

## Objectives

### Define SPA and Its Benefits

- **SPA (Single-Page Application)** is a web app that dynamically updates a single HTML page instead of loading new pages from the server.
- **Benefits:**
  - Faster navigation and better user experience.
  - Reduces server load.
  - Efficient for dynamic content rendering.

### Define React and Identify Its Working

- **React** is a JavaScript library for building user interfaces, developed by Facebook.
- It uses components to build UI elements and updates the UI efficiently using a virtual DOM.
- React renders UI based on changes in state or props

### Differences Between SPA and MPA

Feature	SPA	MPA
Page Loading	Loads a single page	Loads a new page per request
Speed	Faster	Slower
Navigation	Handled on client-side	Handled on server-side
Use Case	Dashboards, Web apps	Traditional websites, Blogs

### Pros & Cons of Single-Page Application

#### Pros:

- Better performance once loaded.
- Smooth user experience.
- Can work offline with service workers.

#### Cons:

- Slower initial load.
- SEO challenges.
- Complex routing and state management.

## Explain About React

React is:

- **Component-based:** Breaks UI into reusable pieces.
- **Declarative:** You describe what the UI should look like.
- **Efficient:** Updates and renders only what's necessary.

## Define Virtual DOM

- **Virtual DOM** is a lightweight copy of the real DOM.
- React updates the virtual DOM first, compares it with the previous one (diffing), then updates only the changed parts in the real DOM (reconciliation), which improves performance.

## Features of React

- JSX (JavaScript + XML)
- Components
- One-way data binding
- Virtual DOM
- Hooks for state and lifecycle