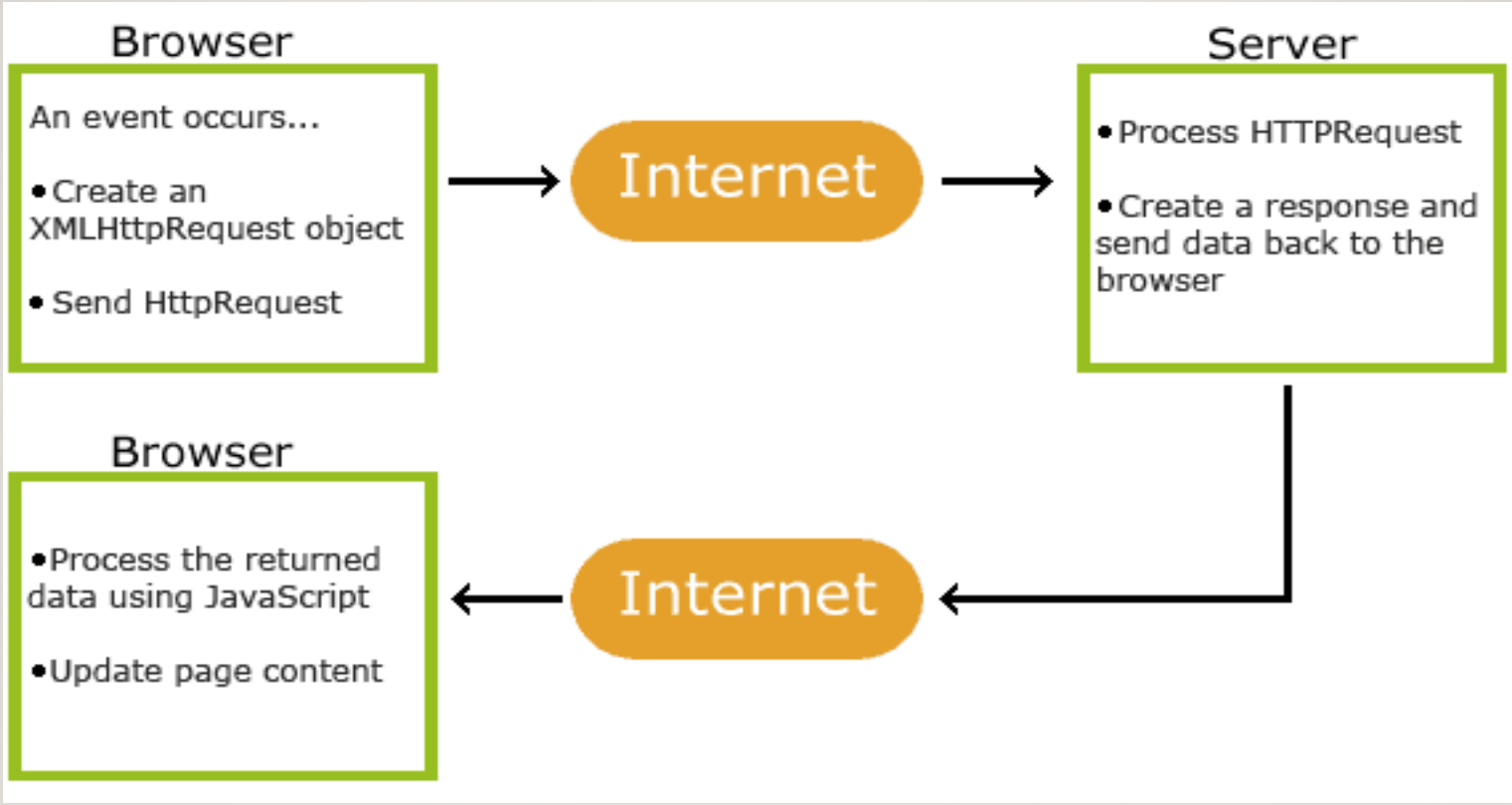
LECTURE – 6

- AJAX
- Node.js

AJAX – ASYNCHRONOUS JAVA AND XML

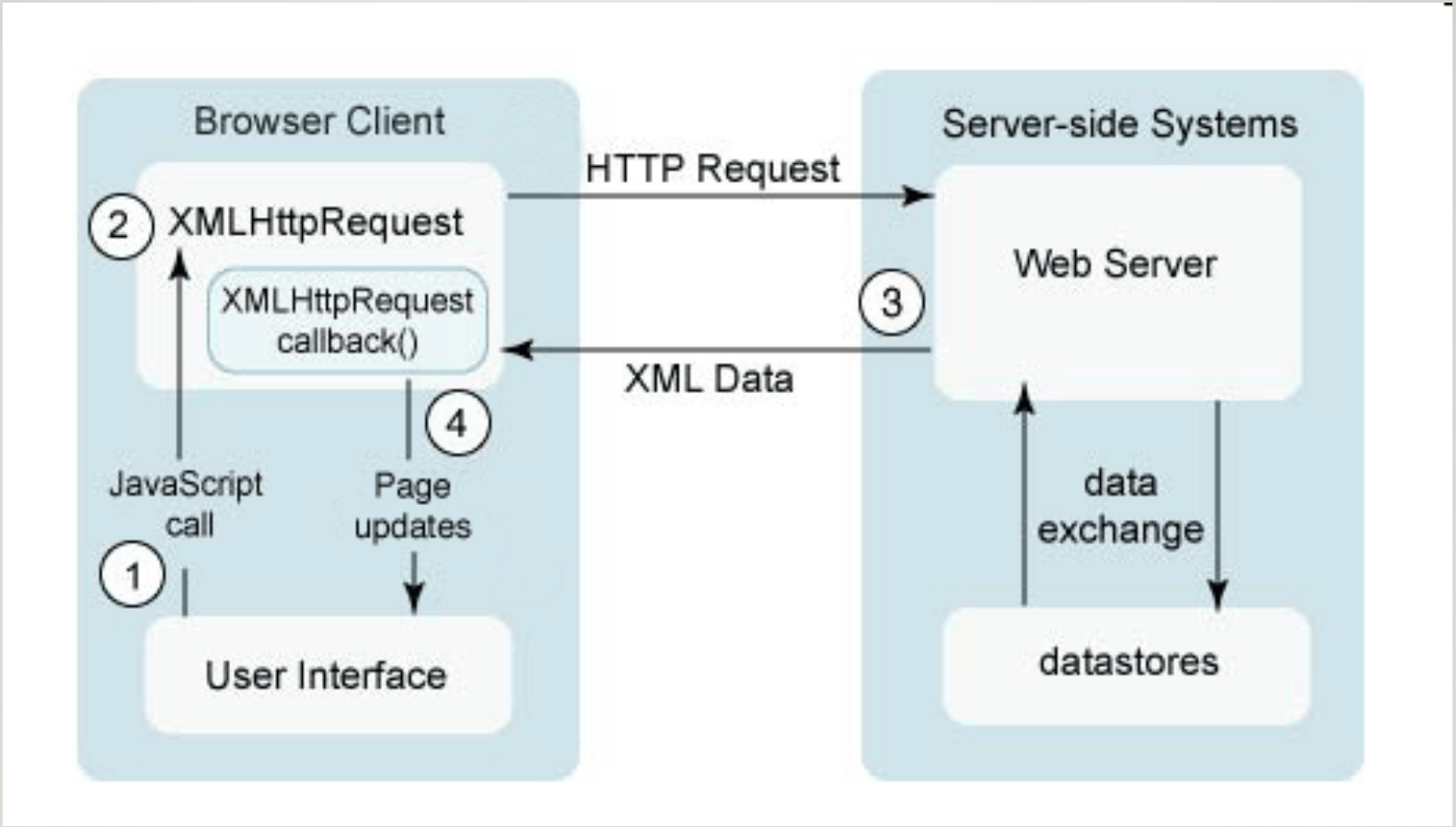
- Made popular by Google (with Google Suggest).
- NOT a new programming language
  - A new way to use existing standards.
- Based on JavaScript and HTTP requests.
- With AJAX, JavaScript communicates
  - Directly with the (web) server
  - using XMLHttpRequest object
  - To retrieve data as needed
  - Using Javascript events (e.g., keyPressed)
  - WITHOUT refreshing the page.

HOW DOES AJAX WORK … CONTD.



Source: W3Schools

HOW DOES AJAX WORK



Source: SUN's JAVA web page

AJAX … CONTD.

- Note: Data is typically stored in XML format
- XMLHttpRequest
  - The basic data structure interfacing the client with server.
  - Sends a request to a server (e.g., Google suggest server) on any events
    - Like "onKeyup(..)" when the user types any character search key.
  - Receives data from the server
  - Updates the required fields with data received from server.

REQUESTS AND RESPONSES

- XMLHTTPRequest
  - open(..) // open a connection to …
  - setRequestHeader(..) // Set the request header
  - send(..) // Send the request
  - status // response 200 OK, or other values
  - readState // Store the state information
  - onreadystatechange // callback function for status change
  - responseText // response in Text
  - responseXML // response in XML

XMLHTTPREQUEST FUNCTIONS

- open(*method, url, async, user, psw)*
  - method: Get/Post
  - url: address of the server
  - sync – true or false (asynchronous call or not)
  - user – username (optional)
  - psw – Password (optional)
- setRequestHeader( ) // Sets label/value pairs in the header
- send( ) or send(string) // Sends the request to the server
- abort( ) // Cancel the current request
- getResponseHeader( ) // Get specific header information
- getAllResponseHeaders( ) // Get all headers' information

XMLHTTPREQUEST OBJECT PROPERTIES

- readyState – Holds the status of XMLHTTPRequest object
  - 0: Request Not initialized
  - 1: Server connection established
  - 2: Request received
  - 3: Processing request
  - 4: Request finished, response is ready
- Status – Returns the status number of a request
  - 200: OK
  - 403: Forbidden
  - 404: Not Found
  - ..Others
- statusText – Status text of a response (e.g., "OK", "Not Found", etc.)
- responseText – response data as a string
- responseXML – response as XML data

NODE.JS

- Open source cross-platform runtime environment
- Runs Javascript engine
- Node.js app runs in a single process
- Uses asynchronous non-blocking calls to resources
- Can handle many (thousands) of requests on a server.

WHAT CAN NODE.JS DO?

- Server side Javascript
- Serves content to browsers
- Generate dynamic page content
- Can create/open/read/write/delete/close files on server
- Can interact with databases on server
- Can handle forms, events, emails, etc.

ADVANTAGES OF NODE.JS

- Fast and makes good use of resources (CPU, memory, etc.)
- Can handle multiple requests simultaneously
- Open source
- Thousands of open source packages are available.

NODE.JS – HIGH LEVEL ARCHITECTURE