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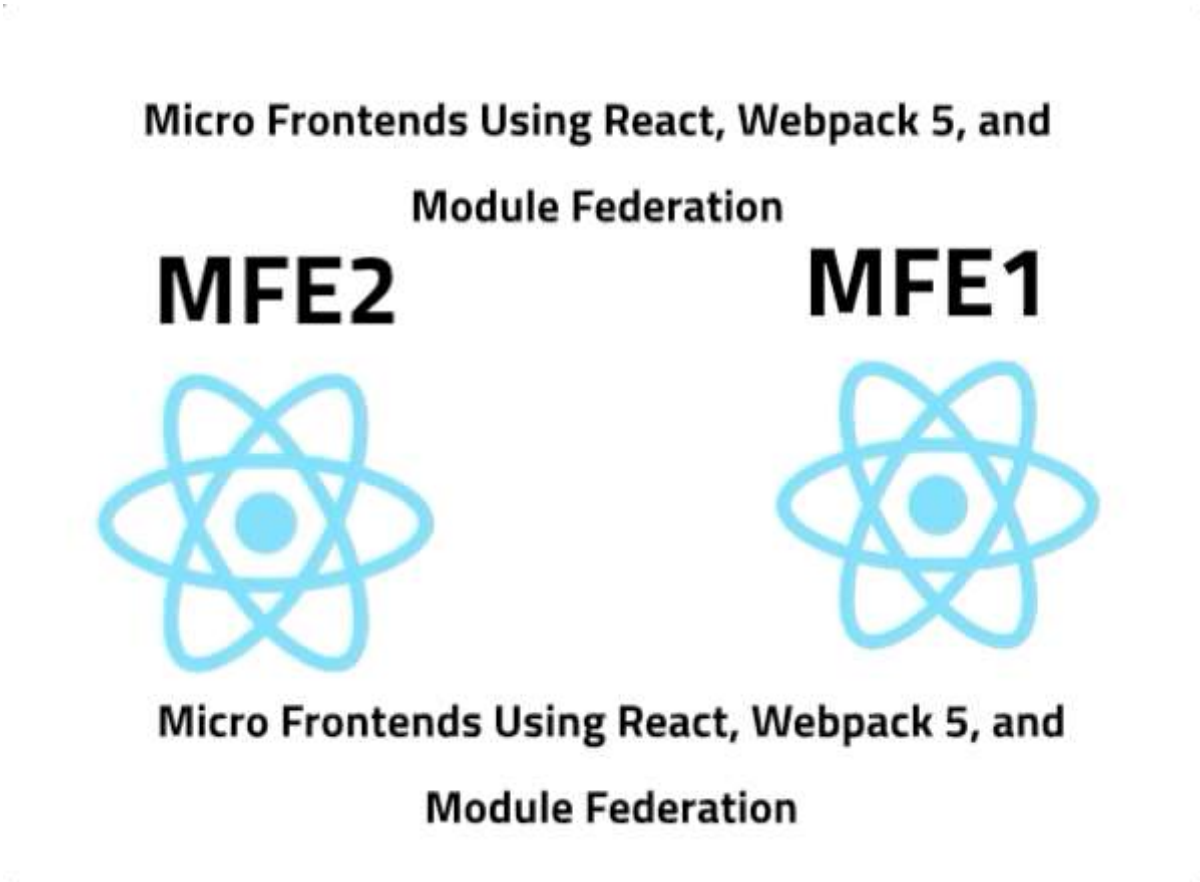
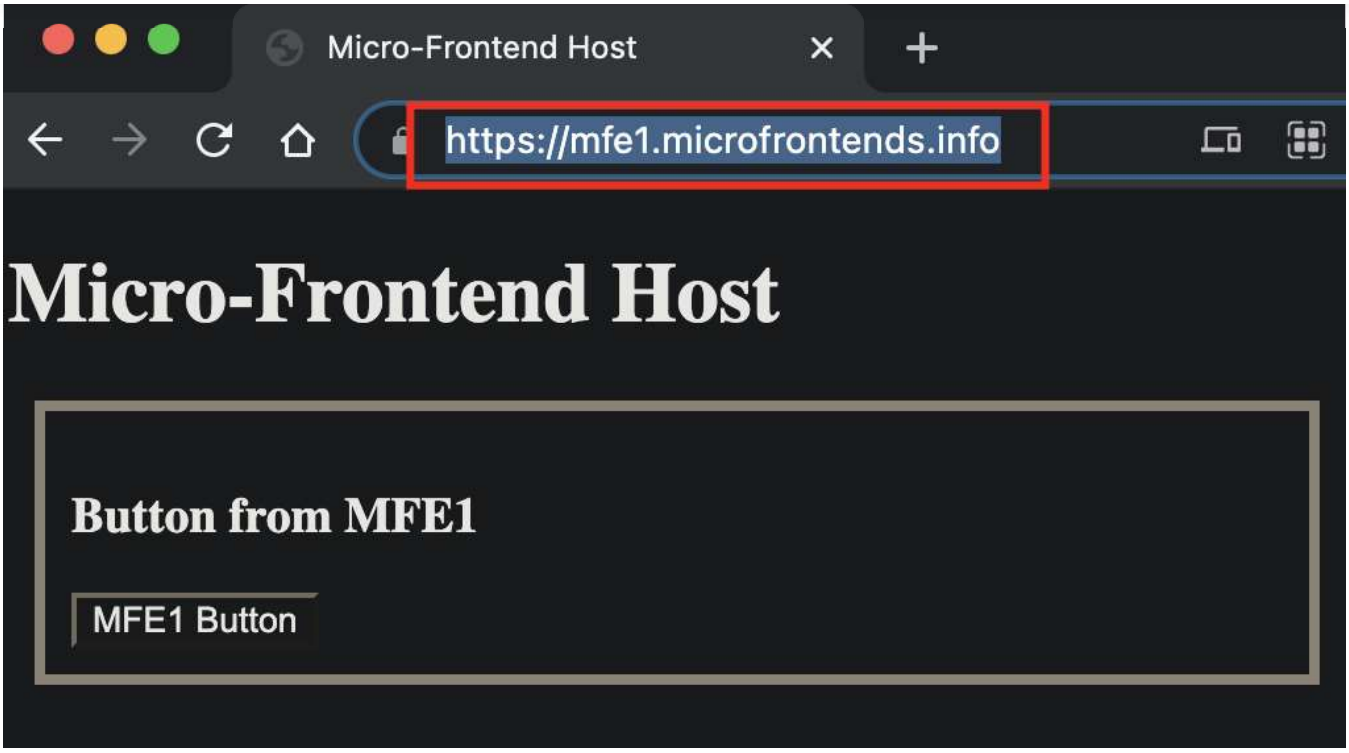
Micro Frontends Step by Step Using React, Webpack 5, and Module Federation With Deployment to AWS



In this article, I will go step by step in creating two Micro Frontend React Components and render a Button component from one into the other.

At the end of this article, you will be able to implement a microfrontend component



If you are new to Microfrontend, you may start with the following article:

Micro-Frontends: What, why, and how

In my previous articles (links at the end of this article and here), I showed hands-on what are Micro Frontends and how...

www.linkedin.com

This hands-on example is a continuation of the following two articles where I explained how Micro Frontends work with Webpack5 and Module Federation. I wanted to give clean steps on React components without all the explanations. Please, refer to those articles for explanations

Micro-Front-Ends: Hands-On Project

Prepare your machine and install nodejs, if needed follow the article/video, below:

medium.com

This article is a continuation of the previous article

medium.com

The final project can be found at https://github.com/ranyelhousieny/react-microfrontends

Micro-Frontends: What, why, and how

In my previous articles (links at the end of this article and here), I showed hands-on what are Micro Frontends and how...

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Table of Contents:

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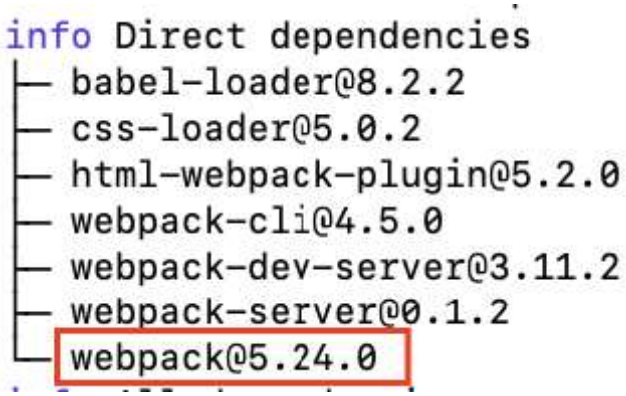
Creating Microfrontends Projects Locally

1. Create two React apps and install dependencies

```
npx create-react-app mfe1

cd mfe1

yarn add webpack webpack-cli webpack-server html-webpack-plugin
babel-loader webpack-dev-server


npx create-react-app mfe2

cd mfe2
```


The nice thing I like about yarn is the report at the end. Check and make sure it installed Webpack 5 or up (you can learn how to install node and yarn here)



I am using yarn with this example because npm has been giving errors with the latest React release.

Note: While I used create-react-app here for an easier walkthrough, I will not depend on it at all and we will create our own webpack.config.js. You may learn how to set up a React project without CRA in this article

Create React App without create-react-app (CRA)

This article will show how to create a React app without using create-react-app (CRA). For more details on why we are...

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After this step, you will need to open visual studio code to complete the rest of the steps.

2. In both Apps, rename index.js to bootstrap.js

in *bootstrap.js*, Remove the imports to index.css and reportWebVitals and keep the file as shown below:

```
import React from 'react';
import ReactDOM from 'react-dom';
import App from './App';

ReactDOM.render(
  <App />,
  document.getElementById(
    'root'
  )
);
```

Here are the files on Github

https://github.com/ranyelhousieny/react-microfrontends/blob/main/mfe1/src/bootstrap.js

We do this step to make bootstrap load asynchronously. It is needed for MFE2 to wait for Webpack to fetch components from MFE1.

3. In both Apps, create a new index.js that has one line

```
import('./bootstrap');
```

Here is the file on Github


4. In MFE1, Create. a Button component

Create a file src/Button.js

Copy inside it this code (It is a very simple component)

```
import React from 'react';

const Button = () => (
  <button>MFE1 Button</button>
);

export default Button;
```

Code can be found at

ranyelhousieny/react-microfrontends

Contribute to ranyelhousieny/react-microfrontends development by

4.1. In MFE1, update App.js as follows

Code can be found at https://github.com/ranyelhousieny/react-microfrontends/blob/main/mfe1/src/App.js

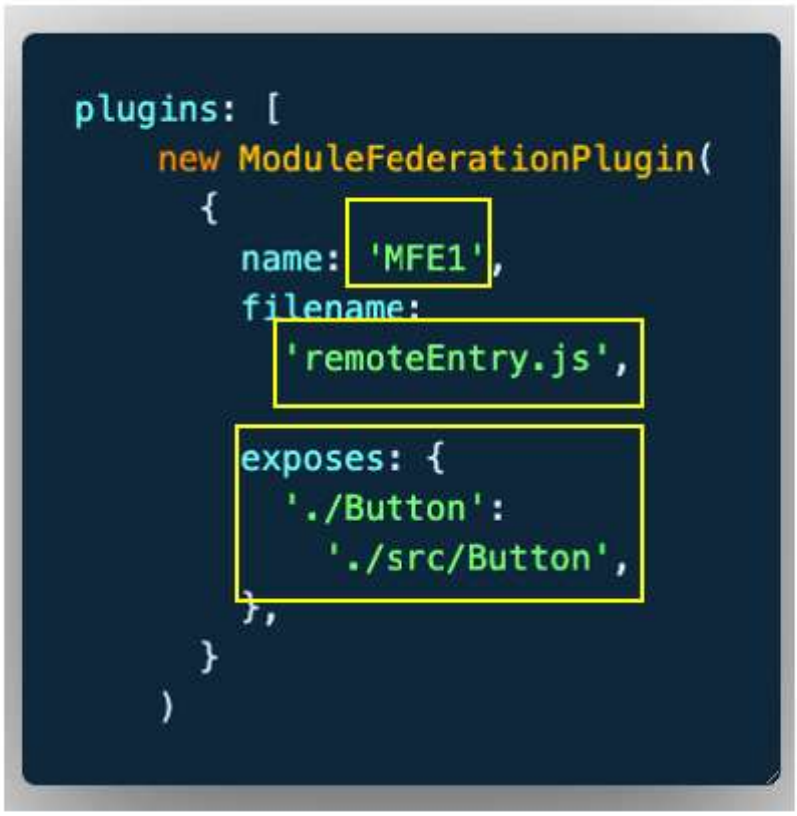
5. In MFE1, Create a Webpack.config.js on the root and put the following inside it

(details about this file and building it step by step can be found here https://www.linkedin.com/pulse/understanding-micro-frontends-webpack5-configurations-rany/ and the video https://youtu.be/AZDDIgJSKU0)

```
const HtmlWebpackPlugin = require('html-webpack-plugin');
const ModuleFederationPlugin =
require('webpack/lib/container/ModuleFederationPlugin');

module.exports = {
  mode: 'development',
  devServer: {
```


```
          /* The following line to ask babel
               to compile any file with extension
               .js */
          test: /\.js?$/,

          /* exclude node_modules directory from babel.
              Babel will not compile any files in this directory*/
          exclude: /node_modules/,

          // To Use babel Loader
          loader:
            'babel-loader',
          options: {
            presets: [
              '@babel/preset-env' /* to transfer any advansed ES to
ES5 */,
              '@babel/preset-react',
            ], // to compile react to ES5
          },
        },
      ],
    },

    plugins: [
      new ModuleFederationPlugin(
        {
          name: 'MFE1',
          filename:
            'remoteEntry.js',

          exposes: {
            './Button':
              './src/Button',
          },
        }
      ),
      new HtmlWebpackPlugin({
        template:
          './public/index.html',
      }),
    ],
  };
```

https://github.com/ranyelhousieny/react-microfrontends/blob/main/mfe1/webpack.config.js

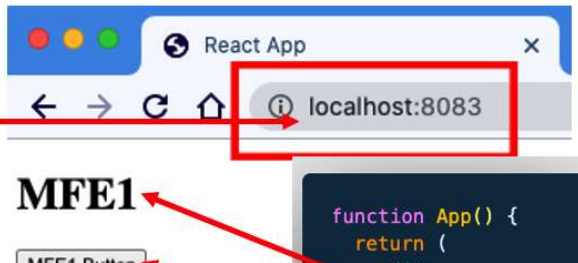



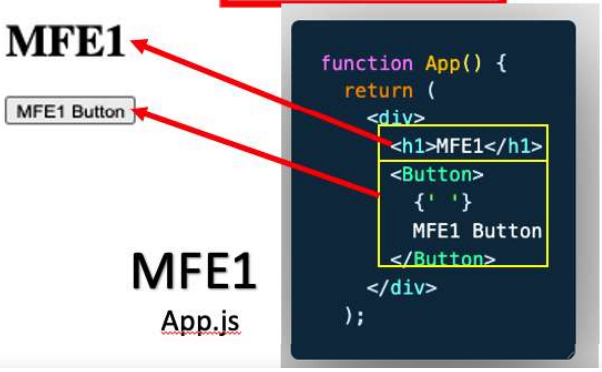
MFE1

webpack.config.js

MFE1

webpack.config.js





MFE1

App.js

In the previous two articles, I demonstrated how to build Micro-Frontends and deploy them to AWS. During the process, I...

www.linkedin.com

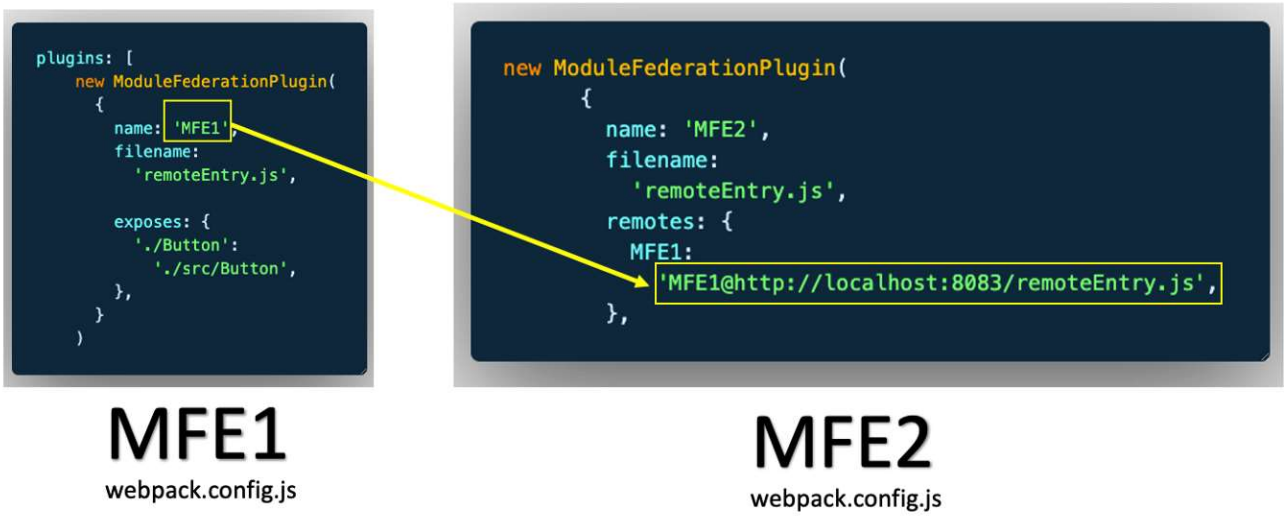
6. In MFE2, Create a Webpack.config.js on the root and put the following inside it

more details about this file here https://www.linkedin.com/pulse/understanding-micro-frontends-webpack5-module-step-rany

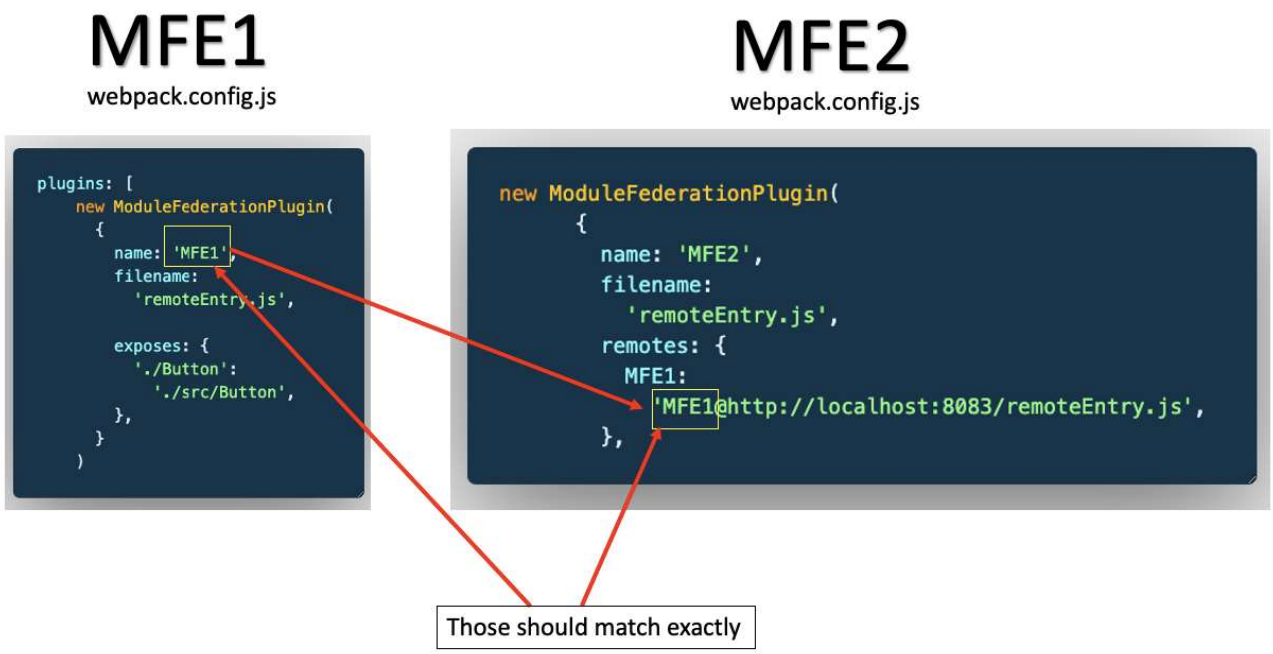
```
const HtmlWebpackPlugin = require('html-webpack-plugin');
const ModuleFederationPlugin =
require('webpack/lib/container/ModuleFederationPlugin');

module.exports = {
  mode: 'development',
  devServer: {
    port: 8082,
  },
  module: {
    rules: [
      {
        /* The following line to ask babel
             to compile any file with extension
             .js */
        test: /\.js?$/,

        /* exclude node_modules directory from babel.
            Babel will not compile any files in this directory*/
        exclude: /node_modules/,

        // To Use babel Loader
        loader:
```


```
            ], // to compile react to ES5
          },
        },
      ],
    },

    plugins: [
      new ModuleFederationPlugin(
        {
          name: 'MFE2',
          filename:
            'remoteEntry.js',
          remotes: {
            MFE1:
              'MFE1@http://localhost:8083/remoteEntry.js',
          },
        }
      ),
      new HtmlWebpackPlugin({
        template:
          './public/index.html',
      }),
    ],
  };
```

https://github.com/ranyelhousieny/react-microfrontends/blob/main/mfe2/webpack.config.js



Here we just said that MFE1 exposed components can be available in MFE2 remotely through http://localhost:8083/remoteEntry.js

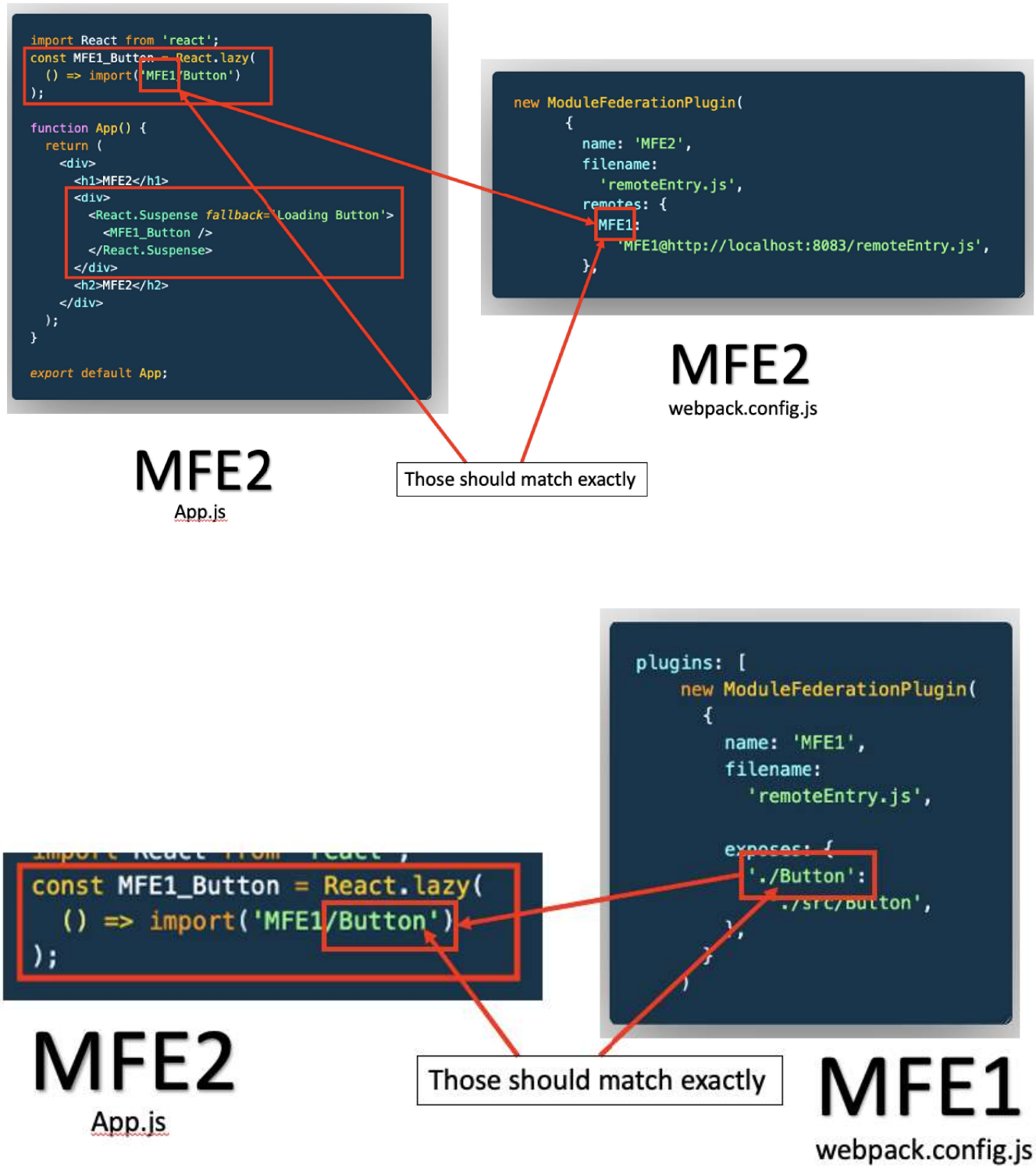


7. In MFE2 src/App.js import Button (Lazy import)

```
const MFE1_Button = React.lazy(
  () => import('MFE1/Button')
);
```

Add it to the App as follows

```
function App() {
  return (
    <div>
      <h1>MFE2</h1>
      <div>
        <React.Suspense fallback='Loading Button'>
          <MFE1_Button />
        </React.Suspense>
      </div>
      <h2>MFE2</h2>
    </div>
  );
}
```



8. Let's run both apps

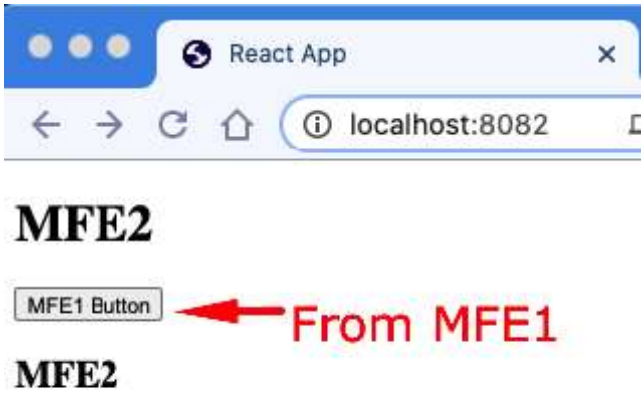
open a terminal inside MFE1 directory and run

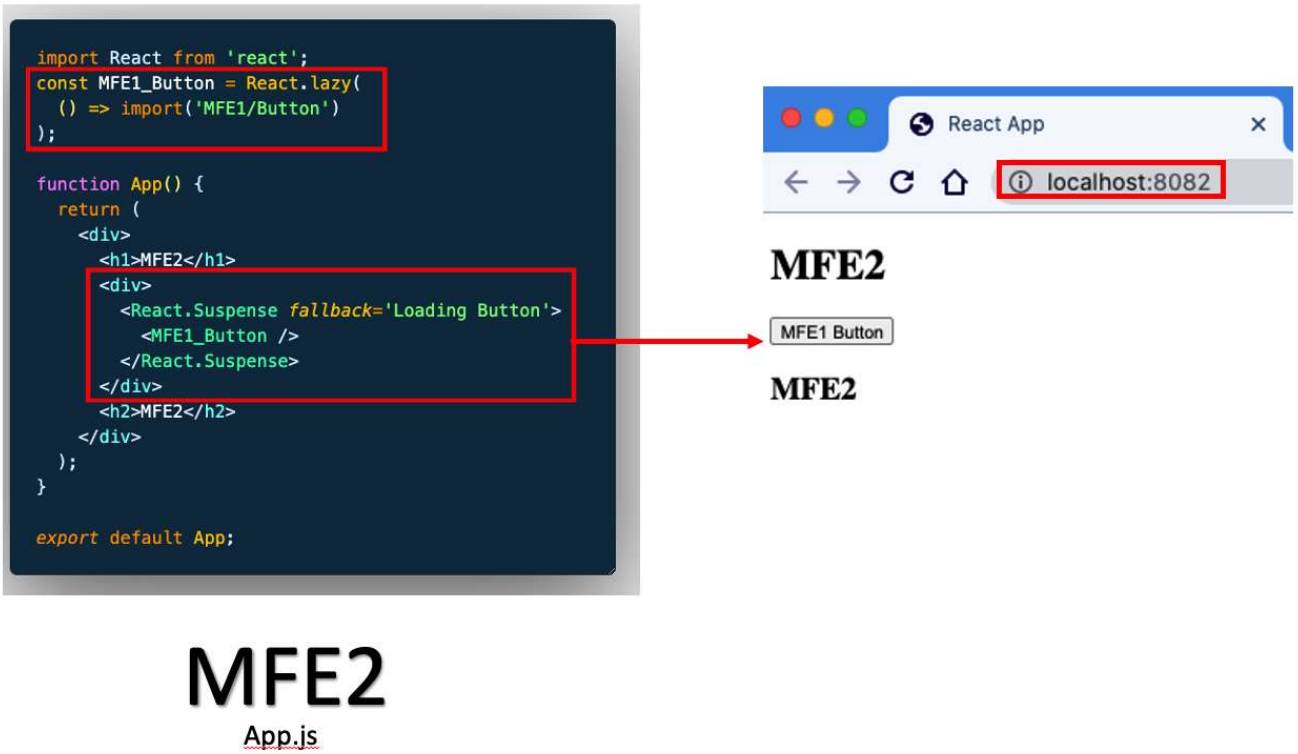
```
yarn webpack serve
```

Now open the browser and navigate to

http://localhost:8082/

You should see the following



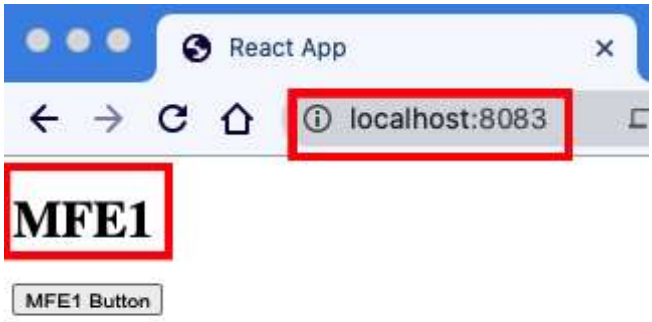


MFE2

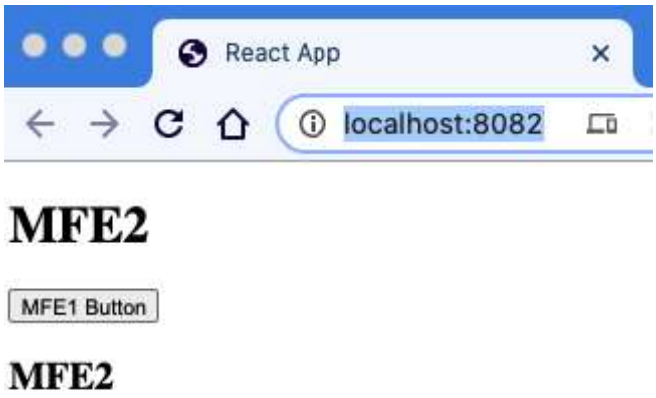
App.js

==========

1. MFE1 on http://localhost:8083/ [We decided this port in the configuration]



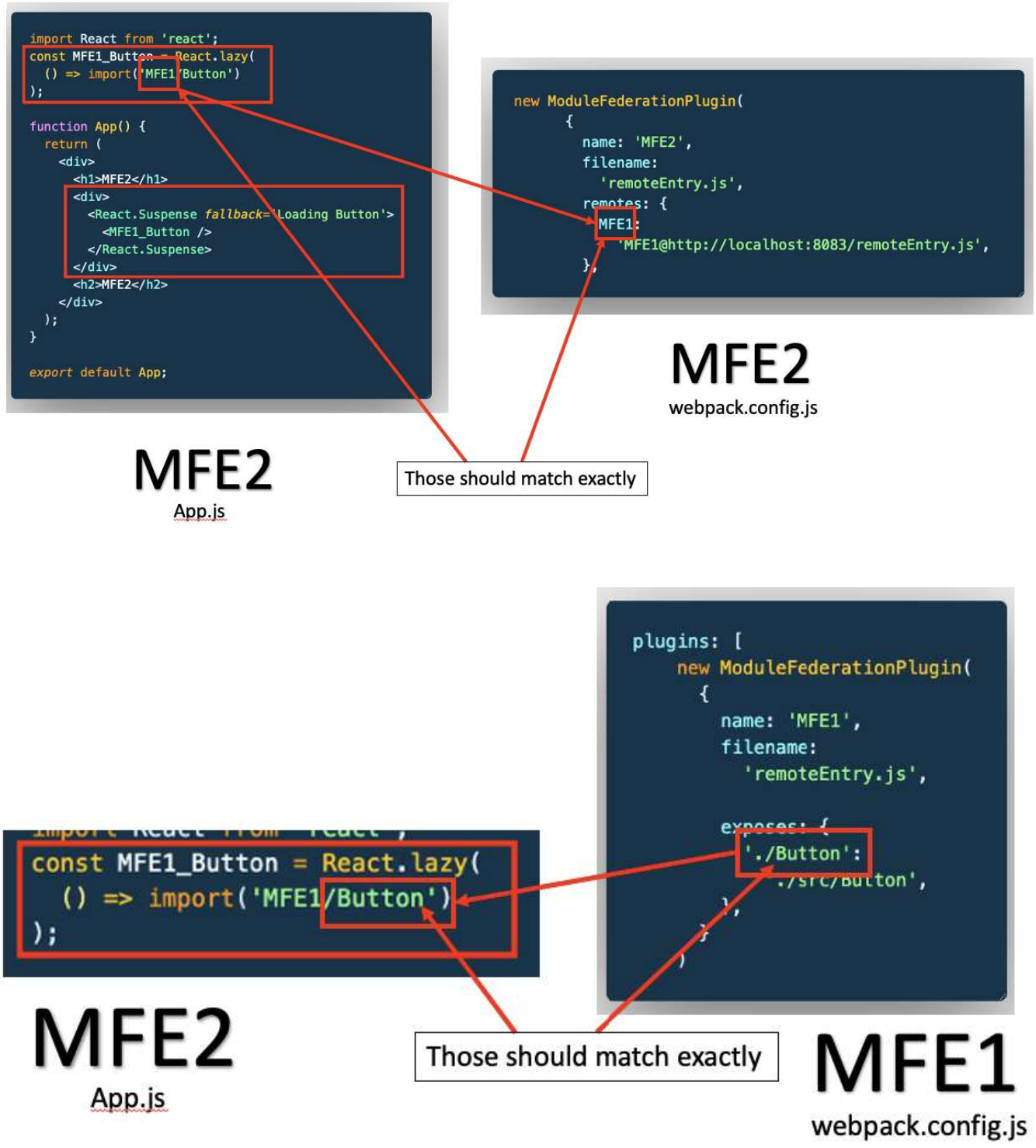
1. MFE2 on http://localhost:8082/



Second: Using Module Federa exposed the Button component from MFE1 site (h 8083/) and imported it into MFE2

1. We added a remote for MFE1 in MFE2

2. We imported the exposed component from MFE1 into App.js in MFE2



3. Finally we Lazy rendered the Button inside MFE1

```
import React from 'react';
const MFE1_Button = React.lazy(
  () => import('MFE1/Button')
);

function App() {
  return (
    <div>
      <h1>MFE2</h1>
      <div>
        <React.Suspense fallback='Loading Button'>
          <MFE1_Button />
        </React.Suspense>
      </div>
      <h2>MFE2</h2>
    </div>
  );
}

export default App;
```

Now, since we have tested and understood how Webpack works locally, let's deploy our apps to AWS in the following article :

Deploying Micro Frontends to AWS Step by Step Using Gitlab, React, Webpack 5, and Module Federation

In my previous article (https://levelup.gitconnected.

www.linkedin.com

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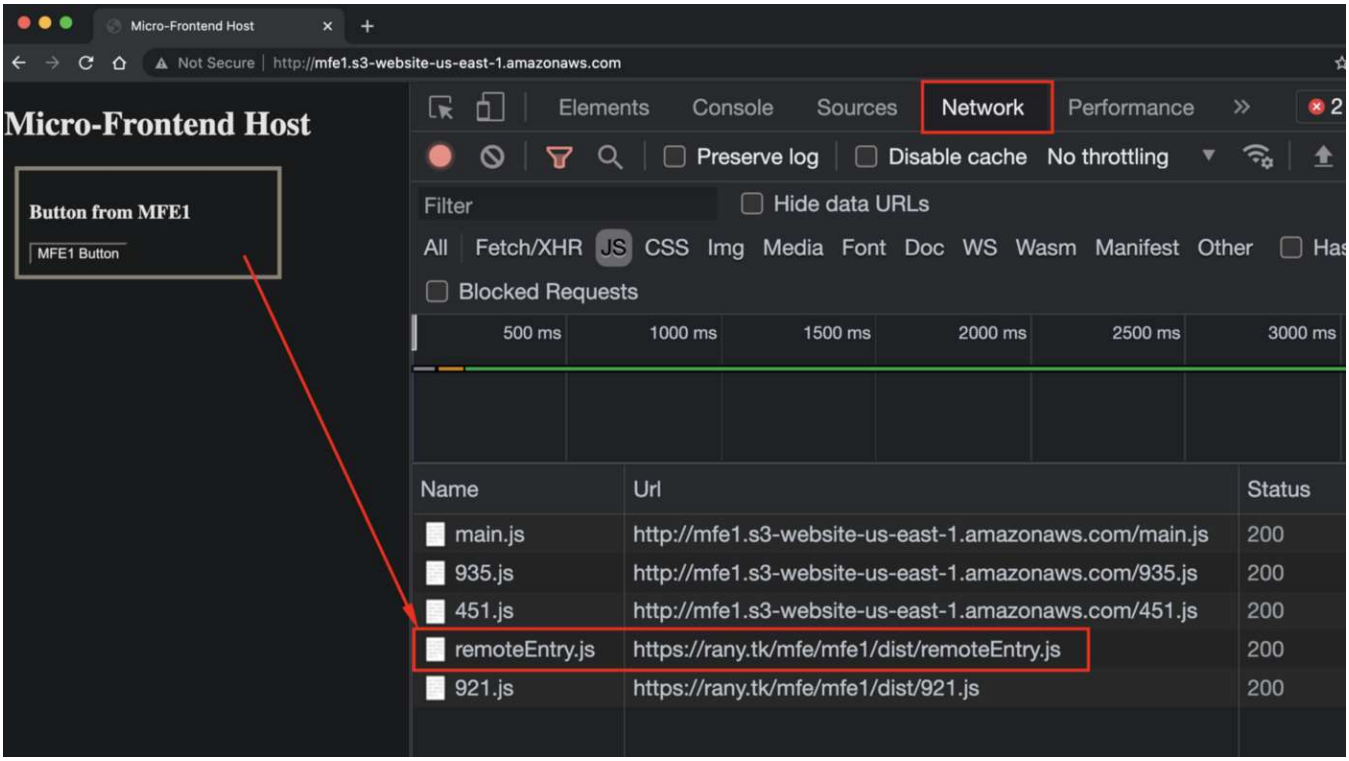
Deploying Microfrontends

After we implemented and tested the Microfrontends locally, let's deploy them to AWS. Follow the steps in the following article to deploy to AWS:

Deploying Micro Frontends to AWS Step by Step Using React, Webpack 5, and Module Federation

In my previous article (https://levelup.gitconnected.

You can browse the deployed version at http://mfe1.s3-website-us-east-1.amazonaws.com/



If you click inspect and then Network as shown above, you can see the call to get https://rany.tk/mfe/mfe1/dist/remoteEntry.js

Now, we created a host and added a microfrontend inside it then we deployed to AWS.

==========

Add AWS CloudFront

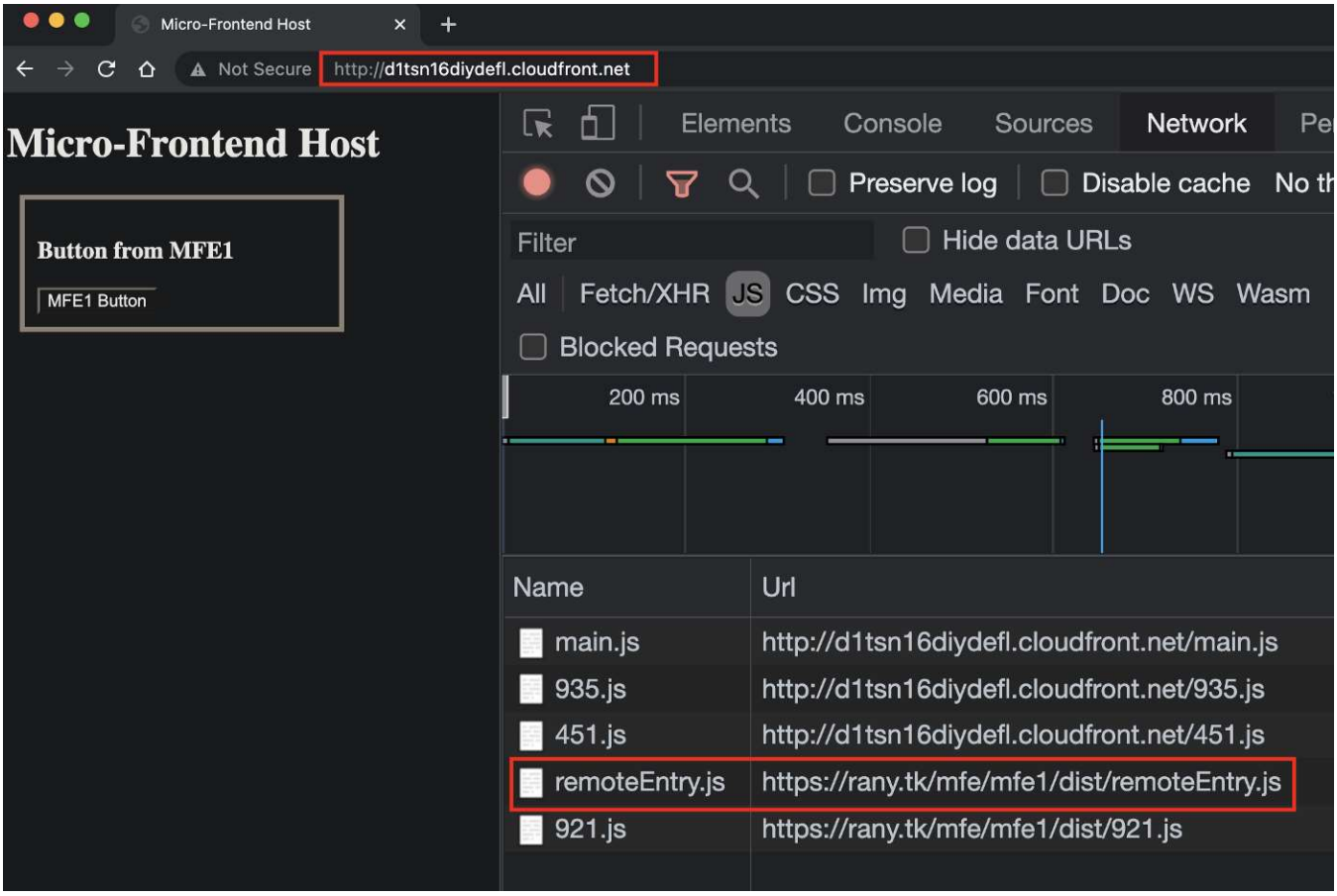
after deploying to S3, let's add CloudFront for caching, security, and to add a domain name. This is a very important step when deploying a website. Follow the following article to add CloudFront

Adding CloudFront to Web-Enabled AWS S3 Bucket

This article builds over the previous article (https://www.linkedin.

www.linkedin.com

Now, you can access MFE2 from the following Link
http://d1tsn16diydefl.cloudfront.net/



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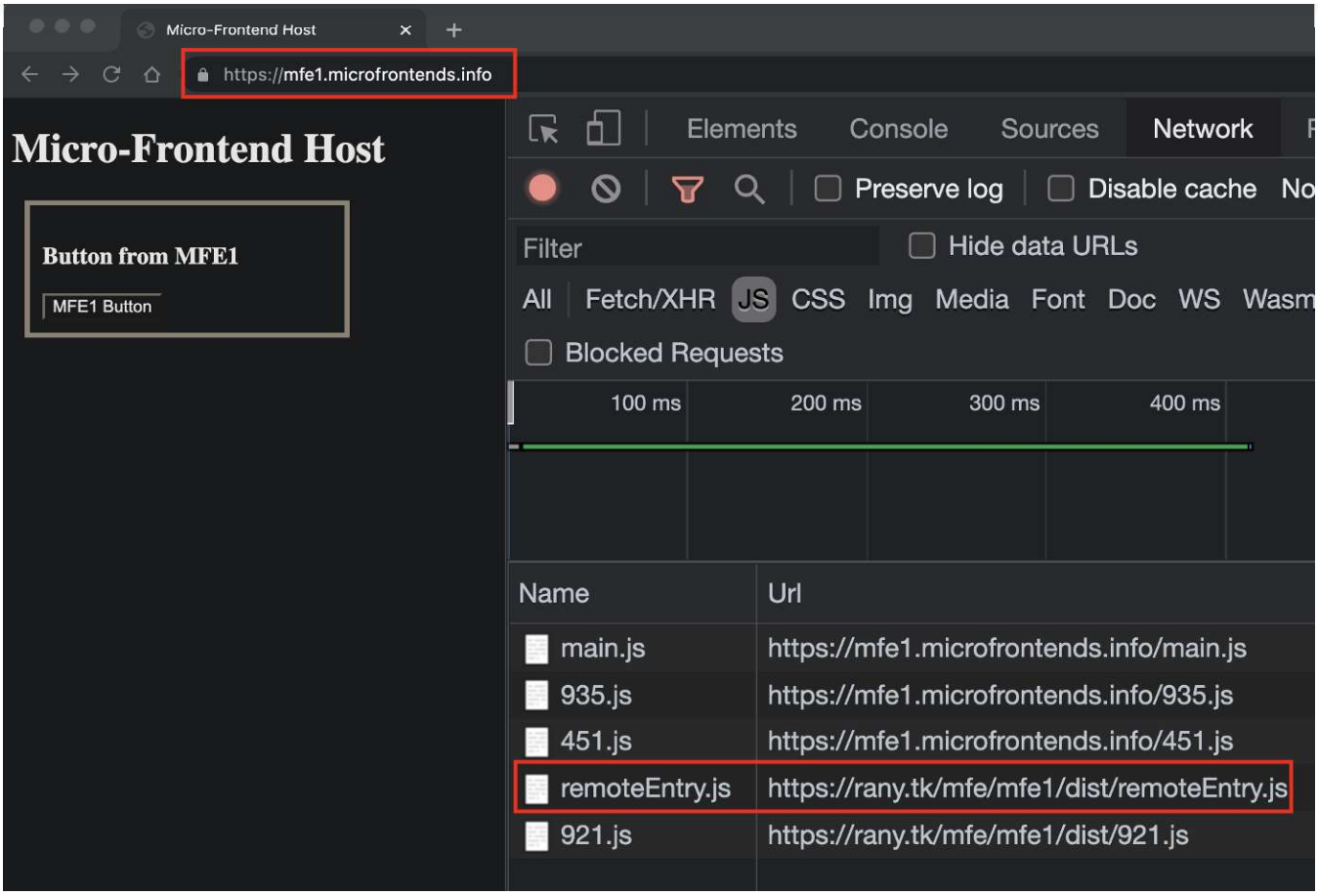
Purchasing and Adding a Domain name:

Now, it is very hard to memorize the previous link http://d1tsn16diydefl.cloudfront.net/. In the following article, I will go step by step to purchase microfrontends.info and render the site to https://mfe1.microfrontends.info/

https://www.linkedin.com/pulse/adding-domain-certificate-website-aws-s3-web-enabled-rany



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