

Web Development and Database Management

CMP 315

(3 Units)

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Outline

- Introduction
- The Client – Server Model
- Web Application Architecture
- The Web Application Language
- Relational Database Management System
- Web Application with Database System

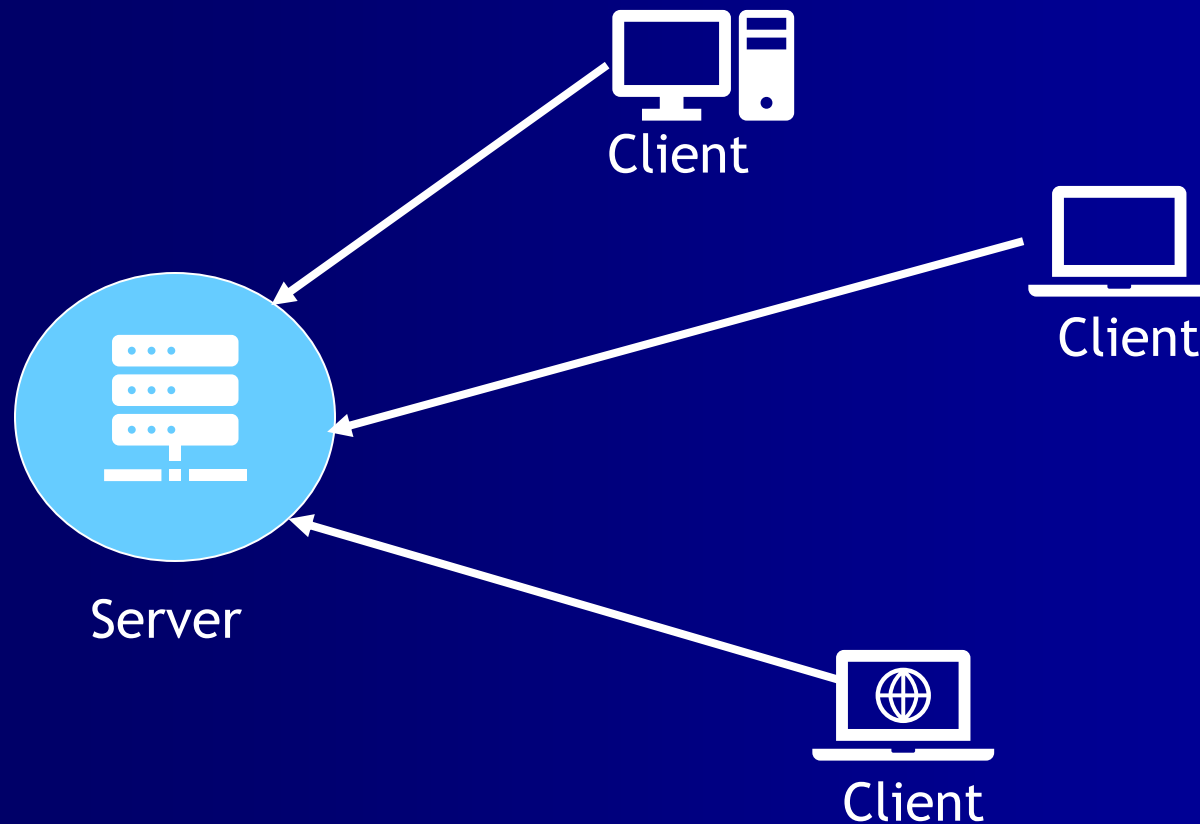
The Client – Server Model

- Client-Server Model – The client-server model is application model that describes the conversation between two computing entities over a network.
- Clients are the entities requesting resources or services, and Servers are the entities providing that resources or services.
- A Server can provide resources or services to many clients

The Client – Server Model

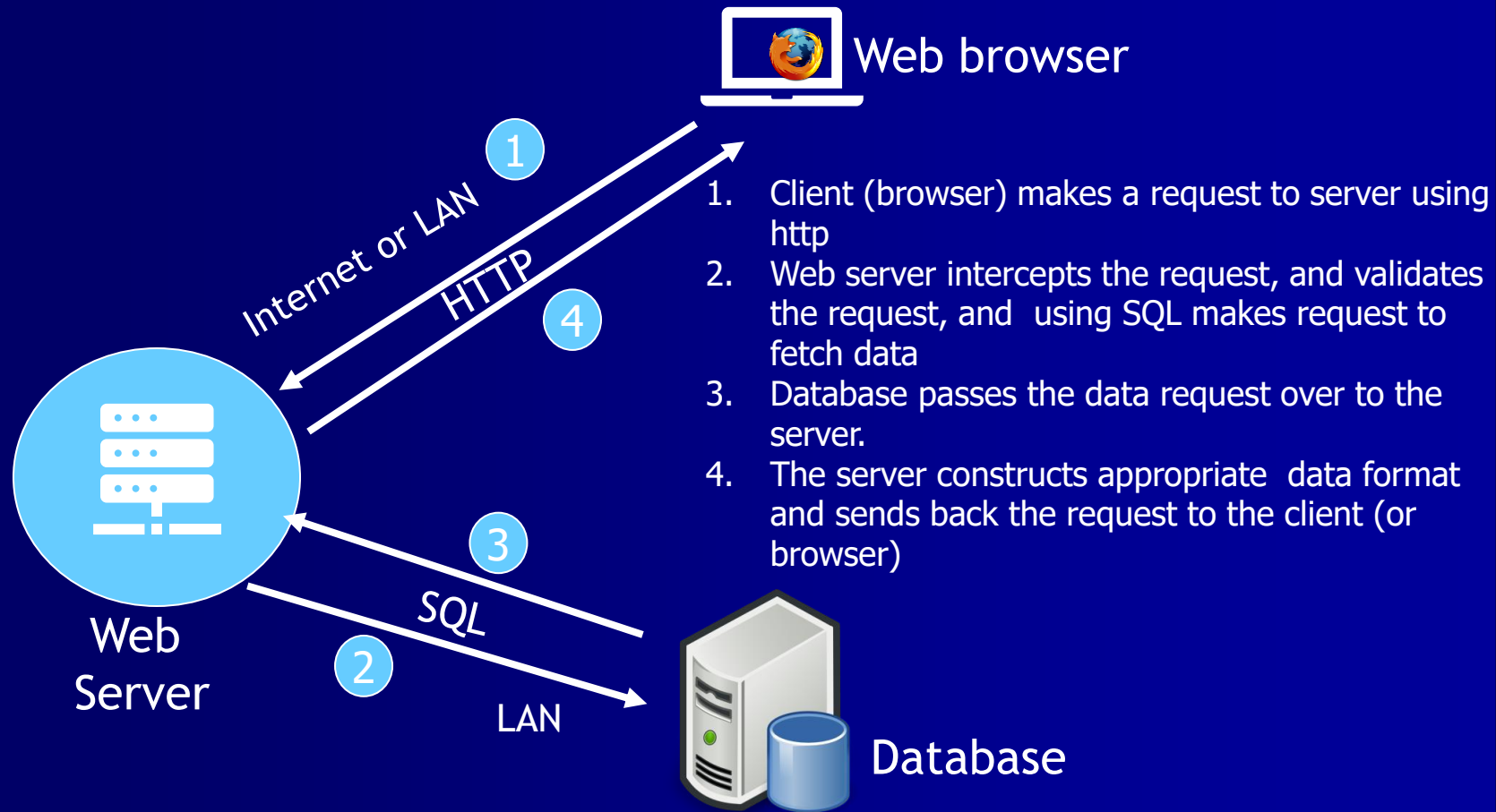
- The client-server architecture describes a system that hosts, delivers, and manages most of the web resources and services that the clients may request.
- All requests and services are delivered over a network, and it is also discussed as the networking computing model or client server network.

The Client – Server Model



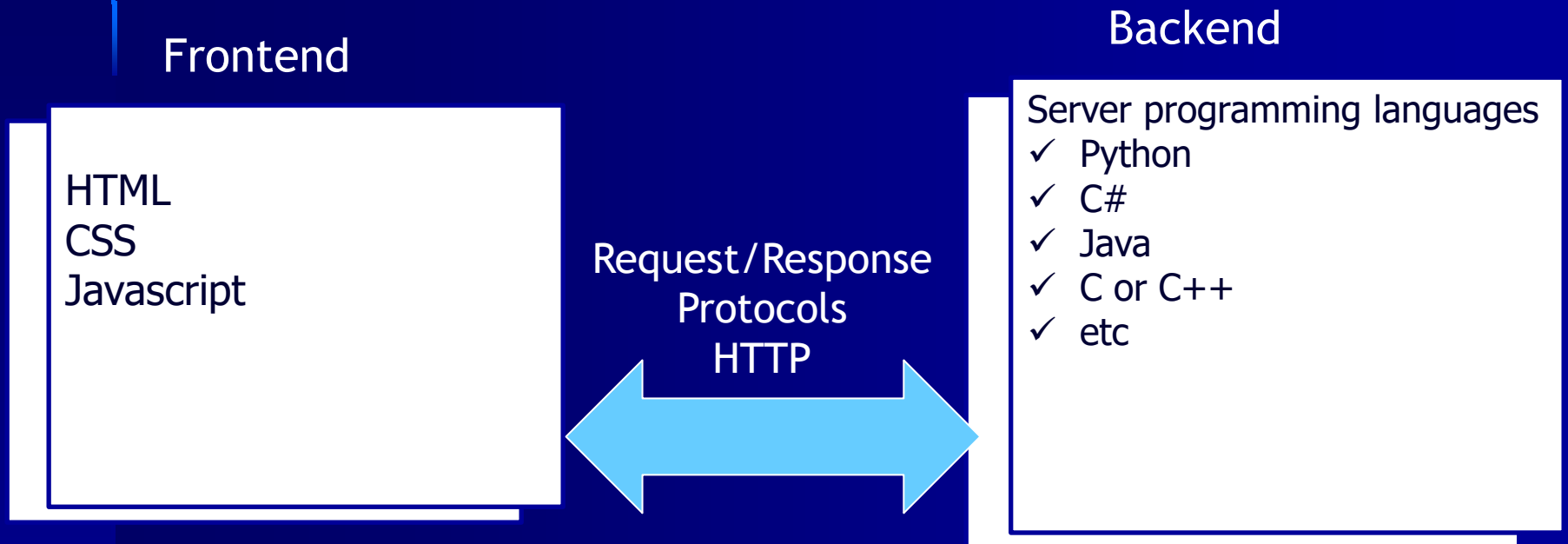
One server can provide resources or services to multiple clients concurrently

Web Application Architecture



A simple web application architecture

Web Application Architecture



- ✓ A frontend uses HTML, CSS and Javascript to process and render web pages
- ✓ HTML is responsible for the structure and organisation of web pages
- ✓ CSS is responsible for the 'look and feel' or the beauty of the web pages
- ✓ Javascript adds client-side logic to the web pages
- ✓ The backend provides business logics and communication to database

Web Application Model

- A Web application is an application that can be accessed by the users through a Web browser or a specialized user agent.
- The browser creates HTTP requests for specific URLs that map to resources on a Web server.
- The server renders and returns HTML pages to the client, which the browser can display. The core of a Web application is its server-side logic.
- The web application can contain several distinct layers. The typical example is a three-layered architecture comprised of presentation, business, and data layers.

The HTML

- HTML, (hypertext markup language), is an hierarchical data structure that presents a formatting system for displaying the content retrieved from the server to the Browser.
- Each retrieval unit is known as a Web page (from World Wide Web), and the web pages in most cases contain hypertext links that helps related pages to be linked and accessed.

The HTML

- HTML, which is a scripting language for describing the structure of Web pages, gives content creators the means to: curate content and publish online documents with headings, text, tables, lists, photos, etc.
- Access and retrieve online information via hypertext links, at the click of a button.
- All HTML documents must start with a document type declaration: `<!DOCTYPE html>` . The HTML document itself begins with `<html>` and ends with `</html>` . It contains `<head> ...</head>` for metadata and the visible part is between `<body>` and `</body>` .

The HTML Structure

`<!DOCTYPE html>`

Document Type declaration

`<html>`

The HTML element start tag

`<head>`

The head element start tag

`<title>Page Title</title>`

The Title element start and close tags

`</head>`

The head element close tag

`<body>`

The body element start tag

`<h1>My First Header</h1>`

The content elements start and close tags

`<p>My first paragraph.</p>`

`</body>`

The body element close tag

`</html>`

The HTML element close tag

The CSS

- CSS is the language for describing the 'look and feel' - presentation of Web pages, including colours, layout, and fonts.
- It allows one to adapt the presentation to different types of devices, such as large screens, small screens, or printers.
- CSS is independent of HTML and can be used with any other markup such as XML-based markup language.
- The separation of HTML from CSS makes it easier to maintain sites, share style sheets across pages, and tailor pages to different environments.
- CSS is included in the web page by either referencing or inline.

The CSS example

```
p {  
  font-family: "helvetica neue", helvetica, sans-serif;  
  letter-spacing: 1px;  
  text-transform: uppercase;  
  text-align: center;  
  border: 2px solid rgb(0 0 200 / 0.6);  
  background: rgb(0 0 200 / 0.6); color: rgb(255 255 255 / 1);  
  box-shadow: 1px 1px 2px rgb(0 0 200 / 0.4);  
  border-radius: 10px; padding: 3px 10px;  
  display: inline-block;  
  cursor: pointer;  
}
```

The Javascript

- JavaScript is a client side dynamic programming language that is used to enhance the performance of web applications.
- It allows you to implement dynamic features on web pages that cannot be done with only HTML and CSS.
- JavaScript enables to create dynamically updating content, control multimedia, animate images, and helps in many ways to add pretty much more in web applications.

The Javascript

- `const para = document.querySelector("p");`
- `para.addEventListener("click", updateName);`
- `function updateName() {`
- `const name = prompt("Enter a new name");`
- `para.textContent = `Player 1: ${name}`;`
- `}`

Important References

The HTML Description

- <https://www.w3.org/standards/webdesign/htmlcss>

HTML Element Reference

- <https://www.w3schools.com/tags/>

HTML Tutorial

- <https://www.w3schools.com/html/default.asp>

- Download IDE

<https://code.visualstudio.com/>

<https://code.visualstudio.com/download>