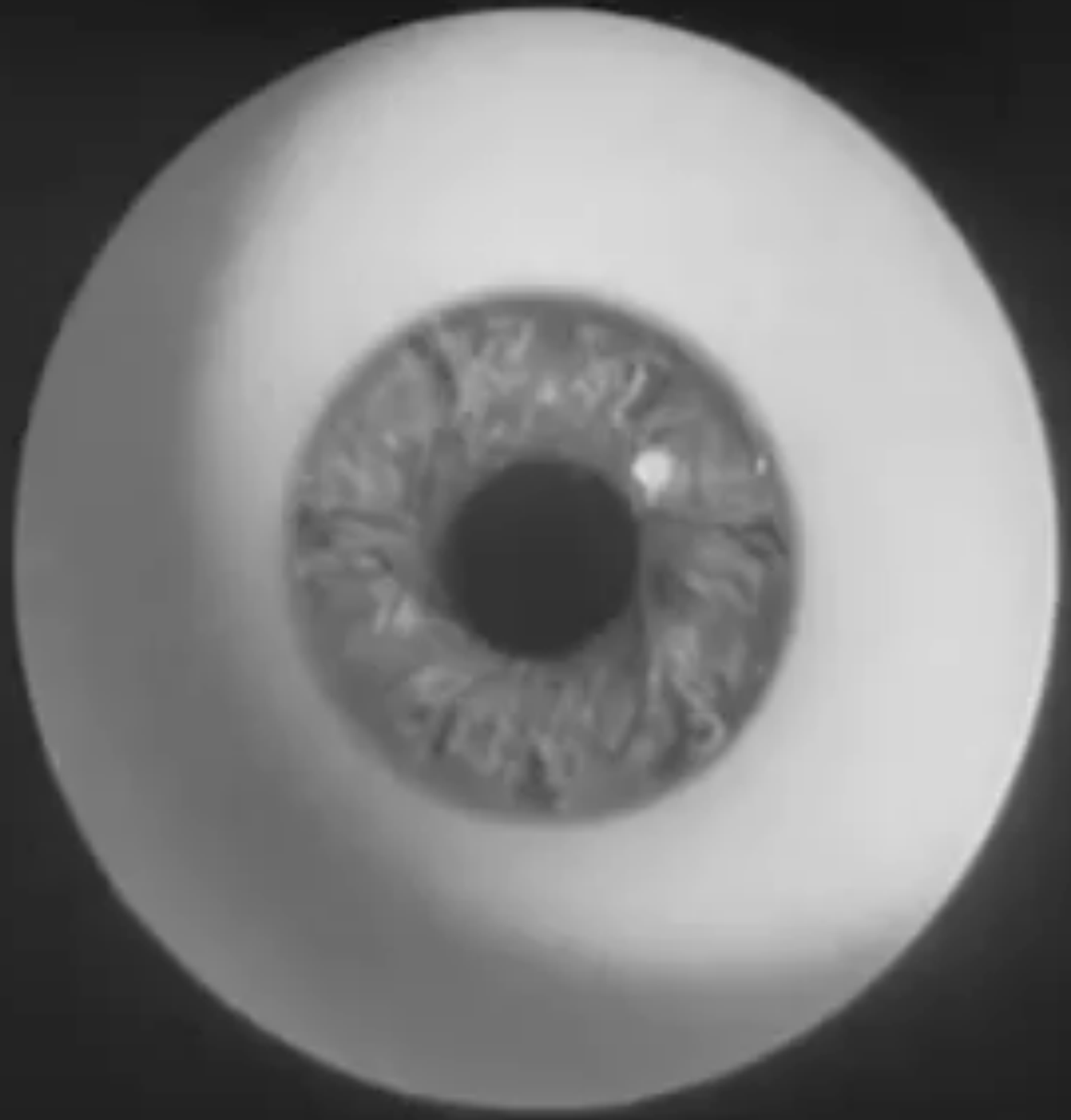
Single Page Applications

done right

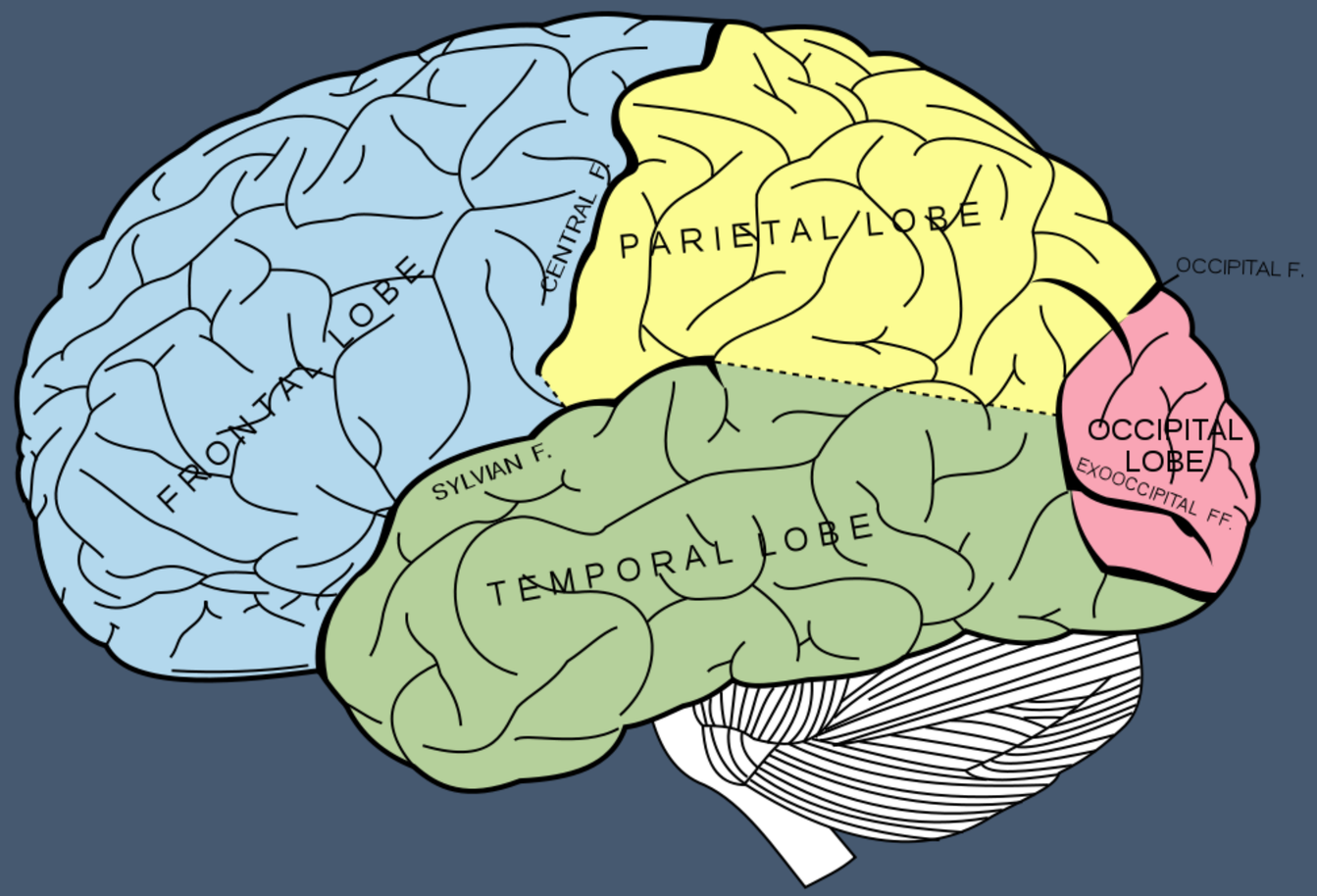
@eduardolundgren

HOW TO LOSE WEIGHT in the browser

Perceived performance



Persistence of vision


FRONTAL LOBE
CENTRAL F.
PARIETAL LOBE
OCCIPITAL F.
OCCIPITAL LOBE
EXOOCCIPITAL FF.
SYLVIAN F.
TEMPORAL LOBE

Real time

24 frames
per second

41 milliseconds
per frame

60 fps

24 fps

User Perspective

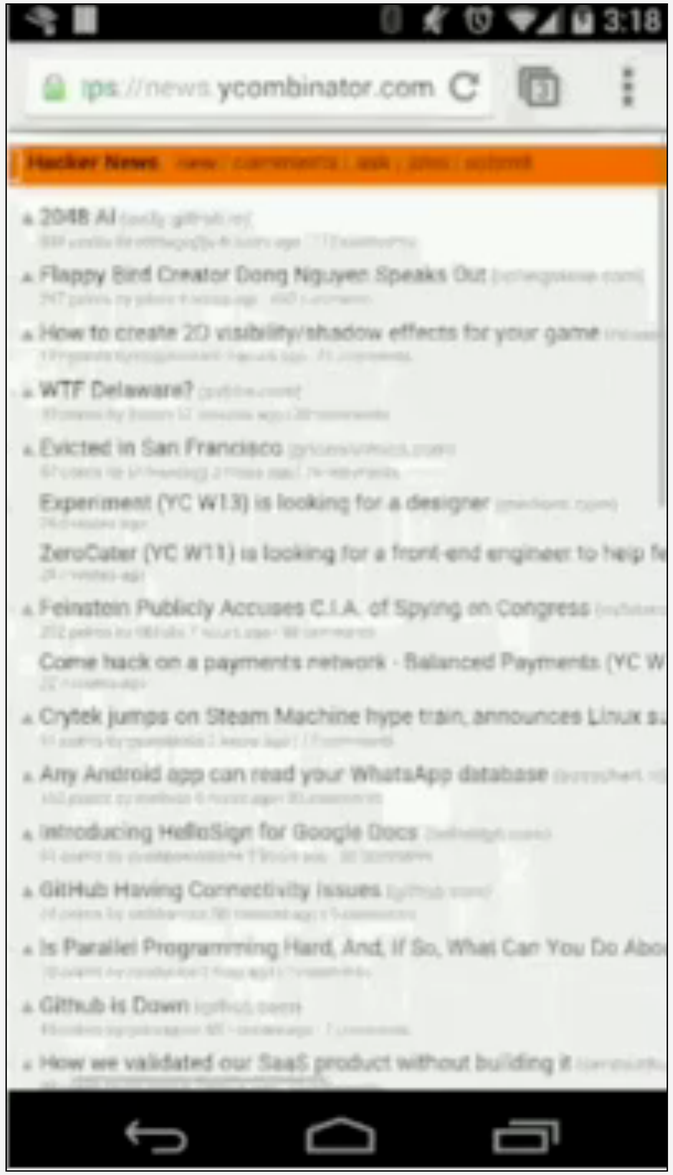
Interval	User perspective
0 - 100 milliseconds	Instant
100 - 300 milliseconds	Perceptible delay
300 - 1000 milliseconds	Task Focus, Perceptible delay
1+ second	Mental context switch
10+ seconds	I'll come back later

10 milliseconds on an e-commerce can reduce sales.

10 milliseconds can make a really good game into a really bad game.

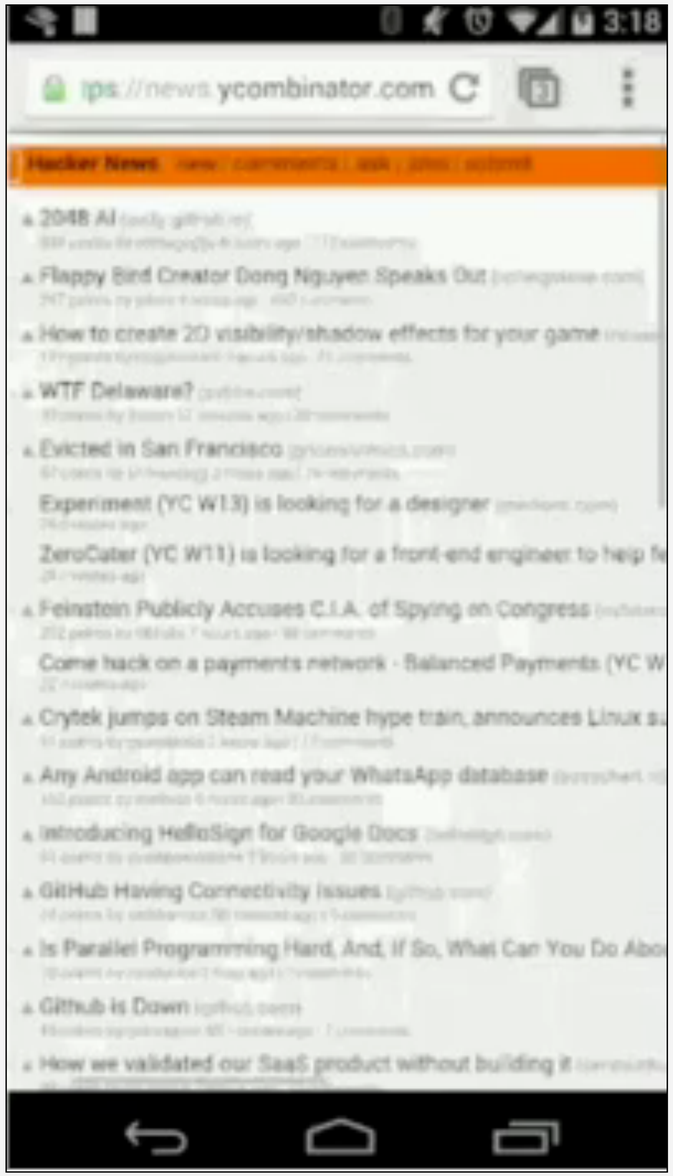
Hacker News, technically, it's fast

- 10KB of HTML
- 3KB of CSS
- 500Bytes of GIFs
- First render in <500ms



What is the problem?

- The page loads really fast, but I can't read anything
- Needs to zoom and scroll
- The perceived performance is actually 5+ seconds



~~Page **load time**~~

Task completion

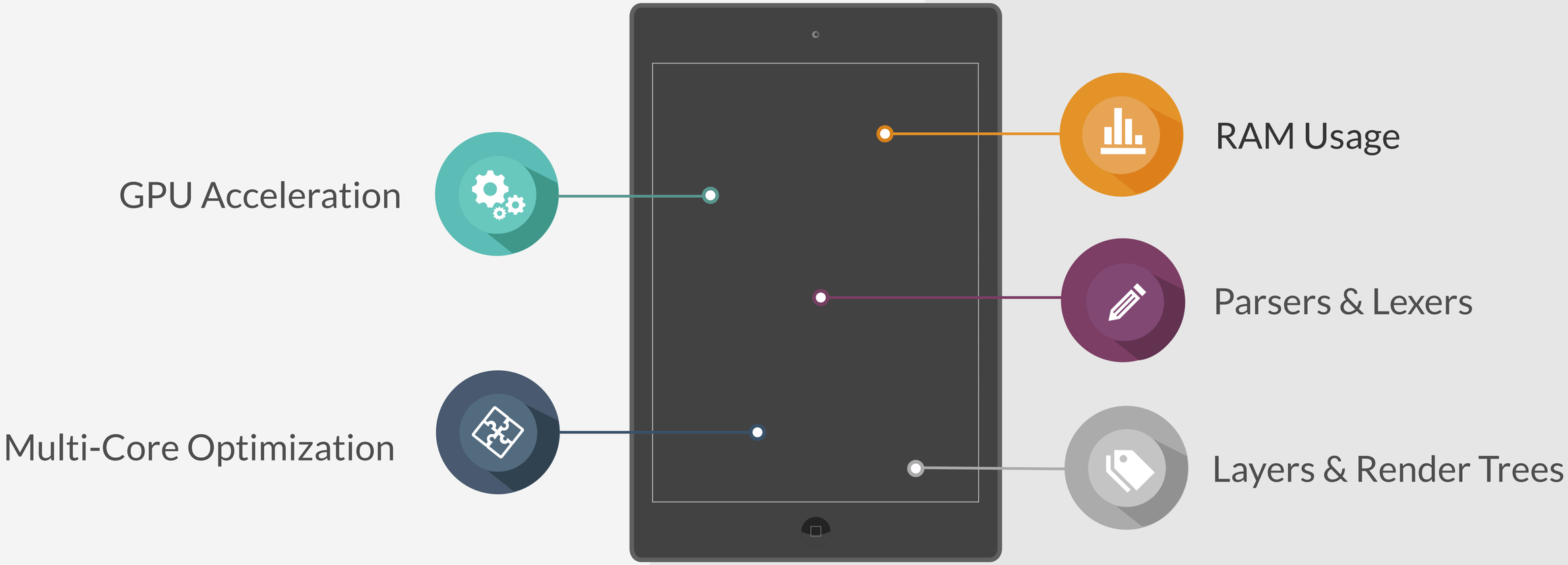
What really **matters**?
Visits, engagement, conversions.

What is **performance**?

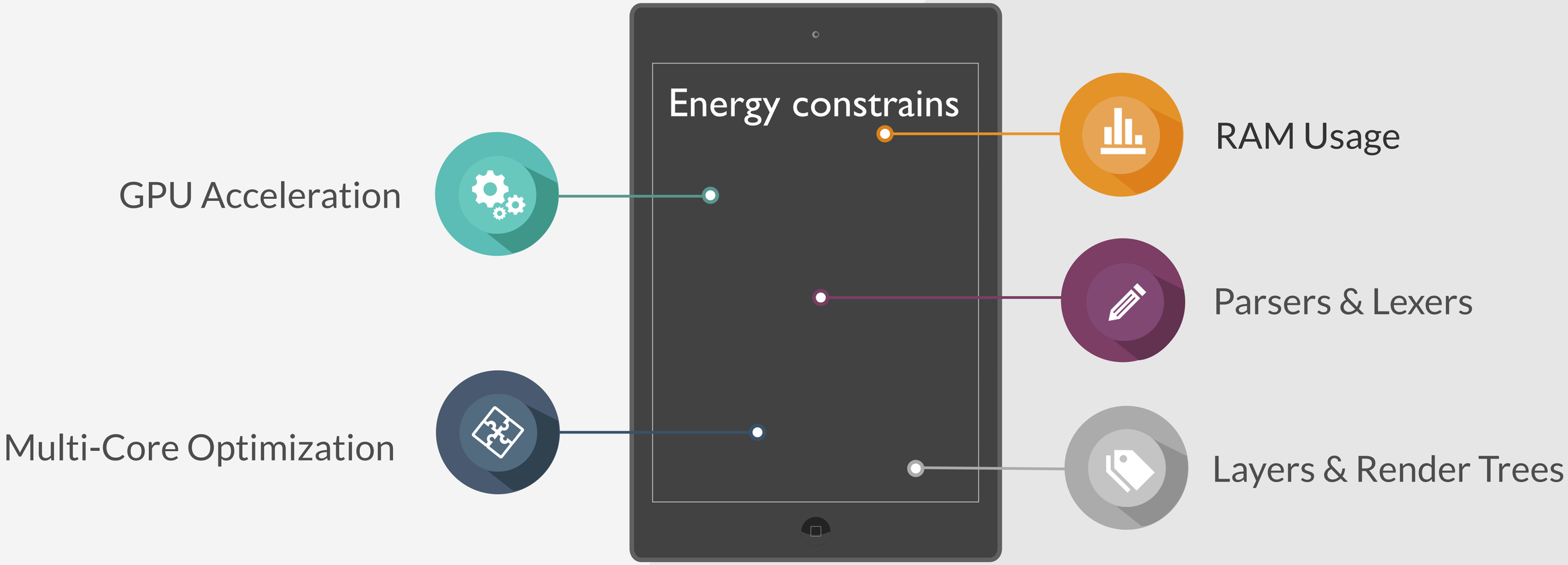
“**Performance** means many different **things** to many different **people**”

Actual performance

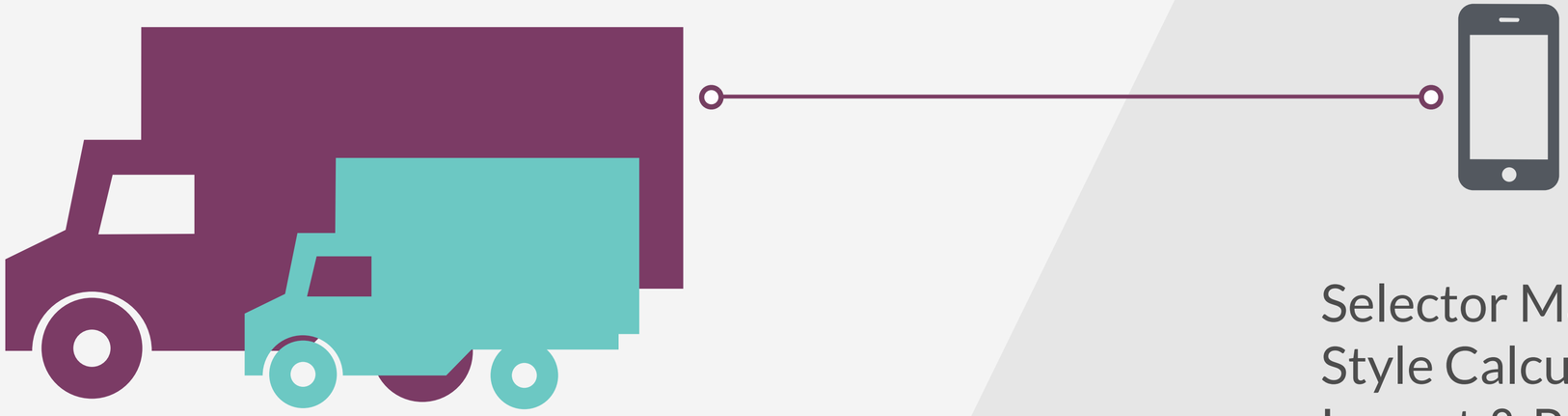
Actual performance



Actual performance



Transport



Bytes When you ship bytes, needs to execute those bytes.

Parse What happens after shipping those bytes?

Selector Matching
Style Calculation
Layout & Painting
JavaScript
GC Performance
Latency
Bandwidth
Protocols

Is there such thing
as **fast enough**?

You made it **2x faster**,
is that enough?

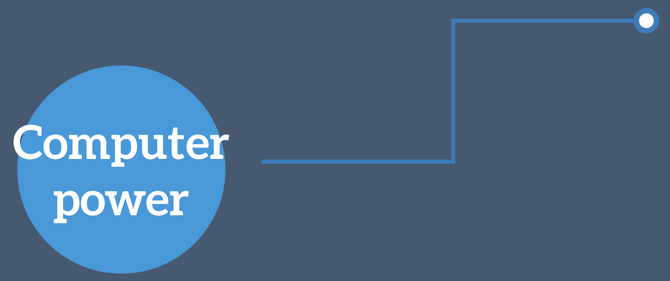
When we talk about **Perceived Performance** it is a factor of multiple things.

Perceived Performance **=**

f(Expected Performance, UX, Actual Performance **)**

Perceived Performance **=**

f(Expected Performance, UX, **Actual Performance)**



Perceived Performance =

f(Expected Performance, **UX**, Actual Performance **)**

It's the glue!

“**Performance is** not just milliseconds and bytes. It's also how milliseconds and bytes translate to **how the user perceives the app**”

Ilya Grigorik
Developer Advocate, Google

Single Page Application

NCSA Mosaic for MS Windows

File Edit Options Navigate Hotlist Annotate Help

Document Title: NCSA Mosaic Home Page

Document URL: http://www.ncsa.uiuc.edu/SDG/Software/Mosaic/NCSAMosaicHome.html

N C S A

MOSAIC

X Window System • Microsoft Windows • Macintosh

Welcome to NCSA Mosaic, an Internet information browser and World Wide Web client. NCSA Mosaic was developed at the National Center for Supercomputing Applications at the University of Illinois in --> Urbana-Champaign. NCSA Mosaic software is copyrighted by The Board of Trustees of the University of Illinois (UI), and ownership remains with the UI.

Jan `97

The Software Development Group at NCSA has worked on NCSA Mosaic for nearly four years and we've learned a lot in the process. We are honored that we were able to help bring this technology to the masses and appreciated all the support and feedback we have received in return. However, the time has come for us to concentrate our limited resources in other areas of interest and development on Mosaic is complete.

All information about the Mosaic project is available from the homepages.

NCSA Mosaic Platforms:

- NCSA Mosaic for the X Window System
- NCSA Mosaic for the Apple Macintosh
- NCSA Mosaic for Microsoft Windows

World Wide Web Resources The following resources are available to help introduce you to cyberspace and keep track of its growth:

- A glossary of World Wide Web terms and acronyms
- An INDEX to Mosaic related documents
- NCSA Mosaic Access Page for persons with disabilities
- Mosaic and WWW related Tutorials
- Internet Resources Meta-Index at NCSA

NUM

“**SPA** is a web site that fits on a single web page with the goal of providing a more fluid user experience”

SPAs were pioneered in the mid-2000s by web apps like Gmail and Google Maps.

Gmail Calendar Documents Photos Reader Web more Hiking Fan

Gmail by Google

SEARCH MAIL SEARCH THE WEB Show search options Create a filter

Mail

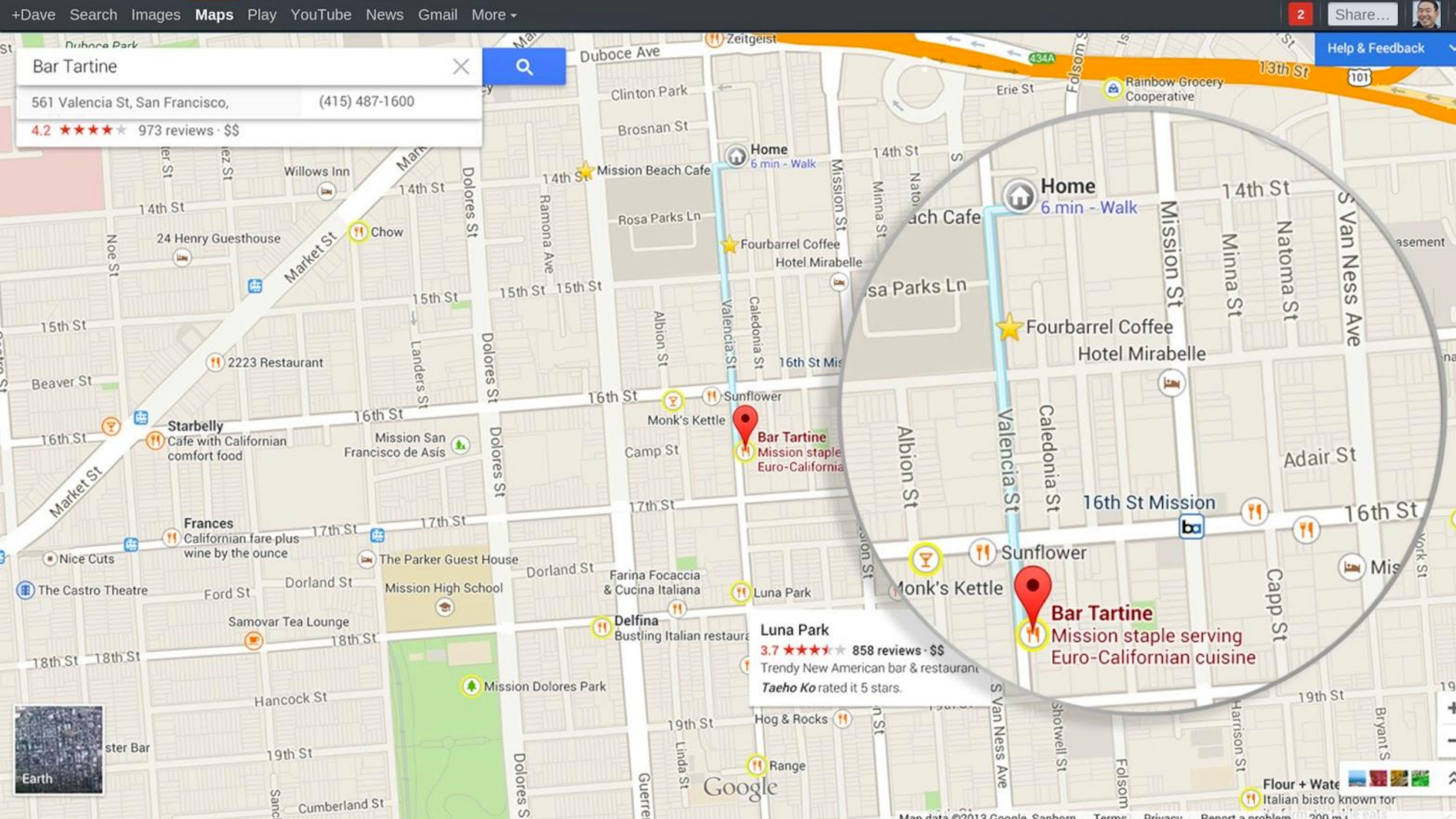
COMPOSE MAIL

Inbox (3)
Starred
Sent Mail
Drafts (2)
Hiking (3)
Urgent!
12 more

Chat
Search, add, or invite
Hiking Fan
Set status here
Call phone
Arielle
Emily

Archive Report spam Delete Move to Labels More 1 - 15 of 15

Jason Cornwell	Please return my stapler - Hi, You seem to have taken my stapler. Please,	1:10 pm
Paul McDonald	Fun Hike Yesterday! - Thanks for the great hike yesterday, it was awesome	1:06 pm
Arielle Reinstein	July 4th weekend - Hi there: I heard you'll be around this weekend and I'd lc	Jun 28
JS Bach	Tonhalle concert Friday - Hey man, there's a great concert this Friday evenir	Jun 22
Christine Chiu	Hi Hiking, Looking for opinion on my diet/fitness app - Hi Hiking, I bumped ir	Jun 9
Yan Tseytlin (2), Draft	Hey there! - I heard you found a great place to go hiking. Let me know when	Mar 28
Kenneth, me (2)	Group dinner? - Sushi sounds great! On Fri, Mar 25, 2011 at 10:06 AM, Ken	Mar 25
Kenneth, me (2)	Long time! - Hey Ken! Things have been really good! And lunch sounds grea	Mar 24
Michael Bolognino	This weekend - Hi there. Let's meet up at 8PM tonight for burgers and then h	Mar 24
Arielle Reinstein	dipsea trail - When it stops raining I really want to hike the Dipsea Trail agair	Mar 24
Jason Toff	How are you? - Hey there. We haven't spoken in a while. How are you? Wou	Mar 24

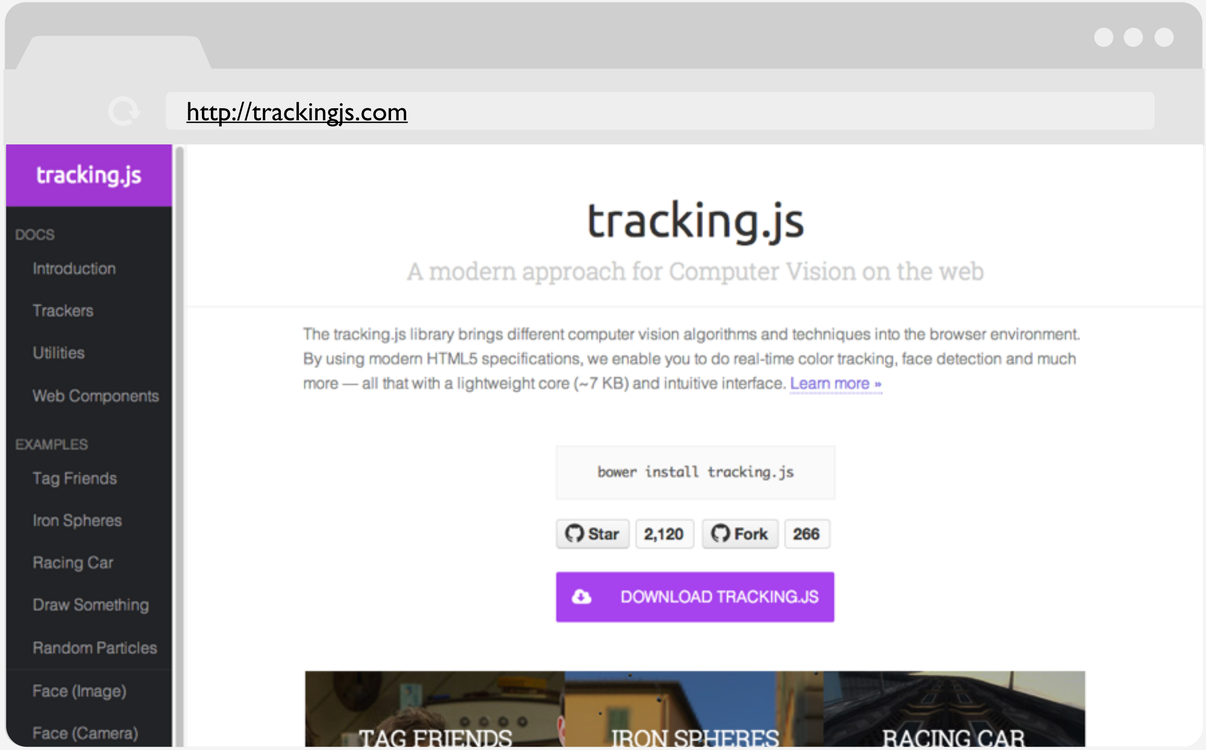

+Dave Search Images Maps Play YouTube News Gmail More
Share...
Help & Feedback
Bar Tartine
561 Valencia St, San Francisco, (415) 487-1600
4.2 973 reviews · $$
Home
6 min - Walk
Fourbarrel Coffee
Hotel Mirabelle
Sunflower
Monk's Kettle
Bar Tartine
Mission staple serving
Euro-Californian cuisine
Luna Park
3.7 858 reviews · $$
Trendy New American bar & restaurant
Taeho Ko rated it 5 stars.
Mission Beach Cafe
Starbelly
Cafe with Californian comfort food
Frances
Californian fare plus wine by the ounce
Delfina
Bustling Italian restaurant
Mission Dolores Park
Mission High School
Mission San Francisco de Asís
Farina Focaccia & Cucina Italiana
Hog & Rocks
Range
Flour + Water
Italian bistro known for
Duboce Ave
14th St
15th St
16th St
17th St
18th St
19th St
Mission St
Valencia St
Dolores St
Market St
Google

These days the approach is widely employed by others

How to build a Single Page Application?

<iframe>

Ajax


http://trackingjs.com
tracking.js
DOCS
Introduction
Trackers
Utilities
Web Components
EXAMPLES
Tag Friends
Iron Spheres
Racing Car
Draw Something
Random Particles
Face (Image)
Face (Camera)
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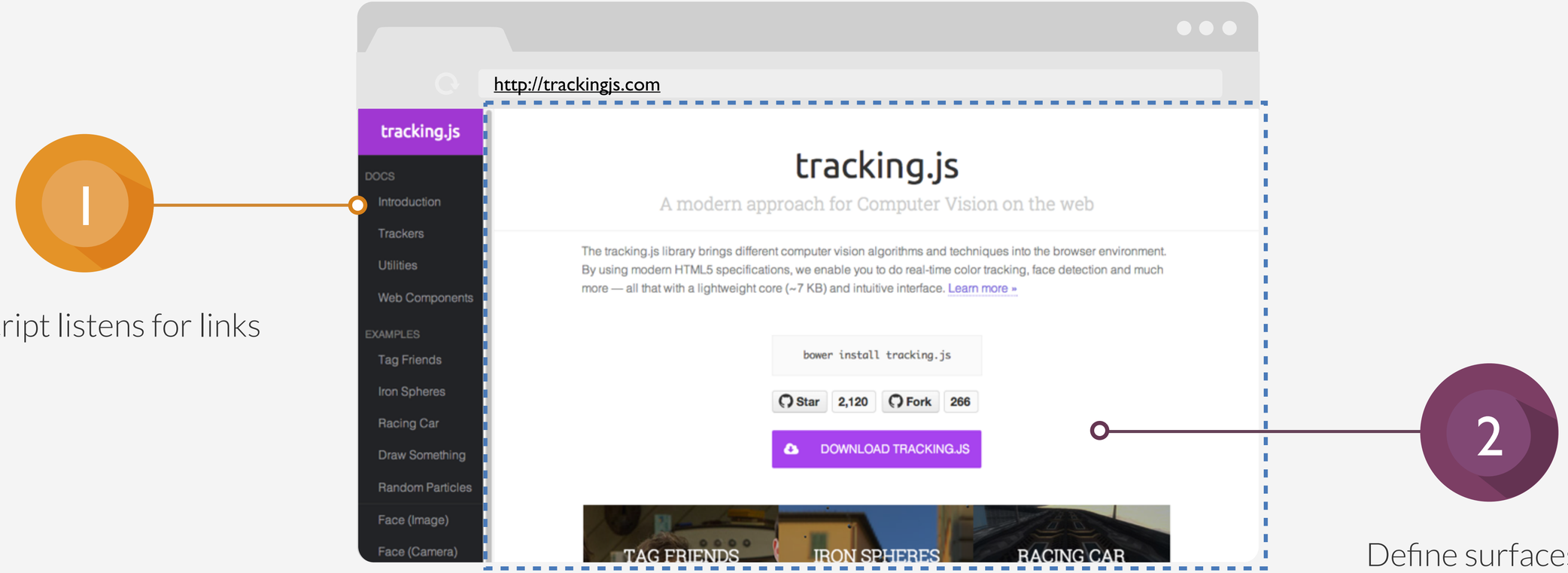
A modern approach for Computer Vision on the web
The tracking.js library brings different computer vision algorithms and techniques into the browser environment. By using modern HTML5 specifications, we enable you to do real-time color tracking, face detection and much more — all that with a lightweight core (~7 KB) and intuitive interface. Learn more »
bower install tracking.js
Star
2,120
Fork
266
DOWNLOAD TRACKING.JS
TAG FRIENDS
IRON SPHERES
RACING CAR

Ajax

```
var xhr = new XMLHttpRequest();
xhr.onload = successFn;
xhr.onerror = errorFn;
xhr.open('GET', '/foo.html');
xhr.send();
```

Ajax


1
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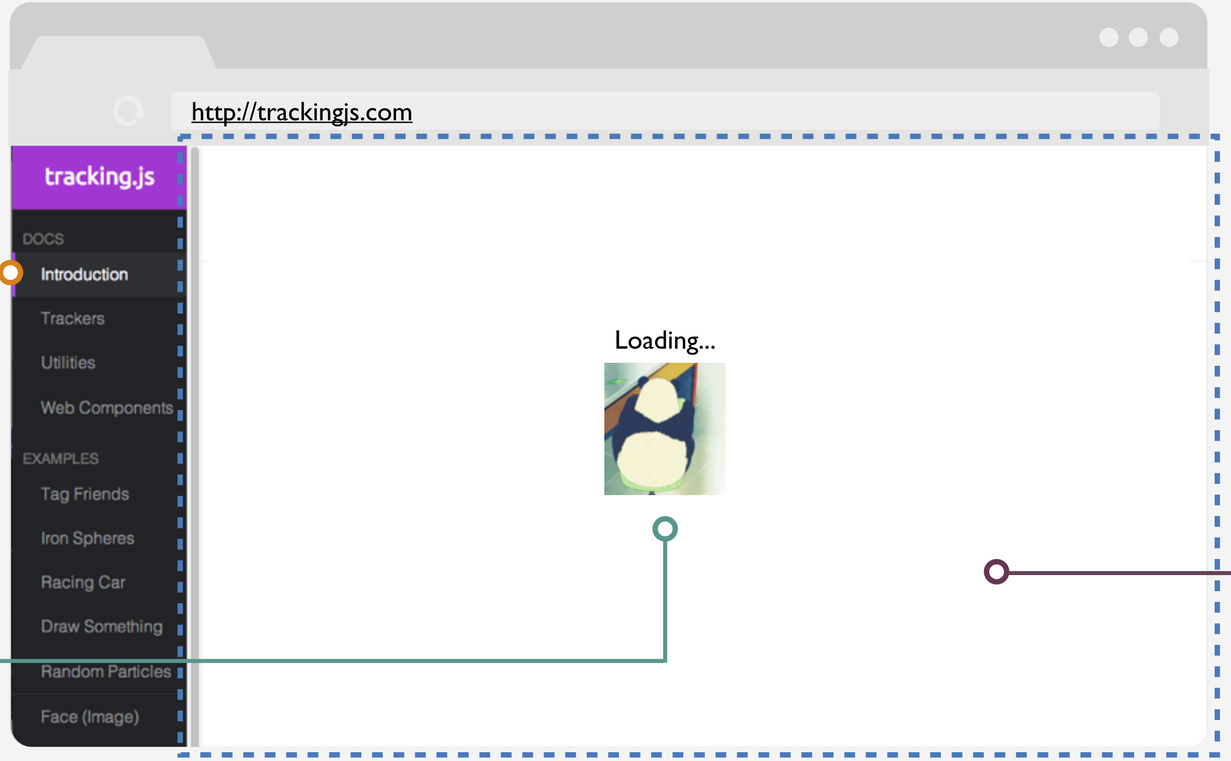
2
Define surfaces to update on navigate

Ajax



1

Link is clicked
Request content using XHR

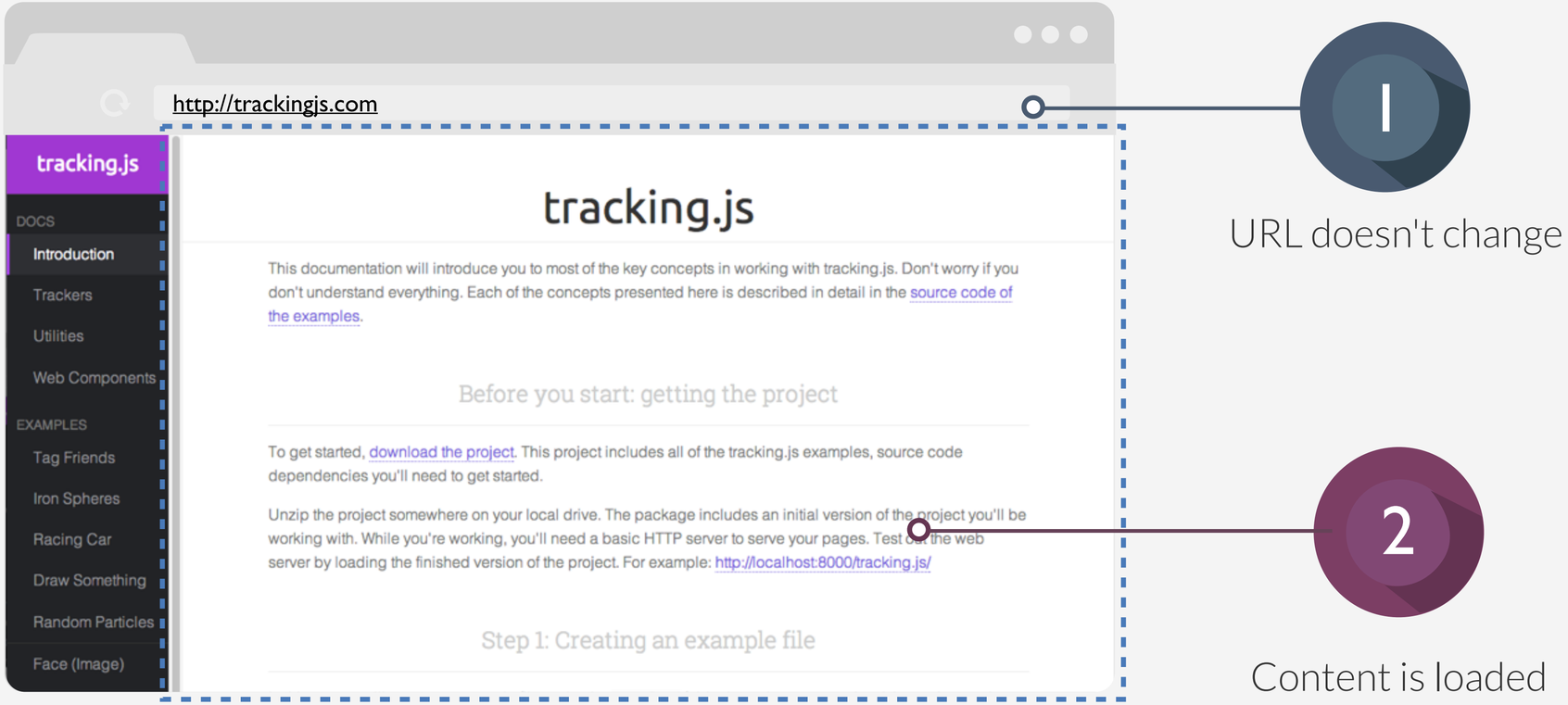
2

Some fancy loader appears

3

Content is empty

Ajax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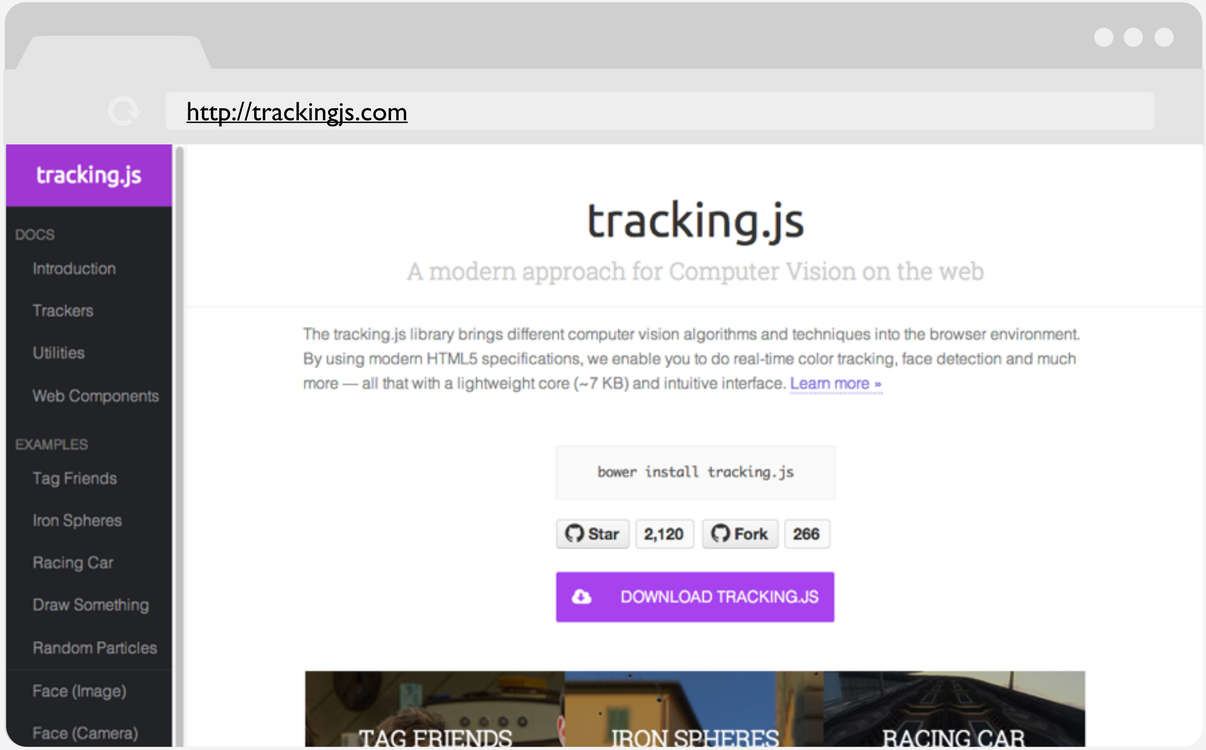
tracking.js
This documentation will introduce you to most of the key concepts in working with tracking.js. Don't worry if you don't understand everything. Each of the concepts presented here is described in detail in the source code of the examples.
Before you start: getting the project
To get started, download the project. This project includes all of the tracking.js examples, source code dependencies you'll need to get started.
Unzip the project somewhere on your local drive. The package includes an initial version of the project you'll be working with. While you're working, you'll need a basic HTTP server to serve your pages. Test out the web server by loading the finished version of the project. For example: http://localhost:8000/tracking.js/
Step 1: Creating an example file
1
URL doesn't change
2
Content is loaded

Hijax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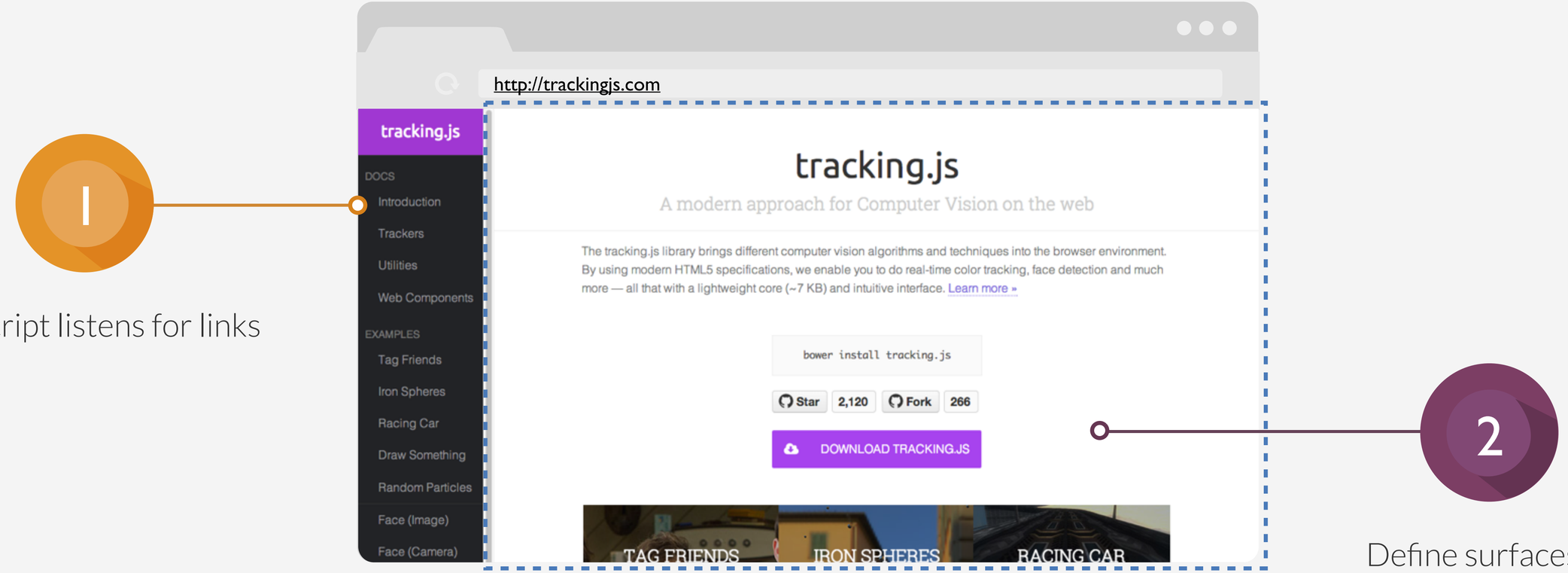
Hijax

```
var xhr = new XMLHttpRequest();
xhr.onload = successFn;
xhr.onerror = errorFn;
xhr.open('GET', '/foo.html');
xhr.send();
location.hash = '#foo';
```

Hijax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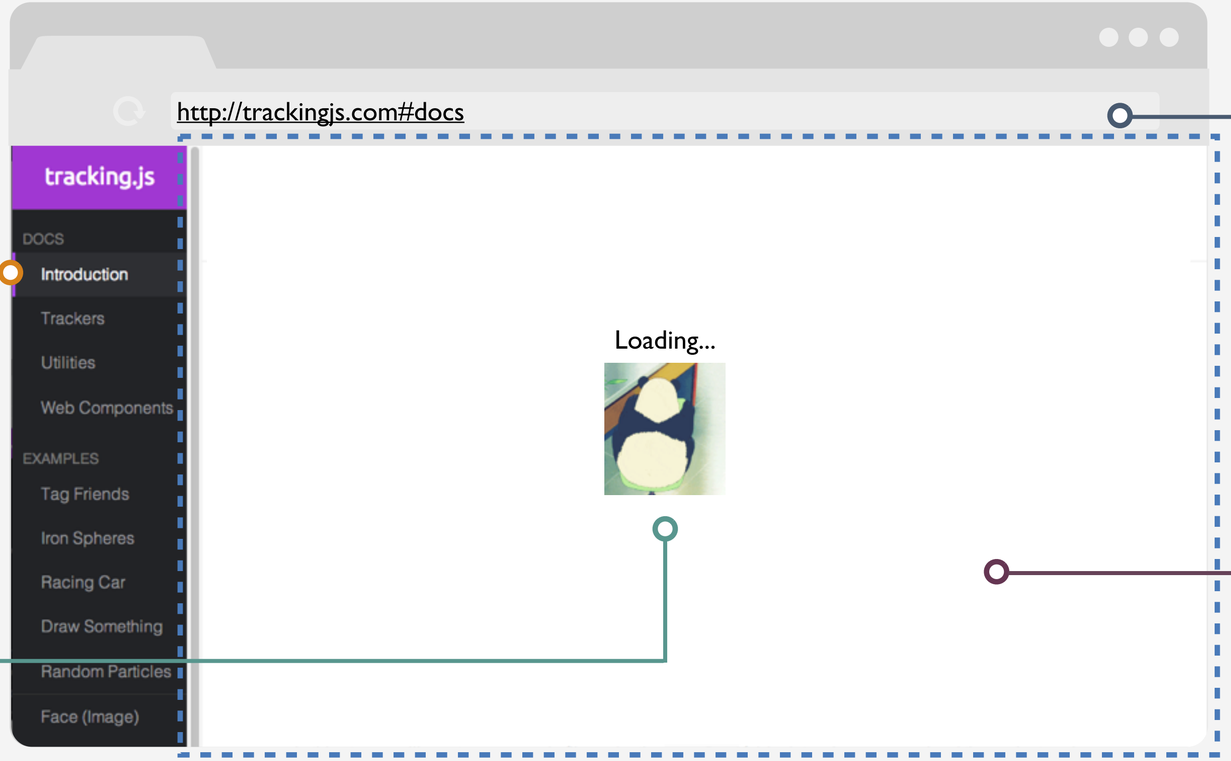


1

Link is clicked
Request content using XHR

2

Some fancy loader appears

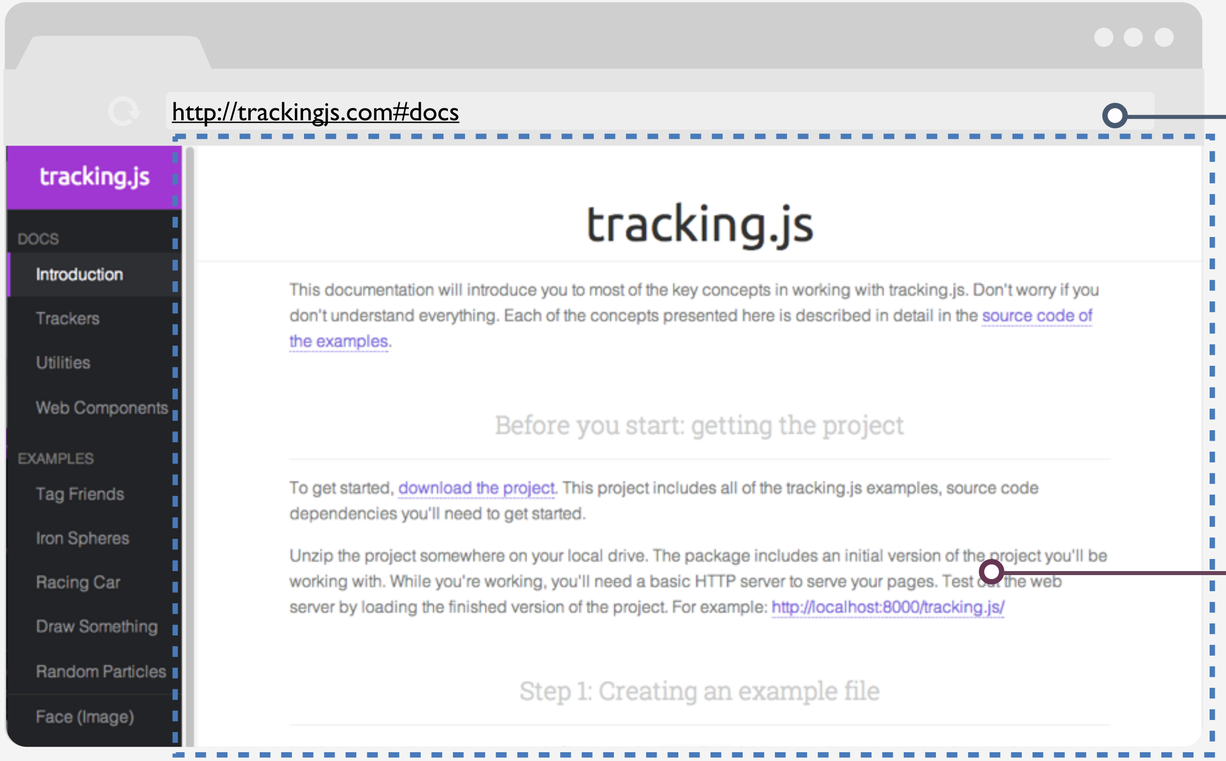
3

URL updates with hash bang #

4

Content is empty

Hijax



1

URL updates with hash bang #

2

Content is loaded

Okay, so what is a **good** single page app then?

SEO & **Bookmark**ability

Share or bookmark a link should always display the **same content**

History API

~~window.location.href = "page.html";~~

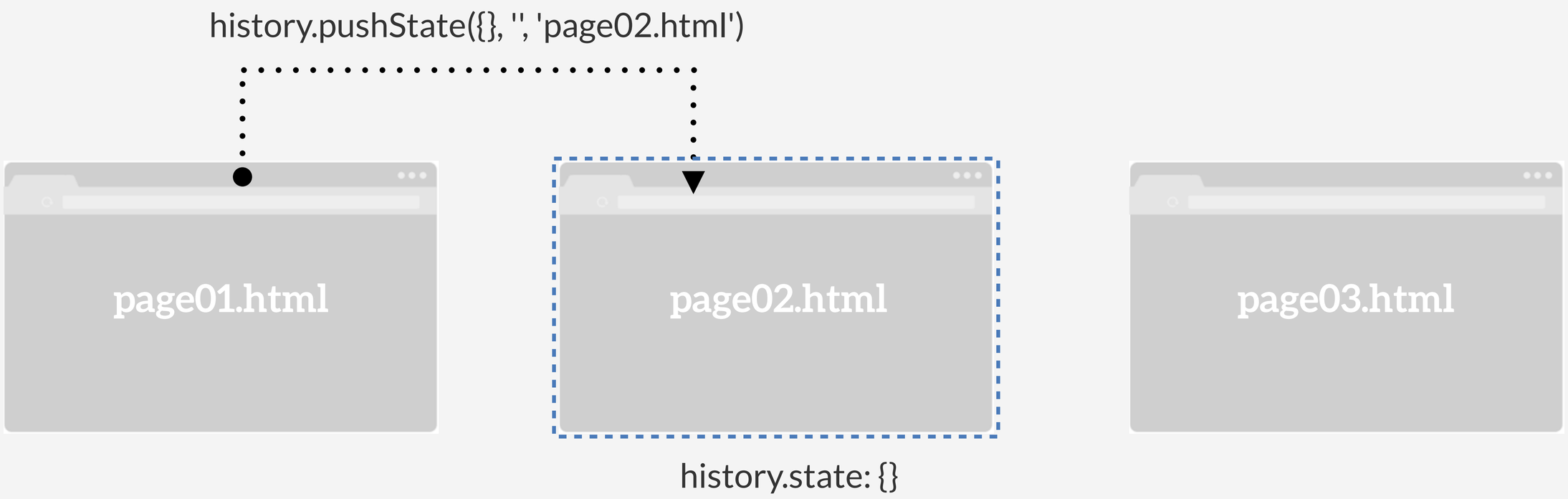
```
history.pushState({}, "title", "page.html");
history.replaceState({}, "title", "page.html");
```

History API

history.state: null

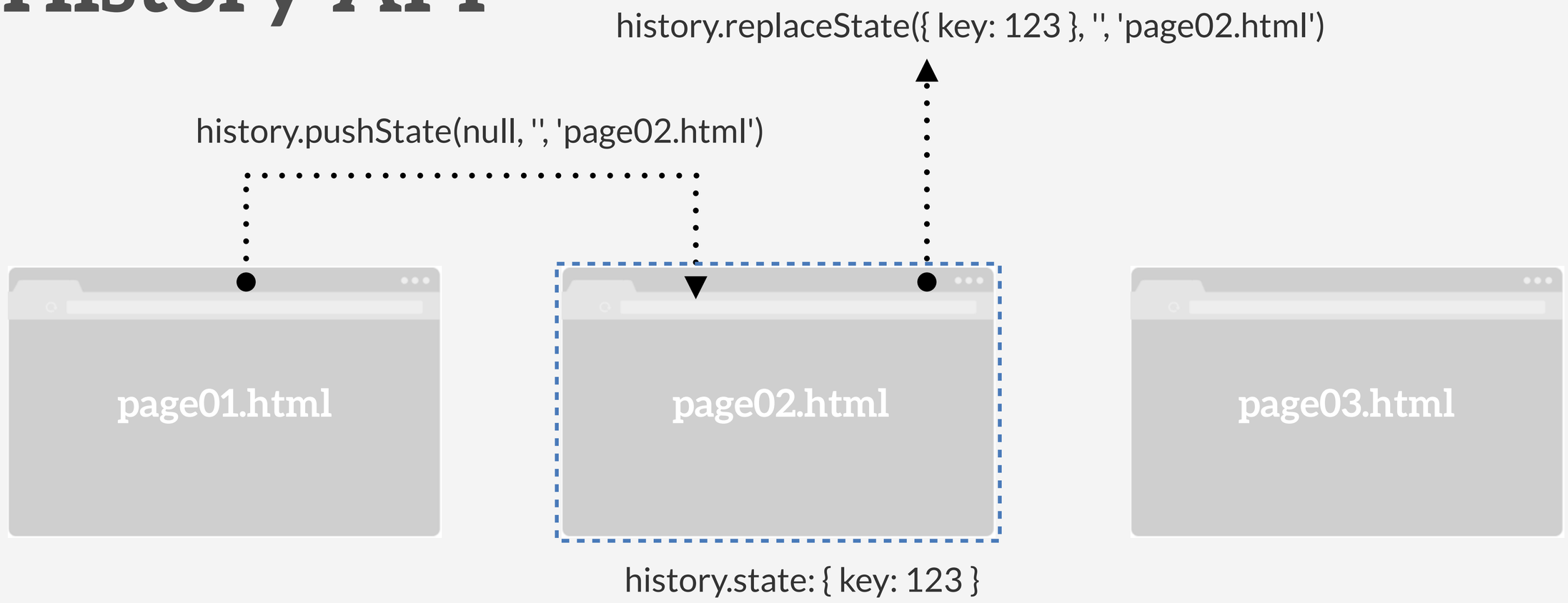
Navigate between pages without page refresh

History API



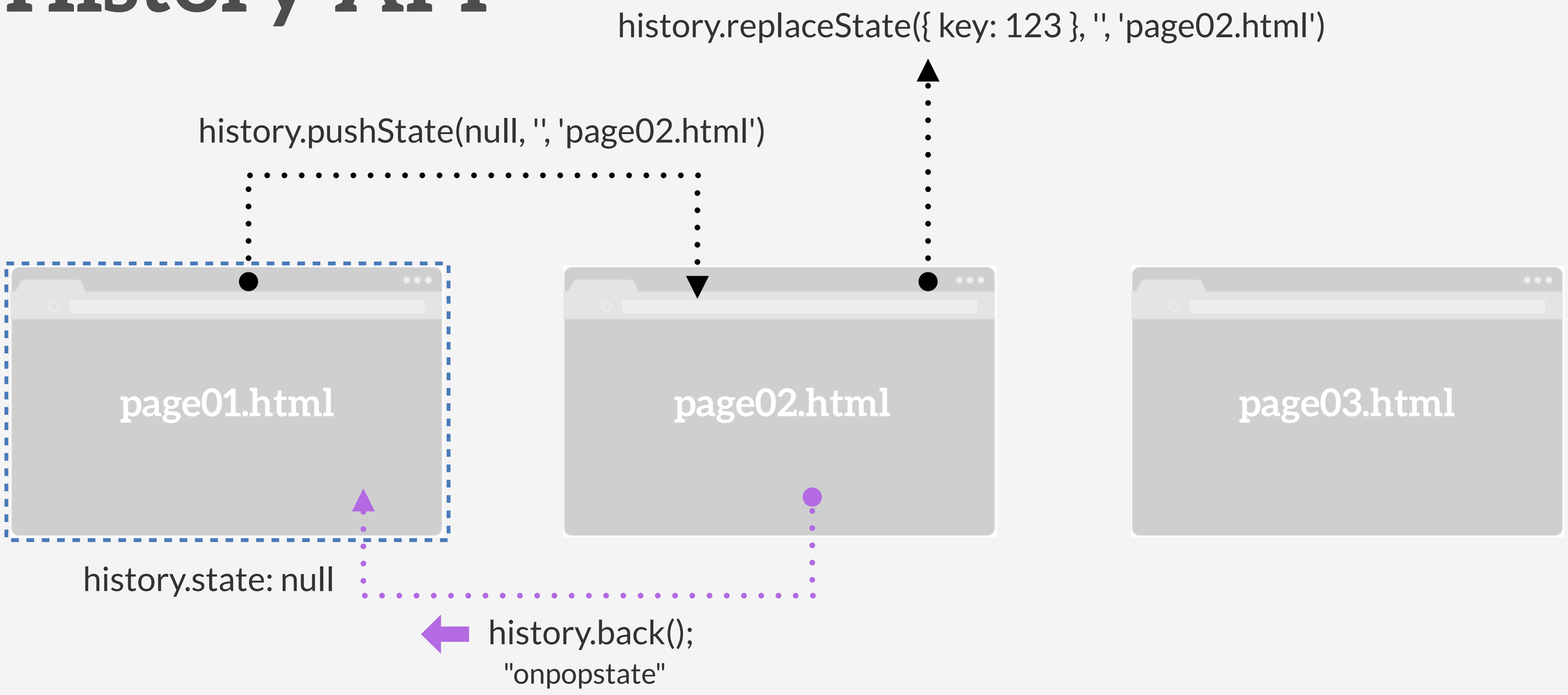
Navigate between pages without page refresh

History API



Navigate between pages without page refresh

History API



Navigate between pages without page refresh

twitter.com/#!/robert0muehsig

twitter

Rob

@robe

Web De

http://co

Twitter, Inc. [US] https://twitter.com/eduardolundgren

ome Notifications Discover Me

uardo Lundgren

TWEETS	PHOTOS/VIDEOS	FOLLOWING	FOLLOWERS
2,141	116	809	1,571

Tweets Tweets and replies

History navigation

By using **History API** you can manipulate the browser history, so you can use browser's **back & forward** buttons

Cacheable screens

Once you load a certain **surface** this content is **cached** in memory and is retrieved later on **without any additional request**

eduardolundgren (Eduardo

GitHub, Inc. [US] https://github.com/eduardolundgren

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Eduardo Lundgren

eduardolundgren

Developer Program Member

Liferay, Inc.
Brazil
edu@rdo.io
http://eduardo.io
Joined on Aug 07, 2009

528 Followers | **134** Starred | **44** Following

Organizations

Contributions | Repositories | Public activity | Follow

Popular repositories

- **tracking.js** — A modern approach for Computer Visio... — 2,121 ★
- **dotfiles** — The first JavaScript-based dotfiles powe... — 222 ★
- **jquery-simulate** — jQuery Simulate is a plugin to simulate ... — 79 ★
- **video-camera-element** — Web Component wrapper for getUserM... — 67 ★
- **Sublime-JSLint** — Sublime Text Editor 2 JSLint Support — 32 ★

Repositories contributed to

- **brianchandotcom/liferay-plugins** — 13 ★
- **liferay/alloy-ui** — AlloyUI is a framework built on top of YU... — 912 ★
- **brunobasto/liferay-plugins** — 1 ★
- **node-gh/gh** — GitHub command line tools made with ... — 856 ★
- **node-gh/gh-jira** — NodeGH plugin for integrating Jira, an i... — 7 ★

Public contributions

Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug

M W F

Summary of Pull Requests, issues opened, and commits. Learn more.

Less More

Year of contributions	Longest streak	Current streak
2,485 total	22 days	22 days
Aug 19 2013 - Aug 19 2014	July 28 - August 18	July 28 - August 18

Contribution activity

Period: 1 week

UI feedback

When some **content is requested**, it indicates to the user that **something is happening**

Pending navigations

Block UI rendering
until data is **loaded**

Forums (166) - eduardolu

https://mail.google.com/mail/u/0/#category/forums

Google

category:forums

+Eduardo 38 Share

Gmail

More

1–50 of 6,160

COMPOSE

Inbox (25)
Starred
Important
Sent Mail
Drafts (1)
All Mail
Spam (1,466)
Categories
Social (225)
Promotions (233)
Updates (211)
Purchases (8)
Travel (3)
Finance (86)
Forums (166)
Circles
itaú
polymer (161)
More

geekydhaval, Eric (2)	polymer	[polymer-dev] New e polymer...Help Needed!!! - Take a spin on polymer-project.org! We have a getting started tutorial, a basic creating element	1:50 pm
Scott Beeson (4)	polymer	[polymer-dev] bower.json missing entries for web-animations-js? - Sorry, missed a line. That was under core-animation | ├─┬ core-animation#0.3.5	11:05 am
Mike, 'Rob, Marco (3)	polymer	[polymer-dev] polymer on Windows - Hi, Will polymer work with Windows as the target platform in a PhoneGap/Cordova app? I run into this	Aug 18
Silver, 'Steve (3)	polymer	[polymer-dev] paper-input broken in template repeat - Hmm, I'm not able to reproduce any problem. See this example: http://jsbin.com/wiqoqu/1/edit.	Aug 18
'Google+' via Polymer	polymer	[polymer-dev] Khanh Hua added you to his circles and invited you to join Google+ - Khanh Hua added you to his circles and invited you to join Goog	Aug 18
Sachin, 'Rob (4)	polymer	[polymer-dev] Submit paper- input element of a form - You can submit a form, it just won't submit values coming from custom elements. It will only	Aug 18
Don Olmstead	polymer	[polymer-dev] Profiling polymer polyfills - I'm exporting my Polymer elements to a platform that doesn't have native implementations of	Aug 17
'klim klim' via Polymer	polymer	[polymer-dev] Android Apps on Google Play - https://play.google.com/store/apps/new?hl=en Отправлено из Yahoo Почты на Android Follow Polym	Aug 17
Marco, 'Rob (5)	polymer	[polymer-dev] shadow tag doesn't work with nested elements - Inserisci qui il codice... Works fine!! i have used this solution to implement a preform	Aug 17
Gopesh, 'Steve (3)	polymer	[polymer-dev] Polymer not Working in Google chrome(version 36.0.1985.143 m) - Hi all, Thanks for the quick reply..now its working fine by adding n	Aug 17
Michael, 'Steve (3)	polymer	[polymer-dev] Designer panes and browser differences - I can acknowledge the IE issue. It's due to a difference in flexbox between browsers. We'll	Aug 15
Daniel .. Daniel, 'Rick (13)	polymer	[polymer-dev] PSA: PointerEvents and PointerGestures are being replaced by polymer-gest... - On Fri, Aug 15, 2014 at 3:08 PM, Daniel Freedman	Aug 15
cletusw, Elliott (3)	polymer	[polymer-dev] Shadow DOM bug? - Thanks! Em quinta-feira, 14 de agosto de 2014 22h06min32s UTC-6, Elliott Sprehn escreveu: That should	Aug 15
mofirouz .. Eric, Juan (13)	polymer	[polymer-dev] AngularJS (2.0) and Polymer - Hi all, I have a couple question about the future of AngularJS, specifically about the upcoming 2.0	Aug 15
'Jelte Liebrand' via . (6)	polymer	[polymer-dev] testing our polymer elements - Hi, We've been adding a bunch of polymer elements to our code (kudos btw, polymer rocks!), and	Aug 14
august, 'Steve (2)	polymer	[polymer-dev] dynamically pass in a template to a polymer-element - Hi, I have been trying to do the following using a variety of techniques in p	Aug 14
Martin, Eric, 'Scott (4)	polymer	[polymer-dev] Registering 'global' filters - What's the preferred way of registering 'global' filters alongside the 'built-in'	Aug 14

State retention

Scrolling, reloading or navigating through the **history** of the page should get back to where it was

eduardolundgren/tracking

GitHub, Inc. [US] https://github.com/eduardolundgren/tracking.js

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eduardolundgren / tracking.js

Star 2,121 | Fork 266

A modern approach for Computer Vision on the web http://trackingjs.com

316 commits | 3 branches | 3 releases | 12 contributors

branch: master | tracking.js / +

Merge branch 'pr-94'

eduardolundgren authored 10 days ago | latest commit bd9a08938c

assets	Decouple from DOM/make it node-compatible - Fixes #47	2 months ago
build	Build	10 days ago
examples	Add ogv version of minion's video	20 days ago
src	Merge branch 'pr-94'	10 days ago
test	Adds tests for color dimension constraints	10 days ago
.bowerrc	Change bower dir to sibling folder	28 days ago
.editorconfig	Move project build to gulp	2 months ago
.gitignore	Change bower dir to sibling folder	28 days ago
.jshintrc	Move project build to gulp	2 months ago
.travis.yml	Removes old node versions	2 months ago
LICENSE.md		25 days ago
README.md	Updates README	19 days ago
bower.json	Added dat-gui dependency on bower.json	26 days ago

Code

Issues 12

Pull Requests 2

Pulse

Graphs

HTTPS clone URL

https://github.cc

You can clone with HTTPS or Subversion.

Clone in Desktop

Download ZIP

State retention

window.history.state = {};

State object size limits (640KB)
Serialized objects

Memory

Memory management to avoid leaks

Click to go forward, hold to see history

SPA - Master Demo

localhost:8080/web/guest/home?p_p_id=33&p_p_lifecycle=0&p_p_state=normal&p_p_mode=view&p_p_col_id=column-1&p_p_col_count=4&_33_redirect=http%3A%2F%...

Welcome | wiki | content | message boards | calendar | blogs | wiki display

Admin | My Sites | Test Test

Welcome / Add Entry

Blogs

New Blog Entry

Web Content Display

Select existing web content or add some web content to be displayed in this portlet.

Elements | Network | Sources | Timeline | Profiles | Resources | Audits | Console

Capture stacks 3752 of 6554 records shown

Events

Frames

Memory

10.00 s | 20.00 s | 30.00 s | 40.00 s | 50.00 s | 1.0 min | 1.2 min | 1.3 min | 1.5 min | 1.7 min | 1.8 min

75.8 MB

56.9 MB

RECORDS

0 | 20 ms | 40 ms | 60 ms | 80 ms | 100 ms | 120 ms | 140 ms | 160 ms

DETAILS

Event × 2

Event (mouseout)

Event (mousemove)

Event (mousemove)

Event (mousemove)

Event (mousemove)

Event (mousemove)

Event (mousemove)

Event (mousemove)

Event (mousemove)

Event (mousemove)

Event (mousemove)

Memory recover

COUNTERS

Documents [4:4]

Nodes [33708:33708]

Listeners [2021:2021]

Zeno Rocha - Google+

https://plus.google.com/+ZenoRochaBN/posts

Google+

Search for people, pages, or posts

+Eduardo

Share

Profile

Zeno Rocha

Works at Liferay, Inc.
Attended Universidade Federal do Estado do...
Lives in Rio de Janeiro, RJ

Following

1,620 followers | 342,899 views

About Posts Photos YouTube +1's

Zeno Rocha
Shared publicly - Aug 12, 2014

Offline First: Everything you need to know to create offline web apps

In his circles

277 people

Jean Nascimento Add

Jared Smith Add

Davi Fontenele Add

Hybrid rendering

Ajax + server-side rendering allows **disable pushState** at any time, allowing progressive enhancement.

Rise of the SPA — Medium

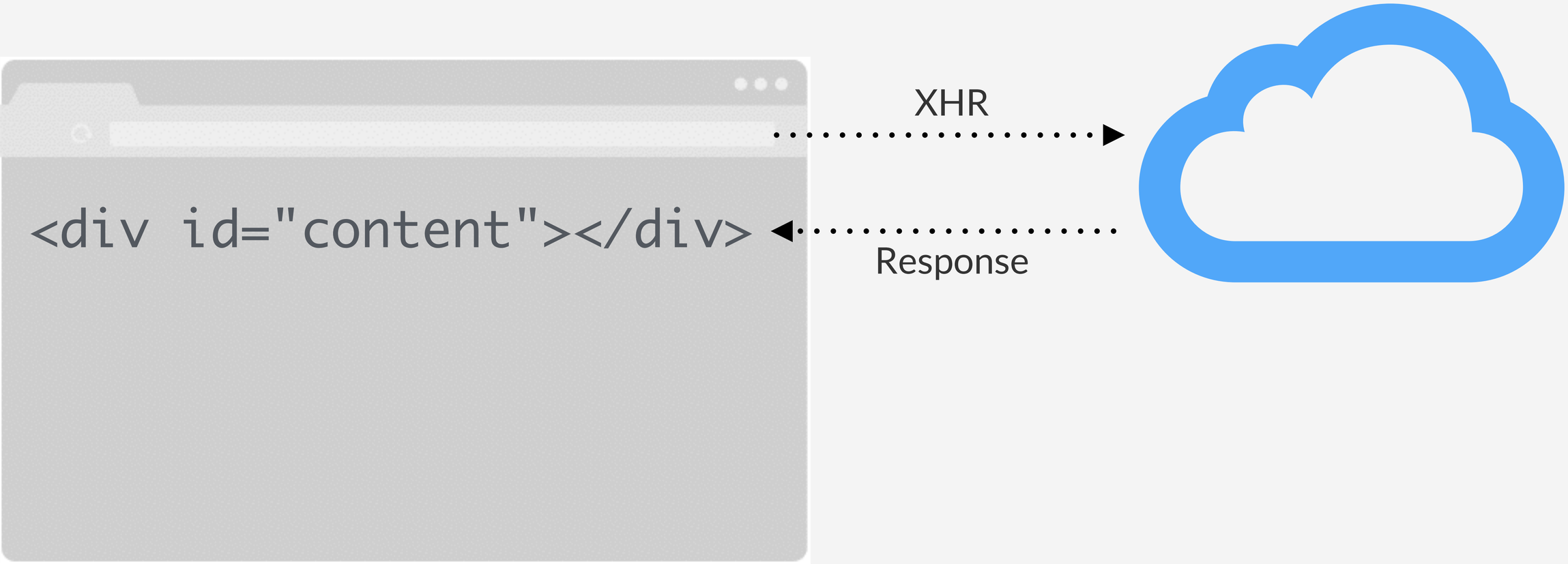
https://medium.com/@dpup/rise-of-the-spa-fb44da86dc1f

Daniel F Pupius on Jan 7, 2013

5 min

Rise of the SPA

Client-side only rendering



Zeno Rocha

https://www.facebook.com/zenorocha

Zeno Rocha | Eduardo | Home 2

Zeno Rocha

Friends | Following | Message | ...

Timeline | About | Photos | Friends 210 Mutual | More

Recent
2010s
2000s
Born

ABOUT

Front End Engineer at Liferay
Past: Globoesporte.com and Petrobras

Studied Information Systems at Universidade Federal do Estado do Rio de Janeiro
Past: Colégio Estadual do Paraná

Current City | Ask

From Curitiba, Brazil

Followed by 876 people

PHOTOS · 330

Post | Photo / Video

Write something...

Front in BH was with Zeno Rocha and 4 others at Teatro Ney Soares.
August 17

Sponsored

Mente Quântica -...
Aumente o Poder da Mente

Use Esta Tecnologia para Conquistar Uma Mente Mais Poderosa! Garantido.

Like Page · Sandro Martins Costa likes this page

Chat (133)

Page resources management

Evaluate scripts and stylesheets
from dynamic loaded resources

BrazilJS 2014

braziljs.com.br

EN | PT

A MAIOR CONFERÊNCIA DE JAVASCRIPT DO UNIVERSO!

21 E 22 DE AGOSTO DE 2014

PORTO ALEGRE / RS

Elements Network »

<top frame>

Filter Regex All Errors Warnings

```
> var div = document.createElement('div');

  div.innerHTML = '<script>alert("hijack");
  </script>';

  document.body.appendChild(div);
```

Timeout detection

Timeout if the request takes too long to load

“**Mimic the native browser behavior** is what makes your Single Page Application **done right.**”

2012

BRAZILJS
PORTO ALEGRE 2012
A MAIOR CONFERÊNCIA
DE JAVASCRIPT
DO UNIVERSO
30 e 31 de Agosto
Teatro do Bourbon Country
Porto Alegre / RS
JS

tracking.js

A modern approach for Computer Vision on the web

2013

Custom Elements

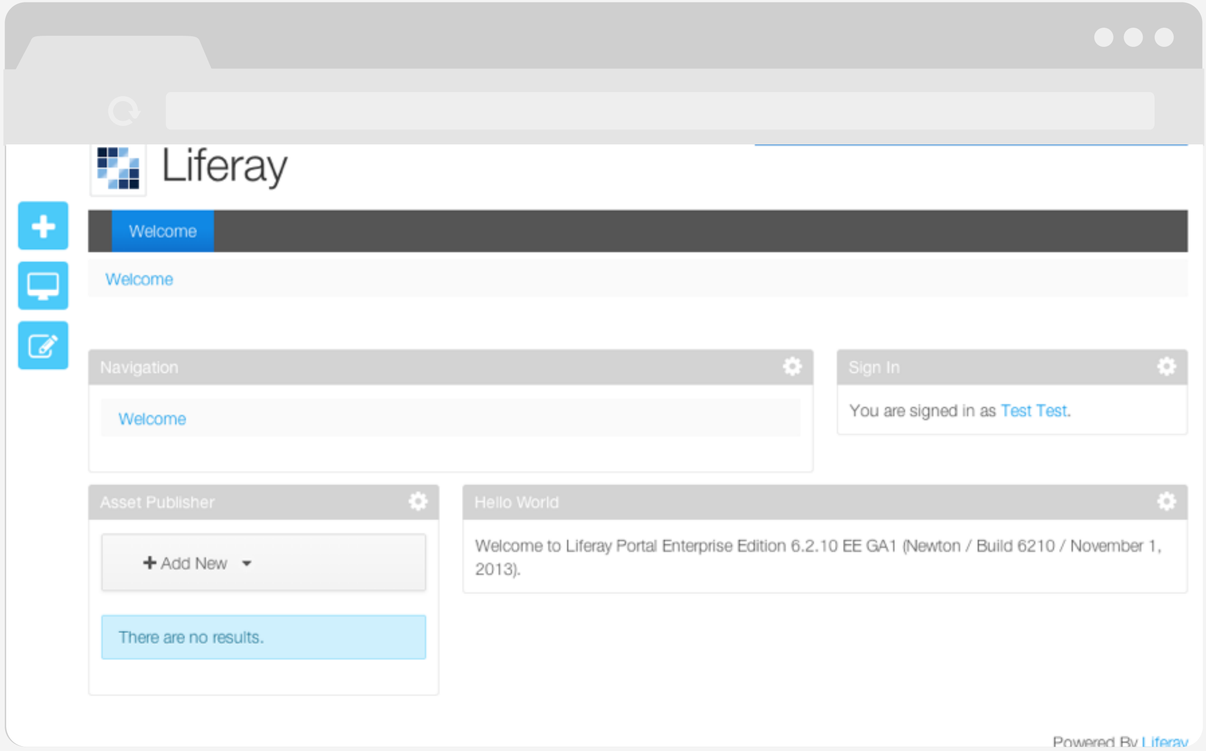
a web components gallery for modern web apps

2014?

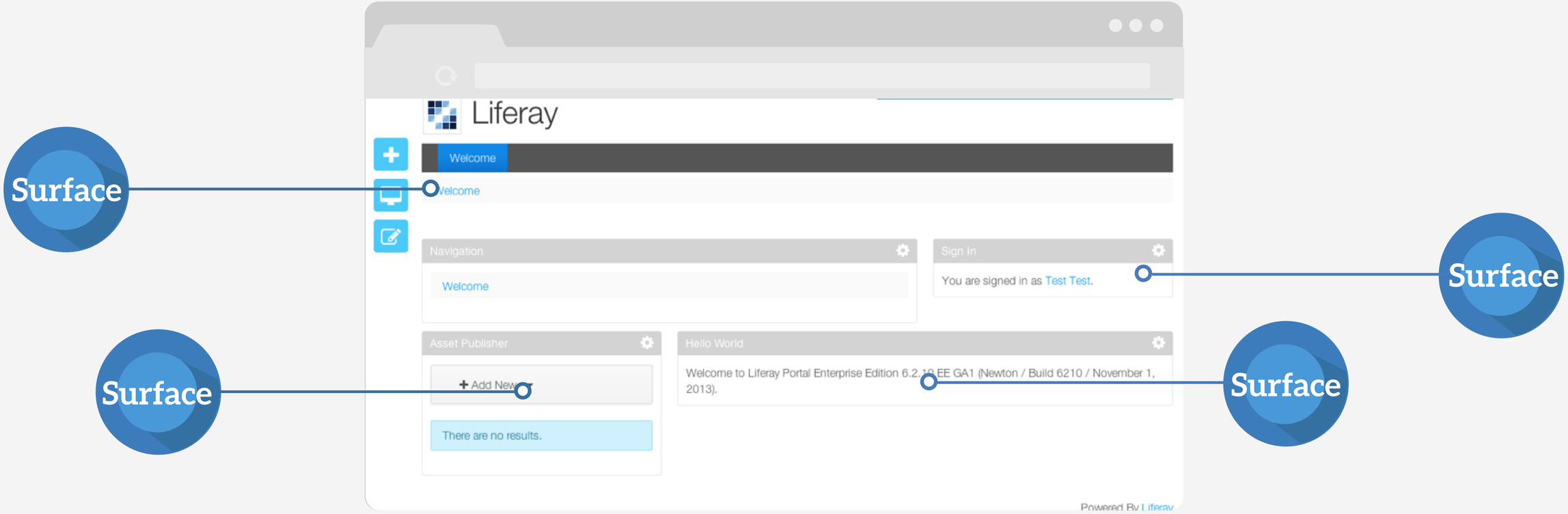
SENNA

A BLAZING-FAST SINGLE PAGE APPLICATION ENGINE

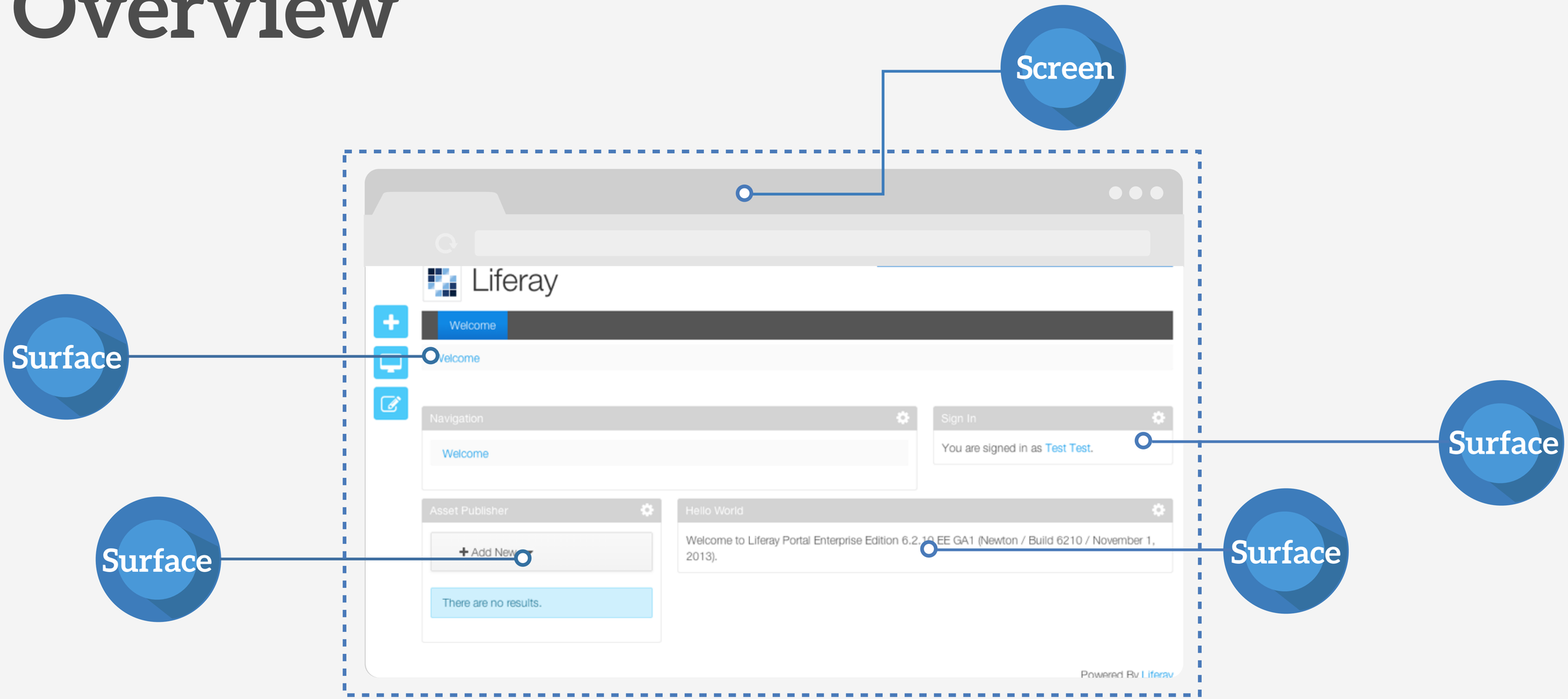
Overview


Liferay
Welcome
Welcome
Navigation
Welcome
Sign In
You are signed in as Test Test.
Asset Publisher
+ Add New
There are no results.
Hello World
Welcome to Liferay Portal Enterprise Edition 6.2.10 EE GA1 (Newton / Build 6210 / November 1, 2013).
Powered By Liferay

Overview


Surface
Surface
Surface
Surface
Liferay
Welcome
Welcome
Navigation
Welcome
Sign In
You are signed in as Test Test.
Asset Publisher
+ Add New
There are no results.
Hello World
Welcome to Liferay Portal Enterprise Edition 6.2.10 EE GA1 (Newton / Build 6210 / November 1, 2013).
Powered By Liferay

Overview


Screen
Surface
Surface
Surface
Surface
Liferay
Welcome
Welcome
Navigation
Welcome
Sign In
You are signed in as Test Test.
Asset Publisher
+ Add New
There are no results.
Hello World
Welcome to Liferay Portal Enterprise Edition 6.2.10 EE GA1 (Newton / Build 6210 / November 1, 2013).
Powered By Liferay

App Framework – YUI Libra

https://yuilibrary.com/yui/docs/app/

Home | Quick Start | Documentation | Community | Contribute | Other Projects

YUI > Infrastructure > App Framework

App Framework

The YUI App Framework is a rollup of the App, Model, Model List, Router, and View components, combined to form a simple MVC-style framework for writing single-page JavaScript applications.

You can use these components separately or together to create anything from simple non-interactive views to rich applications with URL-based routing, data binding, and full client-server synchronization.

If you've used DocumentCloud's excellent Backbone.js framework, many of the classes and APIs provided by App Framework components will look familiar to you. There are important differences

youtube/spfjs · GitHub

GitHub, Inc. [US] https://github.com/youtube/spfjs

GitHub | This repository | Search | Explore | Features | Enterprise | Blog

youtube / spfjs

Star

SPF is a JavaScript framework for navigation and page updates from YouTube

308 commits | 1 branch | 0 releases | 14 contributors

branch: master | spfjs / +

Merge pull request #59 from nicksay/remove-deprecated-response-keys ...

nicksay authored 12 hours ago | latest commit 73db1a2b28

src	Merge pull request #59 from nicksay/remove-deprecated-response-keys	12 hours ago
third-party	Move all third party code to a "third-party" directory.	3 days ago
web	Add the initial documentation files.	9 days ago

HTTPS

http

dpup/surface · GitHub

GitHub, Inc. [US] https://github.com/dpup/surface

GitHub | This repository | Search | Explore | Features | Enterprise | Blog

dpup / surface

Star

38 commits | 1 branch | 0 releases | 1 contributor

branch: master | surface / +

Update README.md

dpup authored on Mar 7, 2012 latest commit b9e5d6e522

bin	Add Apache Licence boilerplate	3 years ago
example	Add a compilation to be used as a bundle with an externed interface, …	3 years ago
README.md	Update README.md	3 years ago
app.js	Do not try to navigate to links that are on a different host.	3 years ago

HTTPS

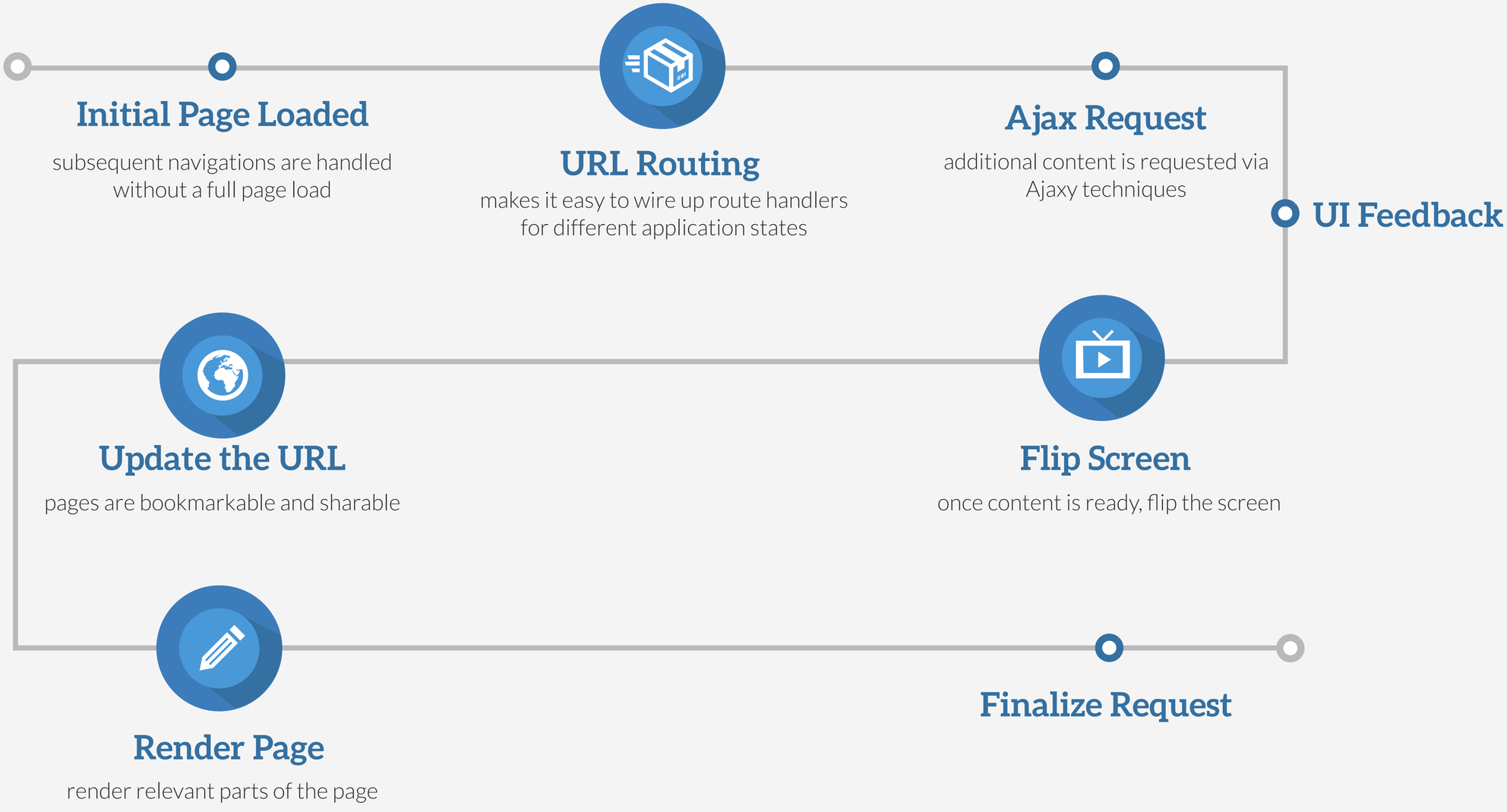
http

dpup commented on Mar 25 Owner

Don't use ids when working with components or SPAs, because yes they will collide. Use classes, this is good practice even without Surface.

Daniel Pupius
Former Googler, Medium Chief Engineer

Lifecycle

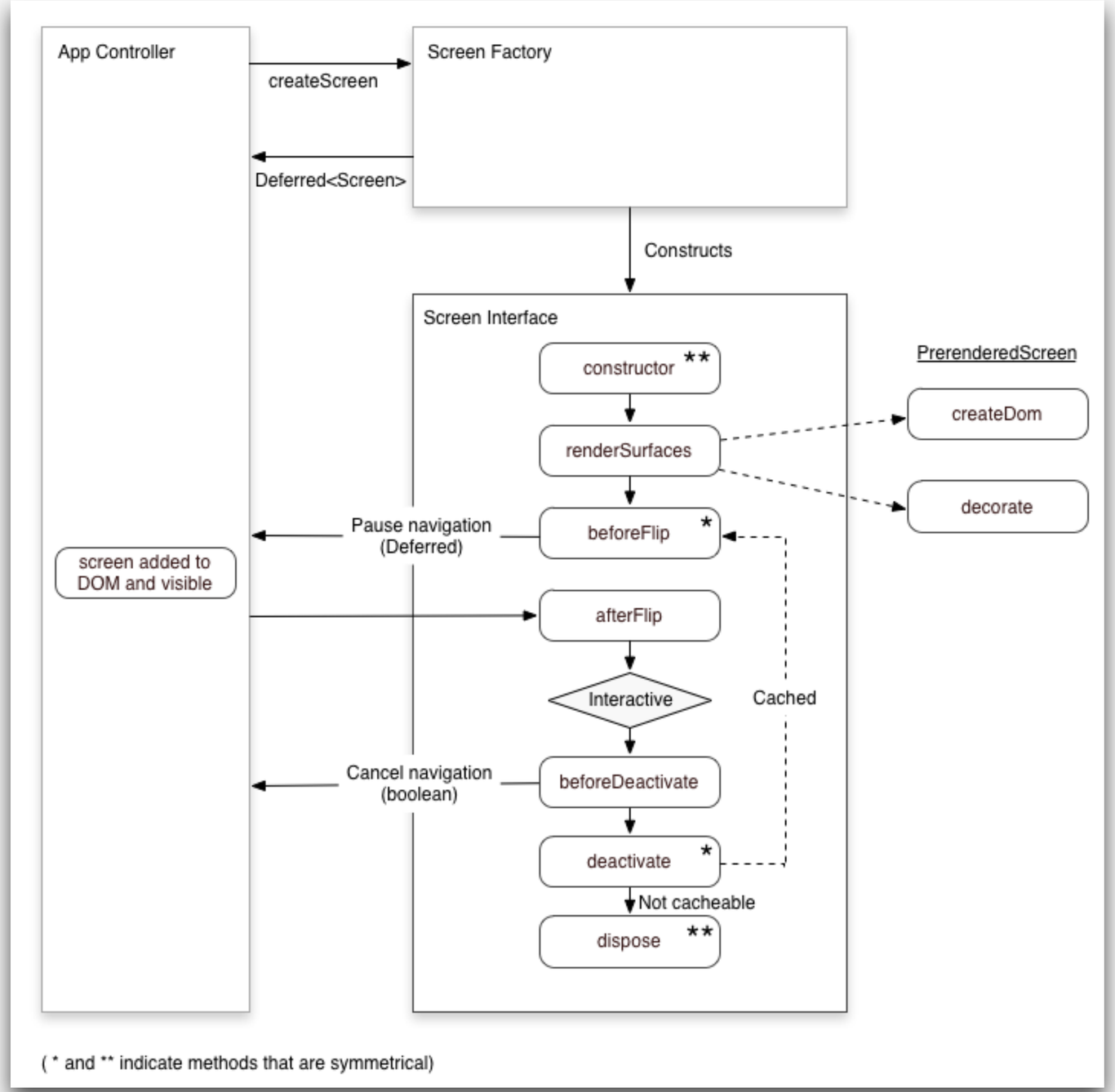

Initial Page Loaded
subsequent navigations are handled without a full page load
URL Routing
makes it easy to wire up route handlers for different application states
Ajax Request
additional content is requested via Ajaxy techniques
UI Feedback
Flip Screen
once content is ready, flip the screen
Finalize Request
Update the URL
pages are bookmarkable and sharable
Render Page
render relevant parts of the page

Our solution

senna.App

senna.Screen

senna.Surface



JavaScript

```
var app = new senna.App();
app.addSurfaces(['header', 'body', 'footer']);
app.addRoutes(new senna.Route(/.*\.html/, senna.Screen));
app.navigate('/foo.html');
```

Data attributes

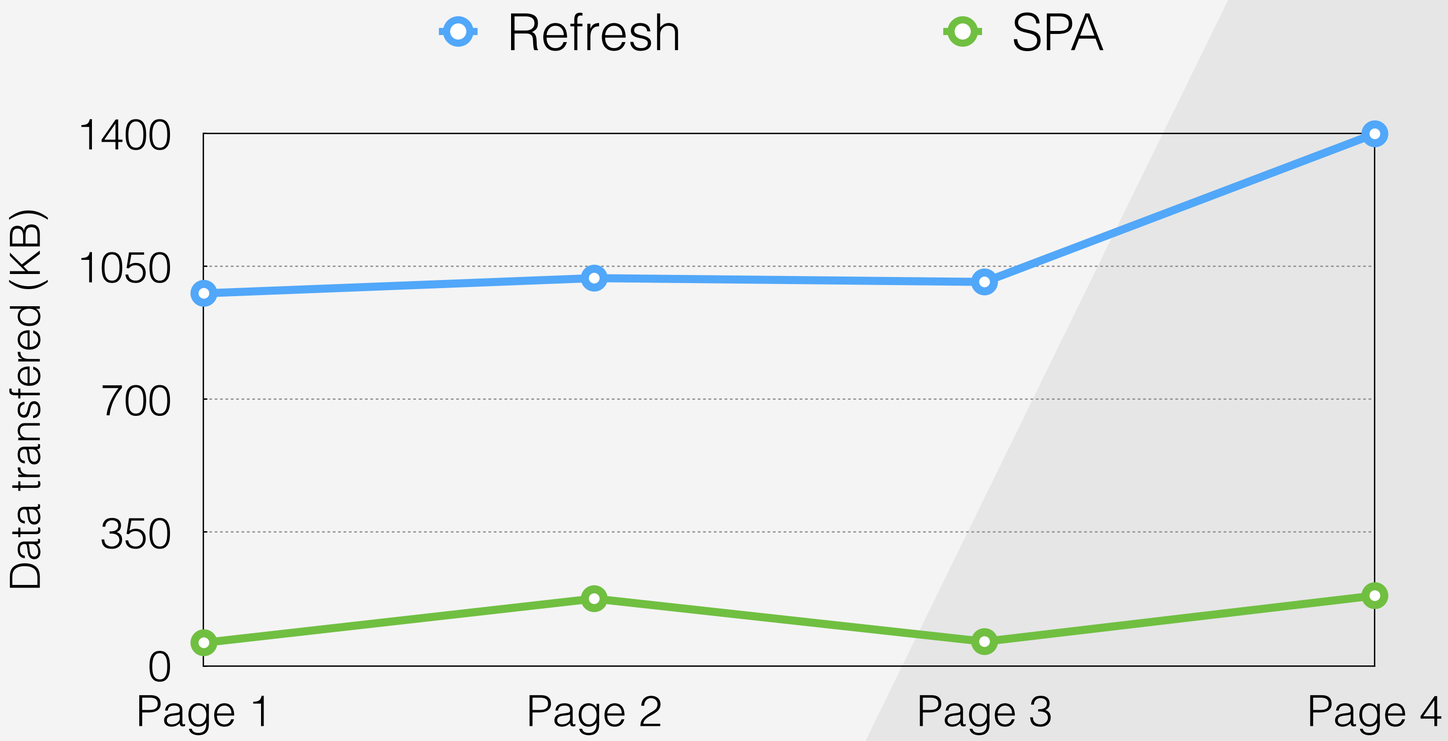
```
<link rel="senna-route" href="regex:.*\.html" type="senna.Screen">

<body data-senna>
    <div id="header" data-senna-surface></div>
    <div id="body" data-senna-surface></div>
    <div id="footer" data-senna-surface></div>
</body>
```

Web components?

Coming soon...

Demo **time**

Less Bandwidth



Developer Tools – http://localhost:8080/web/guest/home?p_p_id=artists_WAR_jukeboxportlet&p_p_lifecycle=0&p_p_state=normal&p_p_mode=view&p_p_col_id=column-1&p_p_col...

Elements | Network | Sources | Timeline | Profiles | Resources | Audits | Console | PageSpeed

Preserve log

Filter | All | Documents | Stylesheets | Images | Scripts | XHR | Fonts | WebSockets | Other | Hide data URLs

Name / Path	Method	Status / Text	Type	Size / Content	Time / Latency
/documents/11503/11504/11765	GET	200 OK	image...	19.5 KB	8 ms
help.png /html/themes/classic/images/portlet	GET	200 OK	image...	3.5 KB 3.0 KB	9 ms 7 ms
93dd7b6f-5a52-42bf-b039-3ff34c0... /documents/11503/11504/11648	GET	200 OK	image...	37.1 KB 36.7 KB	9 ms 7 ms
9fcb77db-b8f9-4457-b494-f9e9f31... /documents/11503/11504/11717	GET	200 OK	image...	70.8 KB 70.4 KB	9 ms 6 ms
de1ffcd1-08d3-4f7e-b65a-88e7d12... /documents/11503/11504/11819	GET	200 OK	image...	145 KB 144 KB	9 ms 6 ms
5c2b0574-5891-4d40-b5e9-d8b88... /documents/11503/11504/11858	GET	200 OK	image...	51.9 KB 51.5 KB	8 ms 5 ms
0c6e562e-7b56-432d-bba5-d42c7f... /documents/11503/11504/11867	GET	200 OK	image...	442 KB 442 KB	11 ms 8 ms
fontawesome-alloy.woff /html/themes/classic/css/aui/alloy-for	GET	200 OK	applic...	37.5 KB 37.1 KB	3 ms 2 ms
user_male_portrait?img_id=11945&i... /image	GET	200 OK	image...	3.1 KB 2.7 KB	5 ms 4 ms
?browserId=other&minifierType=&la... /combo	GET	200 OK	text/css	577 B 320 B	4 ms 3 ms
Zd2E9abXLFGSr9G3YK2MsNxB8OB85... themes.googleusercontent.com/static/f	GET	200 OK	font/w...	16.2 KB 15.8 KB	58 ms 56 ms
?browserId=other&minifierType=&la... /combo	GET	200 OK	text/j...	15.0 KB	34 ms
?browserId=other&minifierType=&la... /combo	GET	200 OK	text/css	329 B 154 B	3 ms 3 ms
?browserId=other&minifierType=&la... /combo	GET	200 OK	text/ja...	4.7 KB 12.7 KB	5 ms 4 ms
?browserId=other&minifierType=&la... /combo	GET	200 OK	text/css	1.5 KB 5.7 KB	8 ms 7 ms
available_languages.jsp?browserId=o... /html/js/liferay	GET	200 OK	text/ja...	668 B 1.2 KB	4 ms 4 ms
?browserId=other&minifierType=&la... /combo	GET	200 OK	text/ja...	17.5 KB 54.7 KB	39 ms 37 ms
?browserId=other&minifierType=&la... /combo	GET	200 OK	text/css	1.2 KB 3.9 KB	4 ms 3 ms
?browserId=other&minifierType=&la... /combo	GET	200 OK	text/ja...	23.3 KB 75.9 KB	40 ms 38 ms
?browserId=other&minifierType=&la... /combo	GET	200 OK	text/ja...	1.9 KB 4.2 KB	4 ms 3 ms
?browserId=other&minifierType=&la... /combo	GET	200 OK	text/css	585 B 366 B	3 ms 3 ms
?browserId=other&minifierType=&la... /combo	GET	200 OK	text/ja...	5.2 KB 13.7 KB	5 ms 4 ms
?browserId=other&minifierType=&la... /combo	GET	200 OK	text/ja...	2.0 KB 4.2 KB	4 ms 3 ms
?browserId=other&minifierType=&la... /combo	GET	200 OK	text/ja...	1.5 KB 3.2 KB	4 ms 3 ms
?browserId=other&minifierType=&la... /combo	GET	200 OK	text/ja...	5.3 KB 16.2 KB	13 ms 12 ms

39 requests | 1.3 MB transferred | 8.03 s (load: 526 ms, DOMContentLoaded: 422 ms)

1.3MB transferred

Developer Tools – http://localhost:8080/web/guest/home

Elements | Network | Sources | Timeline | Profiles | Resources | Audits | Console | PageSpeed

Preserve log

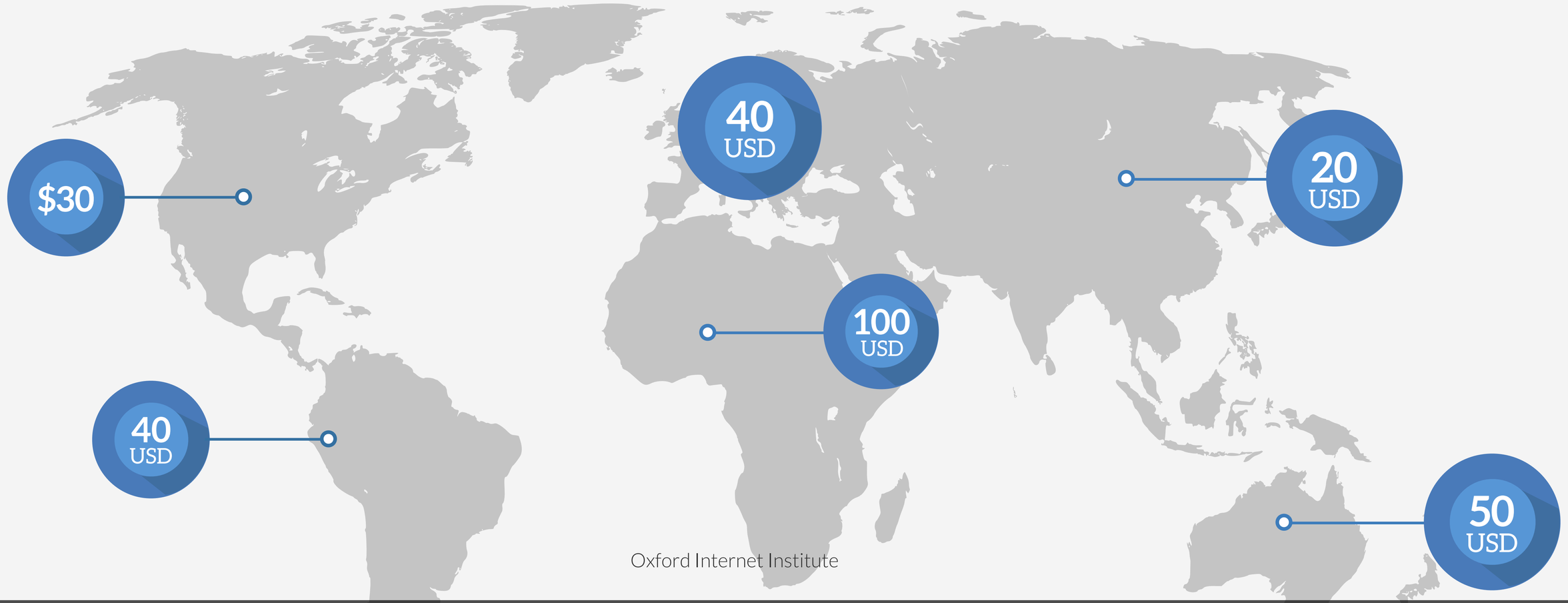
Filter | All | Documents | Stylesheets | Images | Scripts | XHR | Fonts | WebSockets | Other | Hide data URLs

Name / Path	Method	Status / Text	Type	Size / Content	Time / Latency
home?p_p_id=artists_WAR_jukeboxp... /web/guest	GET	200 OK	text/h...	16.0 KB 118 KB	207 ms 206 ms
help.png /html/themes/classic/images/portlet	GET	200 OK	image...	3.5 KB 3.0 KB	3 ms 2 ms
?browserId=other&minifierType=&la... /combo	GET	200 OK	text/css	485 B 79 B	4 ms 3 ms
?browserId=other&minifierType=&la... /combo	GET	200 OK	text/ja...	2.7 KB 7.3 KB	7 ms 6 ms

4 requests | 22.7 KB transferred

22.7KB transferred

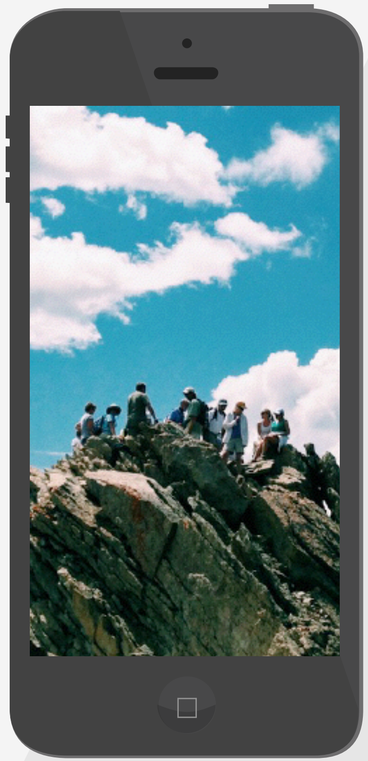
Low Cost



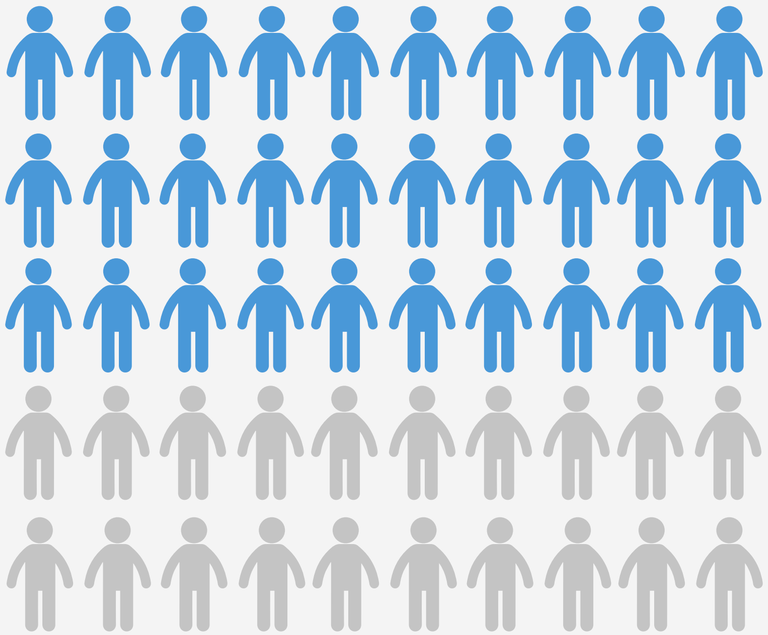
Oxford Internet Institute

Monthly broadband subscription

Mobile



Productivity



Main features

- SEO, Bookmarkability
- UI Feedback
- History navigation
- Hybrid rendering
- Pending navigation
- Cacheable screens
- State retention
- Timeout detection
- Resources management

~8KB

And more...

- Zero dependencies
- Lightweight ~8KB
- Data attributes
- Open source
- Fully tested
- Built in promises

Senna | Introduction

sennajs.com

SENNA

Home Docs Github Download

SENNA

A BLAZING-FAST SINGLE PAGE APPLICATION ENGINE

Star 5 Fork 1

bower install senna

Carrier 1:09 PM

sennajs.com

SENNA

Home Docs Github Download

Documentation

TABLE OF CONTENTS

Features

Routes

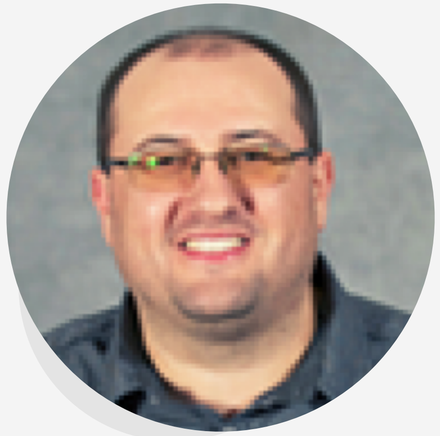
Screens

Data attributes

This documentation will introduce you to most of the key concepts in working with Senna. Don't worry if

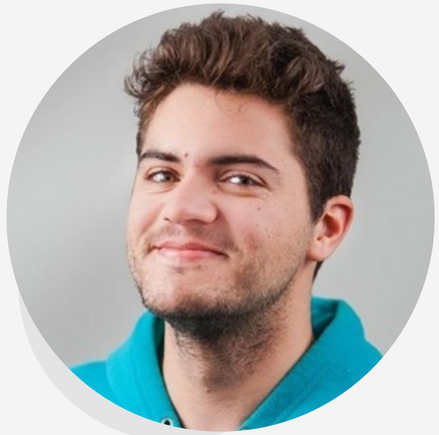
Team

Iliyan Peychev



Iliyan Peychev

Pedro Marques



Zeno Rocha

Thank you!

@eduardolundgren

LIFERAY