Controller-Server Communication

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Controller's role in MVC

Controller must fetch model (in server) for the view

Other needs, such as authentication, to communicate with the server

Asynchronous JavaScript and XML widely used

- Asynchronously send and receive data without requiring full page reload
- Uses HTTP requests and responses
- Can handle data in many formats – JSON is prevalent today
- XMLHttpRequest – earliest method, but outdated
- Fetch – promise-based, modern and elegant method

XMLHttpRequest

Is a built-in browser object that allows to make HTTP requests in JavaScript

```
// 1. Create a new XMLHttpRequest object
let xhr = new XMLHttpRequest();

// 2. Configure it: GET-request for the URL server-url
xhr.open('GET', 'server-url');

// 3. Send the request over the network
xhr.send();
```

XMLHttpRequest – wait for a response

```
// 4. This will be called after the response is received

xhr.onload = function() {
  if (xhr.status != 200) { // analyze HTTP status of the response
    alert(`Error ${xhr.status}: ${xhr.statusText}`); // e.g. 404: Not Found
  } else { // show the result
    alert (JSON.parse(xhr.responseText));
};

xhr.onprogress = function(event) {
      alert(`Received ${event.loaded} bytes`)
};
xhr.onerror = function() {
  alert("Request failed"); //network error, bad url, etc.
};
```

Fetch API

fetch() is a modern and versatile way to send and get network requests

```
// basic syntax
let promise = fetch(url, [options])

• url: the URL to access
• Options: methods, headers, etc.

Without options GET method by default
```

The browser starts the request right away and returns a promise that the caller should use to get the result

Getting a response is a two-step process

Step 1 of response

Promise fulfils with a response that contains status, but don’t have the body yet

```
let response = fetch(url);
```

Step 1 of response

Promise fulfils with a response that contains status, but don’t have the body yet

```
let response = await fetch(url);

if (response.ok) { // if HTTP-status is 200-299
  // get the response body (step 2)

} else {
  alert("HTTP-Error: " + response.status);
}
```

Step 2 of response

Response provides multiple promise-based methods to access the body in various formats

```
let response = await fetch(url);

if (response.ok) { // if HTTP-status is 200-299
  // get the response body
  let json = await response.json();
} else {
  alert("HTTP-Error: " + response.status);
}
```

Example fetch

Get the latest commit from github

```
let url = 'https://api.github.com/repos/javascript-tutorial/en.javascript.info/commits';

let response = await fetch(url);


// read response body and parse as JSON
let commits = await response.json();


alert(commits[0].author.login);
```

Example fetch using then

Get the latest commit from github

```
fetch('https://api.github.com/repos/javascript-
tutorial/en.javascript.info/commits')
  .then(response => response.json())
  .then(commits => alert(commits[0].author.login));
```

Axios – promise based http client

Transforms JSON data automatically; Handles 404 like errors

```
import axios from 'axios';

axios.get(‘url’)
  .then(response => {
    console.log(response.data);
  })
  .catch(error => {
    console.error('Error fetching data:', error);
  });
```

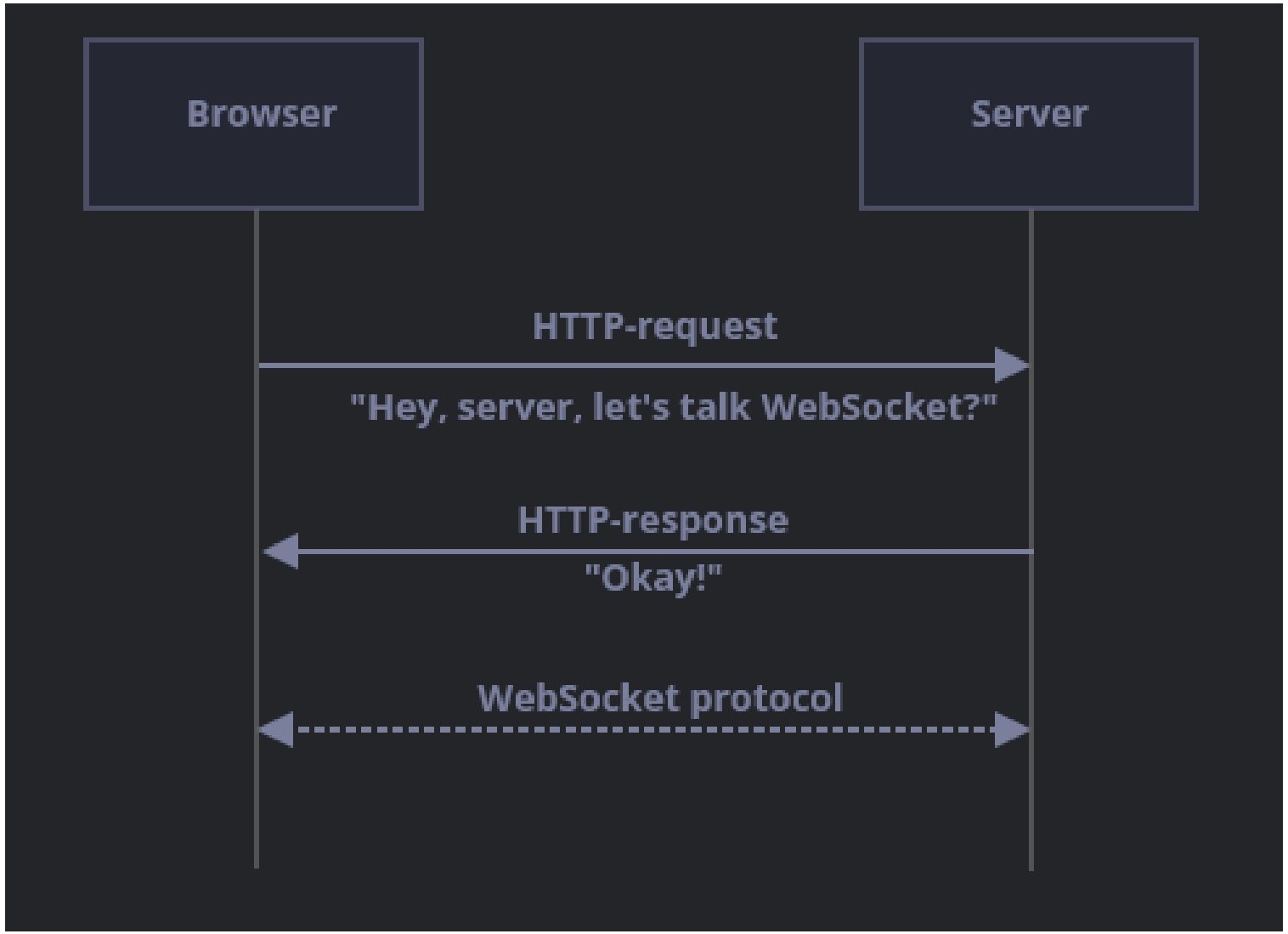
WebSocket

Provides a way to exchange data between browser and server via a persistent connection

The data can be passed in both directions as “packets”, without breaking the connection and the need of additional HTTP-requests

Great for services that require continuous data exchange, e.g. online games, real-time trading systems

Opening a webSocket



Sources

1. Javascript.info - Network requests
2. CS 142 Lectures