Node.js
Web server creation

Web Server

- Web server can refer to
  - hardware
  - software
  - both of them working together

Web Server

- **hardware side**

  - a web server is a computer that stores **web server software** and a **website's component files** (ie. HTML docs, images, CSS & JS files)

  - a web server *connects* to the Internet and supports *physical data interchang*e with other devices connected to the web.

Web Server

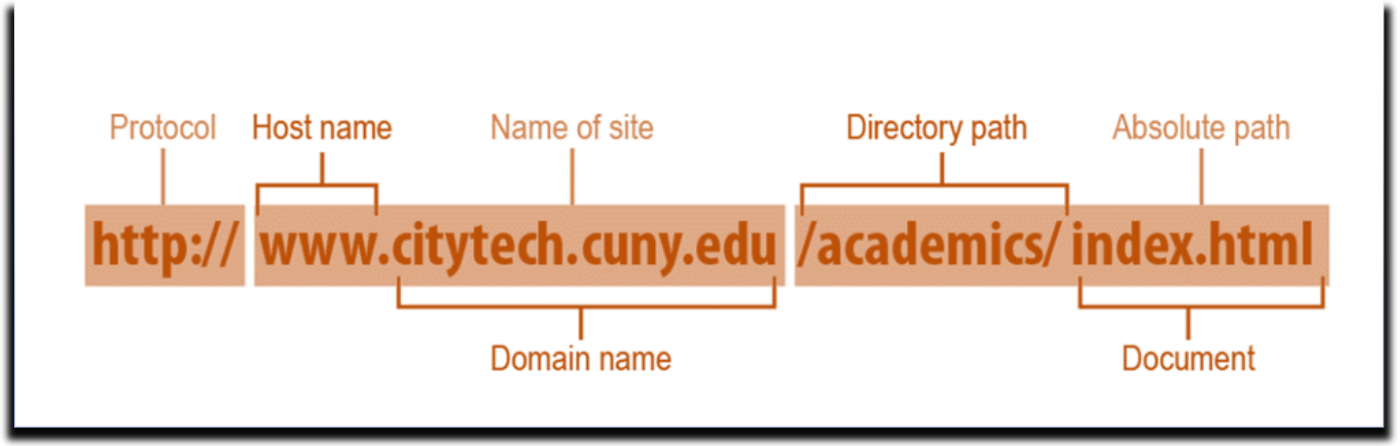
- **Software side**
  - a web server includes several parts that control **how** web users access hosted files. At a minimum, this is an HTTP server.

    HTTP is a communication protocol (communication protocol :is a system of rules that allows two or more parties to communicate.

- **An HTTP server**
  - software that understands URLs (web addresses) and HTTP (the protocol your browser uses to view webpages).
  - a protocol that allows clients & web servers to communicate

Web Server

- An HTTP server can be accessed through the **domain names** of the websites it stores, and it delivers the content of these hosted websites to the end user's device. (source)

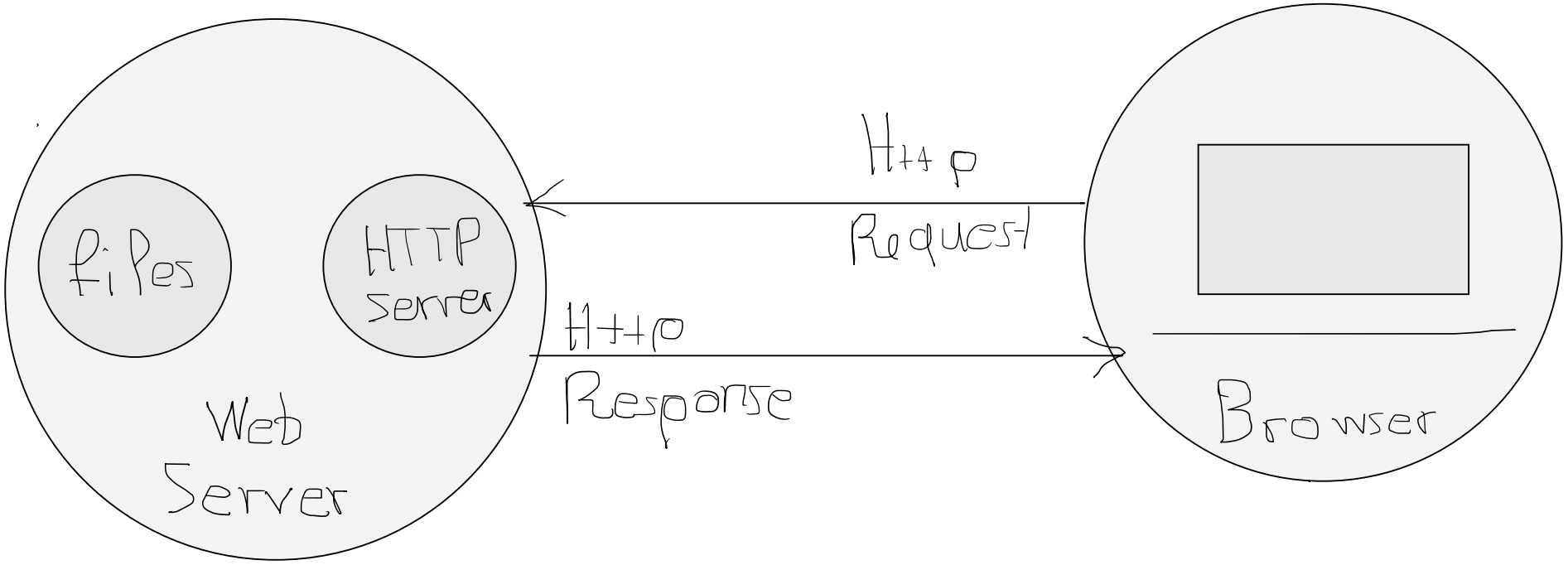


https://stuyhsdesign.wordpress.com/web-design/domain-name/

Web Server

- So this is how a web server basically **works**
  - When a browser needs a file that is hosted on a web server, the browser **requests** the file via HTTP
  - When the request reaches the correct (hardware) web server, the (software) HTTP server **accepts** the request, **finds** the requested document, and sends it back to the browser (**response**), also through HTTP. (or returns 404)

Web Server



Source:https://developer.mozilla.org/

Web Server

- To publish a website we need-> **static** or **dynamic** web server

- **Static web server**

  - consists of a computer (hardware) with an HTTP server (software)
  - sends its hosted files **as-is** to your browser.

Web Server

- **Dynamic web server**
  - ➢ consists of a static web server plus extra software, most commonly an application server and a database.
  - ➢ **application server updates hosted files** before sending content to browser via the HTTP server.

Dynamic web sites

Dynamic web sites

- For example, an application server might **fill** an HTML template with content from database.
- Dynamic webpages usually consist of only a few HTML templates and a database, rather than thousands of static HTML documents.
- Easier to maintain and deliver the content.

Node.js as a Web Server

- Lets see how we can **create a web server** capable of accepting requests and sending back responses

- Node.js has a module called HTTP-> used to transfer data over the Hyper Text Transfer Protocol (HTTP)

Node.js as a Web Server

- HTTP module can **create** an HTTP server that
  - **listens** to server ports for requests and
  - **gives** a response back to the client

Node.js as a Web Server

Include HTTP module:

- const http = require('http’);

create an HTTP server:

- const server = http.createServer()
  - Create the server with the aforementioned method that accepts a **callback** function that will fire every time a new request hits our server

Node.js as a Web Server

http.createServer() method

- turns your computer into an HTTP server.
- generates an HTTP Server object
  - HTTP Server object can **listen to ports** on your machine and execute a **requestListener method** whenever a request is received.
  - Callback function to be executed every time the server gets a request.

HTTP Server Methods and Properties:https://www.w3schools.com/nodejs/obj_http_server.asp

Node.js as a Web Server

Listen for incoming requests at localhost port 8080

- server.listen(8080,'127.0.0.1',callback) 3

Node.js as a Web Server

```
server.listen(8080,'127.0.0.1',()=>{
    console.log('hI! We are listening to requests! ');
});
```

3

- 8080: port number
- Localhost(like a domain name on the web) is an alias for the IP address 127.0. 0.1 -> points back to our computer that is acting as a host for our website

- If we console.log(req) we shall see that the **req Object** is huge, with many properties and methods

```
//1st part: create a server object
const server= http.createServer((req, res) => {

  console.log(req);
  }); //the server object listens on port 8080
```

- Lets see some specific options
  - Req.url
  - Req.method (type of request, get post etc)

```
//1st part: create a server object
const server= http.createServer((req, res) => {

  console.log(req.url, req.method);
  res.end();
  }); //the server object listens on port 8080
```

Node.js as a Web Server

- Res object: response
- res.write method: write to the response
- res.end method: ending the response which then sends it to the browser

Node.js as a Web Server

```
const http = require('http');
//create a server
//creatServer method will accept a callback function that will fire
//every time a new request hits our server

//1st part: create a server object
const server= http.createServer((req, res) => {

    res.write('Hello!'); //write a response to the client
    res.end('Hello World!I am ending');
    // res. end() function is used to end the response process.
  }); //the server object listens on port 8080

  //2nd part: listen to incoming requests from the client
  //port is a subaddress in a host
  //host is : 127.0.0.1 localhost
  //callback function is optional
  server.listen(8080,'127.0.0.1',()=>{
      console.log('hI! We are listening to requests! ');
  });
```

Node.js as a Web Server

- Save code (first_webserver.js)
- Initiate the file: node first_webserver.js
- See the result at localhost: http://localhost:8080
  - That way the browser knows to connect to our own computer via this particular port number
- We have a real web server running on our computer!

Node.js as a Web Server

If you check at the terminal-> you will see that the app keeps running

Remember that in previous examples-> app was executing its code and then it stopped , exited the application.

When we start a server we do not have this behavior-> the app is waiting to receive requests

Steps…

- Step 1: We created a server, using createServer & passed in **a callback function**
  - ➢This callback function
    - ➢ is executed each time a new request hits our server
    - ➢accesses two fundamental variables: request & response variables

- Step 2: we **used** the created ***server object*** and started listening for incoming requests from the client

Check

https://stackoverflow.com/questions/28094192/difference-between-response-setheader-and-response-writehead

https://developer.mozilla.org/en-US/docs/Learn/Server-side/Express_Nodejs/deployment


To be continued...