HTTP Web Fundamentals

What is a DNS Server?

- DNS is like a big phone book that contains that takes the URL entered by users in the browser and matches it to an IP address.
    - The IP address uniquely identifies each internet connected device.
    - Example: 102.23.122.32. this grouping of numbers is known as an octet, which is 4 groups of numbers, 0-255 (100.32.11.251)

Rendering web sites

- Once the browser know's the web page IP address it submits a GET request to get all of the page content (JS, HTML, CSS, etc.)
- Most of these requests will use HTTPS which is a secure (encrypted) version of HTTP. HTTPS enables communication without unauthorized parties reading or modifying data.

What is a Web server?

- Web is a type of software that receives and responds to HTTP(S) requests. Examples of popular web servers are: Apache, Nginx, and Microsoft IIS.
- Important
    - HTTP runs on port 80 by default.
    - HTTPS runs on port 443 by default.

How do you make a website?

- The actual content of the web page is normally a combination of **HTML**, **CSS** and **JavaScript**. HTML defines the structure of the page, and the content. CSS allows you to change how the page looks and make it look fancy. JavaScript is a programming language that runs in the browser and allows you to make pages interactive or load extra content.

Requests

- GET – retrieves the web content
- POST- posts requests send data to a web server, like adding a comment or performing a user login.

Responses

- The web server should reply with a response.
    - Breakdown of statues codes:
        - 100-199: Information
        - 200-299: Successes (200 OK is the norm response to get from a GET)
        - 300-399: Redirects (The information you want is elsewhere)
        - 400-499: Client errors (You did something wrong, like asking for something that does not exist)
        - 500-599: Server errors (The server tried, but something else went wrong on their side)

- HTTP authentication and code breakdowns
- `Because HTTP is stateless (Each request is independent and no state is tracked internally)`

What are Cookies?

- Small bits of data that are stored in your browser.
- Browser do not share cookies (data) with other browsers.
- Cookies are most commonly used for session management and ads (tracking cookies)

Why Cookies?

- Because HTTP is stateless, cookies are used to keep track of data while you're on the web. For example if you're shopping online, the cookies will keep track of pages you visited, items in your shopping cart, etc.

Cookie Structure

- Cookies have a name, value, an expiry date, and path.
- The name identifies the cookie, the value is where data is stored, the expiry date is when the browser will get rid of the cookie automatically and the path determines what requests the cookie will be sent with.

Cookies