



## Welcome to this session: React Routing

**The session will start shortly...**

Questions? Drop them in the chat.  
We'll have dedicated moderators  
answering questions.



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# Skills Bootcamp Cloud Web Development

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- No question is daft or silly - **ask them!**
- There are **Q&A sessions** midway and at the end of the session, should you wish to ask any follow-up questions. Moderators are going to be answering questions as the session progresses as well.
- If you have any questions outside of this lecture, or that are not answered during this lecture, please do submit these for upcoming Academic Sessions. You can submit these questions here: **Questions**

# Skills Bootcamp Cloud Web Development

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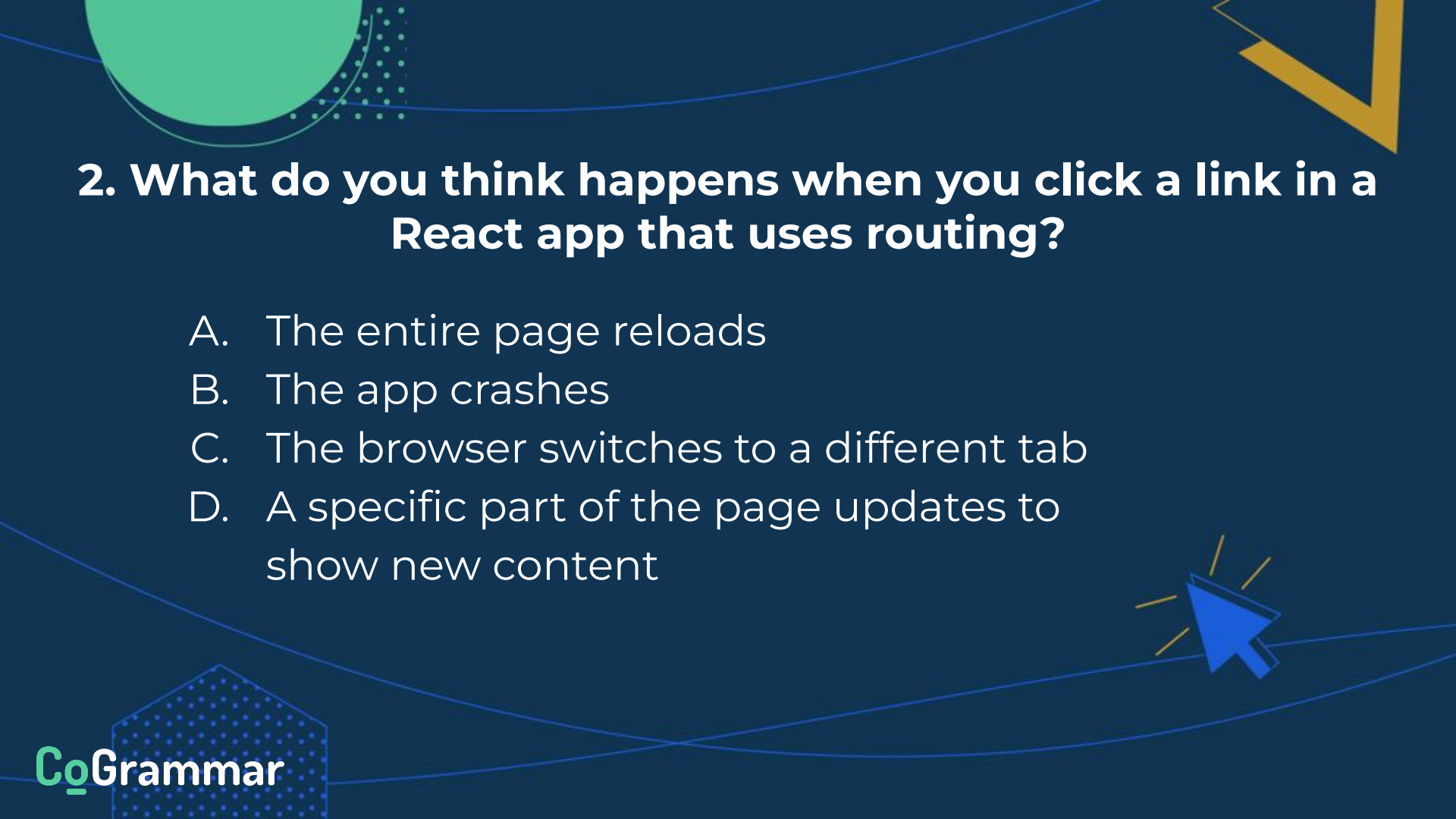
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# 1. What does "routing" mean in the context of a web application?

- A. Styling the application
- B. Deciding how users navigate between different parts of the application
- C. Managing user authentication
- D. Optimizing the app for search engines





## 2. What do you think happens when you click a link in a React app that uses routing?

- A. The entire page reloads
- B. The app crashes
- C. The browser switches to a different tab
- D. A specific part of the page updates to show new content

## Learning Outcomes

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- Understanding the concept of Routing and its purpose in web applications.
- Configure Routing using react-router-dom and understand it's core components.
- Implement basic routing by setting up routes for different components as pages.
- Handling dynamic routing and pass state values using inbuilt hooks from react-router-dom



# Routing

## Definition and Use Cases

- ❖ Routing can be termed as the **conditional rendering** of components based on the **URL** in the browser.
- ❖ Routing allows users to **navigate between different pages or views** within a web application.
- ❖ Routing with plain HTML/CSS used to be **file based**, the anchor (`<a></a>`) were used to create hyperlinks that link to different web pages which were the different (.html) files in your project.



# Routing in React

- ❖ In the context of React, **client side routing** is executed.
- ❖ This allows your app to **update the URL from a link click** without making another request for another document from the server, making your application **render immediately**.
- ❖ In simple terms, routing in React involves **dynamically updating the content** of the website without reloading the entire page.
- ❖ Routing in React is mostly implemented using **routing libraries** or frameworks. Two common libraries in use for a seamless routing experience are **React Router DOM** and **Reach Router**.

# React Router DOM

Achieves client side routing in your React application by using its inbuilt routing APIs.

- ❖ To use React Router in your application, you need to install it first using npm or yarn

```
Terminall.sh

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

# Configuration

- ❖ After installing React Router, you need to configure your app to use it. This will be done in the root of your Javascript file (`main.js`).

```
index.js

7  //other React imports
8  import { createBrowserRouter, RouterProvider } from 'react-router-dom';
9
10 const paths = createBrowserRouter([
11   {
12     path: '/',
13     element: <h1>Hello World</h1>
14   }
15 ])
16
17
18 const root = ReactDOM.createRoot(document.getElementById('root'));
19 root.render(
20   <React.StrictMode>
21     <RouterProvider router={paths} /> {/** replaced <App/> */}
22   </React.StrictMode>
23 );
```

# React Router APIs

- ❖ From the configuration example shown, we made two important imports:
  1. **createBrowserRouter**: this configures Browser Router which enables client side Routing in our React application.
    - It is a function that takes in a list of available paths in our application, the paths will be defined by objects.
    - Currently, we've only created one path which is the home path using a '/' and it renders a `<h1>` text saying Hello World.

# React Router APIs

2. **RouterProvider:** All path objects created by the `createBrowserRouter` API are passed to the provider component as a value of the `router` prop to render your app and enable routing.
- ❖ After this configuration, upon running your React server, you will have a text displaying Hello World on the home page.



# Multiple Pages

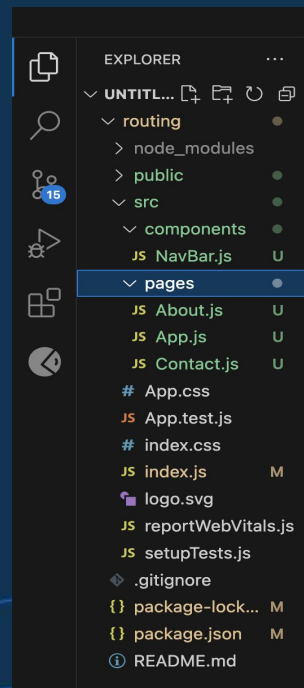
- ❖ Having multiple pages in our React app is one of the main achievements of routing.
- ❖ We do this by creating **other path objects** and **pointing** the path elements to their specific components.
- ❖ The **element property** of the path object will be replaced by a **React component from your project**.
- ❖ In this case, we have three components representing three pages and all are stored in a folder called pages for best practice purpose.



# Multiple Pages

```
index.js
6 //other React imports
7 import App from './pages/App';
8 import About from './pages/About'
9 import Contact from './pages/Contact'
10 import { createBrowserRouter, RouterProvider } from 'react-router-dom';
11
12 const paths = createBrowserRouter([
13   {
14     path: '/',
15     element: <App/>
16   },
17   {
18     path: '/about',
19     element: <About/>
20   },
21   {
22     path: '/contact',
23     element: <Contact/>
24   }
25 ])
26
27
28 const root = ReactDOM.createRoot(document.getElementById('root'));
29 root.render(
30   <React.StrictMode>
31     <RouterProvider router={paths} />
32   </React.StrictMode>
33 );
```

Folder structure:





# Navigating through React Router pages

- ❖ For hyperlinks, we are used to utilizing the `<a>` tag in HTML. Using `<a href="">` causes a page refresh which can lead to losing an application's state.
- ❖ To achieve complete client side routing with React Router, we use its `<Link>` element to navigate from page to page. Instead of the `{href='/path'}` attribute in `<a>` tags, the link element provides a `{to='/path'}` property to direct the link to the desired URL path.
- ❖ The `<Link>` element does not cause a page refresh hence the application's state cannot be lost.

# Example

**Note that the structure of the App component is also implemented on the About and Contact component**

- ❖ The { Link } element is imported from 'react-router-dom'
- ❖ You can also use { NavLink } to know whether a page is active or not.

```
NavBar.js

1  import { Link } from "react-router-dom"
2
3  const NavBar = () =>{
4    return (
5      <nav>
6        <Link to="/">Home</Link>
7        <Link to="/about">About</Link>
8        <Link to="/contact">Contact</Link>
9      </nav>
10    )
11  }
12
13  export default NavBar
```

```
App.js

1  import NavBar from "../components/NavBar"
2
3  function App () {
4    return (
5      <section>
6        <NavBar/>
7        <h1>Home</h1>
8      </section>
9    )
10  }
11
12  export default App
```

# Dynamic Routing

- ❖ Dynamic routing is a way of rendering a new component by updating a particular segment in the URL called params.
- ❖ We achieve this by adding `{:id}` to the path, the colon section of the path will represent the dynamic segment. The suffix of the path will be replaced by respective path id or name.
- ❖ Note that you can name the id to anything as long as it rhymes with the intention. i.e `{:itemId}`, `{:userId}`.

# Example

index.js

```
6 //other React imports
7 import App from './pages/App';
8 import About from './pages/About'
9 import Contact from './pages/Contact'
10 import User from './pages/User';
11 import { createBrowserRouter, RouterProvider } from 'react-router-dom';
12
13
14 const paths = createBrowserRouter([
15   {
16     path: '/',
17     element: <App/>
18   },
19   {
20     path: '/about',
21     element: <About/>
22   },
23   {
24     path: '/contact',
25     element: <Contact/>
26   },
27   {
28     path: '/user/:userId', //dynamic path, has the /:userId suffix
29     element: <User/>
30   }
31 ])
32 //other configurations
```

NavBar.js

```
1 import { Link } from "react-router-dom"
2
3 const NavBar = () =>{
4   return (
5     <nav>
6       <Link to="/">Home</Link>
7       <Link to="/about">About</Link>
8       <Link to="/contact">Contact</Link>
9       <Link to="/user/1">User 1</Link>
10      <Link to="/user/2">User 2</Link>
11      <Link to="/user/3">User 3</Link>
12    </nav>
13  )
14 }
15
16 export default NavBar
```

# useParams() Hook

- ❖ The useParams hook returns an object of key/value pairs of the dynamic params from the current URL matched by the dynamic path.
- ❖ We created a `User.js` component that utilized the useParams to access the params of the `{ /user/:userId }` path.

```
●●● User.js

1  import { useParams } from "react-router-dom";
2
3  const User = ()=>{
4    const { userId } = useParams()
5    return (
6      <section>
7        User: { userId }
8      </section>
9    )
10 }
11
12 export default User;
```

# Passing State Variables

- ❖ State can be passed via the `<Link>` element in the same way we pass props to components. We use an extra prop called `{state}`.
- ❖ State can also be passed via a `useNavigate` hook provided by React Router which returns a function that lets you navigate programmatically.
- ❖ To access the state, we use a `useLocation` hook which returns a location object with the state property containing the state passed from the component.



# Passing State

Using `<Link state={data}>`

```
NavBar.js

1 import { Link } from "react-router-dom"
2
3 const NavBar = () =>{
4
5   const user1 = {
6     id: 1,
7     name: 'user1',
8     role: 'Frontend Developer'
9   }
10  const user2 = {
11    id: 2,
12    name: 'user2',
13    role: 'Backend Developer'
14  }
15
16  return (
17    <nav>
18      <Link to="/">Home</Link>
19      <Link to="/about">About</Link>
20      <Link to="/contact">Contact</Link>
21      <Link to="/user/1" state={user1}>User 1</Link>
22      <Link to="/user/2" state={user2}>User 2</Link>
23      {/**other Link tags */}
```

Using `useNavigate` hook

```
NavBar.js

1 import { Link, useNavigate } from "react-router-dom"
2
3 const NavBar = () =>{
4   const navigate = useNavigate()
5
6   const user1 = {
7     id: 1,
8     name: 'Dan',
9     role: 'Frontend Developer'
10  }
11  const user2 = {
12    id: 2,
13    name: 'Walobwa',
14    role: 'Backend Developer'
15  }
16
17  const handleNavigatestate = (id, userData)>{
18    navigate(`/user/${id}`, { state: userData})
19  }
20
21
22  return (
23    <nav>
24      <Link to="/">Home</Link>
25      <Link to="/about">About</Link>
26      <Link to="/contact">Contact</Link>
27      <button onClick={()=>handleNavigatestate(user1.id, user1)}>User 1</button>
28      <button onClick={()=>handleNavigatestate(user2.id, user2)}>User 2</button>
29      {/**other Link tags */}
```



# useLocation hook

- ❖ The useLocation hook is used to access the state passed from its respective dynamic path. We access state from the location object returned by the useLocation hook.
- ❖ You need to import useLocation from React Router in order to use it. This gives access to data passed from both the <Link> element and the useNavigate hook.

```
1  import { useParams, useLocation } from "react-router-dom";
2
3  const User = ()=>{
4    const { userId } = useParams()
5
6    //accessing state using use location
7    const location = useLocation()
8    const userData = location.state
9    return (
10     <section>
11       <p>User: { userId }</p>
12       <p>Name: { userData.name}</p>
13       <p>Role: { userData.role}</p>
14     </section>
15   )
16 }
17
18 export default User;
```



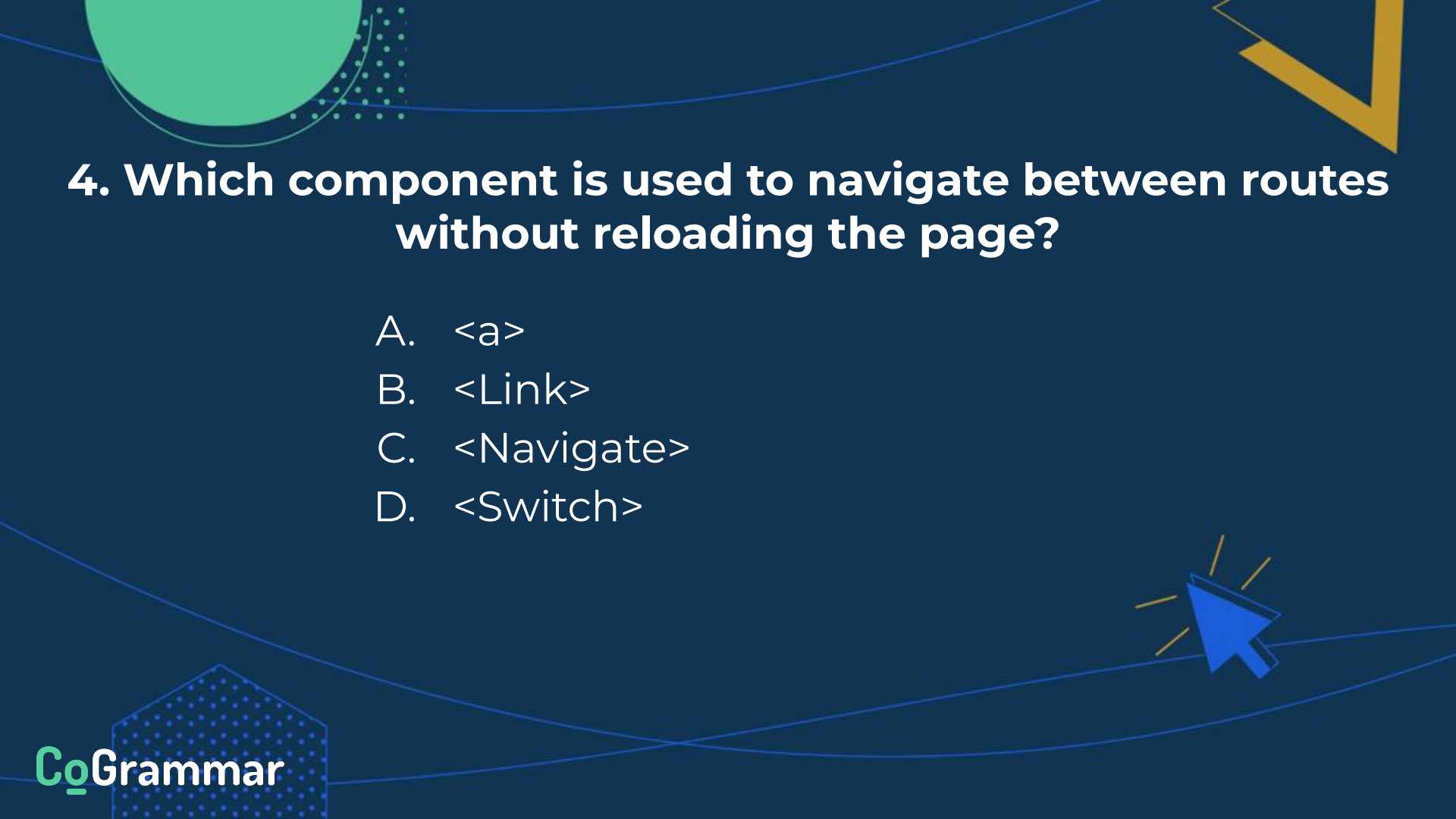
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### 3. Which component is used to define routes in React Router DOM?

- A. <Route>
- B. <RouterLink>
- C. <Switch>
- D. <Navigation>



**4. Which component is used to navigate between routes without reloading the page?**

- A. `<a>`
- B. `<Link>`
- C. `<Navigate>`
- D. `<Switch>`

# Questions and Answers





# Thank you for attending



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