

1) Define SPA and its benefits

A Single-Page Application (SPA) 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. In an SPA, all necessary HTML, CSS, and JavaScript code is either retrieved with a single page load or dynamically loaded and added to the page as needed.

2) Define React and identify its working

React is a free, open-source JavaScript library primarily used for building user interfaces, especially for single-page applications.

Component-Based Architecture

- UI is built as a collection of independent, reusable components.
- Components can be nested and combined to create complex user interfaces.
- Each component manages its own logic and rendering, making applications easier to develop and maintain

JSX (JavaScript XML)

- Developers write UI code in a syntax called JSX, which looks similar to HTML but is used within JavaScript

Virtual DOM

- React uses a Virtual DOM.
- When data changes, React creates a new Virtual DOM, compares it with the previous version, and calculates the differences

3) Identify the differences between SPA and MPA

SPA : Loads a single HTML page and dynamically updates content

MPA : Loads a new, separate HTML page for each section or navigation—each interaction is a reload.

4) Explain Pros & Cons of Single-Page Application

Pros:

- Feels fast and seamless with near-instant transitions due to dynamic content loading.
- Easier to enable via service workers and client caching.

Cons:

- Less SEO-friendly by default.
- Heavy use of JavaScript frameworks.

5) Define virtual DOM

The virtual DOM is a core concept in React. It is an in-memory, lightweight representation of the actual DOM of a web page. Instead of making direct and frequent updates to the real browser DOM which can be slow and inefficient, React builds a virtual DOM as a JavaScript object that mirrors the structure of the actual DOM

6) Explain Features of React

- Component-Based Architecture
- Declarative UI
- Virtual DOM
- JSX (JavaScript XML)
- Unidirectional Data Flow