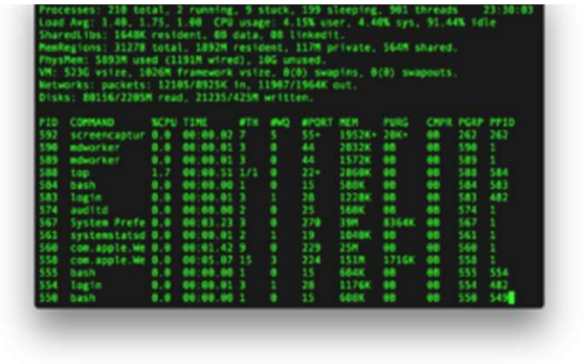
MODULE 2

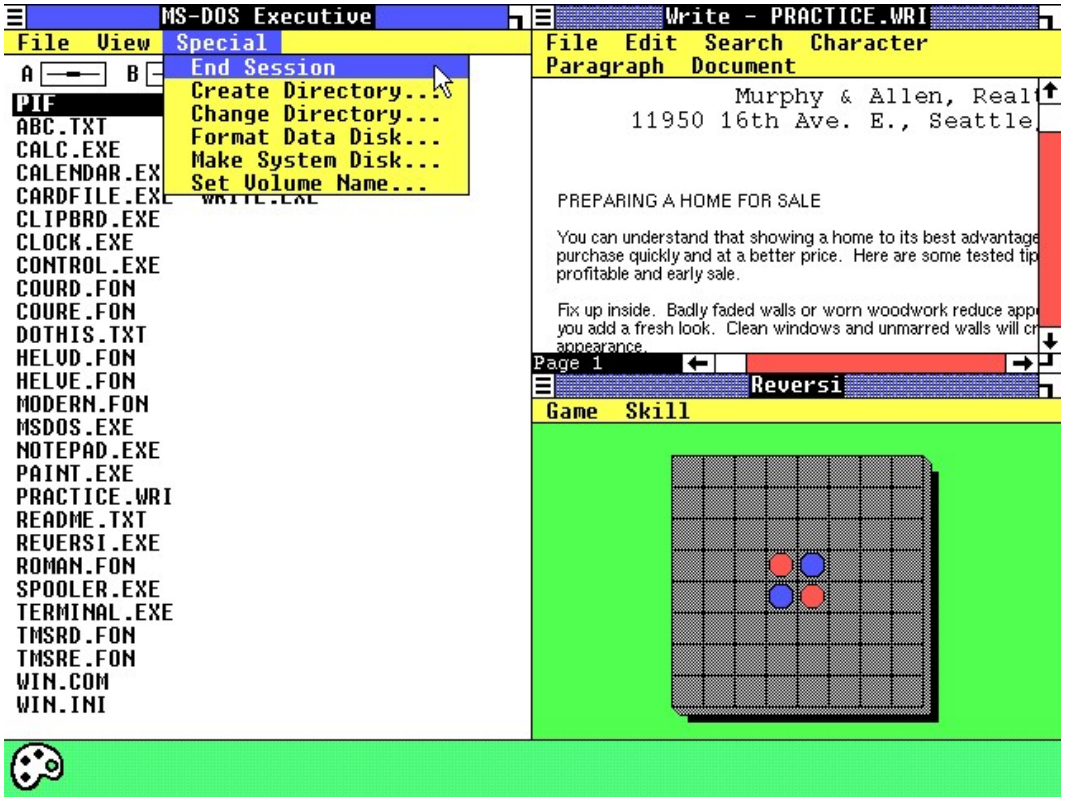
Application Architecture and Introduction to Networks

Before the PC Revolution



PC Revolution!

GUI Revolution



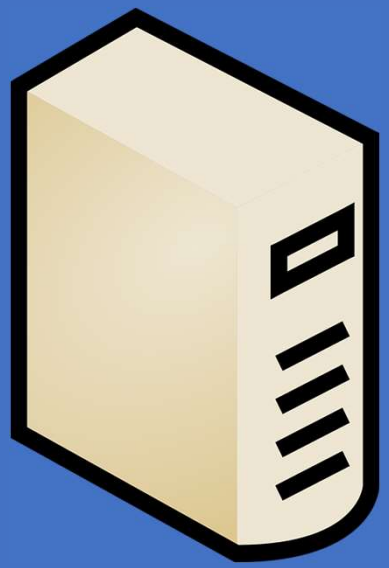
Internet Revolution

Separation of Concerns

User interaction
UI, UX

Module 3

Business
Logic

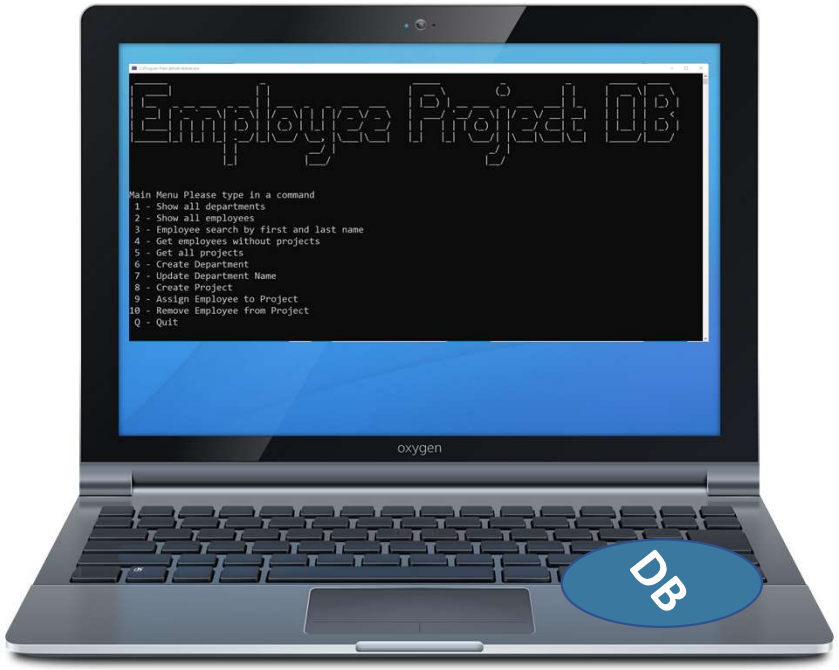


Persistent
Storage

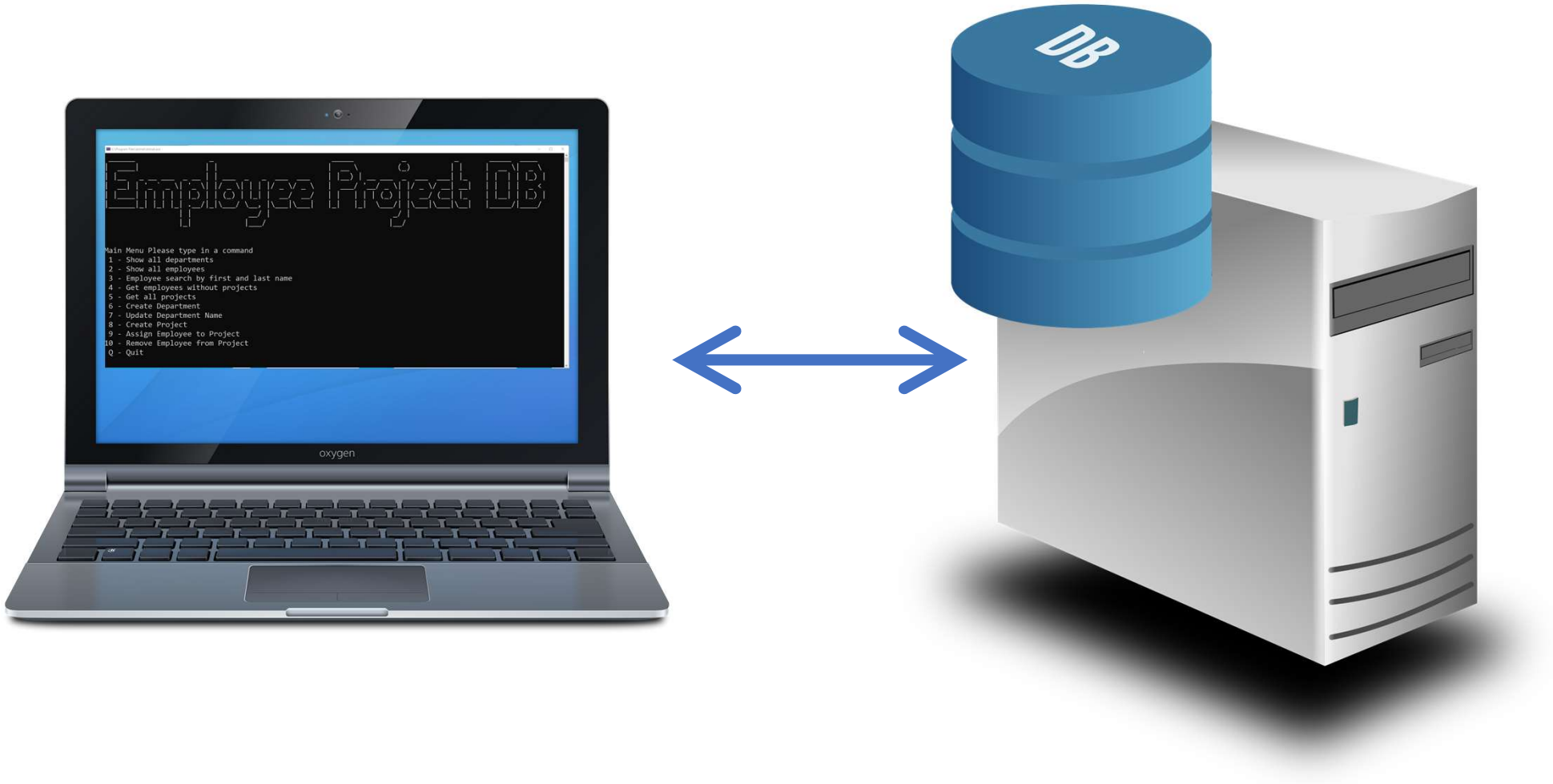
Module 2

Our Application Evolution

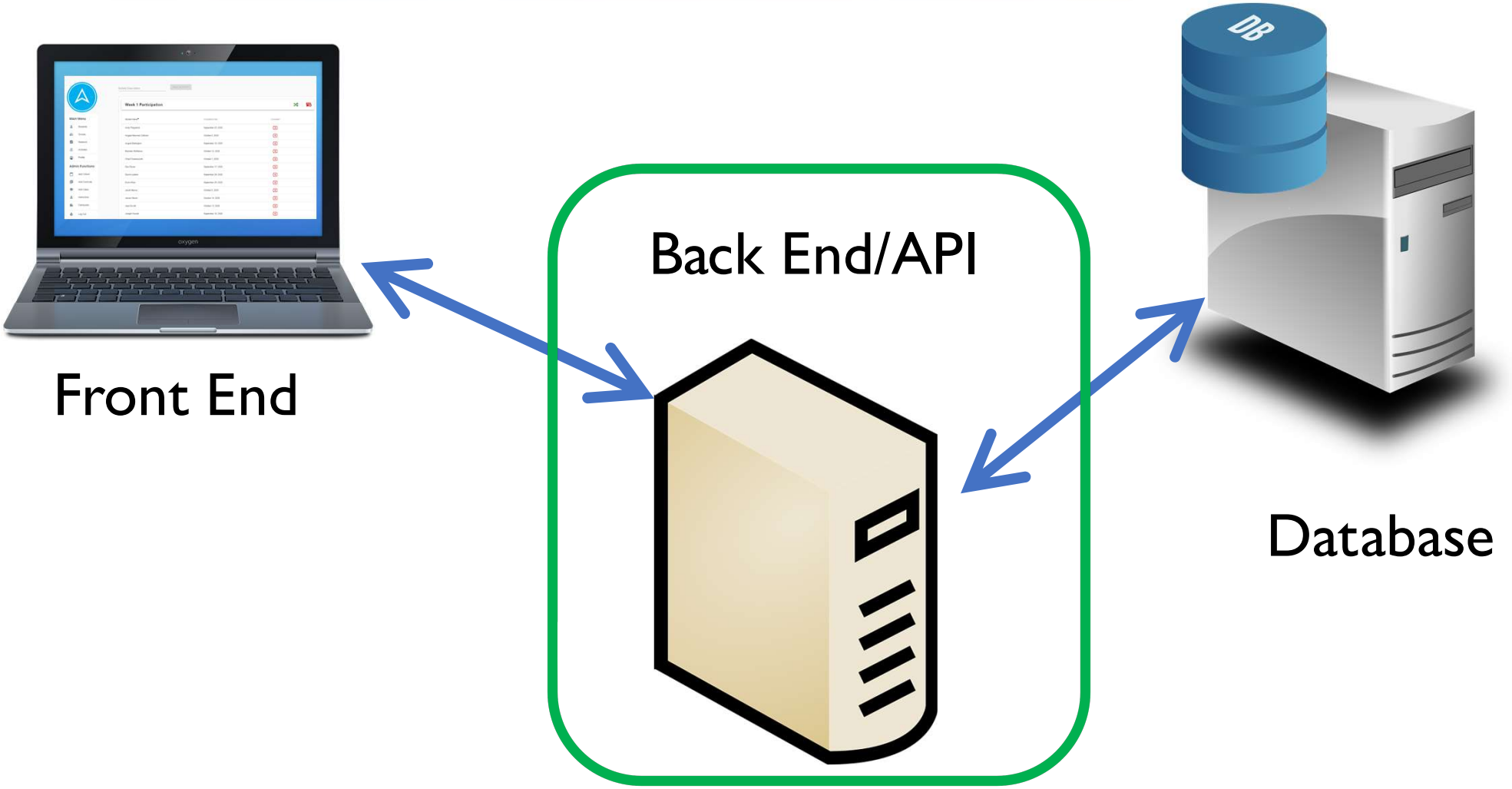
Our Application Evolution



Our Application Evolution



Our Application Evolution

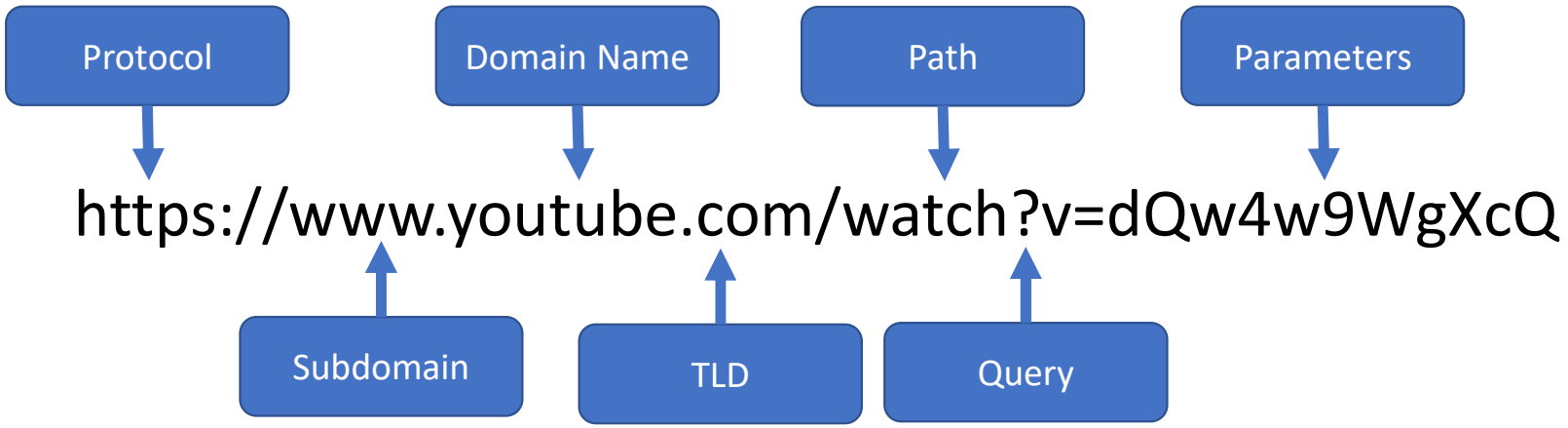


Internet

- Has anyone ever used the internet?

The URL

- What does URL stand for?
- Uniform Resource Locator



IP Address

- Internet Protocol Address (the phone number of the internet)
- Four numbers with 8 bits per number
  - 8 bits == 255 numbers
  - Example IPv4: 54.161.176.89
  - What's your IP address?
- IPv4 is 32 bit allowing for 4.26 billion addresses.

IP Address

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Network Routers

IPv6

- IPv6 is 128 bits allowing for $3.4*10^{38}$ addresses.
- Example of IPv6
  - fe80:0000:0000:0000:c0b5:30b7:3fd7:e2a4

Domain Name System

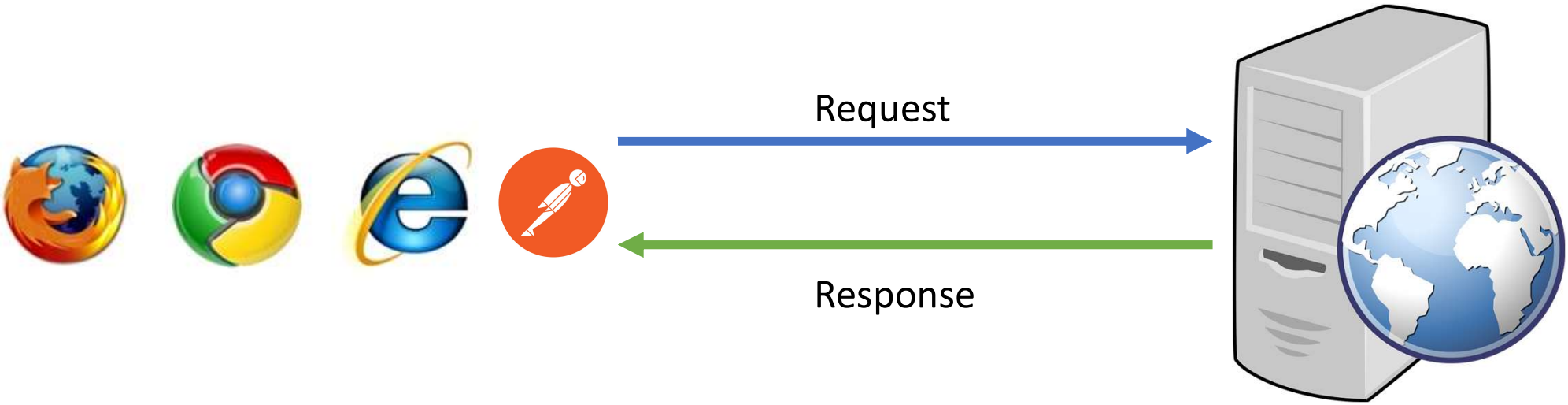
- DNS translates 198.185.159.144 to techelevator.com
- Start with the right most part of the domain: Top Level Domain:
  - .com
  - .net
  - .edu
- Next, is the domain name:
  - techelevator
  - espn
  - msn
- Then, the subdomain.
  - Each subdomain can point to a different IP

Port Numbers

- If IP addresses are your phone number, port numbers are the extension
- Range from 0 – 65535
- Common port numbers:
  - 80 == default http
  - 443 == default https
  - 25 == SMTP (email)
  - 21 == FTP

HTTP and HTTPS

- HTTP: Hypertext transfer protocol
  - How browsers and servers communicate with each other
  - Defines a simple request/response protocol



Key Elements of HTTP Request

- Method: GET, POST, PUT, DELETE, PATCH
- The page to access
- Form parameters

Querystring Parameters

- Querystring parameters allow us to add additional inputs.
- Parameters are represented in key/value pairs with the & symbol.

  https://www.google.com/search?**source=hp&ei=67uWX9noGMHF1QGr2KmwDw&q=techelevator&oq=techelevator**
- Anchor is a specific part of the resource and represents a bookmark in the document. Also abstracted by front end frameworks, much like the file path.

  http://www.yahoo.com#headlinenews

Key Elements of the Response Stream

- HTTP Status code
  - 1xx Informational
  - 2xx Success (200 OK)
  - 3xx Redirect (301 Moved Permanently)
  - 4xx Client Error (400 Bad Request, 401 Unauthorized, 403 Forbidden, 404 Not Found)
  - 5xx Server Error (500 Internal Server Error, 501 Not Implemented)

Response Data

- JSON (JavaScript Object Notation) is a lightweight data-interchange format.


```
{
  "id": 1,
  "name": "Aloft Cleveland",
  "address": {
     "id": "69006b81-7f58-4acc-a10e-f9f87affae5f",
     "address": "1111 W 10th St",
     "address2": "",
     "city": "Cleveland",
     "state": "Ohio",
     "zip": "44113"
  },
  "stars": 3,
  "roomsAvailable": 48,
  "costPerNight": 274,
  "coverImage": "aloft-cleveland.webp"
}
```

Where to host?

- A hosting provider is used to allow us to serve up content over a network.
  - Self Host
  - Shared Hosting Provider
  - Dedicated Host
  - Cloud Host
- What are the upsides/downsides?
- What are some examples?
  - Amazon, Azure, Google, GoDaddy, HostGator, Wordpress, SquareSpace

Web Server vs Application Server

- Web Servers are good for serving up web resources that are static content
- Application Servers are for generating dynamic web pages
  - IIS, Tomcat, Apache

Registering Your Own Domain

- A domain name can be leased from a DNS Registrar.
  - Popular and easy to use registrars are godaddy.com, hover.com or Google's domains.google.
- What you lease is a subdomain of the TLD you choose.
  - Tech Elevator leases the domain techelevator.com.
- You create the subdomains…as many as you like.

WHAT QUESTIONS DO YOU HAVE?

Reading for tonight:

Consuming Web APIs with GET