Shivaprakash Sep 12, 2017

React Router v4 Tutorial – Create Routing for your React Apps

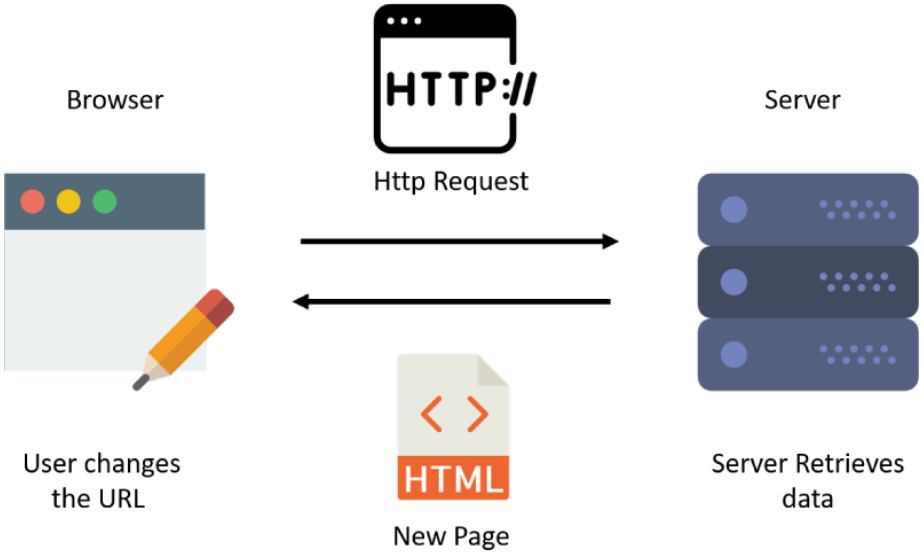
Before I start this blog, I hope that you have gone through the **building blocks** of React in my ***React Tutorial*** blog. If you haven't, please go through it first to get a better understanding of React. While learning the basics of React, I'm sure you must be wondering how to add navigation to your application. If so, you have landed at the right place. In this **React Router** blog, I will be walking you through the **routing** concepts in React.

We will look at the following topics:

- Conventional Routing
- Why Do We Need A React Router?
- Routing In React
- Benefits Of React Router v4

Conventional Routing

In general, when the user types an URL in the browser, an HTTP request is sent to the server, which then retrieves the HTML page. For each *new URL,* the user is redirected to a **new** HTML page. You can refer to the below diagram to get a better understanding of how Routing works.



Why Do We Need A React Router?

Having a single page application limited to **single view** does not do justice to many popular social media websites like Facebook, Instagram which render multiple views using React today. We need to move ahead and learn how to display **multiple views** in our single page application.

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For example, we are used to seeing a home page which displays welcome message and related content. The site's background details can be found on the 'About Us' page, a list of users and their details are listed on a different page and there might be various other pages to include several different views.

So how do you think this is achieved? **Adding a router library** into our application solves this requirement.

Routing In React

This brings us to the topic of today's blog: React Router v4. On 13th March 2017, Micheal Jackson & Ryan Florence released React Router v4 along with a solid documentation.

They believed in the ideology **"Learn Once, Route Anywhere".**

In their speech at React Conf 2017, they explained this by showing how they projected their routing concepts seamlessly from Web to Native platforms, as well as integrating **React Router** into **VR** and creating animations in **React Native**. Though the drawing point from their talk revolved around how their Router API Is '**All About Components**'.

In React, there is only a **single** 'Html' file involved. Whenever a user types in a **new** URL request, instead of fetching data from the server, the Router swaps in a different **Component** for each new URL request. The user is tricked into switching among multiple pages but in reality, each separate **Component re-renders** achieving multiple views as per our needs.

How does React achieve this?

This is where the concept of **'History'** comes into the picture. In React, the Router looks at the History of each **Component** and when there is any change in the History, that **Component** re-renders. Until Router version 4 we had to **manually** set the *History* value. However, from Router v4 the base path is bypassed by the <BrowserRouter> saving us a lot of work. If you still need to access History, HTML5 offers a built-in API which allows us to modify the **History** object through **pushState** and **replaceState** methods.

In fact, React Router 4 is a complete rewrite of the previous release. Creating your own routes is just a natural extension of the React **Components** code that you are already well versed with. Although it will need some time to sink in, Router v4 will start to make a lot of sense once you move ahead.

Alright, let's now take an in-depth look at what version 4 has to offer.

Benefits Of React Router v4

We essentially want to call the Router Component inside React's render method. This is because the entire Router API is all about Components. Of course, each Component's role is to render UI just as any React application.

1. No Need to Manually set History

All we do is wrap our Router App Component inside the <BrowserRouter>.

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

Now, let's understand routing with the help of an example:

All we do is wrap our React App Component inside the <BrowserRouter>.

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

Now, let's understand routing with the help of an example:

We will create three pages. Here is the list of pages along with its address.

Page	Address
Home	'/'
About	'/about'
Topic	'/topic'

2. Packages Split:

The 'react-router' library is now split into three separate packages.

- **react-router-dom**: Designed for web applications.
- **react-router-native**: Designed for mobile applications.
- **react-router-core:** Can be used anywhere for core applications.

We need to install the dependency:

```
$ npm install --save react-router-dom
```

(Use the 'save' command if you don't have the latest npm (5.x) version installed.)
We import the 'BrowserRouter' **Component** from the 'react-router-dom' library along with 'Link' and 'Route'.

We can visualize the **BrowserRouter** as the root Component which renders the children routes.

```
import {
BrowserRouter,
Route,
Link
} from 'react-router-dom'
```

Let's understand the **Link** and **Route** Components before moving ahead with the benefits in Router v4.

Link

Link is used to navigate amongst the **internal routes** in our router application. It is the equivalent of anchor tags: <a> .

Link is passed a string argument **'to'** where the URL's path is specified.

```
<ul>
<li><Link to="/">Home</Link></li>
<li><Link to="/about">About</Link></li>
<li><Link to="/topics">Topics</Link></li>
</ul>
```

Route

We will now look at **<Route>,** which can be considered as the individual **child Components** responsible for rendering the UI, based on user's input location. If the user specified location matches the defined path in **<Route>**, then the **<Route>** can define the **view** in two ways:

1. Create a **Component** specified in **<Route>**
2. Use an inline **render** function

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1. Create a **Component** specified in **<Route>**
2. Use an inline **render** function

The <**Route**> will return null in case the specified URL doesn't match the defined path. The basic **<Route>** takes two arguments, one for **path** and one for rendering **UI.**

Let me illustrate this below:

```
<BrowserRouter>
<div>
<Route exact path="/" render={ ( ) => (<h2> HomePage </h2>) } />
<Route path="/about" component={About}/>
<Route path="/topics" component={Topics}/>
</div>
</BrowserRouter>
```

3. IndexRoute is replaced by 'exact':

No need to use IndexRoute to render the HomePage, you would have noticed the **'exact'** prop in the previous code snippet. This is a good example of React Router v4's **declarative** nature.

Routes in v4 being ***inclusive*** means that more than one route may be rendered *simultaneously*. We employ the **'exact'** prop to settle a contention among multiple matches.

Without using 'exact' in our previous example, the URL **'/'** would match the routes with path '/', '/about ' and '/topics'. However**,** we want **'/'** to match **only** our render function, hence using 'exact' explicitly achieves this.

4. The Router can have only a Single Child element:

This is why we need to wrap our routes within a .

If we fail to do so you will get the following exception.

```
* Uncaught Error: A <Router> may have only one child element *
```

5. Switch:

While we can encapsulate several routes within a single tag. If we wish to render only a single route Component at once, we use a <switch> tag instead. It checks each route for a match **sequentially** and stops once the **first** match is found.

```
<switch>
<route exact path='/'   component={Home}/>
<route path='/users/:id' component={User }/>
<route path='/users'   component={Roster}/>
<switch>
```

In our example, we have placed the route with path 'users/:id' tactically above 'users'. This is because 'users/:id' will match for both 'users' and 'users/:id'.

Now that you have a basic understanding of React Router, here is the entire code to define our Router App Component.

```
const App= () => (
<BrowserRouter>
<div>
<ul>
<li><Link to="/">Home</Link></li>
<li><Link to="/about">About</Link></li>
<li><Link to="/topics">Topics</Link></li>
</ul>
<Route exact path="/" render={ ( ) => (<h2> HomePage </h2>) } />
<Route path="/about" component={About}/>
<Route path="/topics" component={Topics}/>
</div>
</BrowserRouter>
```

```
<ul>
<li><Link to="/">Home</Link></li>
<li><Link to="/about">About</Link></li>
<li><Link to="/topics">Topics</Link></li>
</ul>
<Route exact path="/" render={ ( ) => (<h2> HomePage </h2>) } />
<Route path="/about" component={About}/>
<Route path="/topics" component={Topics}/>
</div>
</BrowserRouter>
)
```

This brings us to the end of this blog. Hope this helped you get a better idea of how React Router works. To learn more on React Router you can check out its documentation as well. Happy learning!

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Got a question for us? Please mention it in the comments section and we will get back to you.

About Shivaprakash (5 Posts)

Shivaprakash is a Research analyst at Edureka. He has expertise on front end web technologies like jQuery and React JS. He is also passionate about data science and exploring new technologies.