Single Page Application (SPA)

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- A Single Page Application (SPA) is a web application that interacts with the user by dynamically rewriting the current web page with new data from the web server, instead of the default method of the browser loading entire new pages from the server.[1]

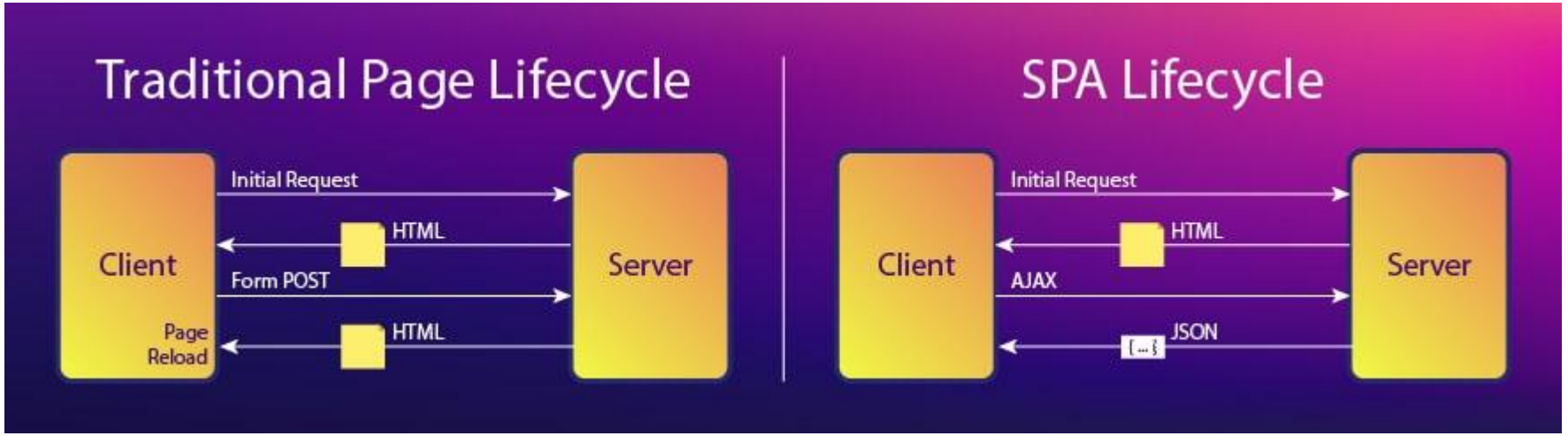
- All required HTML, JS, and CSS code is retrieved by the browser with a single page load. Thereafter, based on user request additional resources are dynamically loaded and added to the page.

- Markup and data are requested independently

- Aims at providing seamless UX - no page reloads, no extra wait time, uninterrupted UX between successive pages, making the application behave more like a native application

Text Courtesy: [1] https://en.wikipedia.org/wiki/Single-page_application

How SPA works



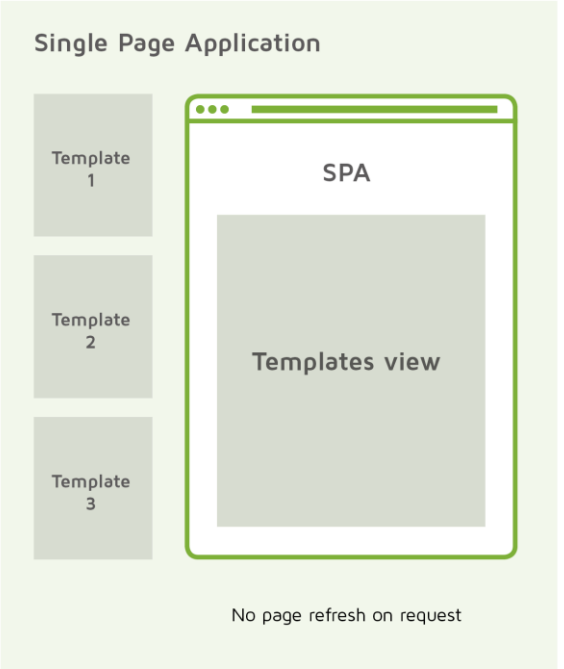


Image Courtesy: https://images.app.goo.gl/in7oYDQvZTbc297d8 and https://images.app.goo.gl/MdECj5hsSd5xXqqZ6

Pros & Cons of SPA

Pros

- Fast, as most resources (HTML, CSS, Scripts) are only loaded once and only data is transmitted back and forth
- Enhanced User Experience
- Highly Cached Application
- Decoupled Front and Back-end
- Less load on server
- Debugging becomes simpler, especially within the Chrome browser's inspection function

Cons

- Slow speed of initial load
- JavaScript dependency in browser
- Less secure due to Cross-Site Scripting (XSS)
- Memory leak in JS can cause system slow down
- SEO is tricky
- Difficult to analyze user behavior
- No browser history

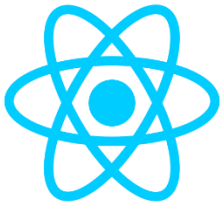
When to use SPA and when not

	Use SPA	Don't use SPA
Want a rich interaction between the user and your application	✓	✗
Want to provide real-time updates on the page	✓	✗
Small / Mid-size applications involving small data volumes	✓	✗
Application content is purely static (like a static website)	✗	✓
Application involves dynamic content loading	✗	✓
SaaS platforms, social networks, and closed communities where SEO doesn't matter	✓	✗
Enterprise-based application involving complex requirements	✗	✓

SPA Frameworks

Some frameworks/ libraries that can be used to create single-page applications

ANGULAR



REACT

VUE

EMBER

POLYMER

BACKBONE

AURELIA

KNOCKOUT

METEOR