CS 6314
Web Programming Languages

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Administrivia

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office hours:

In-person or on Teams

Mon 2 to 3 PM. Tue & Thu: 12:45 to 2:15 PM

or any other suitable time through appointment

Link to the meeting room is on the home page on elearning

box folder:

all class material will be shared in this folder

See elearning homepage for the link

TA: TBA

Goal

Learn how web application work

Browser ⇔ Server ⇔ Storage

Build a web application

using MERN stack

Develop a photo sharing web app

Web Technologies

Browser environment

- HTML, CSS, JavaScript
- Document Object Model (DOM)

Browser-based software

- Model View Controller, Single Page App, Responsive design – React

Backend communication

- HTTP, AJAX, REST
- Cookies, Session, State

Backend implementation

- Webserver – Node.js
- DBMS – Schema, Objects, CRUD, transactions - MongoDB
- End-to-end – Scale and Security

Workload

8 projects – 60 to 70%

- First 6 projects to be done individually
- Last 2 projects – may allow to work with a partner

2 Exams – 10% each

- Coding - practice for job interviews
- Exam 1: Oct 21st
- Exam 2: Dec 2nd

Other work – 10 to 20%

- Short exercises

Attendance

3 consecutive absences lead to one letter grade reduction

More than 6 absences lead to F

Textbooks

All required materials are available online. References will be provided later.

Optional:

Fundamentals of Web Development. 3rd Edition by Randy Connolly and Ricardo Hoar.

Discussion board

We will use the discussion board on elearning

Post your questions in the relevant thread. Do not send me an email

If no relevant thread, create a new thread

Feel free to reply to others' questions

Don't be shy. No question is stupid

Subscribe to the forum to be notified when there is a new post

Be Honest

Do not share your work with others (outside your group)

Do not look at or use solution/code from any external source

We have sophisticated tools to check for similarity between programs

Plagiarism will be reported to the office of academic dishonest

Comet creed

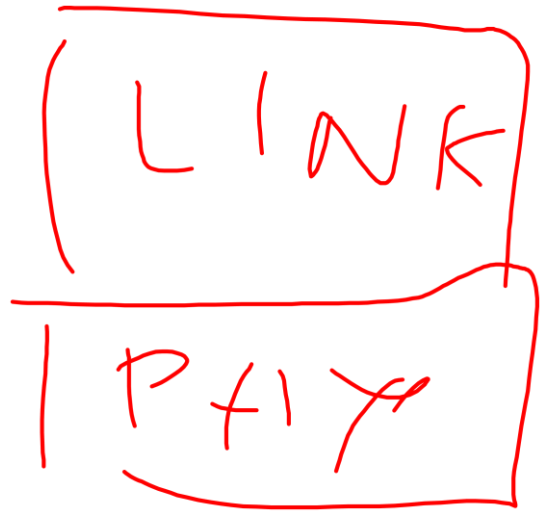
"As a Comet, I pledge honesty, integrity, and service in all that I do."

Internet vs WWW

Internet is the underlying infrastructure

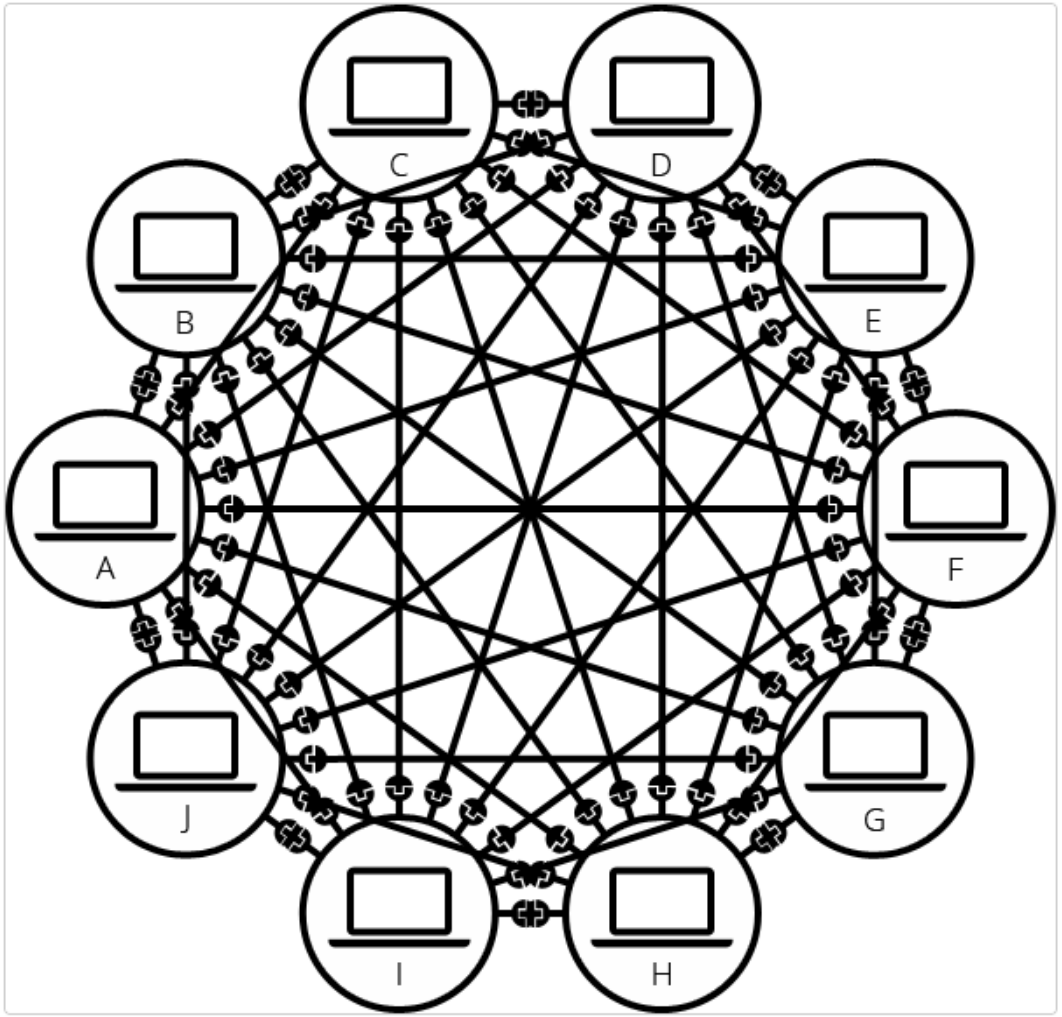
WWW is an application layer on top of the internet

Internet – a deep dive



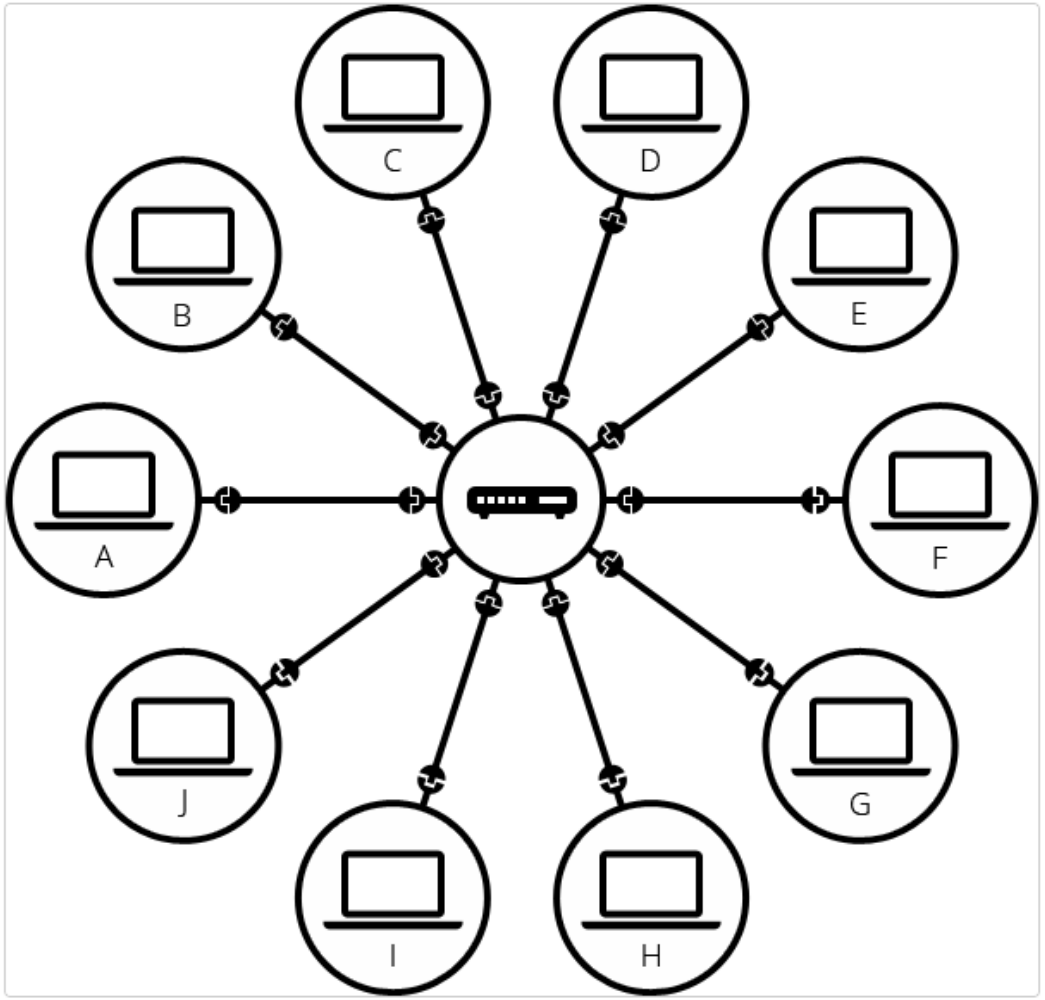
Internet – a deep dive

Directly connected mesh network



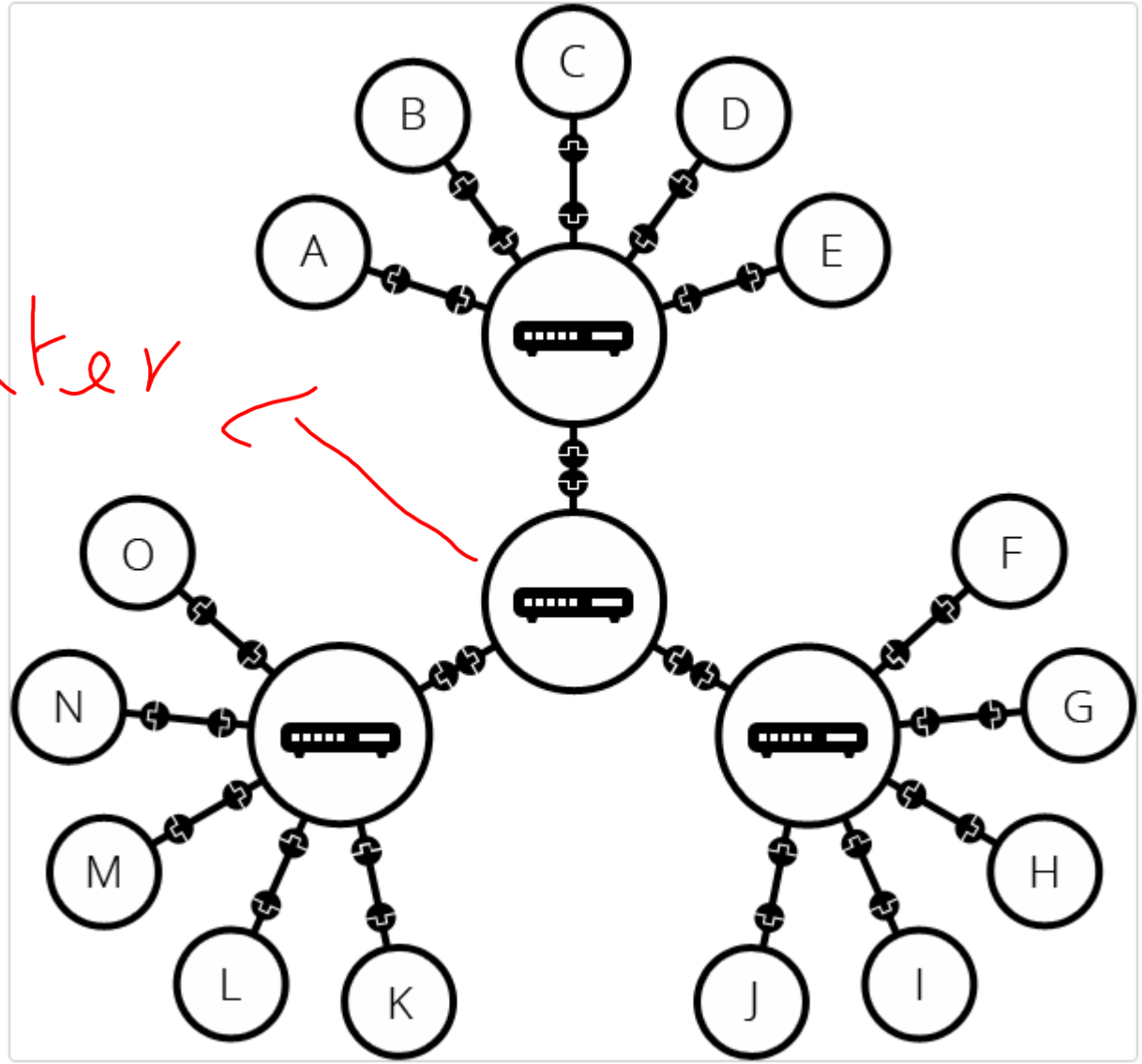
Internet – a deep dive

Switch makes LAN scalable



Internet – a deep dive

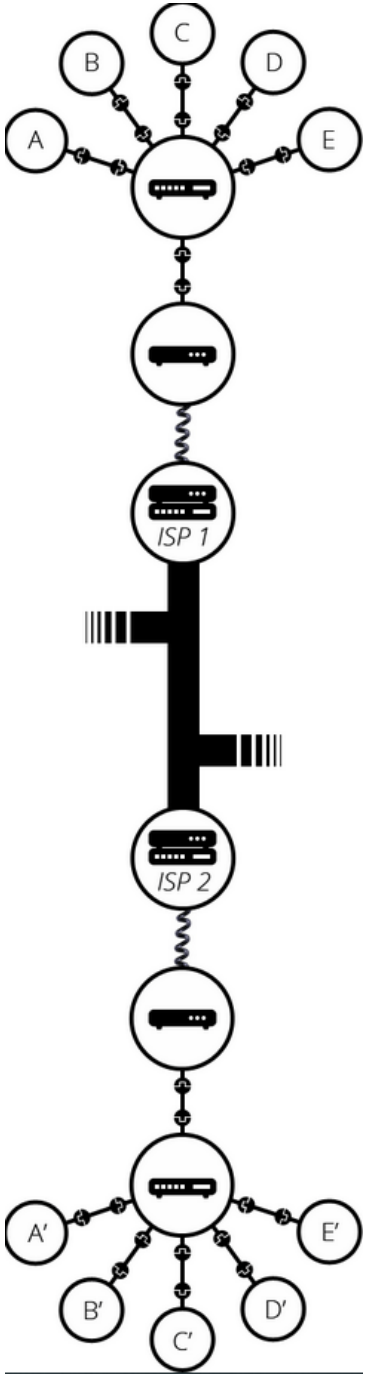
Network of LANs



Router

IP

Internet – a deep dive



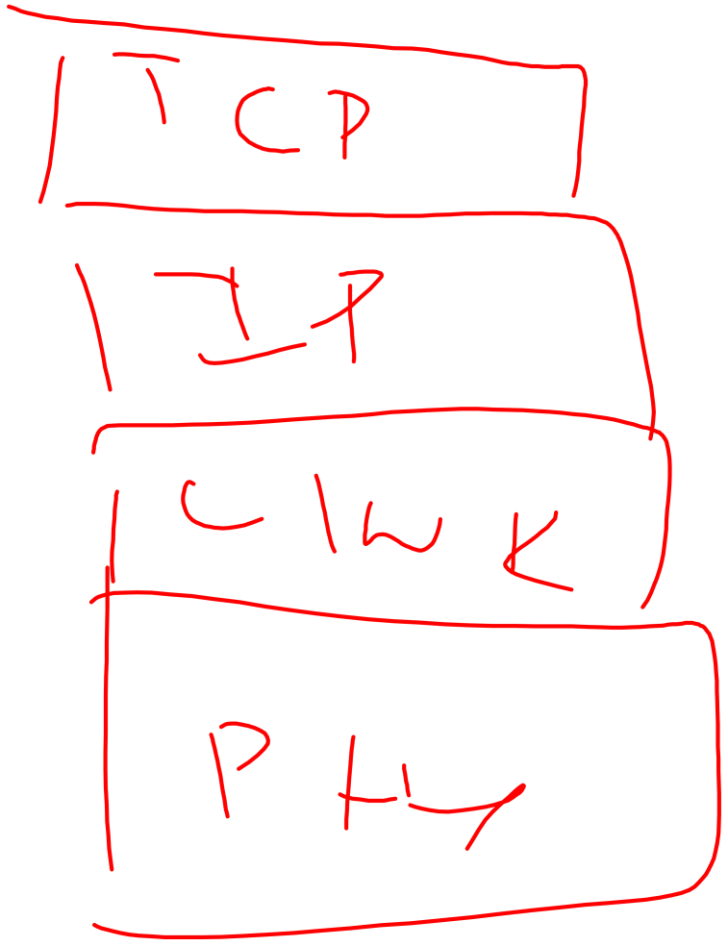
Finding destination

IP address

Port

Domain name

DNS



Pillars of Web

Sr. Tim Berners-Lee published the main features of the web in 1992

- A Uniform Resource Locator (**URL**) to uniquely identify a resource on the WWW
- The Hypertext Transfer Protocol (**HTTP**) to describe how requests and responses operate
- Hypertext Markup Language (**HTML**) to publish documents.
- A software program (**web server software**) that can respond to HTTP requests.
- A program (**a browser**) that can make HTTP requests to URLs and that can display the HTML it receives

Webpage, Website, Web Server

Webpage: a simple document displayed by the browser

- Written in HTML
- Embed CSS, JavaScript, media

Website: Collection of linked webpages that share a unique domain name

- Type the domain on the browser, home page will be displayed

Webserver: Computer hosting websites

- A website and webserver may have different domain name

WebApp: A software that run on the server and is accessed by the user through the internet

Web App vs desktop App

Advantages

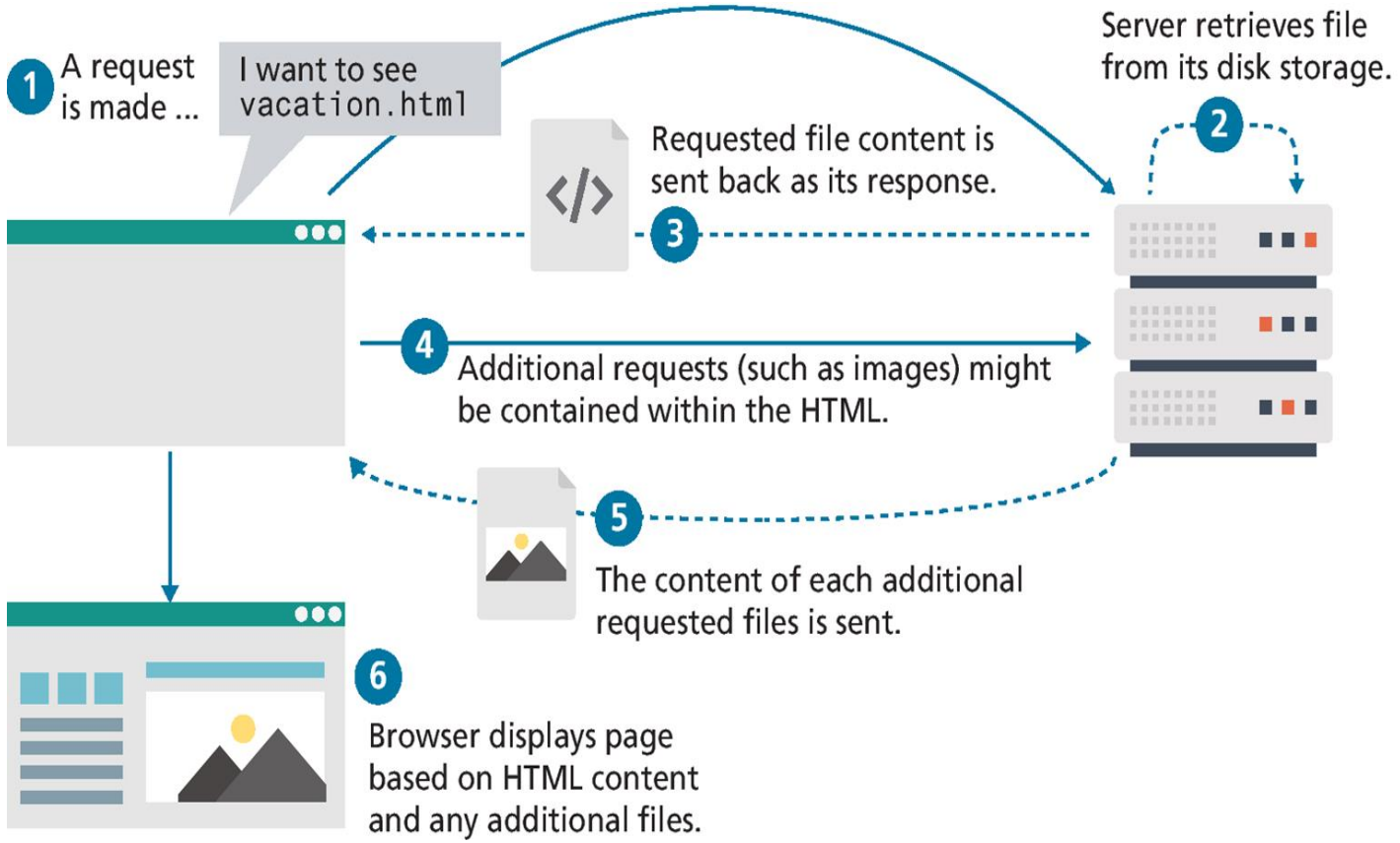
- Can be accessed from any computer
- Can be used with different OS and browsers
- Are easier to roll out program updates since only software on the server needs to be updated as opposed to every computer in the organization using the software
- They have a centralized storage on the server, which means fewer security concerns about local storage (which is important for sensitive information such as health care data)

Web App vs desktop App

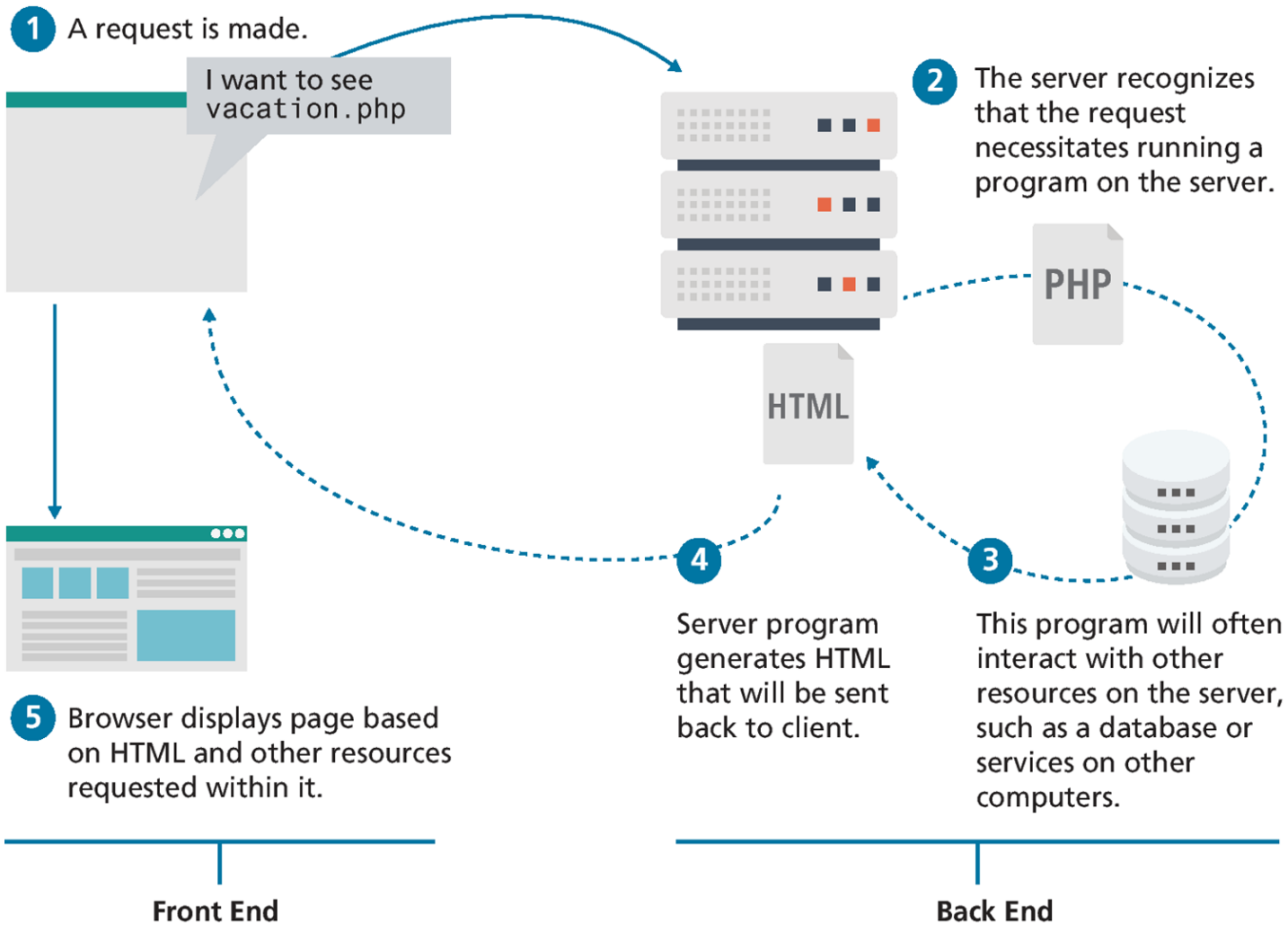
Disadvantages

- Active internet connection required
- Security concerns about sensitive data being transmitted over the Internet.
- Concerns over the storage, licensing, and use of uploaded data.
- Problems with certain websites not having an identical appearance across all browsers.
- Restrictions on software from being installed and hardware from being accessed (like Adobe Flash on iOS).
- additional plugins might interfere with JavaScript, cookies, or advertisements

Static Website during early days



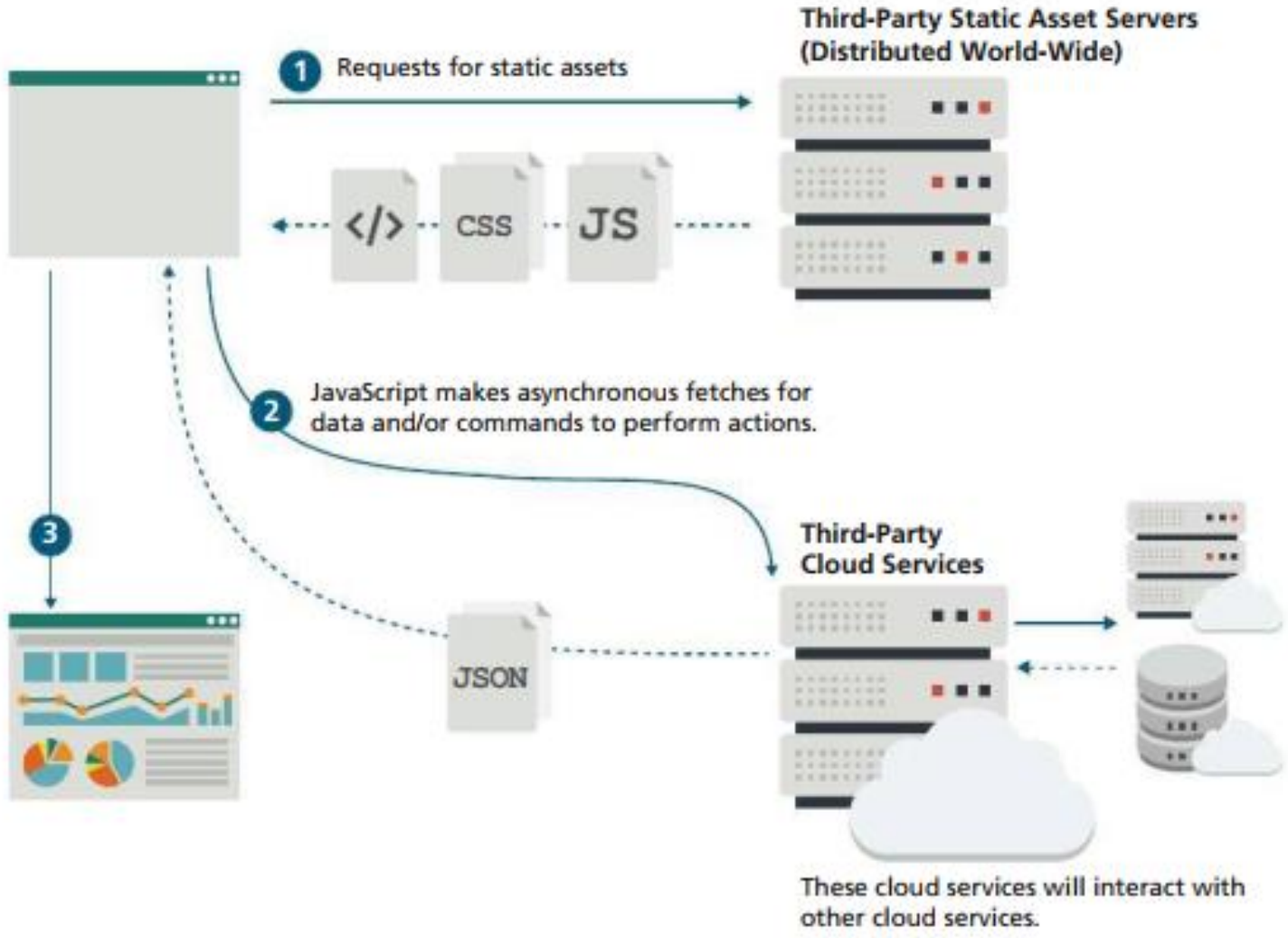
Server-side dynamic website next



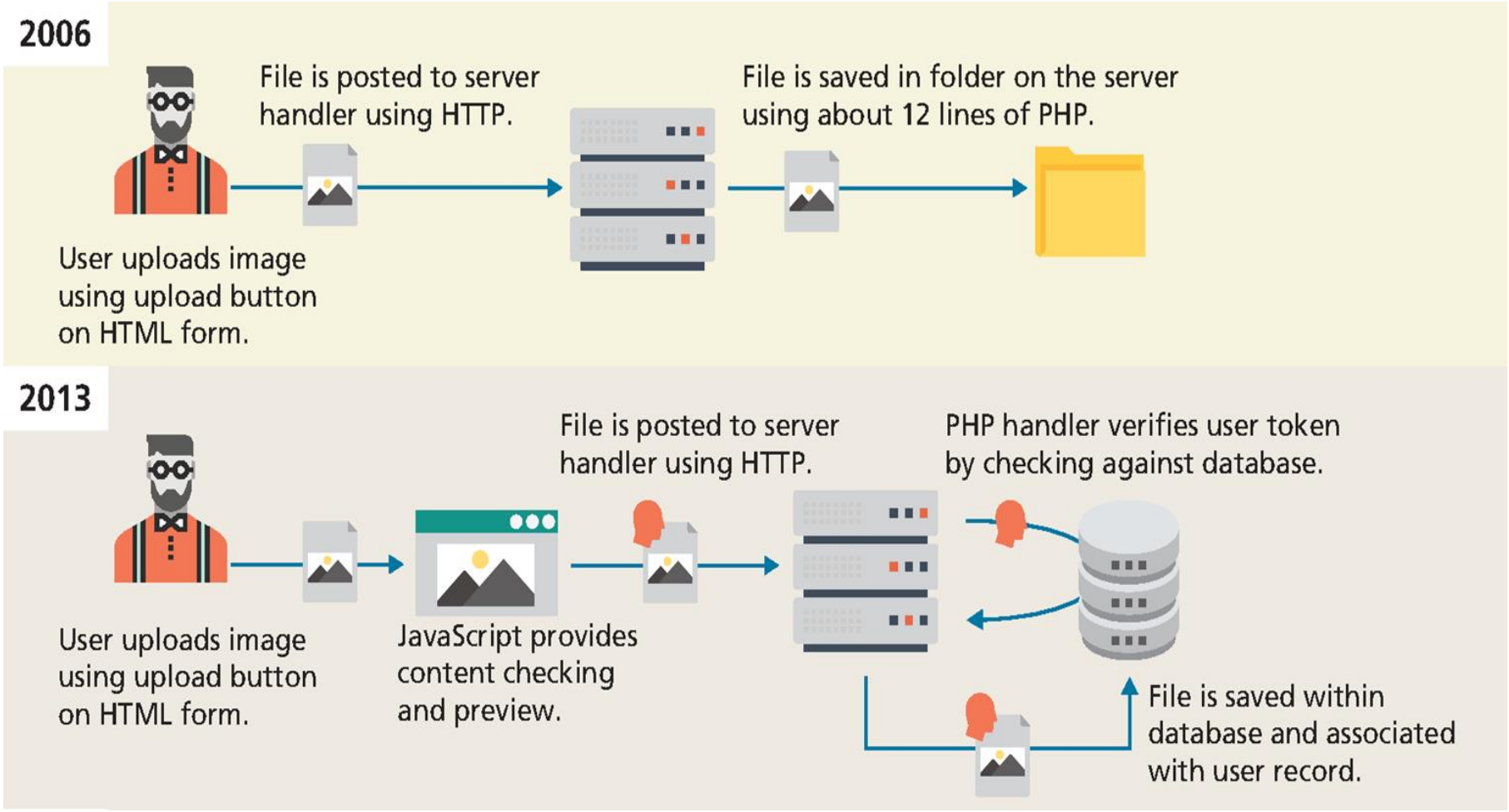
Web 2.0

Interactive user-experience

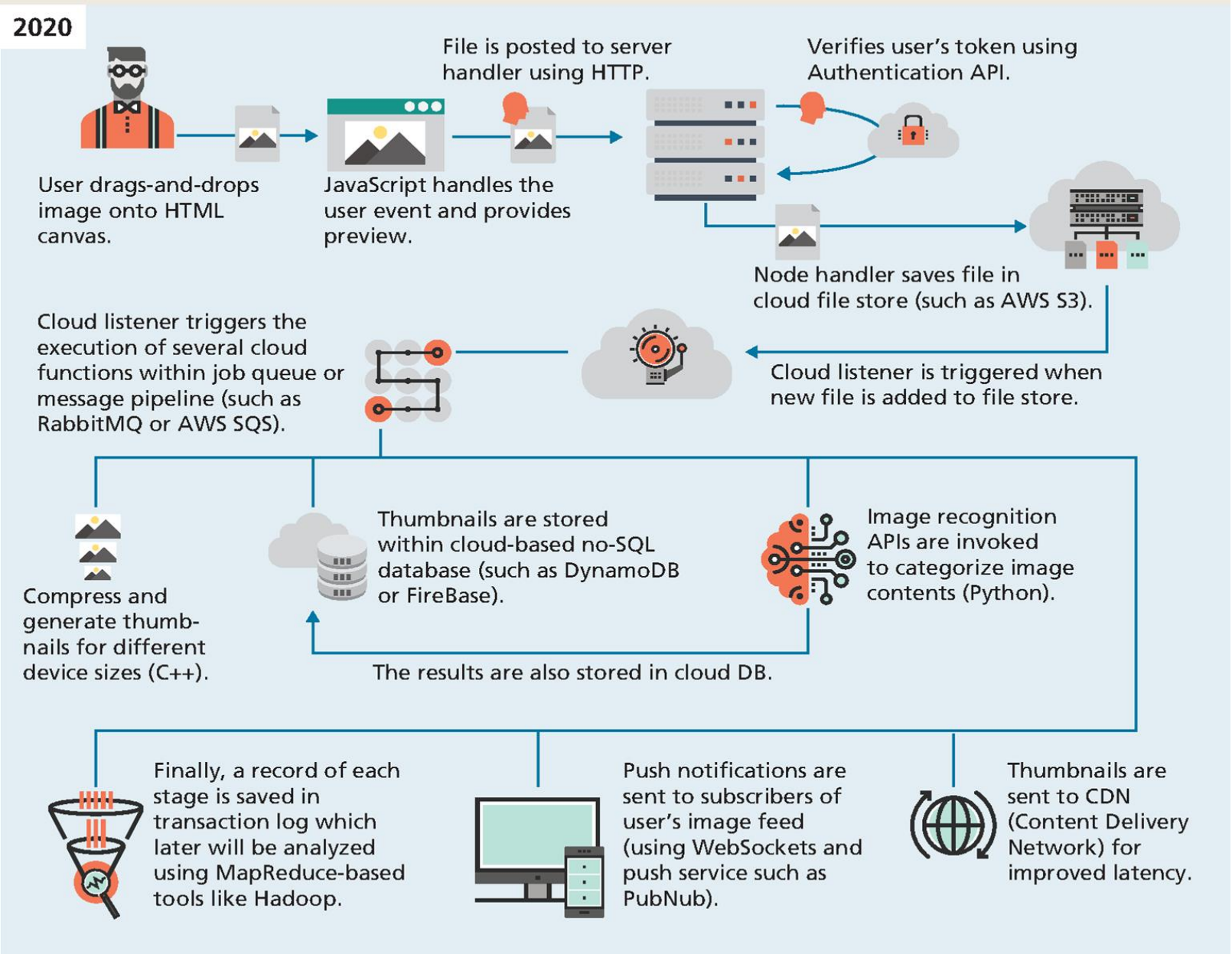
Paradigm shift – programming script migrated towards browsers



Evolving complexity – file upload



Evolving complexity – file upload



Sources

1. MDN Web docs - Web Mechanics
2. Fundamentals of Web Development. 3rd Edition by Randy Connolly and Ricardo Hoar.
3. Stanford CS 142 Web Application - Lectures