

# Components & State

# What is a Component?

## Components & State

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Components let you split the UI into independent, reusable pieces, and think about each piece in isolation.

Conceptually, React components are like JavaScript functions. They accept arbitrary inputs (called “props”) and return React elements describing what should appear on the screen.

# Components & State

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## React class (stateful) vs function (stateless)

```
class MyComponent extends React.Component {  
  render() {  
    return (  
      <Text>Hello World</Text>  
    )  
  }  
}
```

```
const MyComponent = () => (  
  <Text>Hello World</Text>  
)
```

---

<MyComponent />

# Components & State

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## props

React / React Native components accept arbitrary inputs (called "props") that can be used within the components.

```
class MyComponent extends React.Component {  
  render() {  
    return (  
      <Text>{this.props.name}</Text>  
    )  
  }  
}
```

```
const MyComponent = (props) => (  
  <Text>{props.name}</Text>  
)
```

---

```
<MyComponent name="Harry" />
```

# Components & State

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## React class (stateful) vs function (stateless)

### stateful - class

A stateful component either contains state or needs to hook into lifecycle methods

state is data that is private and fully controlled by the component.

```
import React from 'react';
import { Text } from 'react-native';

class App extends React.Component {
  state = { name: 'Chris' }

  // lifecycle methods

  render() {
    return (
      <Text>{this.state.name}</Text>
    )
  }
}
```

---

<App />

# Components & State

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## React class (stateful) vs function (stateless)

### stateless - function

```
import React from 'react';  
import { Text } from 'react-native';
```

```
const App = () => (  
  <Text>Hello World</Text>  
);
```

---

```
<App />
```

# Components & State

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## stateful vs stateless

stateless - es2015 arrow function with explicit return

```
import React from 'react';
import { View, Text } from 'react-native';

const App = () => {
  return (
    <Text>Hello World</Text>
  );
};
```



## Components & State

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### lifecycle concepts

A stateful React component's lifecycle contains distinct phases for creation and deletion. These are referred to as mounting and unmounting. You can also think of them as "setup" and "cleanup".

# Components & State

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## lifecycle concepts - mounting

When we create (or mount) a stateful React component, we will trigger the component lifecycle which will create a new React / React Native component

# Components & State

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lifecycle methods - in order of  
initialization

## Class creation

### **Mounting**

`constructor()` or property initializers

`componentWillMount()`

`render()`

`componentDidMount()`

[read more about property initializers](#)

[react documentation about property initializers](#)

# Components & State

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mounting occurs and lifecycle methods are triggered whenever we create a React or React Native class

```
import React from 'react';
import { View, Text } from 'react-native';

class App extends React.Component {
  constructor() {}

  componentWillMount() {}

  componentDidMount() {}

  render() {
    return(
      <View>
        <Text>{this.state.name}</Text>
      </View>
    )
  }
}
```

Components & State

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lifecycle methods

Component destruction

**Unmounting**

`componentWillUnmount()`

# Components & State

lifecycle methods

Updating component state and props

## Updating state

`shouldComponentUpdate()`

`componentWillUpdate()`

`render()`

`componentDidUpdate()`

## Updating props

`componentWillReceiveProps()`

`shouldComponentUpdate()`

`componentWillUpdate()`

`render()`

`componentDidUpdate()`

# Components & State

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## Creating state

stateful - state using property initializers to declare state

```
import React from 'react';
import { Text } from 'react-native';

class App extends React.Component {
  state = { name: 'Chris' }

  render() {
    return(
      <Text>{this.state.name}</Text>
    )
  }
}
```

# Components & State

---

## Creating state

stateful - using constructor to declare state

```
class Person extends React.Component {  
  constructor(props) {  
    super(props);  
    this.state = {  
      name: 'Chris',  
    };  
  }  
  
  render() {  
    return (  
      <View>  
        <Text>{this.state.name}</Text>  
      </View>  
    );  
  }  
}
```



# Components & State

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composing reusable  
components - class

```
class Name extends React.Component {  
  render() {  
    return <Text>Dave</Text>;  
  }  
}
```

```
export default class extends React.Component {  
  render() {  
    return (  
      <Name />  
    );  
  }  
}
```

# Components & State

---

composing reusable  
components - stateless  
function

```
const Name = () => <Text>Dave</Text>;
```

```
class App extends React.Component {  
  render() {  
    return (  
      <Name />  
    );  
  }  
}
```

# Components & State

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## props

```
<Person name="Chris" />
```

```
<App data={['a', 'b', 'c']} />
```

```
<User loggedIn={false} isActive />
```

```
<User loggedIn={false} isActive={true} />
```

# Components & State

## stateful vs stateless

props - receiving props in  
a class

```
import React from 'react';
import { View, Text } from 'react-native';

class App extends Component {
  render() {
    return (
      <Person name="Chris" />
    )
  }
}

class Person extends React.Component {
  render() {
    return(
      <View>
        <Text>{this.props.name}</Text>
      </View>
    )
  }
}
```

# Components & State

## stateful vs stateless

props - receiving props in a  
stateless function

```
import React from 'react';
import { View, Text } from 'react-native';

class App extends Component {
  render() {
    return (
      <Person name="Chris" />
    )
  }
};

const Person = (props) => (
  <View>
    <Text>{props.name}</Text>
  </View>
);
```

# Components & State

## stateful vs stateless

props - destructuring in  
stateless component

```
import React from 'react';
import { View, Text } from 'react-native';

class App extends Component {
  render() {
    return (
      <Person age={33} name="Chris" />
    )
  }
};

const Person = ({ name, age }) => (
  <View>
    <Text>{name} {age}</Text>
  </View>
);
```

# Components & State

## stateful vs stateless

props - receiving child

components as props

```
const RedContainer = (props) => (  
  <View style={{ backgroundColor: 'red' }}>  
    { props.children }  
  </View>  
);
```

```
class App extends React.Component {  
  render() {  
    return (  
      <RedContainer>  
        <Text>Hello World</Text>  
      </RedContainer>  
    );  
  }  
}
```

# Components & State

## stateful vs stateless

Default props - class

```
class Person extends React.Component {  
  static defaultProps = {  
    name: 'Chris',  
  }  
  
  render () {  
    return (  
      <View>  
        <Text>{this.props.name}</Text>  
      </View>  
    )  
  }  
};  
  
export default App = () => <Person name="Jim" />;
```



# Components & State

---

## stateful vs stateless

Default props - stateless  
component

```
const Person = ({ name }) => (  
  <View>  
    <Text>{name}</Text>  
  </View>  
);  
  
Person.defaultProps = {  
  name: 'Mike'  
};  
  
export default App = () => <Person />;
```

# Components & State

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stateful vs stateless

propTypes

adding prop-types module

```
npm install --save prop-types
```

# Components & State

## stateful vs stateless

propTypes - class declaration

```
import PropTypes from 'prop-types';

class Person extends React.Component {
  static propTypes = {
    name: PropTypes.string.isRequired,
  }

  render() {
    return (
      <View>
        <Text>{this.props.name}</Text>
      </View>
    );
  }
};

class App extends React.Component {
  render() {
    return <Person name="Bob" />;
  }
}
```

# Components & State

## stateful vs stateless

propTypes - stateless component

```
import PropTypes from 'prop-types';
```

```
const Person = ({ name }) => (  
  <View>  
    <Text>{name}</Text>  
  </View>  
);
```

```
Person.propTypes = {  
  name: PropTypes.string.isRequired,  
};
```

```
class App extends React.Component {  
  static navigationOptions = {  
    title: 'Playground',  
  }  
  render() {  
    return <Person name="Bob" />;  
  }  
}
```

# Components & State

## updating state

### setState

setState enqueues changes to the component state and tells React that this component and its children need to be re-rendered with the updated state

```
import React from 'react';
import { View, Text } from 'react-native';

class App extends React.Component {
  state = { name: 'Chris' }

  updateName = () => {
    this.setState({ name: 'Amanda' })
  }

  render() {
    return(
      <View>
        <Text onPress={this.updateName}>{this.state.name}</Text>
      </View>
    )
  }
}
```

# Components & State

---

## updating state

### setState

setState enqueues changes to the component state and tells React that this component and its children need to be re-rendered with the updated state

## SetState

shouldComponentUpdate()

componentWillUpdate()

render()

componentDidUpdate()

# Components & State

## setState

setState forces a rerendering of any component accessing the changed state.

```
import React from 'react';
import { View, Text } from 'react-native';

class App extends React.Component {
  state = { name: 'Chris' }

  updateName = () => {
    this.setState({ name: 'Amanda' })
  }

  render() {
    return (
      <Person name={this.state.name} onPress={this.updateName} />
    )
  }
}

const Person = ({ onPress, name }) => (
  <View>
    <Text onPress={onPress}>{name}</Text>
  </View>
)
```

# Components & State

## setState

setState receives an optional callback.

```
import React from 'react';
import { View, Text } from 'react-native';

class App extends React.Component {
  state = { name: 'Chris' }

  updateName = () => {
    this.setState({ name: 'Amanda' }, () => {
      console.log('name is set!');
    })
  }

  render() {
    return (
      <Text onPress={this.updateName}>{this.state.name}</Text>
    )
  }
}
```



# Components & State

## setState

### State Updates May Be Asynchronous

If you have multiple instances of `setState` being called at once, it may be a good idea to use the `setState` callback.

`this.state` may be updated asynchronously, so you should not rely on its value for calculating the next state.

```
class App extends React.Component {
  state = { value: 0 }

  increment = () => {
    this.setState((state, props) => ({
      value: state.value + 1,
    }));
  }

  render() {
    return (
      <Text onPress={this.increment}>{this.state.value}</Text>
    )
  }
}
```

# Components & State

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## conditional rendering

```
state = { loggedIn: false }

login = () => {
  this.setState({ loggedIn: true })
}

render() {
  const { loggedIn } = this.state;

  if (loggedIn) {
    return <Text>Logged In</Text>
  }

  return <Text onPress={this.login}>Please Log In</Text>
}
```

# Components & State

## conditional rendering

```
state = { loggedIn: false }

login = () => {
  this.setState({ loggedIn: true })
}

render() {
  const { loggedIn } = this.state;

  return (
    <View>
      { loggedIn && <Text>Logged In</Text> }
      { !loggedIn && <Text onPress={this.login}>Please Log In</Text> }
    </View>
  );
}
```

# Components & State

conditional  
rendering  
creating  
components on  
the fly.

```
import {
  Platform,
  TouchableHighlight,
  TouchableNativeFeedback,
  View,
  Text
} from 'react-native';

render() {
  let Button = TouchableHighlight;

  if (Platform.OS === 'android') {
    Button = TouchableNativeFeedback;
  }

  return (
    <View>
      <Button onPress={console.log}>
        <Text>Hello!</Text>
      </Button>
    </View>
  );
}
```

# Components & State

conditional  
rendering  
filtering data in  
render.

```
state = {  
  sport: 'basketball'  
}  
  
render() {  
  let data = [{ name: 'chris', sport: 'baseball' }, { name: 'James', sport: 'basketball' }]  
  
  data = data.filter(d => d.sport === this.state.sport)  
  
  return (  
    <View>  
      {  
        data.map(d => <Text>{d.name}</Text>)  
      }  
    </View>  
  );  
}
```

# Components & State

## creating variables in render - class

```
class extends React.Component {  
  state = {  
    sport: 'basketball'  
  }  
  
  render() {  
    const greeting = `${this.state.sport} is my favorite sport`;  
  
    return (  
      <Text>{greeting}</Text>  
    );  
  }  
}
```

# Components & State

---

creating variables in  
render - stateless  
component

```
const App = ({ sport }) => {  
  const greeting = `${sport} is my favorite sport`;  
  
  return (  
    <Text>{greeting}</Text>  
  );  
};
```

# Components & State

## updating with forceUpdate()

```
state = { loggedIn: false };

updateState = () => {
  this.forceUpdate();
}

updateLoggedIn = () => {
  this.state.loggedIn = true;
}

render() {
  return (
    <View>
      <Text onPress={this.updateLoggedIn}>Log In</Text>
      <Text onPress={this.updateState}>Force Update</Text>
      { this.state.loggedIn && <Text>Logged In</Text>}
    </View>
  );
}
```



# ReactJS fundamentals

lifecycle -

## componentWillMount

`componentWillMount` is invoked immediately before mounting occurs. It is called before `render()`, therefore setting state synchronously in this method will not trigger a re-rendering.

Documentation recommends using either constructor or property initializers instead.

There is even a discussion about to whether this method should be deprecated.

```
componentWillMount() {  
  this.setState({  
    startDateTime: new Date(Date.now())  
  });  
}  
  
render() {  
  return (  
    <Text>{this.state.startDateTime.toLocaleString()}</Text>  
  );  
}
```

# Components & State

---

## lifecycle - componentDidMount

componentDidMount is called immediately after the render() method has taken place.

This is a great place to perform Ajax calls, timeouts, or any other operations.

This lifecycle method is used a lot in real world applications.

```
componentDidMount() {  
  fetchFromApi()  
    .then(data => this.setState({ data })))  
}
```

# Components & State

lifecycle -

## componentDidMount

componentDidMount is called immediately after the render() method has taken place.

This is a great place to perform Ajax calls, timeouts, or any other operations.

This lifecycle method is used a lot in real world applications.

```
componentDidMount() {  
  this.interval = setInterval(() => {  
    this.setState({  
      tick: this.state.tick + 1,  
    });  
  }, 1000);  
}  
  
render() {  
  return (  
    <Text>{this.state.tick}</Text>  
  );  
}
```

# Components & State

## lifecycle - componentWillUnmount

componentWillUnmount  
is invoked immediately  
before a component is  
unmounted and destroyed.  
Perform any necessary  
cleanup in this method,  
such as invalidating timers,  
canceling network  
requests.

```
componentDidMount() {  
  this.interval = setInterval(() => {  
    this.setState({  
      tick: this.state.tick + 1,  
    });  
  }, 1000);  
}  
  
componentWillUnmount() {  
  clearInterval(this.interval);  
}  
  
render() {  
  return (  
    <Text>{this.state.tick}</Text>  
  );  
}
```

# Components & State

---

lifecycle methods -  
called in this order  
when setState is called

## **state changes**

`shouldComponentUpdate()`

`componentWillUpdate()`

`render()`

`componentDidUpdate()`

# Components & State

---

lifecycle methods -  
called in this order  
when props have  
changed and when  
this is not an initial  
rendering.

## **prop changes**

`componentWillReceiveProps()`

`shouldComponentUpdate()`

`componentWillUpdate()`

`render()`

`componentDidUpdate()`

# Components & State

## lifecycle - shouldComponentUpdate

returns boolean

shouldComponentUpdate is always called before render and enables the component to figure out if a re-rendering is needed or can be skipped.

```
state = {  
  tick: 0,  
}  
  
shouldComponentUpdate(nextProps, nextState) {  
  if (this.state.tick !== nextState.tick) {  
    return true;  
  }  
  return false;  
}  
  
tick = () => {  
  this.setState({  
    tick: this.state.tick + 1,  
  });  
}  
  
render() {  
  return (  
    <Text onPress={this.tick}>{this.state.tick}</Text>  
  );  
}
```

# Components & State

lifecycle - componentWillReceiveProps

**componentWillReceiveProps** is only called when the props have changed and when this is not an initial rendering. This method enables us to update the state depending on the existing and upcoming props.

```
componentDidMount() {  
  this.fetchFromApi(this.props.id);  
}  
  
componentWillReceiveProps(nextProps) {  
  if (this.props.id !== nextProps.id) {  
    this.fetchFromApi(nextProps.id);  
  }  
}  
  
fetchFromApi(id) {  
  fetch(`https://someurl/${id}`)  
}
```



# Component Patterns

# Presentational & Container Components

# Presentational & Container Components

---

A container component does data fetching and then renders its corresponding sub-component.

container components:

- Are concerned with how things work.
- May contain both presentational and container components inside but never have any styling applied.
- Provide the data and behavior to presentational or other container components.
- Call Flux actions and provide these as callbacks to the presentational components.
- Are often stateful, as they tend to serve as data sources.

# Presentational & Container Components

---

## presentational components:

- Are concerned with how things look.
- May contain both presentational and container components inside, and usually have some markup and styling of their own.
- Often allow containment via `this.props.children`.
- Have no dependencies on the rest of the app, such as Flux actions or stores.
- Don't specify how the data is loaded or mutated.
- Receive data and callbacks exclusively via props.
- Rarely have their own state (when they do, it's UI state rather than data).
- Are written as functional components unless they need state, lifecycle hooks, or performance optimizations.

# Presentational & Container Components

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## Benefits:

- Better separation of concerns. You understand your app and your UI better by writing components this way.
- Better reusability. You can use the same presentational component with completely different state sources, and turn those into separate container components that can be further reused.
- Presentational components are essentially your app's "palette". You can put them on a single page and let the designer tweak all their variations without touching the app's logic. You can run screenshot regression tests on that page.

# Presentational & Container Components

---

Say you have a component that displays comments. You didn't know about container components. So, you put everything in one place:

```
import React from 'react';
import { View, Text } from 'react-native';

class CommentList extends React.Component {
  state = {comments: [] }

  componentDidMount() {
    fetchSomeComments(comments =>
      this.setState({ comments: comments }));
  }

  render() {
    return (
      <View>
        {this.state.comments.map(c => (
          <Text>{c.body}-{c.author}</Text>
        ))}
      </View>
    )
  }
}
```

# Presentational & Container Components

---

Lets pull out data-fetching into a container component.

```
import React from 'react';
import { CommentList } from './CommentList';

class CommentListContainer extends React.Component {
  state = {comments: [] }

  componentDidMount() {
    fetchSomeComments(comments =>
      this.setState({ comments: comments }));
  }

  render() {
    return (
      <CommentList comments={this.state.comments} />
    )
  }
}
```

# Presentational & Container Components

---

Let's rework CommentList to take comments as a prop.

```
import { View, Text } from 'react-native';

const CommentList = props => (
  <View>
    {props.comments.map(c => (
      <Text>{c.body}–{c.author}</Text>
    ))}
  </View>
);
```



# Presentational & Container Components

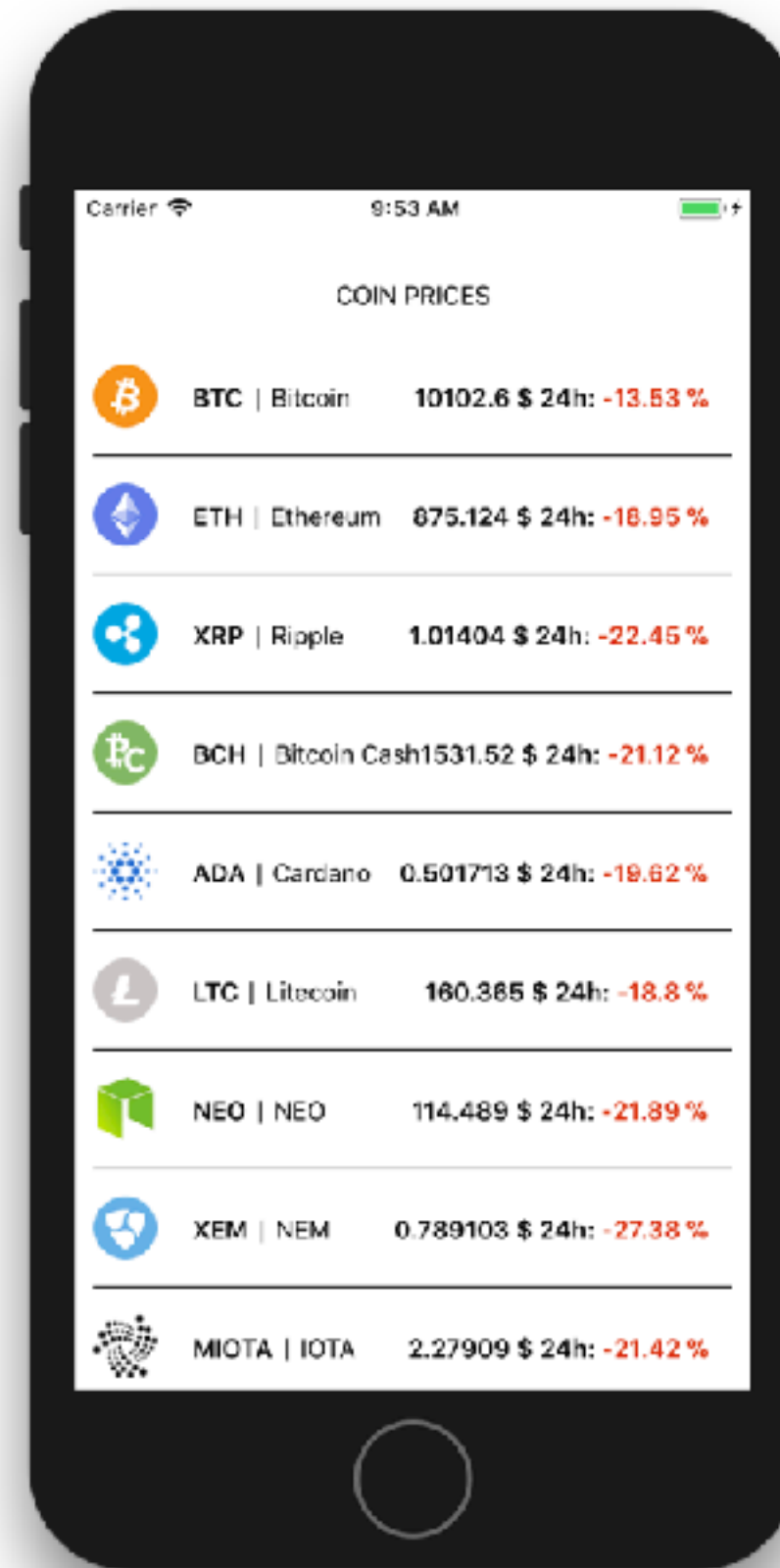
---

So, what did we get?

- We've separated our data-fetching and rendering concerns.
- We've made our `CommentList` component reusable.
- We've given `CommentList` the ability to set `PropTypes` and fail loudly.

# Lets build a screen

---



<https://github.com/hgale/ComponentAndState>

Lets build a screen

---

Pull request with changes:

<https://github.com/hgale/ComponentAndState/pull/1>

# Higher-Order Components

# Higher-Order Components

---

A higher-order component is just a function that takes an existing component and returns another component that wraps it.

```
const EnhancedComponent = higherOrderComponent(WrappedComponent);
```

Whereas a component transforms props into UI, a higher-order component transforms a component into another component.

HOCs are common in third-party React libraries, such as Redux's connect

# Higher-Order Components

For example, say you have a `CommentList` component that subscribes to an external data source to render a list of comments:

```
class CommentList extends React.Component {
  constructor(props) {
    super(props);
    this.handleChange = this.handleChange.bind(this);
    this.state = {
      // "DataSource" is some global data source
      comments: DataSource.getComments()
    };
  }

  componentDidMount () {
    // Subscribe to changes
    DataSource.addChangeListener(this.handleChange);
  }

  componentWillUnmount () {
    // Clean up listener
    DataSource.removeChangeListener(this.handleChange);
  }

  handleChange() {
    // Update component state whenever the data source changes
    this.setState({
      comments: DataSource.getComments()
    });
  }

  render() {
    return (
      <View>
        {this.state.comments.map((comment) => (
          <Comment comment={comment} key={comment.id} />
        ))}
      </View>
    );
  }
}
```

# Higher-Order Components

Later, you write a component for subscribing to a single blog post, which follows a similar pattern:

```
class BlogPost extends React.Component {
  constructor(props) {
    super(props);
    this.handleChange = this.handleChange.bind(this);
    this.state = {
      blogPost: DataSource.getBlogPost(props.id)
    };
  }

  componentDidMount () {
    // Subscribe to changes
    DataSource.addChangeListener(this.handleChange);
  }

  componentWillUnmount () {
    // Clean up listener
    DataSource.removeChangeListener(this.handleChange);
  }

  handleChange() {
    // Update component state whenever the data source changes
    this.setState({
      blogPost: DataSource.getComments()
    });
  }

  render() {
    return ( <TextBlock text={this.state.blogPost} /> );
  }
}
```

# Higher-Order Components

CommentList and BlogPost aren't identical — they call different methods on DataSource, and they render different output. But much of their implementation is the same:

- On mount, add a change listener to DataSource.
- Inside the listener, call setState whenever the data source changes.
- On unmount, remove the change listener.

You can imagine that in a large app, this same pattern of subscribing to DataSource and calling setState will occur over and over again. We want an abstraction that allows us to define this logic in a single place and share them across many components. This is where higher-order components excel.

We can write a function that creates components, like CommentList and BlogPost, that subscribe to DataSource. The function will accept as one of its arguments a child component that receives the subscribed data as a prop. Let's call the function withSubscription:

```
const CommentListWithSubscription = withSubscription( {
  CommentList,
  (DataSource) => DataSource.getComments()
});

const BlogPostWithSubscription = withSubscription( {
  BlogPost,
  (DataSource, props) => DataSource.getComments(props.id)
});
```



# Higher-Order Components

The first parameter is the wrapped component. The second parameter retrieves the data we're interested in, given a DataSource and the current props.

When CommentListWithSubscription and BlogPostWithSubscription are rendered, CommentList and BlogPost will be passed a data prop with the most current data retrieved from DataSource:

```
function withSubscription(WrappedComponent, selectData) {
  // ...and returns another component...
  return class extends React.Component {
    constructor(props) {
      super(props);
      this.handleChange = this.handleChange.bind(this);
      this.state = {
        data: selectData(DataSource, props)
      };
    }

    componentDidMount() {
      // ... that takes care of the subscription...
      DataSource.addChangeListener(this.handleChange);
    }

    componentWillUnmount() {
      DataSource.removeChangeListener(this.handleChange);
    }

    handleChange() {
      this.setState({
        data: selectData(DataSource, this.props)
      });
    }

    render() {
      // ... and renders the wrapped component with the fresh data!
      // Notice that we pass through any additional props
      return <WrappedComponent data={this.state.data} {...this.props} />;
    }
  };
}
```

How do we share state  
between screens?

# Redux

# Redux

**Redux is a predictable state container for JavaScript apps.**

Provides a single source of truth for any data that is being used in multiple parts of your application.

# Redux

## Basic Concepts

---

Out of the box, State / data is managed within a class

```
class App extends React.Component {  
  state = {  
    name: 'Chris'  
  }  
  
  render() {  
    return (  
      <Text>{this.state.name}</Text>  
    );  
  }  
}
```

# Redux

## Basic Concepts

---

Data is also passed down as props

```
const Person = ({ name }) => <Text onPress>{name}</Text>
```

```
class App extends React.Component {  
  state = {  
    name: 'Chris'  
  }  
  
  updateState= (state) => this.setState({.///})  
  
  render() {  
    return (  
      <Person updateState name={this.state.name} />  
    );  
  }  
}
```

# Redux

With Redux, all data is stored in an object and passed down as props.

```
store = {  
  people: {  
    data: []  
  },  
  locations: {  
  
  },  
  friends: {  
  
  },  
}
```

## Basic Concepts

---

```
class App extends Component {  
  render() {  
    return (  
      {  
        this.props.people.data.map((person, index) => {  
          return (  
            <Text>{person.name}</Text>  
          )  
        })  
      }  
    )  
  }  
}
```

# Redux

Provides a single source of truth for any data that is being used in multiple parts of your application.

---

This usually means only a single store for the entire application.



# Redux

## Redux store

---

Store is a JS Object  
Usually key/value map

```
store = {  
  people: {  
  
  },  
  locations: {  
  
  },  
  friends: {  
  
  },  
}
```

# Redux

Redux store is composed of reducers (other javascript objects).

```
store = {                                // peopleReducer.js
  people: {
    data: [],
    isFetching: false,
    isLoading: false,
  },
  locations: {
  },
},
friends: {
},
},
}
```

```
const people = {
  data: [],
  isFetching: false,
  isLoading: false,
}

const peopleStore = (state = people, action) => {
  // reducer logic goes here
}

export default peopleStore
```

# Redux

Redux store is composed of reducers (other javascript objects).

Reducers takes in  
an old state and  
outputs a new  
state

```
// peopleReducer.js
```

```
const people = {  
  data: [],  
  isFetching: false,  
  isLoading: false,  
}
```

```
export default peopleStore = (state = people, action) => {  
  switch (action.type) {  
    case 'IS_LOADED':  
      return {  
        ...state,  
        isLoading: true,  
        data: action.data  
      }  
    }  
  }  
}
```

# Redux

Data in components is read only.

---

Data can only be changed with Actions. These actions get passed to our reducers, where the state is changed and propagated down to the any connected components.

# Redux

Actions are plain objects.

```
export function fetchAction() {  
  return {  
    type: 'IS_FETCHING',  
  };  
}
```

# Redux

Actions may or may not take arguments.

```
// actions.js

export function getUserAction(id) {
  return {
    type: 'GET_USER',
    id: id,
  };
}
```

```
// peopleReducer.js
```

```
const people = {
  isFetching: false, peopleArray: [],
};

const peopleStore = (state = people, action) => {
  switch (action.type) {
    case 'IS_FETCHING':
      return {
        ...state,
        isFetching: true,
      };
    default:
      return state;
  }
};

export default peopleStore;
```

```
// configureStore.js
```

```
import { createStore } from 'redux'
import rootReducer from './reducers'

export default function configureStore() {
  let store = createStore(rootReducer)
  return store
}
```

```
// actions.js
```

```
export function fetchPeople() {
  return {
    type: 'IS_FETCHING',
  };
}
```

```
// in the app
```

```
import { fetchPeople } from './actions'
```

```
const App = () => (
  <Text
    onPress={this.props.fetchPeople}
  >
    Fetch People
  </Text>
);
```

```
// wrap the component in the connect function
// to connect the redux state
```

```
export default connect(
  (state) => ({
    people: state.people
  }),
  (dispatch) => ({
    fetchPeople: dispatch(fetchPeople())
  })
)(App)
```

# Redux

reducers should be pure functions

---

Given the same input produce the same output.

No side effects.

Relies on no external mutable state.

Relies solely on the value of the arguments of the function.

Cannot modify the value of the values passed to them.



# Redux

## Impure functions

---

```
var count = 0;
```

```
function increaseCount(val) {  
    count += val;  
}
```

---

```
function getData(val) {  
    fetch(`http://www.someurl.com/${val}`)  
        .then(data => data.json())  
        .then(json => json.people);  
}
```

# Redux

## Pure functions

---

```
function increaseCount(count, val) {  
  count += val;  
  return count;  
}
```

---

```
function filterDataArray(data, filterType) {  
  return data.filter(d => d.type === filterType)  
}
```

# Redux

---

## Example reducer

```
// reducers/people.js

import { ADD_PERSON, DELETE_PERSON } from '../constants';

const initialState = { peopleArray: [{ name: 'Chris' }] }

export default function peopleReducer(state = initialState, action) {
  switch (action.type) {
    case ADD_PERSON:
      return {
        peopleArray: [...state.peopleArray, action.person],
      };
    case DELETE_PERSON:
      return {
        peopleArray: state.peopleArray.filter(p => p.name !== action.person.name),
      };
    default:
      return state;
  }
}
```

# Redux

---

## Example root reducer using combineReducers

The combineReducers helper function turns an object whose values are different reducing functions into a single reducing function you can pass to createStore.

```
// reducers/index.js

import { combineReducers } from 'redux'
import people from './people'

const rootReducer = combineReducers({
  people
})

export default rootReducer
```

# Redux

---

## Example actions

```
// actions.js
```

```
import { ADD_PERSON, DELETE_PERSON } from './constants';
```

```
export function addPerson(person) {  
  return {  
    type: ADD_PERSON,  
    person,  
  };  
}
```

```
export function deletePerson(person) {  
  return {  
    type: DELETE_PERSON,  
    person,  
  };  
}
```

# Redux

---

## Creating the store

`createStore` creates a Redux store that holds the complete state tree of your app.

```
// configureStore.js

import { createStore } from 'redux'
import rootReducer from './reducers'

export default function configureStore() {
  let store = createStore(rootReducer)
  return store
}
```

# Redux

---

Creating the app entry point and tying the store into the app.

Provider makes the Redux store available to the connect() calls in the component hierarchy below.

```
// index.ios.js

import React from 'react'
import {
  AppRegistry
} from 'react-native'

import { Provider } from 'react-redux'
import configureStore from './configureStore'
import App from './app'

const store = configureStore()

const RNRedux = () => (
  <Provider store={store}>
    <App />
  </Provider>
)

AppRegistry.registerComponent('RNRedux', () => RNRedux)
```

# Redux

---

So far we've used three redux specific methods.  
`combineReducers` and `createStore` from `redux`  
`Provider` from `react-redux`



# Redux

---

Wiring redux up to the UI

```
// app.js

import React from 'react';

import {
  StyleSheet,
  Text,
  View,
} from 'react-native';

class App extends React.Component {
  render() {
    return (
      <View style={styles.container}>
        <Text>Hello from my app</Text>
      </View>
    )
  }
}

const styles = StyleSheet.create({
  container: {
    marginTop: 100,
  }
});

export default App
```

# Redux

---

Hooking the component into redux store using the **connect** method from react-redux

**connect connects a React component to a Redux store.**

```
// app.js
```

```
import { connect } from 'react-redux'
```

```
///
```

```
export default connect(  
  (state) => ({ people: state.people }),  
) (App)
```

# Redux

---

## Manipulating the redux state

update imports

```
// app.js
import { connect } from 'react-redux';
import { addPerson } from './actions';
```

# Redux

## Manipulating the redux state

### update UI

```
// app.js
```

```
<View style={styles.container}>
  <Text style={styles.title}>People</Text>

  <TextInput
    onChangeText={text => this.updateInput(text)}
    style={styles.input}
    value={this.state.inputValue}
    placeholder="Name"
  />

  <TouchableHighlight
    underlayColor="#ffa012"
    style={styles.button}
    onPress={this.addPerson}
  >
    <Text style={styles.buttonText}>Add Person</Text>
  </TouchableHighlight>

  {
    this.props.people.peopleArray.map((person, index) => (
      <View key={index} style={styles.person}>
        <Text>Name: {person.name}</Text>
      </View>
    ))
  }
</View>
```

# Redux

---

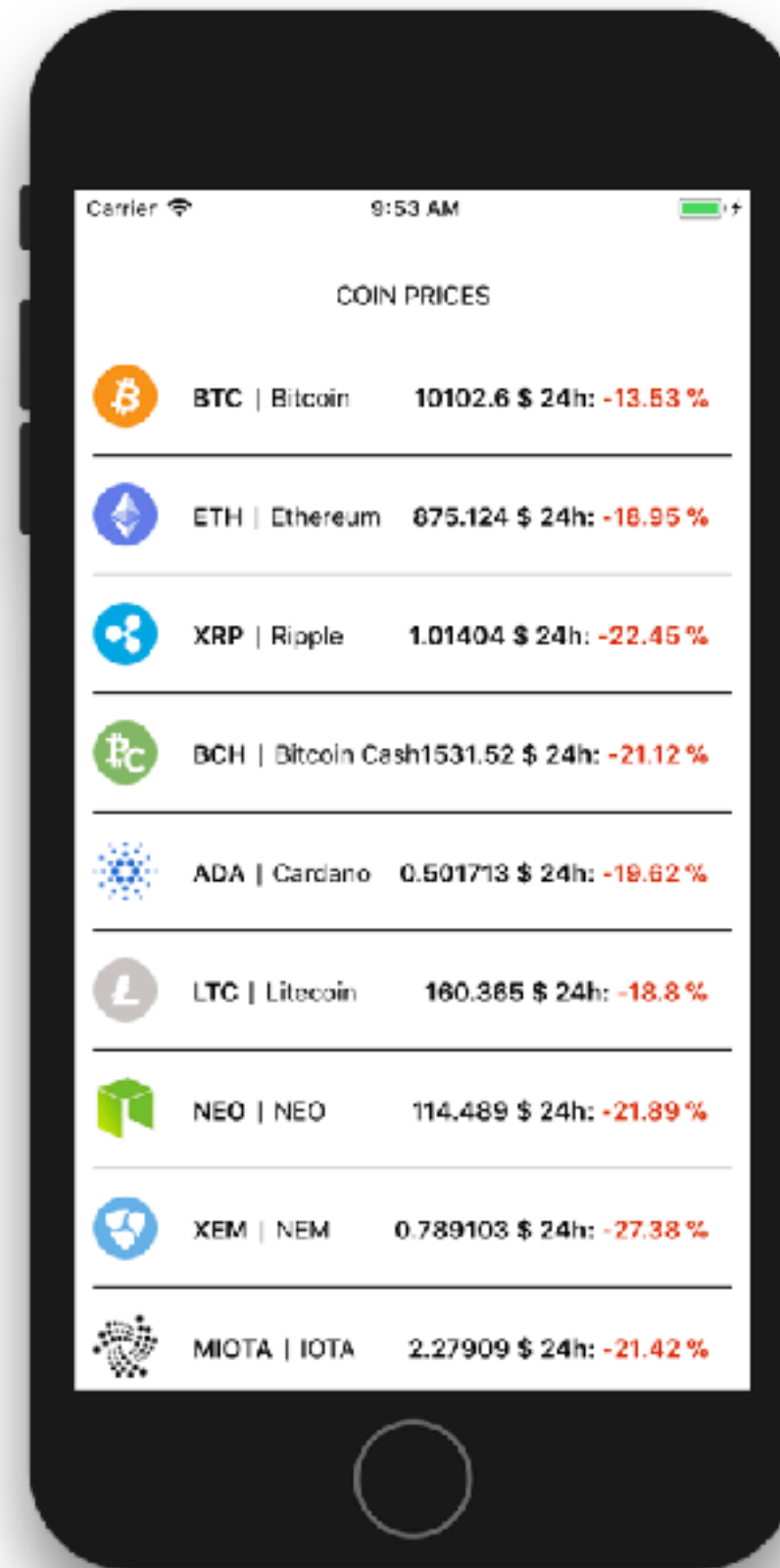
Manipulating the redux state `// app.js`

update connect function

```
function mapStateToProps (state) {  
  return {  
    people: state.people  
  }  
}  
  
function mapDispatchToProps (dispatch) {  
  return {  
    dispatchAddPerson: (person) => dispatch(addPerson(person)),  
  }  
}  
  
export default connect(  
  mapStateToProps,  
  mapDispatchToProps,  
) (App)
```

# Rebuild With Redux

---



<https://github.com/hgale/ComponentAndState>

# Redux

---

An example of a more complicated app (single screen + tabbed navigation) that uses React Native Navigation, Redux:

**<https://github.com/hgale/ReactNativeNavigationExample>**