ELDHOSE E R
S6 - COMPUTER ENGINEERING

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- Applications of AJAX.
- Advantages of AJAX.
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- Conclusion.

What Is Synchronous Programming?

- Program in its most basic form.
- Processes the lines of code sequentially.
- It always starts from the first line of code.
- Then it waits until each line of code has completed its execution before moving on to the next.

What Is Asynchronous Programming?

- Opposite of synchronous programming.
- Processes several lines of codes simultaneously.
- It doesn’t wait until the previous line of code in a program has completed its execution.
- Can cut execution time in half, effectively, faster computers.

What is AJAX Programming ?

- AJAX = **A**synchronous **J**avaScript **A**nd **X**ML.
- AJAX is not a programming language.
- AJAX just uses a combination of:
  - A browser built-in **XMLHttpRequest object** (to request data from a web server)
  - **JavaScript and HTML DOM** (to display or use the data)

History of AJAX

- In 1996, the **iframe tag** introduced it can **load or fetch** content **asynchronously**.
- In 1998, the Microsoft developed the **XMLHttpRequest**.
- It appeared as **XMLHTTP** in the **MSXML library**, with Internet Explorer 5 in March 1999.
- later implemented as the **XMLHttpRequest JavaScript object**.
- Google used it in **Gmail**(2004) and **Google Maps**(2005).

AJAX Technologies

- The term ***Ajax*** represent a broad group of Web technologies that can be used to implement a Web application.
- That communicates with a server in the background, without interfering with the current state of the page.

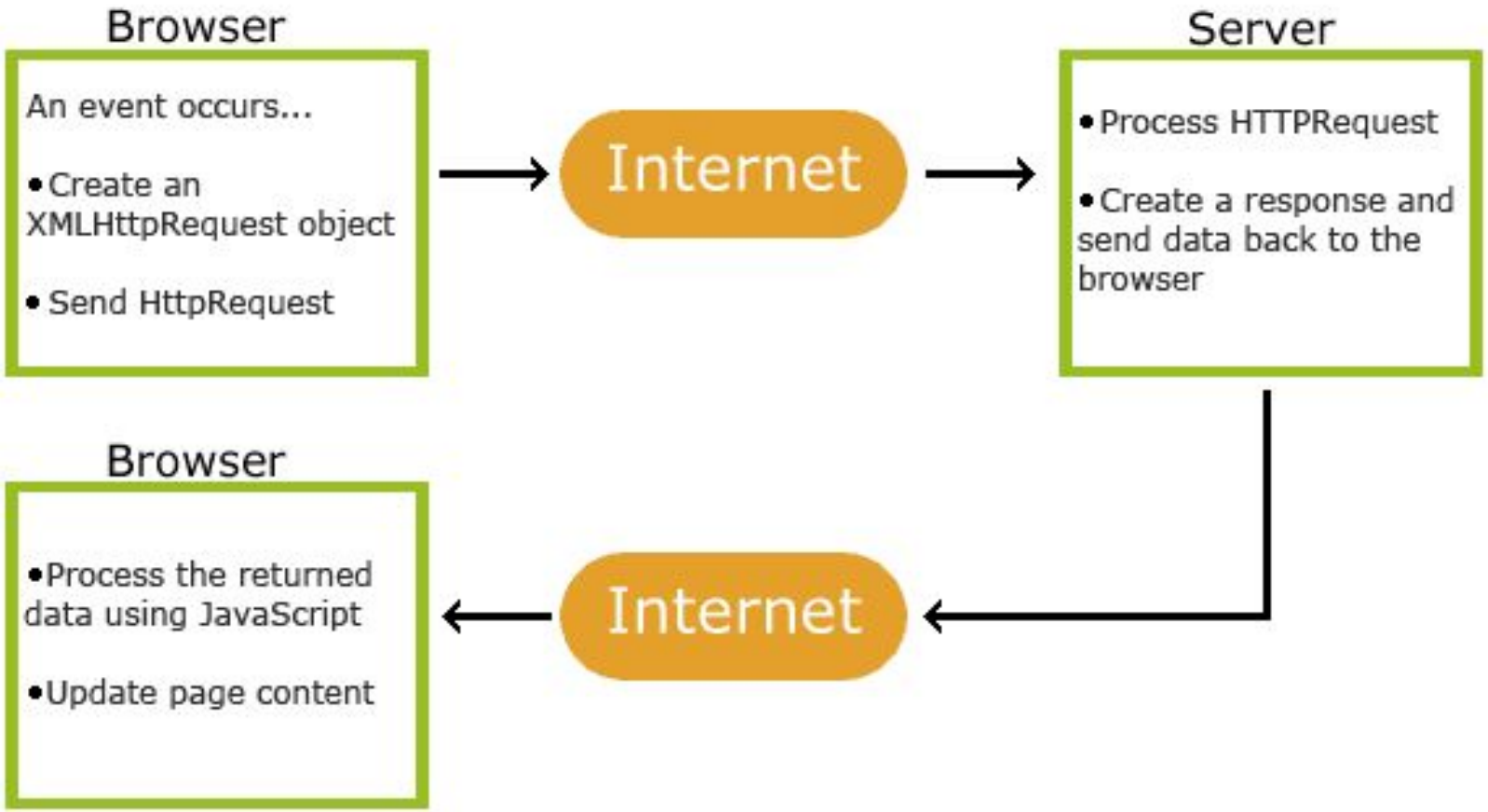
AJAX Technologies

- **HTML (or XHTML)** and **CSS** for presentation.
- The **Document Object Model (DOM)** for dynamic display of and interaction with data.
- **JSON or XML** for the interchange of data, and **XSLT** for XML manipulation.
- The **XMLHttpRequest object** for asynchronous communication.
- **JavaScript** to bring these technologies together

AJAX Technologies

- **XML and XSLT are no longer required** for data interchange and manipulation.
- **JavaScript Object Notation(JSON)** is often used as an alternative format for data interchange.
- formats such as **preformatted HTML or plain text** also used.
- Popular **JS libraries**, including **JQuery**, include abstractions to **assist in executing Ajax requests**.

How AJAX Works ?

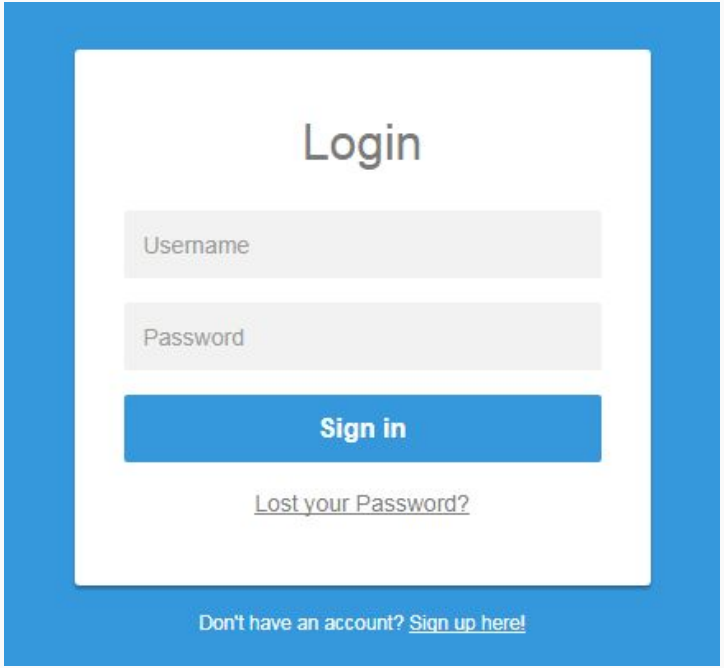


AJAX Working

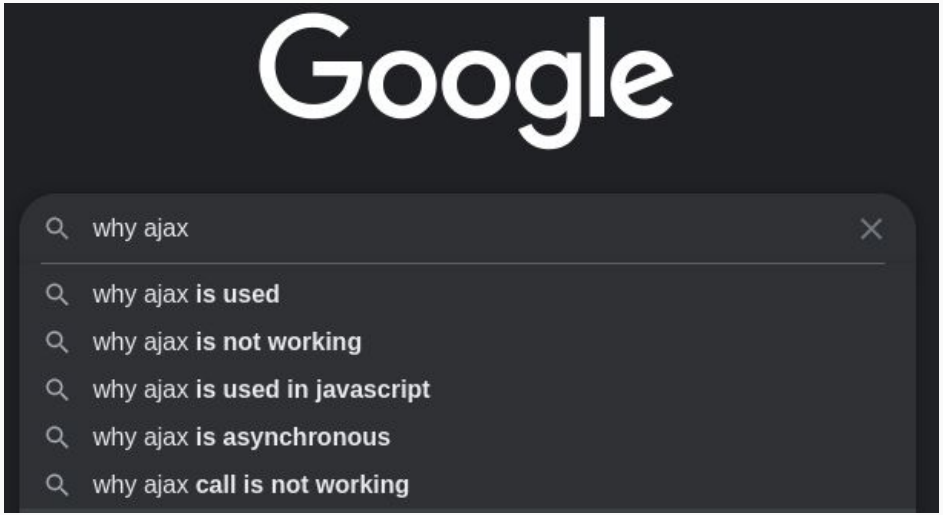
1. Some **event happens** on a webpage. (the page loads, or clicks on a button).
2. JavaScript **creates** an XMLHttpRequest object.
3. This object **sends a request** to the corresponding web server.
4. The server **processes** the request and sends a **response** back to the browser.
5. JavaScript **reads** the response.
6. JavaScript **performs** the proper action, depending on the triggering event.

Applications of AJAX

- Login/Signup Forms.
- Autocompletes.
- Voting / Ratings.
- Form Submission / Validation.
- Chatroom / Instant Messaging.
- External Widgets.



Applications of AJAX



Applications of AJAX

Advantages of AJAX

- Page can be refreshed dynamically.
- UI Response if Faster.
- Smaller Payload , loads Faster.
- Efficient Web Apps.
- Is based on Open Standards.
- Form Validation.

Disadvantages of AJAX

- **View source** is allowed, and **anyone can view** the code source, less secure.
- Search Engines **cannot index** Ajax pages.
- Difficulties to debug.
- Ajax has a **dependency on JavaScript**, so only browsers that support Javascripts or XMLHttpRequest can use pages with Ajax techniques.
- Challenging to bookmark a specific state of the application due to the dynamic web page.
- Pages with successive requests are **unable to register** in history.

AJAX in a nutshell

Key components

- Web browser
- Web server
- AJAX engine (browser/server intermediary)

How Ajax works (Steps)

1. Webpage event happens
2. JavaScript creates XMLHttpRequest object
3. Object sends request to web server
4. Server processes request, responds to browser
5. JavaScript reads response
6. JavaScript performs proper action

Data formats supported

- JavaScript Objection Notation (JSON)
- XML
- HTML
- Text files

Web technologies and tools

- XHTML for content
- XML to receive server data
- Cascading style sheets (CSS) for presentation
- DOM for dynamic content display
- Microsoft object, XMLHttpRequest to fetch data in web browser

Applications of AJAX

- Google Maps
- RSS readers
- desktop tutorials
- chatting
- calendars
- rating widgets
- contact and login forms
- charting components

Conclusion

- AJAX provides functionality to create a robust web application.
- If an AJAX Web Application is coded properly it will run faster than and as secure as a non AJAX program.
- AJAX also allows websites to reduce their overall bandwidth usage and server load by reducing amount of full page loads.

TH ' AJAX ' NKS