Single Page Applications

Diego Cardozo

github.com/diegocard/SPA-Presentation

Agenda

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Motivation (1)

One of the main aspects that influence user experience is load time.

- We use many techniquest to make it quicker:
  - Minimize scripts and CSS
  - Combine images in a single sprite
  - Delay JavaScript execution
  - Handle static files separately (CDN)
  - Resource cache

Motivation (2)

However, even with cache the browser must:

- Re-parse and execute CSS and JavaScript code.
- Download and parse the whole page HTML.
  - Even when only a little part changed.
- Rebuild the DOM tree.
- Render the UI.
- The user sees the page being constructed as he waits.

Motivation (3)

To sum up, SPA is an answer to the following questions:

- ¿How can we achieve a more efficient behavior?
- ¿Can we only load what's new or necessary?
- ¿How can we improve user experience?

Introduction (1)

What is a SPA?

- It is a new approach to building web applications.
- The whole source code is either loaded initially or afterwards dynamically, without reloading the page.
- Navigation is resolved on the client side.
- Server calls are done asynchronously.
- UI is built on the client side.

Introduction (2)

What is NOT a SPA

- Join all webpages for the site and load them statically.
- Black or white, hybrid approaches do exist.
- A silver bullet: it might not be a good idea for some projects.

Introduction (3)

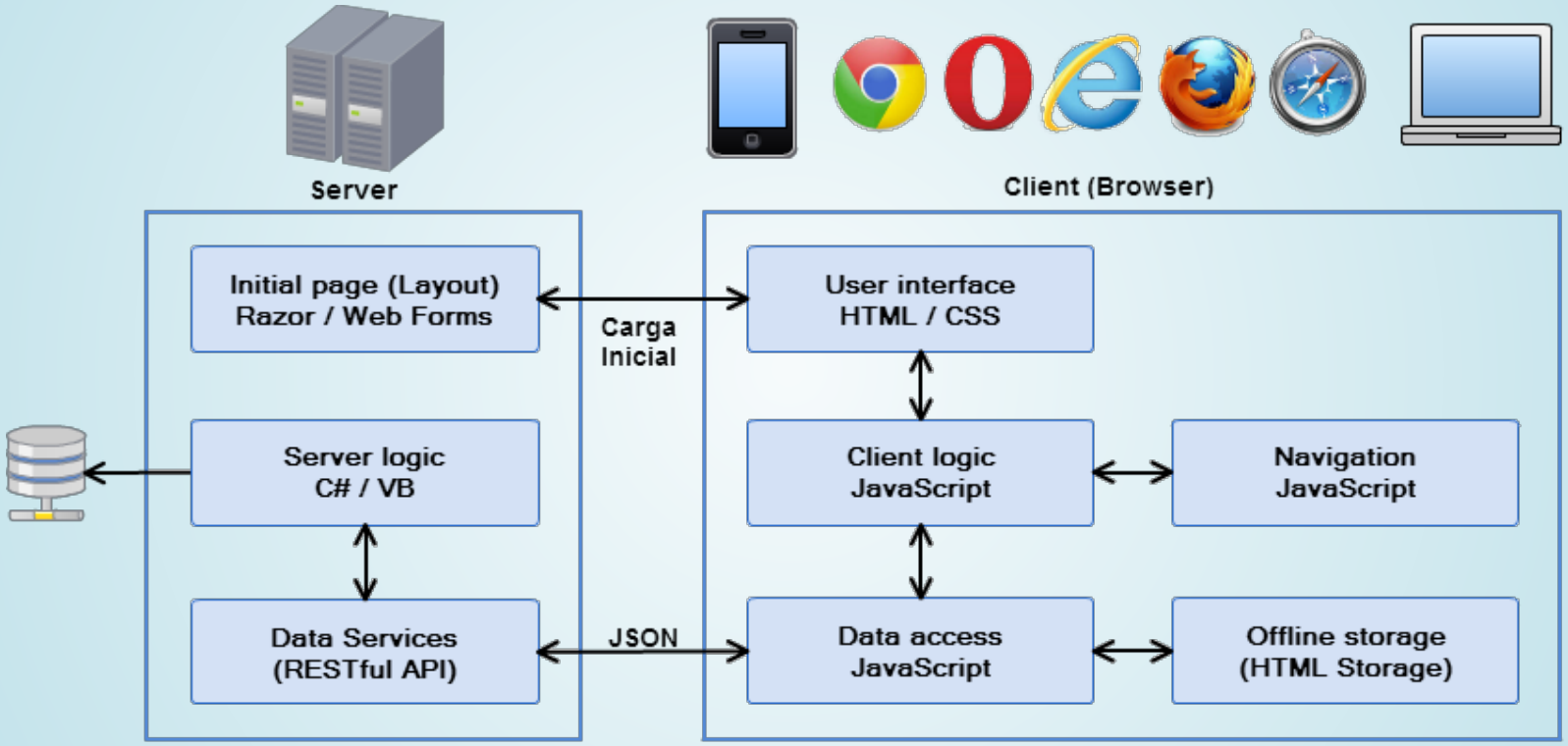
What can a SPA do?

- Show URL changes and navigate forward and backward.
- Manipulate the DOM on the client side.
- Wait for the view to load before showing it.
- Store previously loaded pages on the client.

Examples

- GMail
- **Stashy**
- **Nogginator**
- This presentation

Architecture



Advantages and disadvantages (1)

Advantages

- Faster and slicker UI.
- Easier maintenance.
- Better load distribution.
- The beginning of the development process is faster.
- UI is simply another client.
- Great for testing.
- Perfect approach to combine with mobile applications.

Advantages and disadvantages (2)

Disadvantages

- The initial load can be slow.
- SEO can become complex.
- Requires JavaScript to be enabled.
- Requires additional JavaScript knowledge.
- Breaks analytics, ads and widgets conventions.

Advantages and disadvantages (3)

Other aspects

- We move non-critic business logic to the client.
- Our code used to be90% C#/VB and 10% JS.
- Now it will be 50/50.

This isn't necessarily an advantage or disadvantage, but we will need a different set of tools to maintain good practices.

Tools (1)

Client side development

Frameworks

- Durandal
- Angular
- Ember

Routing

- Sammy
- History

Testing

- QUnit
- Jasmine

View management

- Knockout
- Backbone

Data management

- Breeze
- Amplify

DOM management

- jQuery
- Prototype
- Google closure

Tools (2)

Knockout.js

- Created by Steve Anderson
  - ASP.NET PM for Microsoft.
- Uses MVVM, a design pattern created by John Smith
  - Microsoft MVP for his work in WPF.
- It can be even used when we are not developing SPA.
- Included with MVC's default templates.

Tools (3)

Server side development

- En MVC, nuestros controladores pasan a ser ApiControllers para definir un API RESTful.
- Implementamos una sola vista (layout).
- No vamos a utilizar Razor para renderizar las vistas.
- Vamos a ver un template para Visual Studio que trae un proyecto pre-configurado para SPA (Hot Towel SPA).

Demo (1)

- Start from John Papa's Hot Towel SPA template
- Tour through at Durandal's main components
  - Analyzing each component in depth takes too long.
- We take a look at how the RESTful API is implemented
  - Exposes user data.
- We add a new functionality (sessions).
  - Tour through client code.
  - Mention the most important libraries.

Demo

github.com/diegocard/SPA-Demo

Resources

- learn.knockout.com
- singlepageappbook.com
- todomvc.com
- johnpapa.net
- slideshare.net/dcslides/spa-25806613

If you want to know more

Questions?