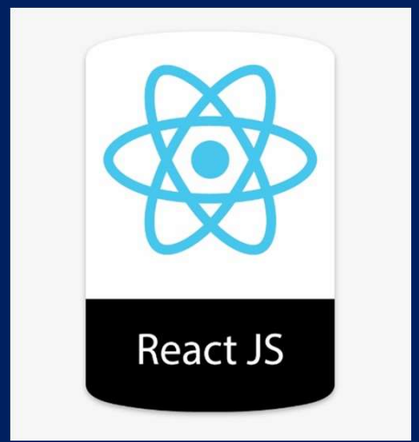
11

React JS



Taking To Server & Testing

Fetching Data – AJAX Requests

- React itself does not have any bias towards a particular approach of fetching data.
- React may not even know if there is a server in the picture!
- React simply renders components using data from two places: props and state.
- In order to use some data from a server that data needs to be in the component's prop or state.

A HTTP library

- To fetch data from the server a HTTP library is required.
- There are multiple libraries available:
  - Use promises? Go with axios
  - Use callbacks? Check superagent
  - Browser based window.fetch()
- *There are competing libraries and there is no "best"*
- It is ***believed*** that Axios and React pair nicely together.
- Install `axios` using `npm`

```
npm install axios --save
```

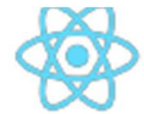
Using Axios

- Axios offers methods for all the HTTP verbs (GET, POST, PUT, DELETE).
- It performs automatic JSON data transformation.

```
import axios from 'axios';

state = {
Post : ''
}

axios.get('http://jsonplaceholder.typicode.com/posts/2')
.then(resp => {
            this.setState({Post:resp.data.title})
})
```



Using Axios...

- Axios helps transform the request and response data.
- GET

```
axios.get('/employee?eid=123')
.then(function (response)
{ // handle success})
```

- POST

```
axios.post('/employee', { firstName: 'Jack', lastName: 'Straw'
})
.then(function (response) {
// todo})
```

Services in React

- React as a library does not explicitly advocate the use of services.
- A “service” in react can essentially be regarded as a collection of helper functions.

```
const DataService = {
    firstMethod: function(value)
        { //to do},
    secondMethod: function(value)
        { //to do }
};
export default DataService;
```

Summary

- AJAX allows fetching of data and update the UI without refreshing the page.
- Client side frameworks incorporate services to make HTTP calls.
- React does not have any built-in capability for making AJAX calls.
- Libraries like React rely on other libraries to facilitate the same.

Testing

- Unit Testing
  - Unit testing refers to testing individual pieces of code.
  - In React, Unit tests typically do not require a browser.
- Functional Testing
  - This involves testing the behavior of a component.
  - Functional tests usually run in isolation.
- Integration Testing
  - This tests the entire application and attempts to replicate an experience the end-user would have when using the application.

Testing - Tools

- Jest
  - Introduced by Facebook for component tests in React.
  - Jest is not only a testing library but also a test runner.
- Enzyme
  - Enzyme was introduced by Airbnb for component tests in React
  - Enzyme is used to render components, access elements, props etc and simulate events.
- Storybook
  - This can be used to render components in their different states.
  - Can be used to ensure components behave correctly in their different states

Testing

- `create-react-app` application comes with Jest as a test runner and assertion library.
  - It is the *official* test runner
- Jest includes all the goodness of Jasmine with its own improvements.
- Jest supports TypeScript and contains most of the functionality in one package and is the best option for React application testing.
- Enzyme is popular for its React testing utility functions that simplify writing assertions.

Jest Basics

- *App.test.js*

```
describe('Addition', () => {
    it('knows that 2 and 2 make 4', () =>
    { expect(2 + 2).toBe(4);
    });
});
```

- The test can be run using

```
npm test
```

Enzyme

- *Enzyme* is built to support different versions of React.
- *Enzyme* introduced adapters to gel well with React.
  - An adapter appropriate to the version of React being used is to be installed.

```
npm install --save-dev enzyme
npm install --save-dev enzyme-adapter-react-16
```

- `setupTests.js` file tells *Jest* and *Enzyme* the adapters that will be used

```
import { configure } from 'enzyme';
import Adapter from 'enzyme-adapter-react-16';
configure({ adapter: new Adapter() });
```

Enzyme

- App.test.js

```
import React from 'react';
import { shallow } from 'enzyme';
import App from './App';
  describe('App component', () => {
     it('has text Hello World', () => {
     const wrapper = shallow(<App />);
     const text = wrapper.find('p').text();
     expect(text).toEqual('Hello World');
  });
});
```

Summary

- Writing tests is an essential part of software development.
- React components are very *testable*
- With *Jest* and *Enzyme* developers can run declarations by gaining access to properties, state and child props of React components.
- *Jest* tooling is developer-friendly and intuitive.

Build

```
npm run build
```

- Creates a `build` directory with a production build of the application.
- Copy the files in the `build` directory to the target server
- The HTTP server can be setup such that clients are served `index.htm`
- Delete the following files to disable debugging support.

```
build/static/js/some_file.js.map
build/static/css/some_file.css.map
```

Building for relative paths

- Create React App produces a build that assumes that the application is hosted at the server root.
- To override this the "homepage" property can be specified in `package.json`

```
"homepage" : http://mysite.com/relativepath
```

- This will allow Create React App to infer the root path correctly for use in the HTML file.

Session Summary

- React is a JavaScript **library** for building user interfaces.
- Declarative views make code predictable.
- React helps build encapsulated components that manage their own state.
- React uses one-way data binding which makes code more predictable and simplifies debugging.
- React makes it faster and easier to build client facing web interfaces leveraging newer JavaScript features.

Resources

- Awesome React - https://github.com/enaqx/awesome-react
  - A collection of awesome things regarding React ecosystem
- React components - https://github.com/brillout/awesome-react-components
  - A collection of react components
- Books
  - Learn ReactJS fast
  - React in action
  - Learning Web Development with React and Bootstrap