Managing Local and Remote State

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Agenda

Build a shoe store app

Local state

- useState

Remote state

- Use useEffect for Async calls
- Loading state
- Error handling and error boundaries
- Promises and async/await
- Custom Hooks

Use mostly function components

Installs

Git

Source Control

git-scm.com

Node

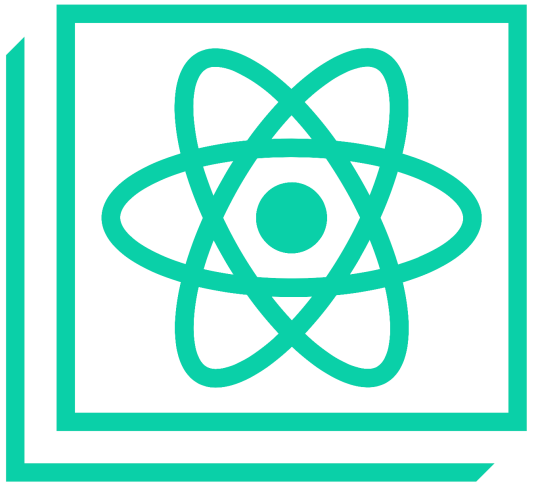
JavaScript outside the browser

nodejs.org

Node 10+ required.

Check your version: node –v

Demo Setup



create-react-app
Generator

VSCode
Editor

Prettier
Code formatter

Demo

Implement shoe listing page

- Why state is necessary
- Fetch and store data
- Handle immutable state
- Implement filter and update state
- Display error page
- Rules of hooks
- Implement custom hook

Demo Caveats

Not using PropTypes or TypeScript

Using plain CSS

I'll provide some code to copy/paste

Hooks API Reference

Hooks are a new addition in React 16.8. They let you use state and other React features without writing a class.

This page describes the APIs for the built-in Hooks in React.

If you're new to Hooks, you might want to check out the overview first. You may also find useful information in the frequently asked questions section.

- Basic Hooks
  - `useState`
  - `useEffect`
  - `useContext`
- Additional Hooks
  - `useReducer`
  - `useCallback`
  - `useMemo`
  - `useRef`
  - `useImperativeHandle`
  - `useLayoutEffect`
  - `useDebugValue`

We'll use these a lot

Dedicated modules

INSTALLATION
MAIN CONCEPTS
ADVANCED GUIDES
API REFERENCE
HOOKS
1. Introducing Hooks
2. Hooks at a Glance
3. Using the State Hook
4. Using the Effect Hook
5. Rules of Hooks
6. Building Your Own Hooks
7. **Hooks API Reference**
8. Hooks FAQ
TESTING
CONCURRENT MODE (EXPERIMENTAL)
CONTRIBUTING
FAQ

Rules of Hooks

Only are for function components

- Can be consumed in classes too

Start with “use”

Only call them at the top level

- Consistent order
- Can’t be called inside functions, conditionals, or loops

Breaking The Rules of Hooks

Nav.js

```
function Nav(props) {
  // WRONG. Can't wrap in conditionals
  if (props.isAdmin) {
    const [role, setRole] = useState('');
  }
  // ...
}
```

Nav.js

```
function Nav() {
  let on = false;
  let setOn = () => {};

  function enableAdmin() {
    // WRONG. Can't nest in func.
    [on, setOn] = useState(false);
  }

  return (
    <button onClick={enableAdmin}>
      Enable admin
    </button>
  );
}
```

Rules of Hooks

Only work in function components

Start with “use”

Only call them at the top level

- Consistent order
- Can’t be called inside functions, conditionals, or loops

Need to run a hook conditionally?

- Place condition *inside* the hook

Synthetic Events

Similar to browser's native event system

Assures events operate consistently cross-browser

Improves performance

Event Handlers

onClick

onChange

onHover

onBlur

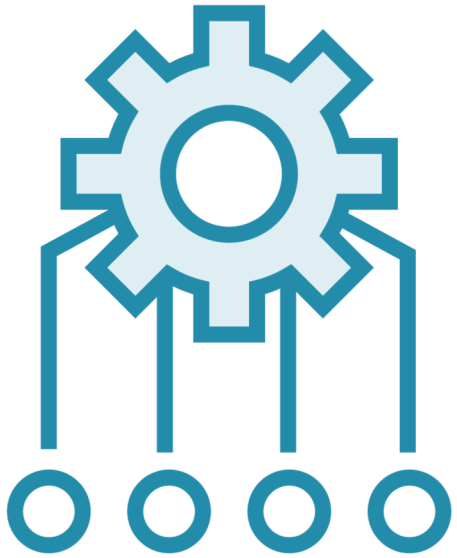
onSubmit

onMouseover

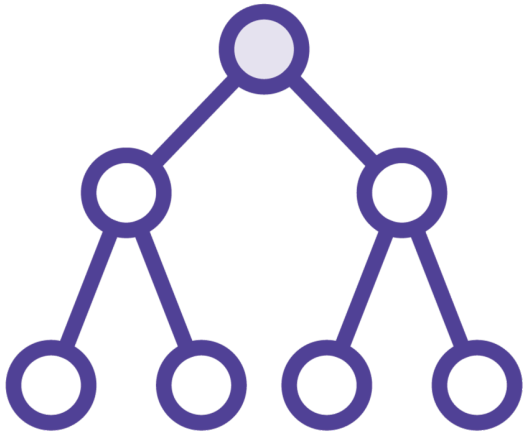
Etc....

When Does React Render?

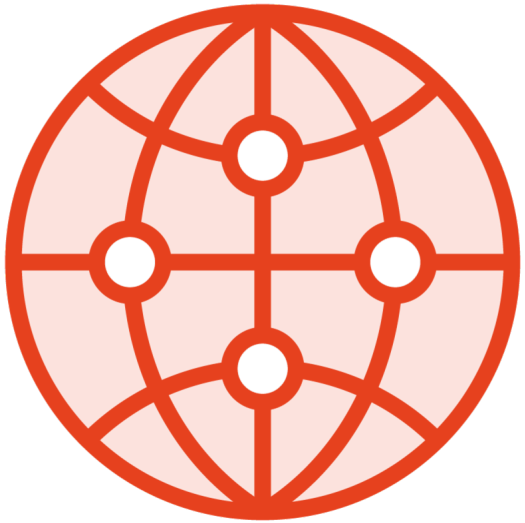
State change



Prop change



Parent renders



Context change

Can skip render via:
shouldComponentUpdate
React.Memo

Can skip render via:
shouldComponentUpdate
React.Memo
PureComponent

Four Ways To Handle HTTP Calls

1 **Inline**

Call fetch/Axios/etc in your component

Not recommended

Maturity Level 1: Inline

```
import React, { useState, useEffect } from "react";

export default function Demo() {
  const [users, setUsers] = useState([]);

  useEffect(() => {
    fetch(`users`)
      .then(resp => resp.json()
      .then(json => setUsers(json));
  }, []);

  return users[0].name;
}
```

Inline calls are hard to handle consistently across the app.

Four Ways To Handle API Calls

1. **Inline**
   Call fetch/Axios/etc in your component
   Not recommended
2. **Centralized functions**
   Call separate function
   We just did this.

Maturity Level 2: Centralized Functions

```
export async function getUsers() {
  const response = await fetch("users");
  if (response.ok) return response.json();
  throw response;
}
```

Maturity Level 2: Centralized Functions

```
import React, { useState, useEffect } from "react";
import { getUsers } from "./services/userService";

export default function Demo() {
  const [users, setUsers] = useState([]);

  useEffect(() => {
    getUsers().then(json => setUsers(json))
  }, []);

  return users[0].username;
}
```

Four Ways To Handle HTTP Calls

1	**Inline**	Call fetch/Axios/etc in your component **Not recommended**
2	**Centralized functions**	Call separate function **We just did this.**
3	**Custom hook**	Create and call your own custom hook **We'll do this later in this module.**
4	**Library**	Call library (react-query, swr, etc) **We'll do this in the final module.**

Four Ways To Handle HTTP Calls

1	**Inline**	Call fetch/Axios/etc in your component **Not recommended**
2	**Centralized functions**	Call separate function **We did this earlier in the module.**
3	**Custom hook**	Create and call your own custom hook **Let's do this next.**
4	**Library**	Call library (react-query, swr, etc)

Inline

```
import { useState, useEffect } from "react";
export default function App() {
  const [products, setProducts] = useState([]);
  const [loading, setLoading] = useState(true);
  const [error, setError] = useState(null);

  useEffect(() => {
    getProducts()
      .then((resp) => resp.json())
      .then((json) => setProducts(json))
      .catch((err) => {
        console.error(err);
        throw err;
      })
      .finally(() => setLoading(false));
  }, []);

  if (loading) return "Loading...";
  if (error) throw error;
  return //JSX HERE
}
```

Custom Hook

```
import React from "react";
import useFetch from "./useFetch";

export default function App() {
  const { data: products, loading, error } = useFetch("products");
  if (loading) return "Loading...";
  if (error) throw error;
  return //JSX HERE
}
```

Maturity Level 4: Library

```
import React from "react";
import { getProducts } from "./services/productService";
import { useQuery } from "react-query";

export default function ReactQueryDemo() {
  const { data, isLoading, error } = useQuery(”products", getProducts);
  if (isLoading) return "Loading...";
  if (error) throw error;
  return data[0].name;
}
```

Summary

Local state

- useState

Remote state

- useEffect
- Async calls
- Promises and async/await
- Loading state
- Declared an Error Boundary
- Error handling and Error Boundaries

Created a custom hook

Next up: Route State