SPA (Single Page Application)

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Introduction

- As you all may know, the content you see in your browser is formed from a combination of HTML, JavaScript, Cascading Style Sheets (CSS), and plugins determined by the required content and functionality.
- A Single-page application (SPA), also known as a single-page interface (SPI), is a web application or website that fits on a single web page with the goal of providing a more fluid user experience.

History

- When the web was born it was originally only hypertext documents linked together. Then there was an introduction of a forms tag which started the “web applications” era.
- And even though the world is slowly moving from browser-based web applications into the mobile domain, there are still two major design patterns that exist for web applications development – multi page web applications (MPA) and single page web applications (SPA).
- MPA is a traditional kind of web application. This means that every time the application needs to display the data or submit data back to server it has to request a new page from the server and then render it in the web browser.
- Ten years later the SPA pattern emerged. SPA is essentially an evolution of the MPA+AJAX design pattern, where the only shell page is generated on the server and all UI is rendered by browser JavaScript code.
- SPA requests the markup and data separately, and renders pages directly in browser. We can do this because of the new advanced MVVM JavaScript frameworks emerged like AngularJS , React JS and KnockoutJS.

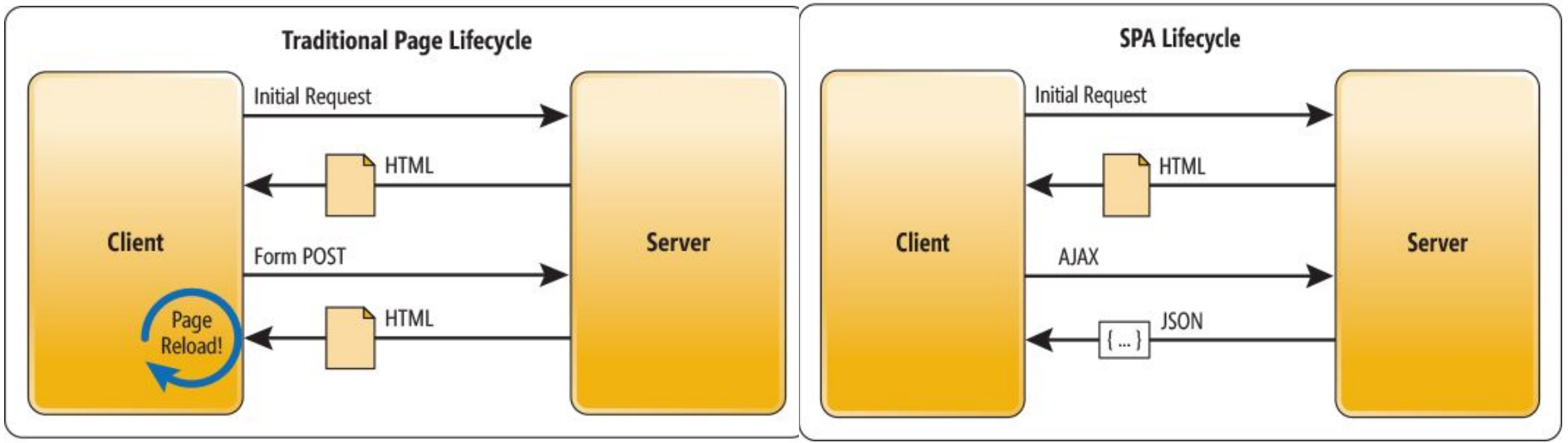
What is SPA ?

- Single Page Application(SPA) is a web application that fits on a single web page with dynamic actions without refreshing the page.
- Single Page Application interactions can be handle without reaching server.
- Single Page Application can improve performance in several ways like loading time, using AJAX, easy to navigate pages etc.
- End users will be more comfortable with Single Page Application, It is very easy to navigate to different page and filter content.
- There are many tricks and technique can use to build awesome Single Page Application.
- AngularJS is one of the more popular Single Page Application framework among others.

What is AJAX ?

- Asynchronous JavaScript and XML(AJAX).
- It is not a programming language.
- AJAX is the method of exchanging data and updating in website without refreshing the page.

The Traditional Page Lifecycle vs. the SPA Lifecycle



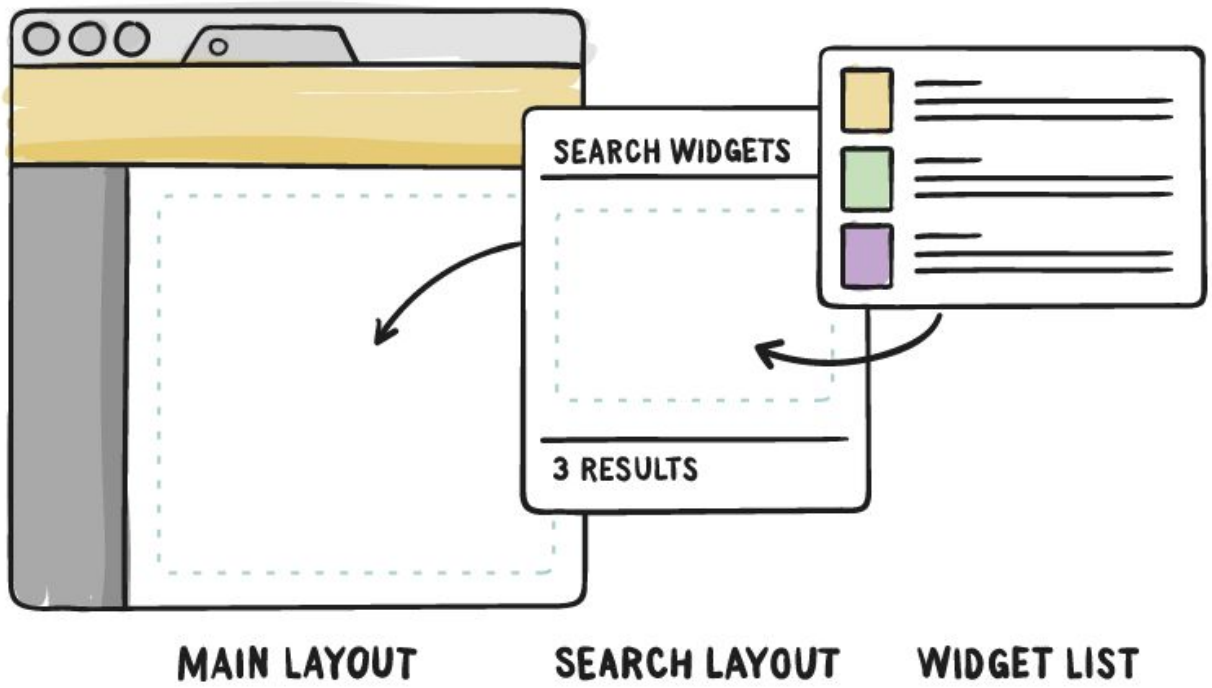
Where does the “Single Page” Come in?

- The core concept behind a Single Page Application is that the browser only uses one URL.
- That means you can bounce around the site, fill out forms, or conduct any normal activity without the location in your browser’s address bar ever changing.
- It’s a simple thing from the user’s perspective, but it has big implications for the programmer.

Object-oriented Design to the Rescue!

- In SPAs, JavaScript is used to create a mini content organization system within the browser.
- Now the JavaScript on the page is in charge of the HTML and this makes a developer's life much easier, with a little help from their favorite framework.
- Using object-oriented design principles, rich JavaScript architectures can be created to manage the user's experience with the content instead of playing catch-up to the constant back and forth hand-off between JavaScript and HTML.

Component based Structure



SPA advantages over MPA

- Faster page loading times
- Improved user experience because the data is loading in the background from server
- No need to write the code to render pages on the server
- Decoupling of front-end and back-end development
- Simplified mobile development; you can reuse the same backend for web application and native mobile application

Any queries? Open to Q&A

Thank You