

**WEB**

**DEVELOPMENT**

# Weekly Schedule

	Monday	Tuesday	Wednesday	Thursday	Friday
Phone office hour	10-11am	7-8am		10-11am	7-8am
CS4550 Live Lecture and Zoom		9:50-11:30			9:50-11:30
Phone office hour	1:30-2:30	1:30-2:30			1:30-2:30
Office hour Zoom only	3:30-4:30	3:30-4:30	3:30-4:30		3:30-4:30
Phone office hour				4:30-5:30	
CS510 Lecture on Zoom	7:30-9:00			7:30-9:00	

# What is the Internet?

- A global network of computers. Network of networks
- Researched by **DARPA** early 60s to survive **WWIII**
- **ARPANET**, a precursor, connected **military** and **academic** networks in **1980s**
- **Commercial** use expanded in **1990s** to what we have today

# What is the Web?

- AKA The World Wide Web or **WWW** or just The Web
- A combination of technologies that **use the Internet** to **share formatted documents** connected to one another
- Invented by **Tim Berners-Lee** in '89 a physicist at **CERN**
- Documents are formatted in **HTML** (Hypertext Markup Language)

# What is the Web?

- **Browsers** fetch HTML documents from **servers** connected by the internet
- Documents are found with **URLs** (Uniform Resource Locator)
- HTML documents format (hyper) text as **anchors** that refer or **link** to other documents

# **Some Milestones**

**1960s - The Internet**

**1970s - Client-server architecture**

**1980s - Personal computers**

**1990s - The World Wide Web**

**2000s - Web Applications**

**2010s - Mobile computing, big data**

**2020s - ??? Neuralink ???**

# Server Frameworks

1993 - Common Gateway Interface (Perl, C++, ...)

1995 - PHP (PHP)

**1999 - Java 2 Enterprise Edition (J2EE)**

2000 - .NET (ASPs, Visual Basic, C#, ...)

2005 - Ruby on Rails (Ruby)

2005 - Django (Python)

**2009 - Node.js (JavaScript)**

2010 - Flask (Python)

# Client Frameworks

1995 - JavaScript (Netscape)

2010 - Backbone

1996 - Adobe Flash

2011 - Ember

2005 - Dojo

2012 - Sails

2006 - jQuery

2012 - Meteor

2010 - Knockout

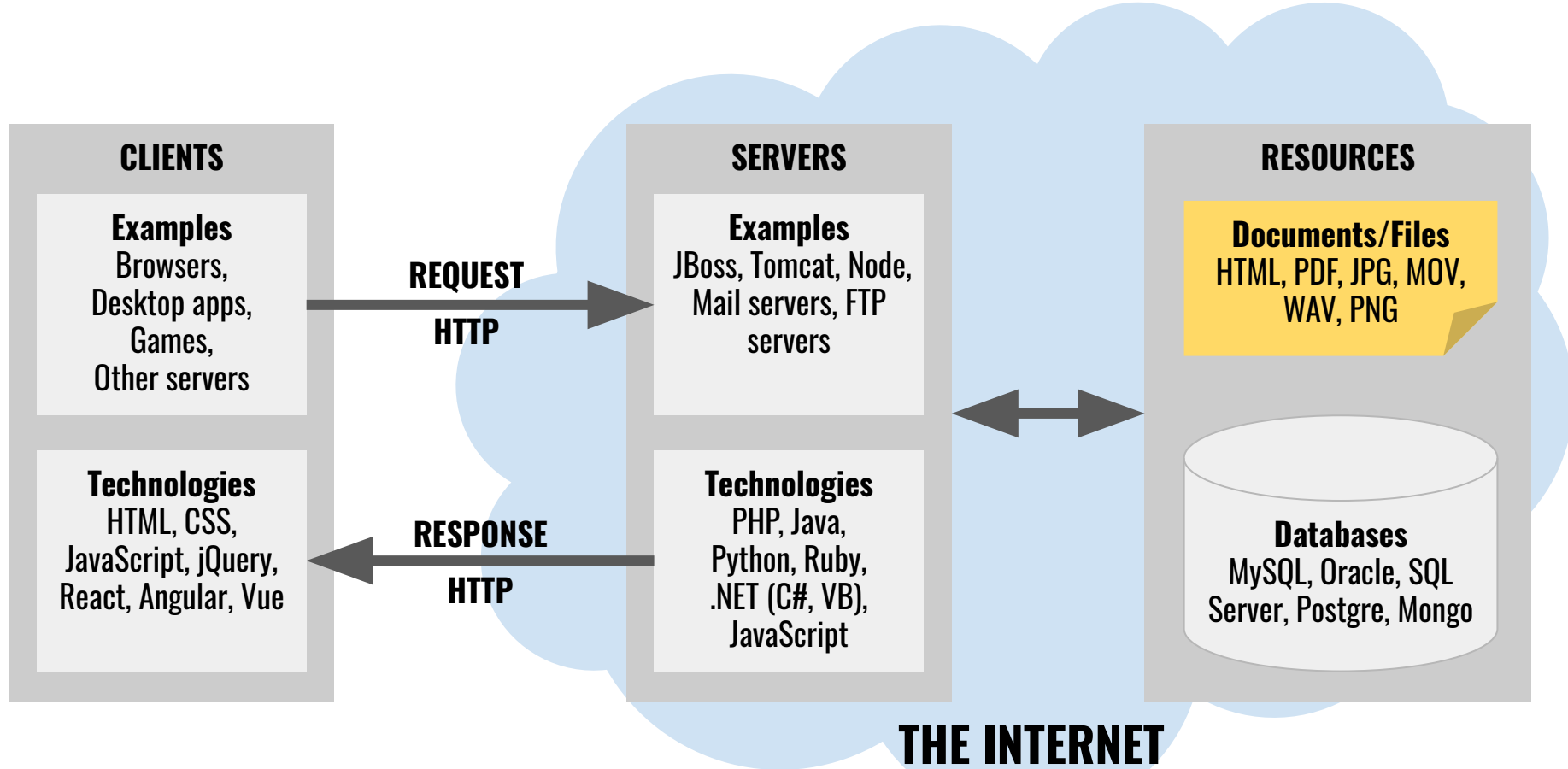
**2013 - React (Facebook)**

**2010 - Angular (Google)**

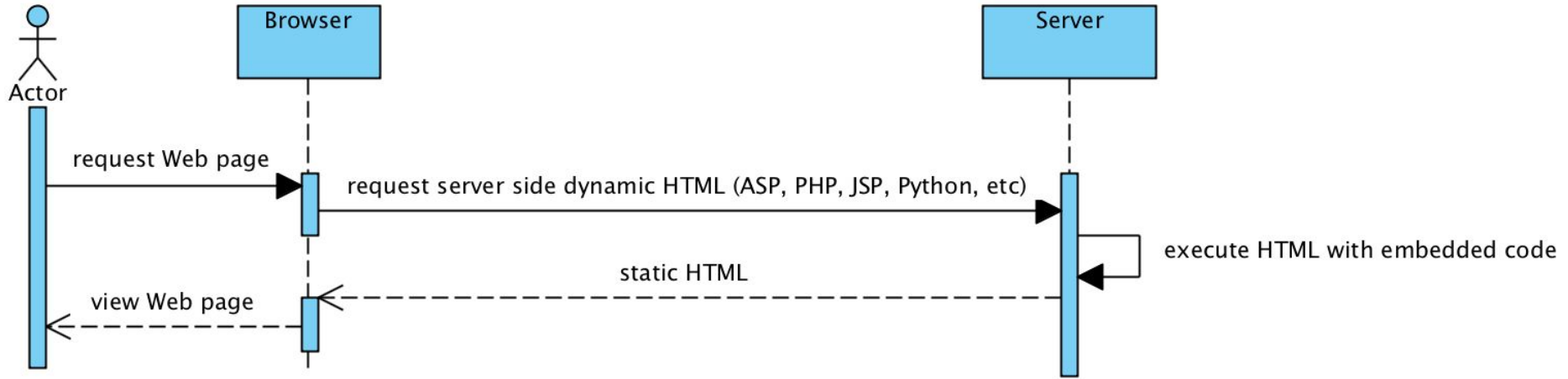
2014 - Vue



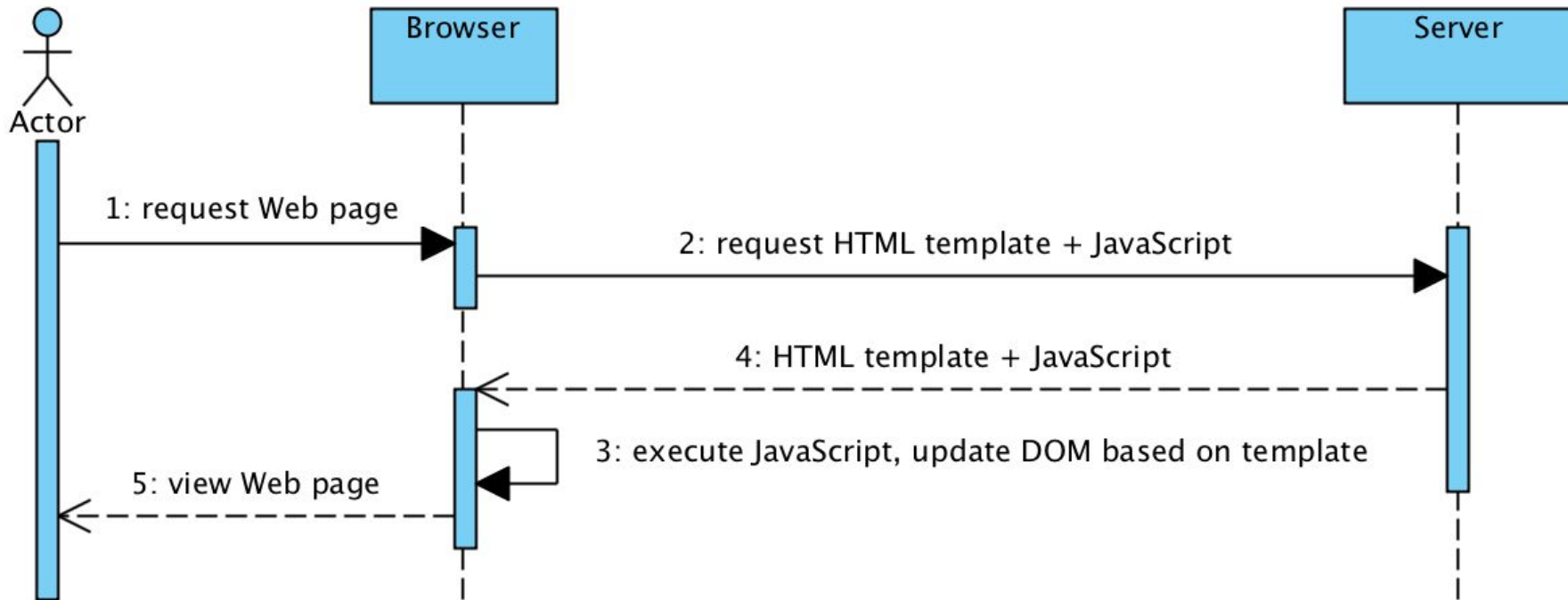
# The Client Server Architecture



# Server Side UI Rendering



# Client Side UI Rendering



# **Web Application Development**

**Applying software engineering skills to build applications using the Web as a framework**

- **Requirements**
- **Data modeling**
- **Interprocess communication**
- **Data storage/retrieval**
- **User interface design**

# **Working in Teams**

**The code belongs to the team**

- **Best practices**
- **Source control, pull requests, code review**
- **Naming conventions, understandability**
- **Application structure**
- **Planification, communication**

# **Working in Large Projects**

- **Scalability**
- **Maintainability**
- **Software development methodologies**
  - **requirements, design, implementation, feedback, testing**
  - **incremental software development**

# Architecture

- **Client-server architecture**
- **Multitier architecture**
- **Separation of concern (SoC)**
  - **Model View Controller (MVC)**
  - **Object-oriented programming**
  - **Aspect-oriented programming**

# Design Patterns

- Singleton
- Factory
- Service
- Model View Controller (MVC)
- Data access object (DAO)
- Inversion of control (IOC)