

www is Communication b/w Web Client & Server  
↓ done by  
request & response

## HTTP Request / Response

Communication between clients and servers is done by **requests** and **responses**:

1. A client (a browser) sends an **HTTP request** to the web
2. A web server receives the request
3. The server runs an application to process the request
4. The server returns an **HTTP response** (output) to the browser
5. The client (the browser) receives the response

## The HTTP Request Circle

A typical HTTP request / response circle:

1. The browser requests an HTML page. The server returns an HTML file.
2. The browser requests a style sheet. The server returns a CSS file.
3. The browser requests an JPG image. The server returns a JPG file.
4. The browser requests JavaScript code. The server returns a JS file
5. The browser requests data. The server returns data (in XML or JSON).

## XHR - XMLHttpRequest

All browsers have a built-in **XMLHttpRequest Object (XHR)**.

XHR is a JavaScript object that is used to transfer data between a web browser and a web server.

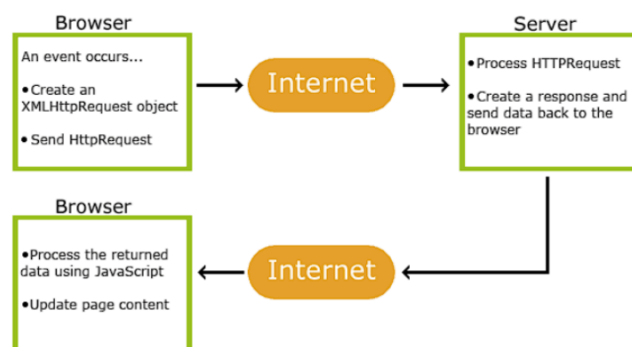
XHR is often used to request and receive data for the purpose of modifying a web page.

Despite the XML and Http in the name, XHR is used with other protocols than HTTP, and the data can be of many different types like [HTML](#), [CSS](#), [XML](#), [JSON](#), and plain text.

The XHR Object is a **Web Developers Dream**, because you can:

- Update a web page without reloading the page
- Request data from a server - after the page has loaded
- Receive data from a server - after the page has loaded
- Send data to a server - in the background

The XHR Object is the underlying concept of [AJAX](#) and [JSON](#):



When a browser request a service from a server, it always returns a HTTP Status Message for every request.

### ✅ 2xx – Success

- **200 OK** — The request succeeded. This is the “normal” successful response. W3Schools
- **201 Created** — A new resource was successfully created (common in APIs). W3Schools
- **204 No Content** — The request succeeded but there’s no content in the response body (useful when you just want a status). W3Schools

### 🔄 3xx – Redirection

- **301 Moved Permanently** — The resource has moved permanently to a new URL; browsers/search engines will update links. W3Schools
- **302 Found** — Temporary redirect; the resource is temporarily at a different URL. W3Schools
- **304 Not Modified** — Used for caching: the resource hasn’t changed since the last request, so client can use its cached copy. W3Schools

### ⚠️ 4xx – Client Error

- **400 Bad Request** — The request was invalid (e.g., malformed syntax). W3Schools
- **401 Unauthorized** — Authentication is required and has failed or has not yet been provided. W3Schools
- **403 Forbidden** — The request is valid, but the server is refusing action. The user may not have the necessary permissions. W3Schools
- **404 Not Found** — The resource requested could not be found. Very common. W3Schools
- **405 Method Not Allowed** — A request method (GET, POST, etc) is not supported for the resource. W3Schools

### ❌ 5xx – Server Error

- **500 Internal Server Error** — A generic catch-all error when the server fails but no more specific message applies. W3Schools
- **502 Bad Gateway** — The server, while acting as a gateway or proxy, received an invalid response from the upstream server. W3Schools
- **503 Service Unavailable** — The server is currently unavailable (e.g., overloaded or down for maintenance). W3Schools
- **504 Gateway Timeout** — The server, acting as a gateway/proxy, didn’t get a timely response from the upstream server. W3Schools

