked, URL visited)	Step 1	This initiates the process and starts the request – starting the waterfall
Page rendered in browser	Step 6	After the code executes, browser rendered.
Browser receives HTML, begins processing	Step 3	Servers sent the HTML to the browser

Topic 4: Requests and Responses

Setup

- Download the folder for this exercise from Frodo.
- Make sure you unzip it.
- Open it in VS Code
- Run `npm i` in the terminal (make sure you're in the web-works folder you just downloaded).
    - You'll know it was successful if you see a node_modules folder in the web-works folder.
- Run `node server.js` in the terminal (also in the web-works folder) and you should see a log to the terminal saying 'serving up port 4500'
- You'll be using this file to figure out what will happen when you make requests to this server, so read it over to see what's going on. We'll be getting into the two GET functions and the POST function.

Part A: GET /

- You'll start by looking at the function that runs when we make a get request to /, which looks like this: http://localhost:4500 or http://localhost:4500/
- You'll use the curl command to make a request and read the response in your terminal

1 Predict what you'll see as the body of the response: two lines of code, different header sizes. First line "Jurrni", second "Journaling your journies"

2 Predict what the content-type of the response will be: text/HTML

- Open a terminal window and run `curl -i http:localhost:4500`

3 Were you correct about the body? If yes, how/why did you make your prediction? If not, what was it and why? Yes, looked at string in function that ran when '/' seen.

4 Were you correct about the content-type of the response? If yes, how/why did you make your prediction? If not, what was it and why? Based on h1, h2 tags. comes back as text/html.

Part B: GET /entries

- Now look at the next function, the one that runs on get requests to /entries.
- You'll use the curl command again. This time, you'll need to figure out how to modify it to get the response that you need.

1 Predict what you'll see as the body of the response: we will see the array enteries

2 Predict what the content-type of the response will be: *** unsure

- In your terminal, run a curl command to get request this server for /entries

3 Were you correct about the body? If yes, how/why did you make your prediction? If not, what was it and why? Yes.

4 Were you correct about the content-type of the response? If yes, how/why did you make your prediction? If not, what was it and why? ***

Part C: POST /entry

- Last, read over the function that runs a post request.

1 At a base level, what is this function doing? (There are four parts to this).
1. Creates an object called newEntry
2. Pushes the object to the end of the enteries array
3. increments globalId
4. display enteries array

2 To get this function to work, we need to send a body object with our request. Looking at the function in server.js, what properties do you know you'll need to include on that body object? Id, date, and content. And what data types will they be (hint: look at the objects in the entries array)? Id will be integer, the other two will be strings.

3 Plan the object that you'll send with your request. Remember that it needs to be written as a JSON object inside strings. JSON objects properties/keys and values need to be in **double quotes** and separated by commas. `$ curl -i -X POST -H 'Content-type: application/json' -d '{"id": "globalId", "date":"June 21", "content": "This is content"}' http://localhost:4500/entry`

4 What URL will you be making this request to? `http://localhost:4500/entry`

5 Predict what you'll see as the body of the response: entries array with object in command line passed in

6 Predict what the content-type of the response will be: applications/json

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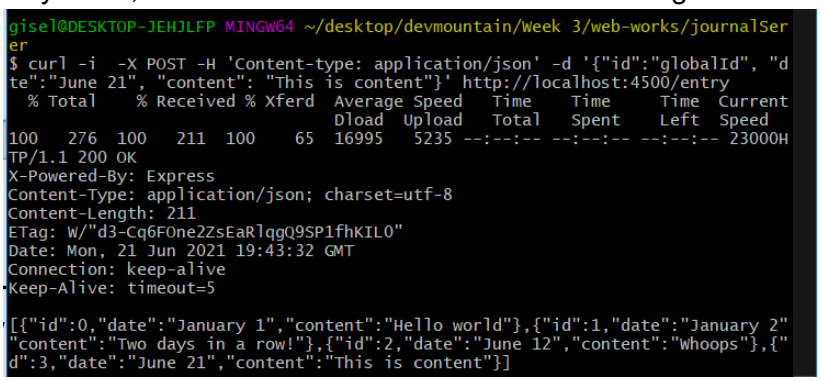
- In your terminal, enter the curl command to make this request. It should look something like the example below, with the information you decided on in steps 3 and 4 instead of the ALL CAPS WORDS.
    - curl -i -X POST -H 'Content-type: application/json' -d JSONOBJECT URL

7 Were you correct about the body? If yes, how/why did you make your prediction? If not, what was it and why? Yes, Predictation made based on entries being sent and entries having new object pushed on.



8 Were you correct about the content-type of the response? If yes, how/why did you make your prediction? If not, what was it and why? Yes, based on using array/object vs html.

Submission

1 Save this document as a PDF
2 Go to Github and create a new repository. (Click the little + in the upper right hand corner.)
3 Name your repository “web-works” (or something like that).
4 Click “uploading an existing file” under the “Quick setup heading”.
5 Choose your web works PDF document to upload.
6 Add “commit message” under the heading “Commit changes”. A good commit message would be something like “Adding web works problems.”
7 Click commit changes.

Further Study: More curl

Visit this link and do the exercises using the website provided. Keep track of the commands you used in this document. (Don’t forget to resubmit to GitHub when you complete this section)