Creating Asynchronous HTTP Requests in JavaScript

This chapter will teach you how to retrieve data from a web server through HTTP requests.

> **WE'LL COVER THE FOLLOWING** ∧
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> - The `fetch()` Method
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In the previous chapter, we discussed synchronous vs asynchronous requests. Since synchronous requests block the calling process until their result is received, only asynchronous HTTP requests should be used when building a web application. However, asynchronous code can be tricky to write and to understand, since statements won't be executed in a linear and sequential fashion like with synchronous operations.

The `fetch()` Method

The best way to send asynchronous HTTP requests in JavaScript is to use the `fetch()` method. Here is its general usage form.

```
// Sends an asynchronous HTTP request to the target url
fetch(url)
  .then(() => {
    // Code called in the future when the request ends successfully
  })
  .catch(() => {
    // Code called in the future when an errors occurs during the request
  });
```

> You might encounter JavaScript code that uses an object called

`XMLHttpRequest` to perform HTTP operations. This is a more ancient
technique now replaced by `fetch()`.

Under the Hood: Promises

When the `fetch()` method is executed, it immediately returns a promise,
which is a wrapper for an operation whose result might be available in the
future. A *promise* is in one of these states:

- *pending*: initial state, not *fulfilled* or *rejected*
- *fulfilled*: meaning that the operation completed successfully
- *rejected*: meaning that the operation failed

A JavaScript promise is an object with `then()` and `catch()` methods. `then()` is
called when the promise is *fulfilled*. It takes the operation result as a
parameter. On the contrary, `catch()` is called when the promise is *rejected*.

What's great about promises is that they can be chained together. Here's how
you could perform a series of asynchronous operations in JavaScript.

```
getData()
  .then(a => filterData(a)) // Called asynchronously when getData() returns
  .then(b => processData(b)) // Called asynchronously when filterData() returns
  .then(c => displayData(c)) // Called asynchronously when processData() returns
  // ...
```

Example: Retrieving a Text File

Let's start with a very basic example: displaying the content of a text file
located on a web server. The file URL is
https://raw.githubusercontent.com/bpesquet/thejsway/master/resources/languages.txt and it has the following content.

> C++;Java;C#;PHP

Here's how to do this in JavaScript using `fetch()`.

```
fetch(
  "https://raw.githubusercontent.com/bpesquet/thejsway/master/resources/languages.txt"
)
```

```
  .then(response => response.text()) // Access and return response's text content
  .then(text => {


    console.log(text); // Display file content in the console
  });
```

The result of the asynchronous HTTP request created by `fetch()` comes under the the form of a `Response` object. This object has several methods to deal with the response of the HTTP call. The `text()` method used in this example reads the response's text content and returns another promise. Its result is managed by the second `then()` method, which simply displays the file's textual content in the console.

To learn more about the `Response` object, consult, as usual, the Mozilla Developer Network.

Dealing with Errors

By nature, external HTTP requests are subject to errors: network failure, missing resource, etc. Handling these errors is done by adding a `catch()` method to the `fetch()` call. A basic level of error handling is to log the error message in the console.

```
fetch("http://non-existent-resource")
  .catch(err => {
    console.error(err.message);
  });
```