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Resize Image Class With PHP

by Paul Underwood MVB · May. 21, 13 · Web Dev Zone · Not set

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A common feature that you will come across in websites is the ability to resize an image to fit an exact size so that it will be displayed correctly on your design. If you have a very large image and you are going to place it on your website in a space that is only 100px x 100px then you will want to be able to resize this image to fit in the space.

One option is to just set the width and height attributes on the image tag in your HTML, this will force the image to be displayed at this size.

```
<img src="image.png" height="100" width="100" alt="Example of resizing an image" />
```

This will work perfectly fine and the image will fit in the 100px x 100px space but the problem is that when the browser loads the image it will not resize the image but will just display it in the limited size. This means that the image will still need to be downloaded at full size, if the image is very large it can take some time for you to download a large image just to be displayed in a small space.

A better solution would be to resize the image to 100px x 100px which will reduce it's size so that the browser doesn't need to download a large image just to display it in a small space.

In this tutorial we are going to create a PHP class that will allow you to resize an image to any dimension you want, it will allow you to resize while keeping the aspect ratio of the image. When the class has resized the image you can either save the image on the server or download the image.

Class Methods

First lets plan out the class we are going to create:

- We need to pass an existing image to the class, this is the image that we will use to resize.
- We need to pass in the desired image dimensions so the class can work out what's the new size of the image.
- Then we need to be able to save the image to a location on the server, and choose to download the image.

```
<?php
/**
 * Resize image class will allow you to resize an image
 *
 * Can resize to exact size
 * Max width size while keep aspect ratio
 * Max height size while keep aspect ratio
 * Automatic while keep aspect ratio
 */
class ResizeImage
{
        /**
         * Class constructor requires to send through the image filename
         *
         * @param string $filename - Filename of the image you want to resize
         */
        public function __construct( $filename )
        {
        }
        /**
         * Set the image variable by using image create
         *
         * @param string $filename - The image filename
         */
        private function setImage( $filename )
        {
        }
        /**
         * Save the image as the image type the original image was
         *
         * @param  String[type] $savePath     - The path to store the new image
         * @param  string $imageQuality           - The qulaity level of image to create
         *
         * @return Saves the image
         */
        public function saveImage($savePath, $imageQuality="100", $download = false)
        {
        }
        /**
         * Resize the image to these set dimensions
         *
         * @param  int $width           - Max width of the image
         * @param  int $height          - Max height of the image
         * @param  string $resizeOption - Scale option for the image
         *
         * @return Save new image
         */
        public function resizeTo( $width, $height, $resizeOption = 'default' )
        {
        }
}
?>
```

The Constructor

This class relies on an original image being found and set on the class, without this the class will not work correctly. Because of this we should pass the image filename into the constructor of the class. This will then check if the file exists on the server, if it does then we can call the set image method where we can get the image and create a resource of the image and store this in a class variable.

```
/**
         * Class constructor requires to send through the image filename
         *
         * @param string $filename - Filename of the image you want to resize
         */
        public function __construct( $filename )
        {
                if(file_exists($filename))
                {
                        $this->setImage( $filename );
                } else {
                        throw new Exception('Image ' . $filename . ' can not be found, try another image.');
                }
        }
```

Set The Image

The set image method is used to create a image resource based on the image given to the class this uses the PHP functions imagecreatefromjpeg, imagecreatefromgif, imagecreatefrompng to create the image resource from the given image. We can then use this with the functions imagesx and imagesy to return the current width and height of the image.

This will allow us to resize the image easier later in the script.

```
/**
         * Set the image variable by using image create
         *
         * @param string $filename - The image filename
         */
        private function setImage( $filename )
        {
                $size = getimagesize($filename);
                $this->ext = $size['mime'];
            switch($this->ext)
            {
                // Image is a JPG
                case 'image/jpg':
                case 'image/jpeg':
                        // create a jpeg extension
                    $this->image = imagecreatefromjpeg($filename);
                    break;
                // Image is a GIF
                case 'image/gif':
                    $this->image = @imagecreatefromgif($filename);
                    break;
                // Image is a PNG
                case 'image/png':
                    $this->image = @imagecreatefrompng($filename);
                    break;
                // Mime type not found
                default:
                    throw new Exception("File is not an image, please use another file type.", 1);
            }
            $this->origWidth = imagesx($this->image);
            $this->origHeight = imagesy($this->image);
        }
```

Resize The Image

The resize function is what we will use to calculate the new values for the image width and height. This takes 3 parameters the new width, new height and the resize option, this will allow us to resize the image to exact dimensions, use the defined width with the height and keep aspect ratio, use the define height keeping the aspect ratio or let the class decide the best way of resizing the image.

Once we have the new width and height of the image we can create a new image resource by using the PHP function imagecreatetruecolor(). Now we can create the new image from the old image resizing it to the new dimensions by using the imagecopyresampled() function.

```
/**
         * Resize the image to these set dimensions
         *
         * @param  int $width           - Max width of the image
         * @param  int $height          - Max height of the image
         * @param  string $resizeOption - Scale option for the image
         *
         * @return Save new image
         */
        public function resizeTo( $width, $height, $resizeOption = 'default' )
        {
                switch(strtolower($resizeOption))
                {
                        case 'exact':
                                $this->resizeWidth = $width;
                                $this->resizeHeight = $height;
                        break;
                        case 'maxwidth':
                                $this->resizeWidth  = $width;
                                $this->resizeHeight = $this->resizeHeightByWidth($width);
                        break;
                        case 'maxheight':
                                $this->resizeWidth  = $this->resizeWidthByHeight($height);
                                $this->resizeHeight = $height;
                        break;
                        default:
```

```
                        if($this->origWidth > $width || $this->origHeight > $height)
                        {
                                if ( $this->origWidth > $this->origHeight ) {
                                 $this->resizeHeight = $this->resizeHeightByWidth($width);
                                         $this->resizeWidth  = $width;
                                } else if( $this->origWidth < $this->origHeight ) {
                                        $this->resizeWidth  = $this->resizeWidthByHeight($height);
                                        $this->resizeHeight = $height;
                                }
                        } else {
                    $this->resizeWidth = $width;
                    $this->resizeHeight = $height;
                }
                break;
        }
        $this->newImage = imagecreatetruecolor($this->resizeWidth, $this->resizeHeight);
        imagecopyresampled($this->newImage, $this->image, 0, 0, 0, 0, $this->resizeWidth, $this->resizeHeight, $this->origWidth,
}
/**
 * Get the resized height from the width keeping the aspect ratio
 *
 * @param  int $width - Max image width
 *
 * @return Height keeping aspect ratio
 */
private function resizeHeightByWidth($width)
{
        return floor(($this->origHeight / $this->origWidth) * $width);
}
/**
 * Get the resized width from the height keeping the aspect ratio
 *
 * @param  int $height - Max image height
 *
 * @return Width keeping aspect ratio
 */
private function resizeWidthByHeight($height)
{
        return floor(($this->origWidth / $this->origHeight) * $height);
}
```

Save The Image

With the new image now set in a class variable we can now use this to save the image on the server. This function will take 3 parameters the save path, the image quality and if we want to download the image.

For each mime type PHP has a function imagejpeg(), imagegif(), imagepng() that will allow you to save the image by passing in the new image resource and the path the image is going to be saved.

Once this image is saved on the server and we decided to download it we can change the headers to allow the browser to download the image on the clients machine.

```
/**
         * Save the image as the image type the original image was
         *
         * @param  String[type] $savePath     - The path to store the new image
         * @param  string $imageQuality           - The qulaity level of image to create
         *
         * @return Saves the image
         */
        public function saveImage($savePath, $imageQuality="100", $download = false)
        {
            switch($this->ext)
            {
                case 'image/jpg':
                case 'image/jpeg':
                        // Check PHP supports this file type
                    if (imagetypes() & IMG_JPG) {
                        imagejpeg($this->newImage, $savePath, $imageQuality);
                    }
                    break;
                case 'image/gif':
                        // Check PHP supports this file type
                    if (imagetypes() & IMG_GIF) {
                        imagegif($this->newImage, $savePath);
                    }
                    break;
                case 'image/png':
                    $invertScaleQuality = 9 - round(($imageQuality/100) * 9);
                    // Check PHP supports this file type
                    if (imagetypes() & IMG_PNG) {
                        imagepng($this->newImage, $savePath, $invertScaleQuality);
                    }
                    break;
            }
            if($download)
            {
                header('Content-Description: File Transfer');
                header("Content-type: application/octet-stream");
                header("Content-disposition: attachment; filename= ".$savePath."");
                readfile($savePath);
            }
            imagedestroy($this->newImage);
        }
```

Full Resize Image Class

```
<?php
/**
 * Resize image class will allow you to resize an image
 *
 * Can resize to exact size
 * Max width size while keep aspect ratio
 * Max height size while keep aspect ratio
 * Automatic while keep aspect ratio
 */
class ResizeImage
{
        private $ext;
        private $image;
        private $newImage;
        private $origWidth;
        private $origHeight;
        private $resizeWidth;
        private $resizeHeight;
        /**
         * Class constructor requires to send through the image filename
         *
         * @param string $filename - Filename of the image you want to resize
         */
        public function __construct( $filename )
        {
                if(file_exists($filename))
                {
                        $this->setImage( $filename );
                } else {
                        throw new Exception('Image ' . $filename . ' can not be found, try another image.');
                }
        }
        /**
         * Set the image variable by using image create
         *
         * @param string $filename - The image filename
         */
        private function setImage( $filename )
        {
                $size = getimagesize($filename);
                $this->ext = $size['mime'];
                switch($this->ext)
            {
                // Image is a JPG
                case 'image/jpg':
                case 'image/jpeg':
                        // create a jpeg extension
                    $this->image = imagecreatefromjpeg($filename);
                    break;
                // Image is a GIF
                case 'image/gif':
                    $this->image = @imagecreatefromgif($filename);
                    break;
                // Image is a PNG
                case 'image/png':
                    $this->image = @imagecreatefrompng($filename);
                    break;
                // Mime type not found
                default:
                    throw new Exception("File is not an image, please use another file type.", 1);
            }
            $this->origWidth = imagesx($this->image);
            $this->origHeight = imagesy($this->image);
        }
        /**
```

```
         * Save the image as the image type the original image was
         *
         * @param  String[type] $savePath     - The path to store the new image
         * @param  string $imageQuality           - The qulaity level of image to create
         *
         * @return Saves the image
         */
        public function saveImage($savePath, $imageQuality="100", $download = false)
        {
            switch($this->ext)
            {
                case 'image/jpg':
                case 'image/jpeg':
                        // Check PHP supports this file type
                    if (imagetypes() & IMG_JPG) {
                        imagejpeg($this->newImage, $savePath, $imageQuality);
                    }
                    break;
                case 'image/gif':
                        // Check PHP supports this file type
                    if (imagetypes() & IMG_GIF) {
                        imagegif($this->newImage, $savePath);
                    }
                    break;
                case 'image/png':
                    $invertScaleQuality = 9 - round(($imageQuality/100) * 9);
                    // Check PHP supports this file type
                    if (imagetypes() & IMG_PNG) {
                        imagepng($this->newImage, $savePath, $invertScaleQuality);
                    }
                    break;
            }
            if($download)
            {
                header('Content-Description: File Transfer');
                        header("Content-type: application/octet-stream");
                        header("Content-disposition: attachment; filename= ".$savePath."");
                        readfile($savePath);
            }
            imagedestroy($this->newImage);
        }
        /**
```

```
 * Resize the image to these set dimensions
 *
 * @param  int $width           - Max width of the image
 * @param  int $height          - Max height of the image
 * @param  string $resizeOption - Scale option for the image
 *
 * @return Save new image
 */
public function resizeTo( $width, $height, $resizeOption = 'default' )
{
        switch(strtolower($resizeOption))
        {
                case 'exact':
                        $this->resizeWidth = $width;
                        $this->resizeHeight = $height;
                break;
                case 'maxwidth':
                        $this->resizeWidth  = $width;
                        $this->resizeHeight = $this->resizeHeightByWidth($width);
                break;
                case 'maxheight':
                        $this->resizeWidth  = $this->resizeWidthByHeight($height);
                        $this->resizeHeight = $height;
                break;
                default:
                        if($this->origWidth > $width || $this->origHeight > $height)
                        {
                                if ( $this->origWidth > $this->origHeight ) {
                                 $this->resizeHeight = $this->resizeHeightByWidth($width);
                                         $this->resizeWidth  = $width;
                                } else if( $this->origWidth < $this->origHeight ) {
                                        $this->resizeWidth  = $this->resizeWidthByHeight($height);
                                        $this->resizeHeight = $height;
                                }
                        } else {
                    $this->resizeWidth = $width;
                    $this->resizeHeight = $height;
                }
                break;
        }
        $this->newImage = imagecreatetruecolor($this->resizeWidth, $this->resizeHeight);
imagecopyresampled($this->newImage, $this->image, 0, 0, 0, 0, $this->resizeWidth, $this->resizeHeight, $this->origWidth, $this->
        imagecopyresampled($this->newImage, $this->image, 0, 0, 0, 0, $this->resizeWidth, $this->resizeHeight, $this->origWidth, $this->o
        }
        /**
         * Get the resized height from the width keeping the aspect ratio
         *
         * @param  int $width - Max image width
         *
         * @return Height keeping aspect ratio
         */
        private function resizeHeightByWidth($width)
        {
                return floor(($this->origHeight/$this->origWidth)*$width);
        }
        /**
         * Get the resized width from the height keeping the aspect ratio
         *
         * @param  int $height - Max image height
         *
         * @return Width keeping aspect ratio
         */
        private function resizeWidthByHeight($height)
        {
                return floor(($this->origWidth/$this->origHeight)*$height);
        }
}
?>
```

Using The Resize Image PHP Class

Because we have created this to allow you to resize the image in multiple ways it means that there are different ways of using the class.

- Resize the image to an exact size.
- Resize the image to a max width size keeping aspect ratio of the image.
- Resize the image to a max height size keeping aspect ratio of the image.
- Resize the image to a given width and height and allow the code to work out which way of resizing is best keeping the aspect ratio.
- You can save the created resize image on the server.
- You can download the created resize image on the server.

- You can download the created resize image on the server.

Resize Exact Size

To resize an image to an exact size you can use the following code. First pass in the image we want to resize in the class constructor, then define the width and height with the scale option of exact. The class will now have the create dimensions to create the new image, now call the function saveImage() and pass in the new file location to the new image.

```
$resize = new ResizeImage('images/Be-Original.jpg');
$resize->resizeTo(100, 100, 'exact');
$resize->saveImage('images/be-original-exact.jpg');
```

Resize Max Width Size

If you choose to set the image to be an exact size then when the image is resized it could lose it's aspect ratio, which means the image could look stretched. But if you know the max width that you want the image to be you can resize the image to a max width, this will keep the aspect ratio of the image.

```
$resize = new ResizeImage('images/Be-Original.jpg');
$resize->resizeTo(100, 100, 'maxWidth');
$resize->saveImage('images/be-original-maxWidth.jpg');
```

Resize Max Height Size

Just as you can select a max width for the image while keeping aspect ratio you can also select a max height while keeping aspect ratio.

```
$resize = new ResizeImage('images/Be-Original.jpg');
$resize->resizeTo(100, 100, 'maxHeight');
$resize->saveImage('images/be-original-maxHeight.jpg');
```

Resize Auto Size From Given Width And Height

You can also allow the code to work out the best way to resize the image, so if the image height is larger than the width then it will resize the image by using the height and keeping aspect ratio. If the image width is larger than the height then the image will be resized using the width and keeping the aspect ratio.

```
$resize = new ResizeImage('images/Be-Original.jpg');
$resize->resizeTo(100, 100);
$resize->saveImage('images/be-original-default.jpg');
```

Download The Resized Image

The default behaviour for this class is to save the image on the server, but you can easily change this to download by passing in a true parameter to the saveImage method.

```
$resize = new ResizeImage('images/Be-Original.jpg');
$resize->resizeTo(100, 100, 'exact');
$resize->saveImage('images/be-original-exact.jpg', "100", true);
```

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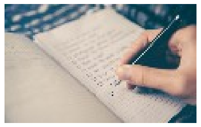
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Learn the Basics of Redux for React

by Braden Kelley · Jul 05, 19 · Web Dev Zone · Tutorial

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What is React and Redux? When and how do you use them together?

Often used to create Single-Page App (SPA), React is a component-based framework that can add unlimited amount of independent components to websites. Redux is an open-source state management system built-in with a set of developer tools useful of debugging.

Today, we'll learn the basics of Redux and React by building a simple app and will secure the app using Okta for authentication.

When to Use Redux With React

React components can accept properties as well as manage their own state. Redux provides a global app state that any component can link into.

Redux is not something that every app needs. While it has its advantages, it can also add quite a bit of complexity. There is also a myriad of variants on Redux to try to simplify it, and there are countless ways to architect the files needed. Generally, Redux should not be added to any project without a good understanding of why you need it. Here are a few examples of what React-Redux can give you over a vanilla React approach:

- Redux gives you a global state. This can be helpful when you have deeply nested components that need to share the same state. Rather than passing unrelated properties down the component tree, you can simply access the Redux store.
- Debugging can be much simpler.
    - You can rewind the data to specific points to see the state of the app before or after any given action.

    - You can rewind the data to specific points to see the state of the app before or after any given action.
    - It’s possible to log all actions a user took to get to a specific point (say an app crash, for example).
    - Hot-reloading is more reliable if the state is stored outside the component itself.
- Business logic can be moved into the Redux actions to separate business logic from components.

Create a Search App in React

This will be a pretty simplified example, but hopefully gives you an idea what some of the benefits are of using Redux in a React app. TV Maze provides an open API for querying TV shows. I’ll show you how to create an app that lets you search through TV shows and display details for each show.

Assuming you have Node installed on your system, you’ll next need to make sure you have `yarn` and `create-react-app` in order to complete this tutorial. You can install both by using the following command line:

```
npm i -g yarn@1.13.0 create-react-app@2.1.3
```

Now you can quickly bootstrap a new React app with the following command:

```
create-react-app react-redux
```

That will create a new directory called `react-redux`, add some files for a skeleton project, and install all the dependencies you need to get up and running. Now you can start the app with the following:

```
cd react-redux
yarn start
```

Set Up Redux for Your React App

First, you’ll want to install the dependencies you’ll need. Use the following command:

```
yarn add redux@4.0.1 react-redux@6.0.0 redux-starter-kit@0.4.3
```

Redux Actions

Redux has a few moving parts. You’ll need **actions** that you can dispatch to tell redux you want to perform some action. Each action should have a `type` , as well as some sort of payload. Create a new file, `src/actions.js` with the following code:

```
export const SEARCH_SHOWS = 'SEARCH_SHOWS';
export const SELECT_SHOW = 'SELECT_SHOW';

export const searchShows = term => async dispatch => {
  const url = new URL('https://api.tvmaze.com/search/shows');
  url.searchParams.set('q', term);

  const response = await fetch(url);
  const results = await response.json();

  dispatch({ type: SEARCH_SHOWS, results, term });
};

export const selectShow = (id = null) => ({ type: SELECT_SHOW, id });
```

You'll be using `redux-thunk` , which allows us to handle actions asynchronously. In the example above, `selectShow` is a simple, synchronous action, which just selects a show using a given ID. On the other hand, `searchShows` is async, so instead of returning a JSON object, it returns a function that accepts a `dispatch` function. When the action is finished, instead of returning the payload, you pass it into the `dispatch` function.

Redux Reducers

The next thing you'll need is a **reducer** to tell Redux how an action should affect the data store. Reducers should be pure functions that return a new state object rather than mutating the original state. Create a new file, `src/reducers.js` with the following code:

```
import { combineReducers } from 'redux';
import { SEARCH_SHOWS, SELECT_SHOW } from './actions';

const initialShowState = {
  detail: {},
  search: {},
  selected: null,
};

```

```
const shows = (state = initialShowState, action) => {
  switch (action.type) {
    case SEARCH_SHOWS:
      const detail = { ...state.detail };
      action.results.forEach(({ show }) => {
        detail[show.id] = show;
      });

      return {
        detail,
        search: {
          ...state.search,
          [action.term]: action.results.map(({ show }) => show.id),
        },
      };
    case SELECT_SHOW:
      return {
        ...state,
        selected: action.id,
      };
    default:
      return state;
  }
};

export default combineReducers({
  shows,
});
```

In this example, you have a single `shows` reducer, and its state will be stored in `state.shows`. It's common to separate logic into different sections using this method, combining them using `combineReducers`.

The reducer takes the current state object. If the state is `undefined`, which will be true during initialization, then you will want to provide a default, or initial, state. You then need to look at the `type` of the action to determine what you should do with the data.

default, or initial, state. You then need to look at the type of the action to determine what you should do with the data.

Here, you have the `SEARCH_SHOWS` action, which will update the `detail` cache for each object and store a list of search results by ID. The data that TV Maze returns looks like:

```
[
  { score: 14.200962, show: { id: 139, name: "Girls", /* ... */ } },
  { score: 13.4214735, show: { id: 23542, name: "Good Girls", /* ... */ } },
  // ...
]
```

This was simplified in the reducer, so the detail for each show is stored by ID, and the search results are just an array of IDs stored by the search term. This will cut down on memory because you won't need a separate copy of each show detail for each search term.

For the `SELECT_SHOW` action, you just set `selected` to the ID of the show.

If you don't recognize the action, you should just return the state as it is currently. This is important so that the state doesn't become `undefined` .

Redux Store

Now that you have your reducer, you can create the **store**. This is made easy by `redux-starter-kit` . A lot of the boilerplate has been moved into that, making it customizable but with some very reasonable defaults (such as including Redux Thunk to handle async actions and hooking into Redux Devtools for better debugging). Create a new file `src/store.js` with the following code:

```
import { configureStore } from 'redux-starter-kit';
import reducer from './reducers';

export default configureStore({ reducer });
```

React Redux

React and Redux are really two separate concepts. In order to get Redux working with your app, you'll need to use `react-redux` to bridge the two pieces (strictly speaking, it's not 100% necessary to use `react-redux` , but it makes things *a lot* simpler). Replace the contents of `src/App.js` with the following:

```
import React from 'react';

import { Provider } from 'react-redux';
import store from './store';

const App = () => (
  <div>TODO: Build TV search components</div>
);

export default () => (
  <Provider store={store}>
    <App />
  </Provider>
);
```

The `Provider` component has access to the store and passes it along to child components using `context`. A component, later on, can access the store, even if it is deeply nested in the React tree.

Create the Search and Detail Components for Your React App

Before you get started building out the components, I'll have you install a few more dependencies.

- To make the UI look somewhat decent, without a lot of work, you can use Bootstrap.
- There's a search component called React Bootstrap Typeahead that will work and look nice with minimal setup.
- The summary data that comes from TV Maze contains some HTML, but it's bad practice to insert that directly because it could contain some cross-site scripting attacks. To display it, you'll need an HTML parser like React HTML Parser that will convert the raw HTML to safe React components.

Install these with the following command:

```
yarn add bootstrap@4.2.1 react-bootstrap-typeahead@3.3.4 react-html-parser@2.0.2
```

Then, in `src/index.js`, you'll need to add required CSS imports. You also will no longer need the default CSS from `create-react-app`. Replace this line:

```
import './index.css';
```

with the following two lines:

with the following two files:

```
import 'bootstrap/dist/css/bootstrap.min.css';
import 'react-bootstrap-typeahead/css/Typeahead.css';
```

Search Component

Create a new file `src/Search.js` containing the following:

```
import React, { useState } from 'react';
import { connect } from 'react-redux';
import { AsyncTypeahead } from 'react-bootstrap-typeahead';

import { searchShows, selectShow } from './actions';

const Search = ({ shows, fetchShows, selectShow, onChange }) => {
  const [value, setValue] = useState('');
  const options = (shows.search[value] || []).map(id => shows.detail[id]);

  return (
    <AsyncTypeahead
      autoFocus
      labelKey="name"
      filterBy={() => true}
      onSearch={term => {
        fetchShows(term);
        setValue(term);
      }}
      onChange={selectShow}
      placeholder="Search for a TV show..."
      isLoading={Boolean(value) && !shows.search[value]}
      options={options}
    />
  );
};

const mapStateToProps = state => ({
  shows: state.shows,
});

const mapDispatchToProps = dispatch => ({
  fetchShows: value => dispatch(searchShows(value)),
  selectShow: ([show]) => dispatch(selectShow(show && show.id)),
});

export default connect(
  mapStateToProps,
  mapDispatchToProps
)(Search);
```

React-Redux's `connect` function is the glue that connects a component to the Redux store. It requires a `mapStateToProps` function that will transform the Redux state into properties that will be passed to your component. In this case, it is getting the `shows` subset of the store, which contains the `detail`, `search`, and `selected` you set up earlier.

The `connect` function also takes an optional `mapDispatchToProps` function, which allows your component to receive function properties that will dispatch actions. Here, you're getting a function `fetchShows` to search for shows with the search term you pass in, and another function `selectShow` that will tell redux which show you've selected.

The `AsyncTypeahead` component from `react-bootstrap-typeahead` gives you a few hooks to trigger a search or select an option. If the user has started typing but the redux store doesn't have any results yet (not even an empty array), then this adds a loading icon to the search box.

Detail Component

Next, to display the details of the selected show, create a new file `src/Detail.js` containing the following:

```
import React from 'react';
import ReactHtmlParser from 'react-html-parser';
import { connect } from 'react-redux';

```

```
const Detail = ({ show }) =>
  show ? (
    <div className="media">
      {show.image && (
        <img
          className="align-self-start mr-3"
          width={200}
          src={show.image.original}
          alt={show.name}
        />
      )}
      <div className="media-body">
        <h5 className="mt-0">
          {show.name}
          {show.network && <small className="ml-2">{show.network.name}</small>}
        </h5>
        {ReactHtmlParser(show.summary)}
      </div>
    </div>
  ) : (
    <div>Select a show to view detail</div>
  );

const mapStateToProps = ({ shows }) => ({
  show: shows.detail[shows.selected],
});

export default connect(mapStateToProps)(Detail);
```

If there is no show selected, you'll get a simple message to select a show first. Since this is connected to the Redux store, you can get the detail for a selected show with `shows.detail[shows.selected]`, which will be `undefined` if there is no show selected. Once you've selected one, you'll get the detail passed in as the `show` prop. In that case, you can show the artwork, name, network, and summary for the show. There's a lot more information contained in the details, so you can display quite a bit more information if you want to play around with the detail page some more.

Add the Components to Your React App

Now that you've created the Search and Detail components, you can tie them into your app. Back in `src/App.js`, replace the placeholder `App` functional component (containing the `TODO`) with the following:

```
  <div className="m-3">
    <Search />
    <div className="my-3">
      <Detail />
    </div>
  </div>
```

You'll also need to make sure to import those components at the top of the file:

```
import Search from './Search';
import Detail from './Detail';
```

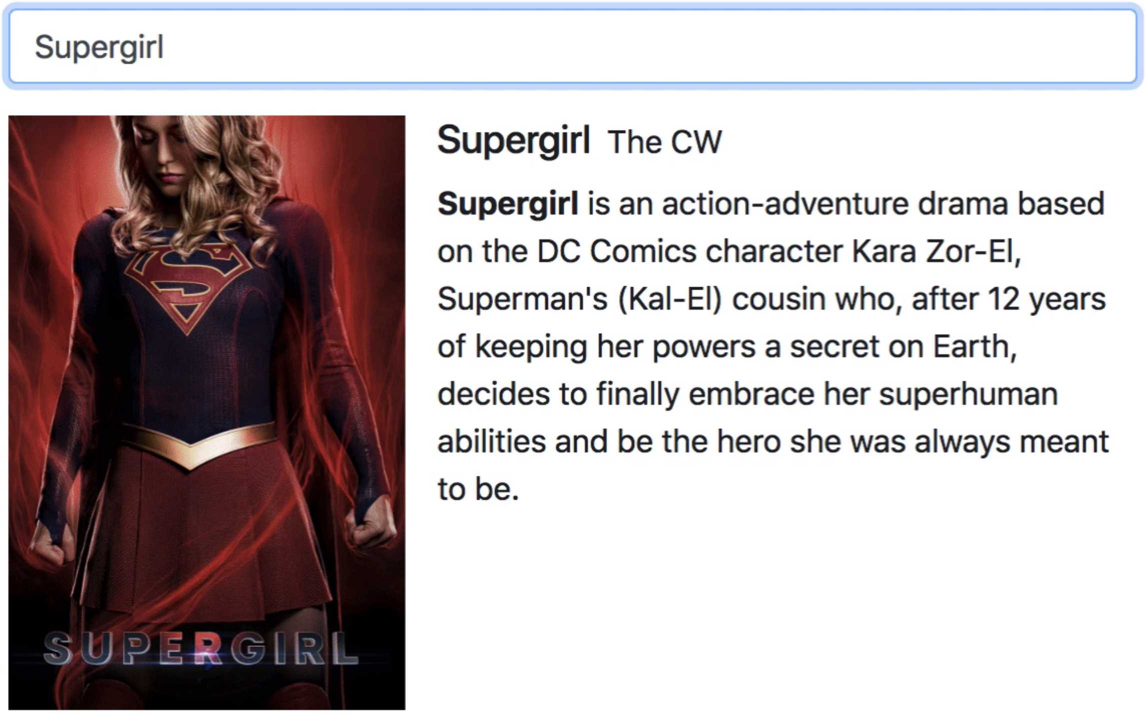
For reference, here's the full

```
import React from 'react';

import { Provider } from 'react-redux';
import store from './store';

import Search from './Search';
import Detail from './Detail';

const App = () => (
  <div className="m-3">
    <Search />
    <div className="my-3">
      <Detail />
    </div>
  </div>
);
```

```

export default () => (
  <Provider store={store}>
    <App />
  </Provider>
);
```

Profit

You should now have a fully functional web app where you can search for TV shows and get some details.

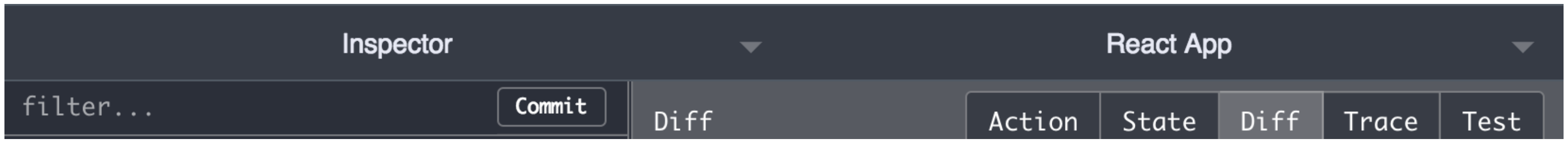


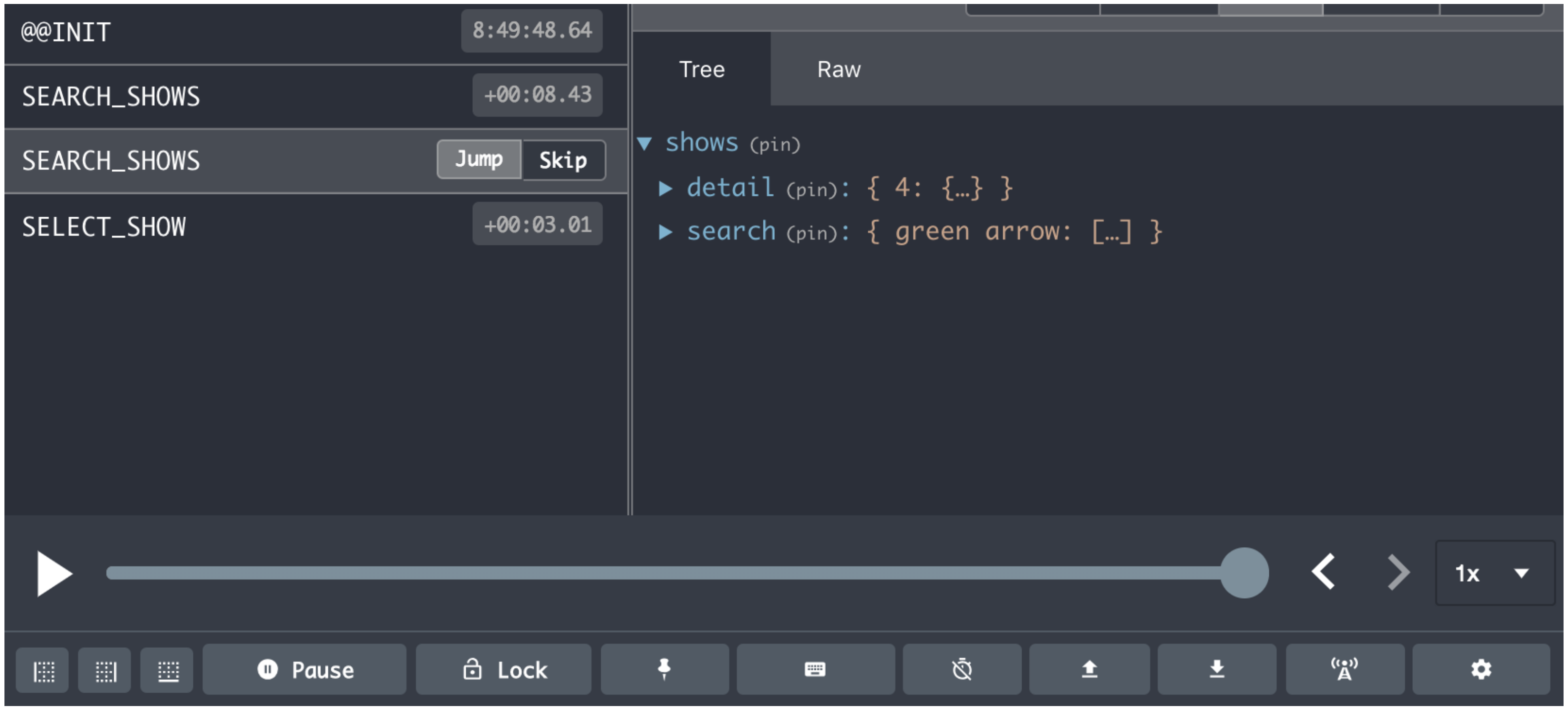
Supergirl

Supergirl The CW

Supergirl is an action-adventure drama based on the DC Comics character Kara Zor-El, Superman's (Kal-El) cousin who, after 12 years of keeping her powers a secret on Earth, decides to finally embrace her superhuman abilities and be the hero she was always meant to be.

If you install the Redux DevTools Extension you'll also be able to replay actions, view the data in the store, and much more.



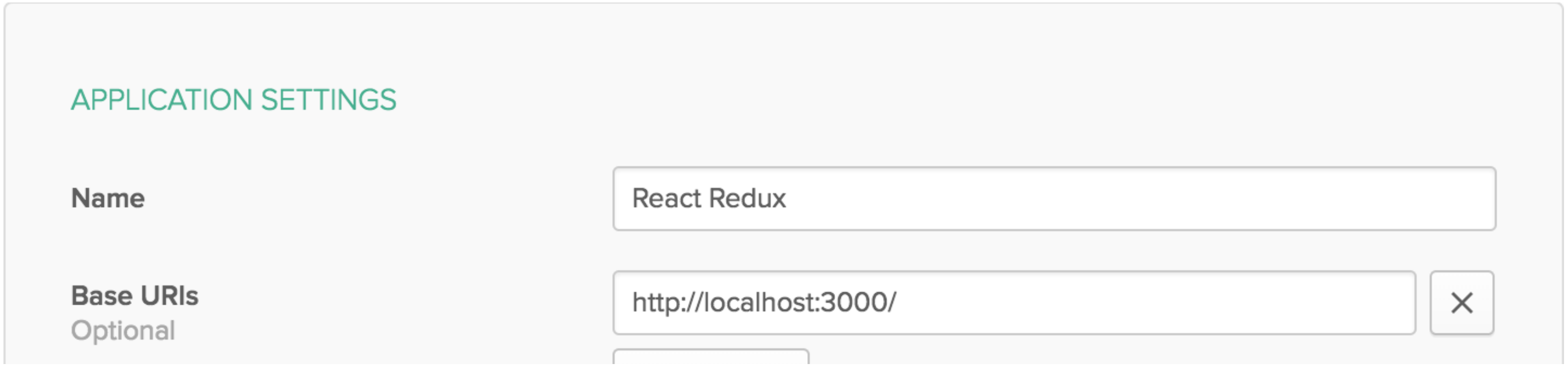


```
▼ shows (pin)
  ▶ detail (pin): { 4: {…} }
  ▶ search (pin): { green arrow: […] }
```

Add User Authentication to Your React Redux App

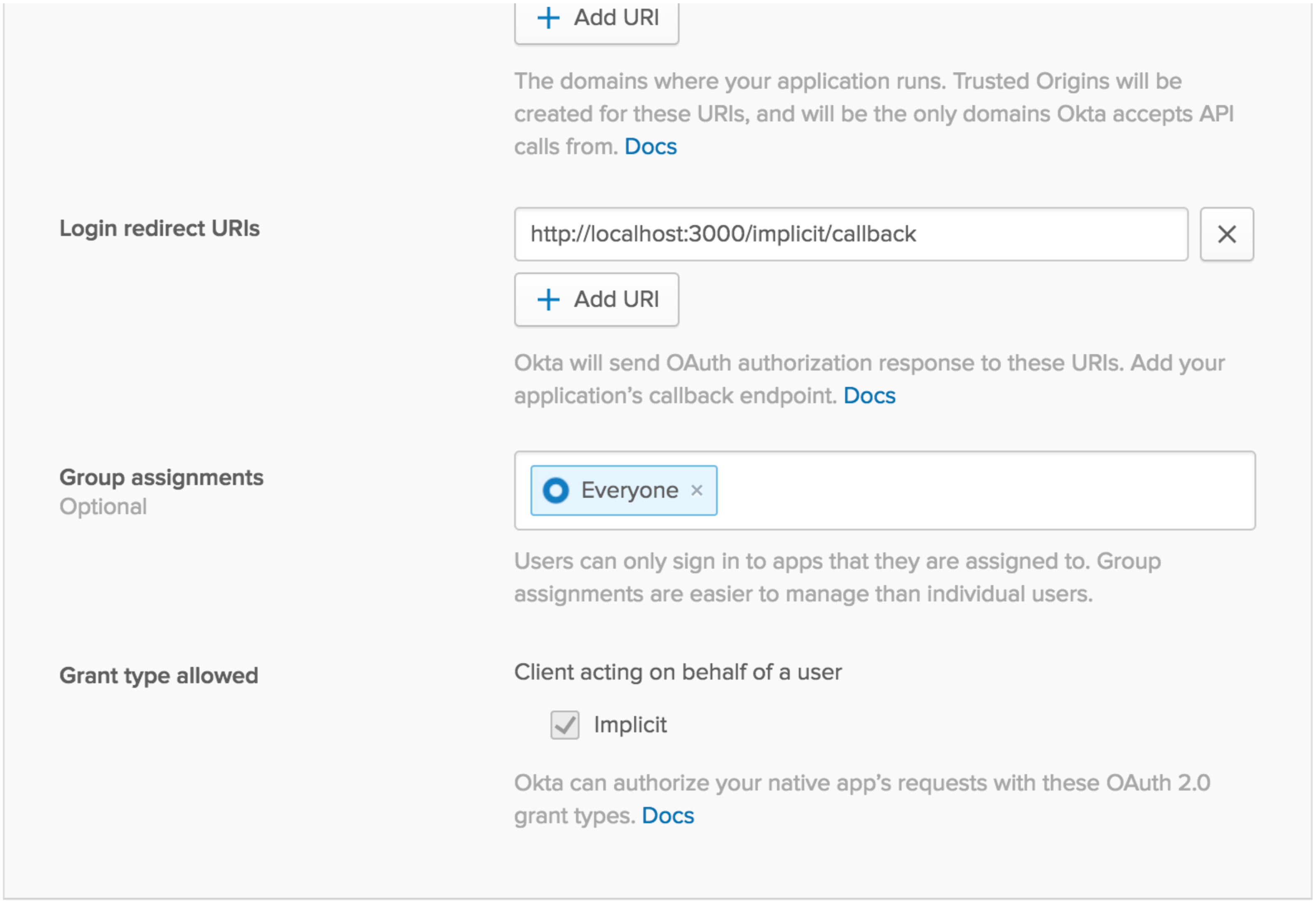
Okta is a cloud service that allows developers to create, edit, and securely store user accounts and user account data, and connect them with one or multiple applications. If you don't already have one, sign up for a forever-free developer account. Log in to your developer console, navigate to **Applications**, then click **Add Application**. Select **Single-Page App**, then click **Next**.

Since Create React App runs on port 3000 by default, you should add that as a Base URI and Login Redirect URI. Your settings should look like the following:



APPLICATION SETTINGS

Name	React Redux
Base URIs Optional	http://localhost:3000/



The domains where your application runs. Trusted Origins will be created for these URIs, and will be the only domains Okta accepts API calls from. Docs

Login redirect URIs: http://localhost:3000/implicit/callback

Okta will send OAuth authorization response to these URIs. Add your application's callback endpoint. Docs

Group assignments
Optional: Everyone ×

Users can only sign in to apps that they are assigned to. Group assignments are easier to manage than individual users.

Grant type allowed: Client acting on behalf of a user

✓ Implicit

Okta can authorize your native app's requests with these OAuth 2.0 grant types. Docs

Click **Done** to save your app, then copy your **Client ID** and paste it as a variable into a file called `.env.local` in the root of your project. This will allow you to access the file in your code without needing to store credentials in source control. You'll also need to add your organization URL (without the `-admin` suffix). Environment variables (other than `NODE_ENV`) need to start with `REACT_APP_` in order for Create React App to read them, so the file should end up looking like this:

```
REACT_APP_OKTA_ORG_URL=https://{yourOktaDomain}
REACT_APP_OKTA_CLIENT_ID={yourClientId}
```

You may need to restart your server before it will recognize these changes. You can find the running instance and then hit `ctrl-c` to close it.

Then run it again with `yarn start`.

The easiest way to add Authentication with Okta to a React app is to use Okta's React SDK. You'll also need to add routes, which can be done using React Router. Go ahead and add these dependencies:

```
yarn add @okta/okta-react@1.1.4 react-router-dom@4.3.1
```

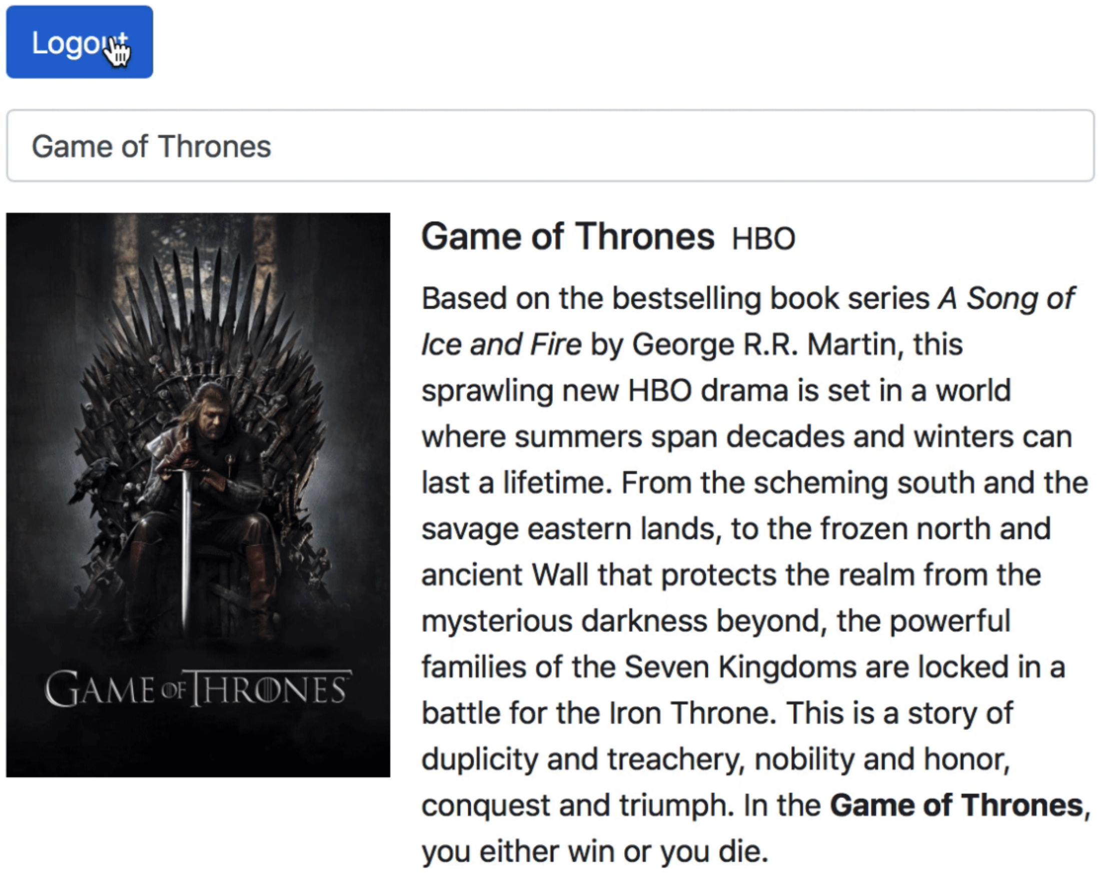
You'll need to make some changes to `src/App.js` now. Here's what the final output should be, but I'll go over what the differences are:

```
import React, { useState, useEffect } from 'react';
import { BrowserRouter as Router, Route } from 'react-router-dom';
import { Security, ImplicitCallback, withAuth } from '@okta/okta-react';

import { Provider } from 'react-redux';
import store from './store';

import Search from './Search';
import Detail from './Detail';

const App = withAuth(({ auth }) => {
  const [authenticated, setAuthenticated] = useState(null);

  useEffect(() => {
    auth.isAuthenticated().then(isAuthenticated => {
      if (isAuthenticated !== authenticated) {
        setAuthenticated(isAuthenticated);
      }
    });
  });

  return (
    <div className="m-3">
      {authenticated ? (
        <>
          <div className="mb-3">
          <div className="mb-3">
            <button className="btn btn-primary" onClick={() => auth.logout()}>
              Logout
            </button>
          </div>
          <Search />
          <div className="my-3">
            <Detail />
          </div>
        </>
      ) : authenticated === null ? (
        <h4>Loading...</h4>
      ) : (
        <button className="btn btn-primary" onClick={() => auth.login()}>
          Login to search TV Shows
        </button>
      )}
    </div>
  );
});

export default () => (
  <Provider store={store}>
    <Router>
      <Security
        issuer={`${process.env.REACT_APP_OKTA_ORG_URL}/oauth2/default`}
        client_id={process.env.REACT_APP_OKTA_CLIENT_ID}
        redirect_uri={`${window.location.origin}/implicit/callback`}
      >
        <Route path="/" exact component={App} />
        <Route path="/implicit/callback" component={ImplicitCallback} />
      </Security>
    </Router>
  </Provider>
);
```

The main `App` functional component now uses a piece of state to track whether or not a user is authenticated. Whenever the component renders, an effect checks whether or not authentication has changed. This makes sure that if a user logs in or out the component will properly update. Because it's wrapped with Okta's `withAuth`, it can now access the `auth` prop in order to check for authentication.

The main portion of the `return` statement in `App` now renders the same thing it previously did, but only if the user is authenticated. It also adds a Logout button in that case. If `authenticated` is `null`, that means Okta hasn't yet told you whether or not you're authenticated, so it just shows a simple "Loading" text. Finally, if you're not authenticated, it just shows a login button that will redirect you to your Okta org to sign in.

The default export now wraps the app with React Router and Okta, as well as Redux. This now allows you to use `withAuth` to pull authentication information out of context. It also uses Okta and React Router to decide whether to render `App` or redirect you to log in or out.



Game of Thrones HBO

Based on the bestselling book series *A Song of Ice and Fire* by George R.R. Martin, this sprawling new HBO drama is set in a world where summers span decades and winters can last a lifetime. From the scheming south and the savage eastern lands, to the frozen north and ancient Wall that protects the realm from the mysterious darkness beyond, the powerful families of the Seven Kingdoms are locked in a battle for the Iron Throne. This is a story of duplicity and treachery, nobility and honor, conquest and triumph. In the **Game of Thrones**, you either win or you die.

It’s important to keep in mind that there are limitations to Redux. There’s a short, but sweet, read from the author of Redux called You Might Not Need Redux going into more detail and offering a great summary of whether or not you should consider Redux for your app.

Learn More About React, Redux, and Secure Authentication

I’m hoping that after reading this tutorial you’ve learned more about what Redux is and how it can be useful, particularly when paired with React. While not always necessary for small apps, I hope you can see how Redux can be a really powerful tool for larger applications with a lot of moving parts. If you want to see the final code sample for reference, you can find it on GitHub.

For more examples using Okta with React, check out some of these other posts, or browse the Okta Developer Blog.

- Build a Basic CRUD App with Laravel and React
- Build a Basic CRUD App with Node and React
- Build User Registration with Node, React, and Okta
- Build a React Application with User Authentication in 15 Minutes

If you have any questions about this post, please add a comment below. For more awesome content, follow @oktadev on Twitter, like us on Facebook, or subscribe to our YouTube channel.

A Beginner's Guide to Redux was originally published on the Okta Developer Blog on March 18, 2019.

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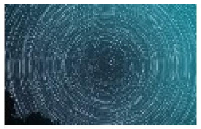
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