

React and SPA - Theory Summary

Define SPA and its Benefits

SPA (Single Page Application) is a web application or website that interacts with the user by dynamically rewriting the current page rather than loading entire new pages from a server.

Benefits of SPA:

- Faster user interactions after initial load
- Better performance and responsiveness
- Efficient use of bandwidth
- Simplified development and deployment
- Easier to build into a Progressive Web App (PWA)

Define React and Identify Its Working

React is a JavaScript library developed by Facebook for building user interfaces. It enables developers to create large web applications that can update and render efficiently in response to data changes.

React works by:

- Breaking UI into reusable components
- Using a virtual DOM to track changes
- Efficiently updating only the parts of the DOM that changed

Differences Between SPA and MPA

SPA (Single Page Application):

- Loads a single HTML page and dynamically updates it
- Uses frontend frameworks like React, Angular, Vue
- Fast navigation and fewer full-page reloads
- More complex SEO handling

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MPA (Multi Page Application):

- Loads a new HTML page on each navigation
- Traditional model with server-side rendering (PHP, Java, etc.)
- Easier SEO, but slower navigation due to page reloads

Pros and Cons of Single-Page Application

Pros:

- Fast and responsive UI
- Better user experience
- Efficient rendering with virtual DOM

Cons:

- SEO is harder to implement
- Initial load can be slow
- Heavily reliant on JavaScript

Explain About React

React is a declarative, component-based JavaScript library for building UIs. It promotes reusability and modular development using components and JSX syntax. It is widely used for SPAs and allows developers to manage application state effectively.

Define Virtual DOM

Virtual DOM is a lightweight, in-memory representation of the real DOM. React creates this virtual DOM and updates it whenever state or props change. It then compares the virtual DOM with the previous version using a process called "diffing" and updates only the necessary parts of the real DOM.

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Features of React

- Declarative UI development
- Component-based architecture
- Uses JSX (JavaScript + XML)
- Virtual DOM for performance
- Unidirectional data flow
- Large ecosystem and community support