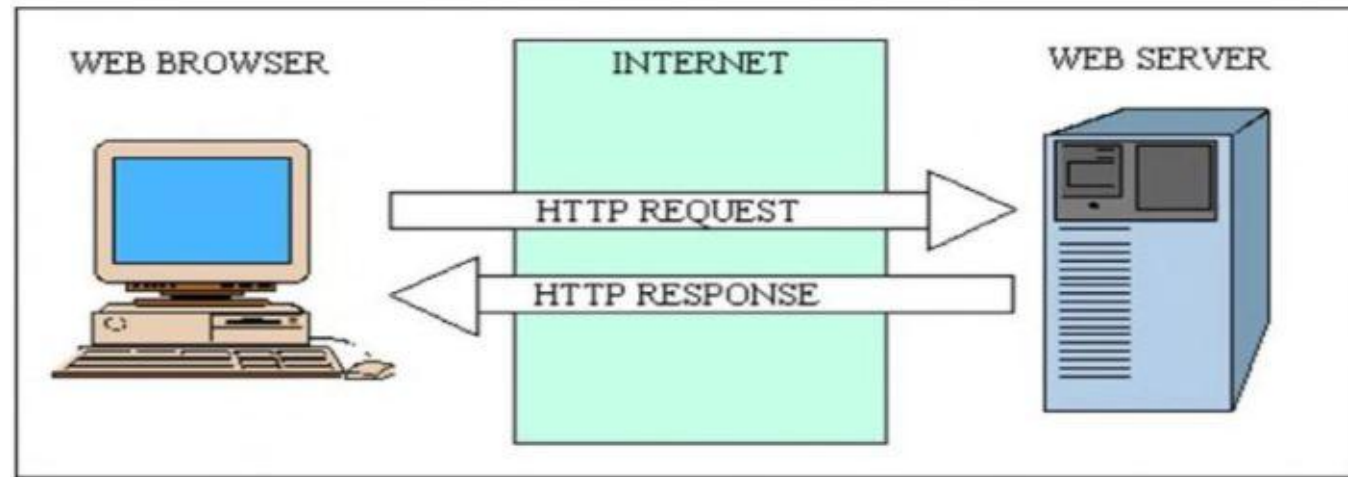


Introduction to FrontEnd Development

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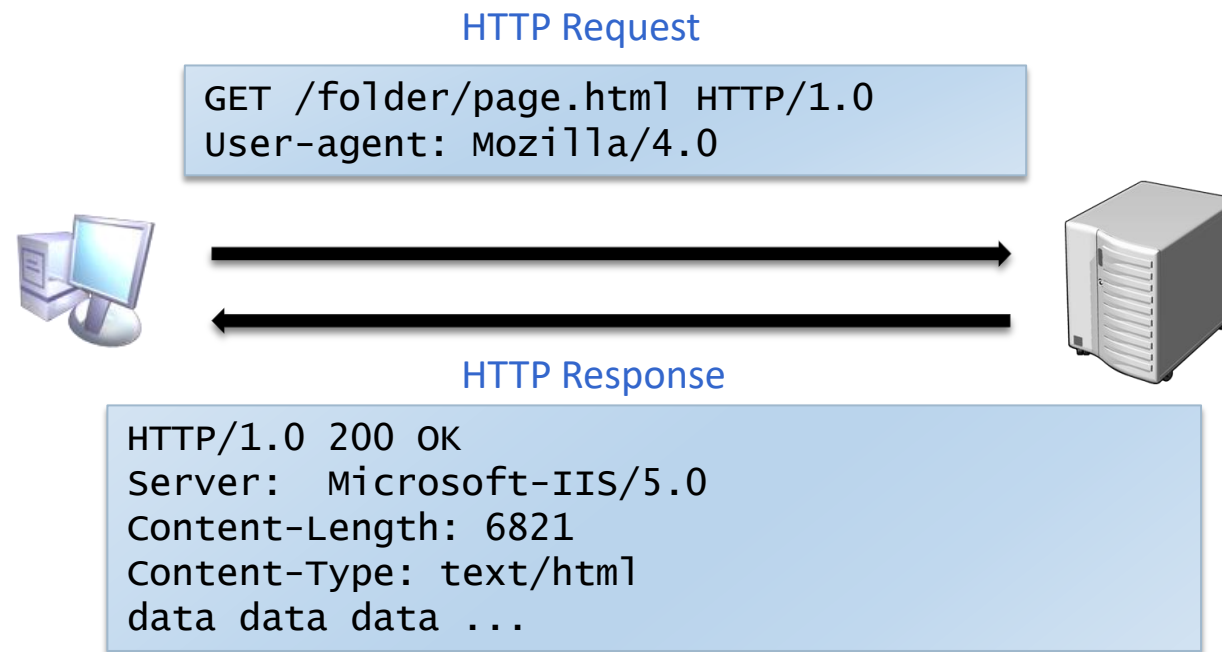
Basic Web Architecture

- ▶ **World Wide Web (WWW)** – an information space where documents and other web resources and can be accessed via the Internet
- ▶ **Web browser** – a software application for retrieving, presenting and traversing information resources on the World Wide Web, such as web pages, images, etc.
- ▶ **Web server** – a server software that can serve contents to the World Wide Web



HyperText Transfer Protocol (HTTP)

- ▶ **Hypertext** is structured text that uses hyperlinks between documents containing text
- ▶ HTTP is the protocol to exchange or transfer hypertext
 - ▶ **Simple** - has a Request and Response (header & body)
 - ▶ **Stateless** - each request is independent from the others



Uniform Resource Locator (URL)

- ▶ Specifies the location of a web resource on a computer network
- ▶ The structure of a URL:

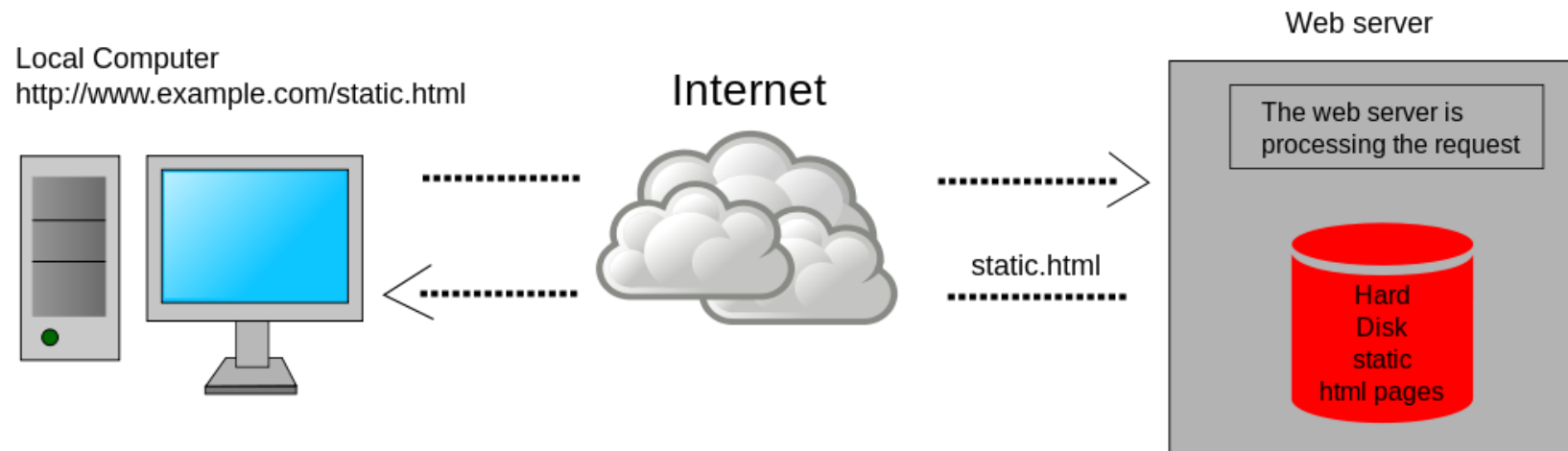
1 2 3 4 5 6 7 8
<https://www.example.com:3000/path/resource?id=123#section-id>

- 1 Scheme - defines how the resource will be obtained.
- 2 Subdomain - www is most common but not required.
- 3 Domain - unique value within its top-level domain.
- 4 Top-level Domain - hundreds of options now exist.
- 5 Port - if omitted HTTP will connect on port 80, HTTPS on 443.
- 6 Path - specify and perhaps find requested resource.
- 7 Query String - data passed to server-side software, if present.
- 8 Fragment Identifier - a specific place within an HTML document.

Static Web Pages

- ▶ A static web page is a web page that is delivered to the user exactly as stored

```
<html>
<head>
  <title>This is a static page</title>
</head>
<body>
  <h1>Hello world</h1>
</body>
</html>
```



Sample Dialog Between the Browser and the Server

- ▶ The user enters the following URL in his browser:

```
http://www.example.com/path/file.html
```

- ▶ The browser translates it into a connection to www.example.com with the following HTTP request:

```
GET /path/file.html HTTP/1.1  
Host: www.example.com
```

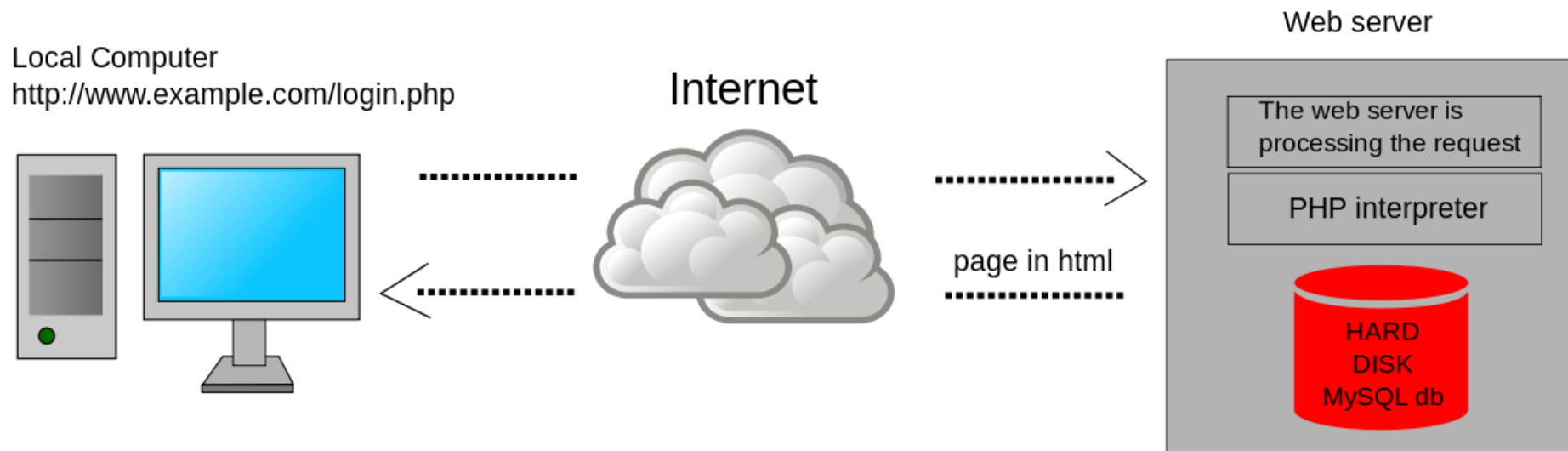
- ▶ The web server on www.example.com appends the given path to its root directory
 - ▶ e.g., on Apache server, this is commonly /home/www
- ▶ The result is the local file system resource:

```
/home/www/path/file.html
```

- ▶ The web server then reads the file, and sends a response to the client's web browser
- ▶ The response describes the content of the file and contains the file itself
 - ▶ or an error message if the file does not exist or is unavailable

Server Side Dynamic Web Pages

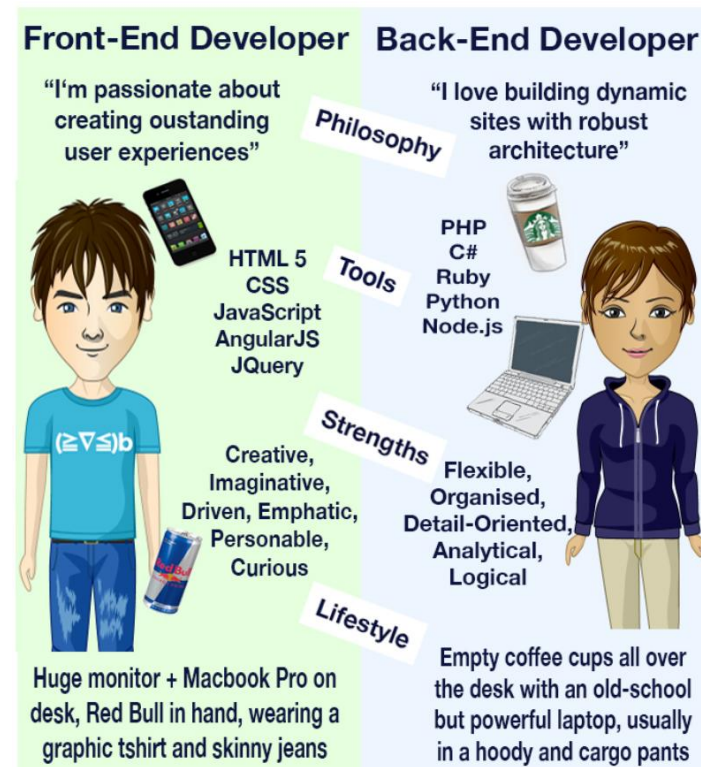
- ▶ Server-side processing allows dynamic page creation
- ▶ There are many server-side languages for creating dynamic pages such as PHP, Perl, ASP, ASP.NET, JSP, and others



Source: Wikipedia

Front-End vs Back-End Development

- ▶ The front-end of a website is everything the user sees, touches and experiences
- ▶ The back-end of a website works behind the scenes to enable the front-end



Source: <https://www.pinterest.com/pin/541628292667889162>

The Big Three

- ▶ While the server can process information in many different languages, the file that it serves to the client must be some combination of the following 3 languages:
 - ▶ **HTML** – content
 - ▶ Different HTML tags describe the structure of content, like paragraphs, blocks, lists, images, tables, forms, etc.
 - ▶ **CSS** – styling and positioning
 - ▶ Tells the browser how each type of element should be displayed, which may vary for different media (like screen, print or mobile device)
 - ▶ **JavaScript** – application logic
 - ▶ Tells the browser how to change the web page in response to events that happen (like clicking on something, or changing the value in a form input)

Web Development Evolution

- ▶ Static content
- ▶ Dynamic content using server side processing
 - ▶ Servlets, ASP.NET, PHP
- ▶ Desktop like development
 - ▶ Rich client libraries, e.g., jQuery, Dojo
 - ▶ AJAX - Asynchronous HTTP requests
- ▶ MVC frameworks
 - ▶ KnockoutJS, EmberJS, AngularJS, Backbone, etc.
- ▶ Mobile Web apps
 - ▶ HTML5, CSS3, jQuery Mobile
- ▶ SOA – service oriented architecture
 - ▶ Server delivers data, not content

