

Mail: jonas.bandi@ivorycode.com

Twitter: @jbandi

JS

JavaScript: The Universal Platform?

ABOUT ME

Jonas Bandi

jonas.bandi@ivorycode.com

Twitter: @jbandi

- Freelancer: www.ivorycode.com
- Dozent an der Berner Fachhochschule seit 2007
- In-House Kurse: Web-Technologien im Enterprise
UBS, Postfinance, Mobiliar, BIT, SBB ...



JavaScript & Angular Schulungen:
<http://ivorycode.com/#schulung>

Back in 1995 ...



Write once, run
everywhere!



HyperCard for the Browser
"Make it look like Java"
Completed in 10 Days

Today ?



AJAX Revolution

2000 - 2006

The screenshot shows a Mozilla Firefox browser window with the Google homepage. The address bar contains the URL `http://www.google.com/webhp?complete=1&hl=en`. The browser's menu bar includes File, Edit, View, Go, Bookmarks, Tools, and Help. The toolbar contains various utility icons like HP, SMS Oskar, HTML valid, CSS valid, HREF valid, Vys JS, SVGA 800x600, XGA 1024x768, userAgent, CSS props, eBook, harm 04/05, and SEcompare. The browser's address bar shows several tabs: Oskar, Weblogy.cz, Gmail - Inbox, eXTratitles.to, IMDb Trapped (2002), InsideGoogle: Googl..., and Google. The main content area displays the Google logo with the text "Suggest BETA" below it. A search bar is visible with the text "As you type, Google" and a dropdown menu showing search suggestions for "karel kryl". The suggestions include "karel kryl" (34,100 results), "karel kgo" (892 results), "karel kryl mp3" (4,100 results), "karel kuchar" (4,900 results), "karel koskuba" (498 results), "karel kapek" (3,840 results), "karel kachyna" (2,210 results), "karel kellner" (27 results), "karel kosik", and "karel krautgartner" (771 results). The dropdown menu also includes links for "Advanced Search", "Preferences", and "Language Tools". The status bar at the bottom shows "Done", "Proxy: None", and "Adblock".

Google - Mozilla Firefox

File Edit View Go Bookmarks Tools Help

`http://www.google.com/webhp?complete=1&hl=en`

HP SMS Oskar HTML valid CSS valid HREF valid Vys JS SVGA 800x600 XGA 1024x768 userAgent CSS props eBook harm 04/05 SEcompare

Disable CSS Forms Images Information Miscellaneous Outline Resize Validation View Source Options

Oskar Weblogy.cz Gmail - Inbox eXTratitles.to IMDb Trapped (2002) InsideGoogle: Googl... Google

Google™

Suggest BETA

Web [Images](#) [Groups](#) ^{New!} [News](#) [Froogle](#) [Desktop](#) [more »](#)

As you type, Google

karel kryl	34,100 results
karel kgo	892 results
karel kryl mp3	4,100 results
karel kuchar	4,900 results
karel koskuba	498 results
karel kapek	3,840 results
karel kachyna	2,210 results
karel kellner	27 results
karel kosik	
karel krautgartner	771 results

[Advanced Search](#)
[Preferences](#)
[Language Tools](#)

results. [Learn more](#)

Done Proxy: None Adblock

Second Browser War

2002 - 2012



Massive JavaScript performance improvement



JavaScript is the Language of the Web.

Another software technology will come along and kill off the web. That judgement day will arrive very soon.

-Forrester Research in 2000

The Web has won!

Any application that can be written in JavaScript, will eventually be written in JavaScript.

- Atwood's Law, 2007

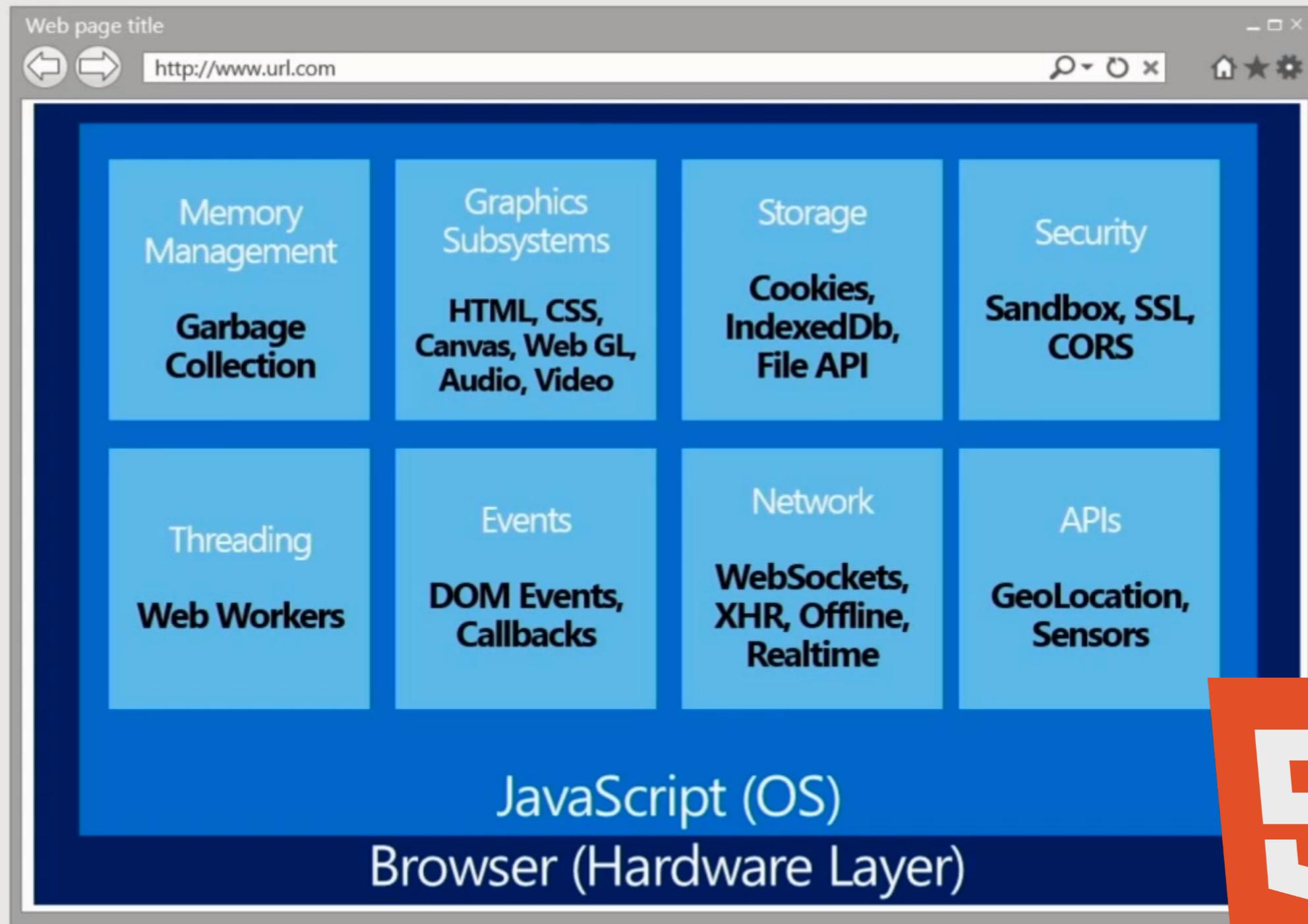
HTML 5



HTML5 explained:

- Html is the structure
- CSS is the colour and style
- JavaScript is everything else

HTML5: An operating system?



Scott Hanselman Fluent 2014 keynote "Virtual Machines, JavaScript and Assembler"
<https://www.youtube.com/watch?v=UzyoT4DziQ4>

Browsers will become a new OSs, JS will become a new C language, the software will migrate into the browser.

- Gary Bernhardt, The Birth & Death of JavaScript



2009



Language

Libraries / Frameworks

dependency management



Toolset
compile
package

Build

Test

Test-Frameworks

Deploy





Language

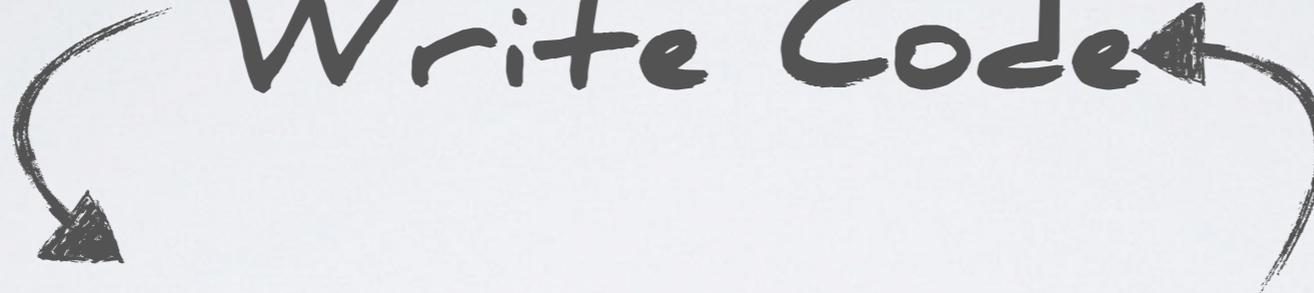


Libraries / Frameworks

dependency management



Write Code



Toolset

Build

Test

compile package

Test-Frameworks



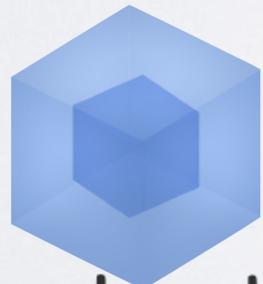
Deploy



TypeScript



GRUNT



webpack

MODULE BUNDLER



ESLint

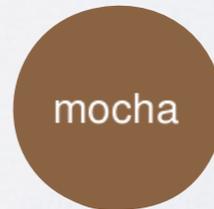


KARMA



Jasmine

Behavior-Driven JavaScript



mocha



Jest

It's Spreading!



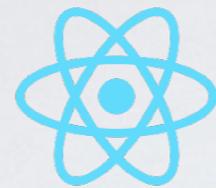
Beyond the Browser



koa



OS X Yosemite



React Native for Windows (UWP)
React Native for macOS



ELECTRON

Building Windows 8 Apps with JavaScript



NW.js

MacGap



Firebase



AWS Lambda



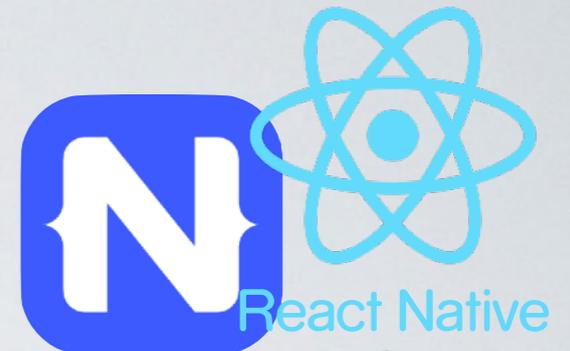
Azure Functions



mongoDB



Apache CouchDB



NativeScript



WEEX



APACHE CORDOVA™

PhoneGap

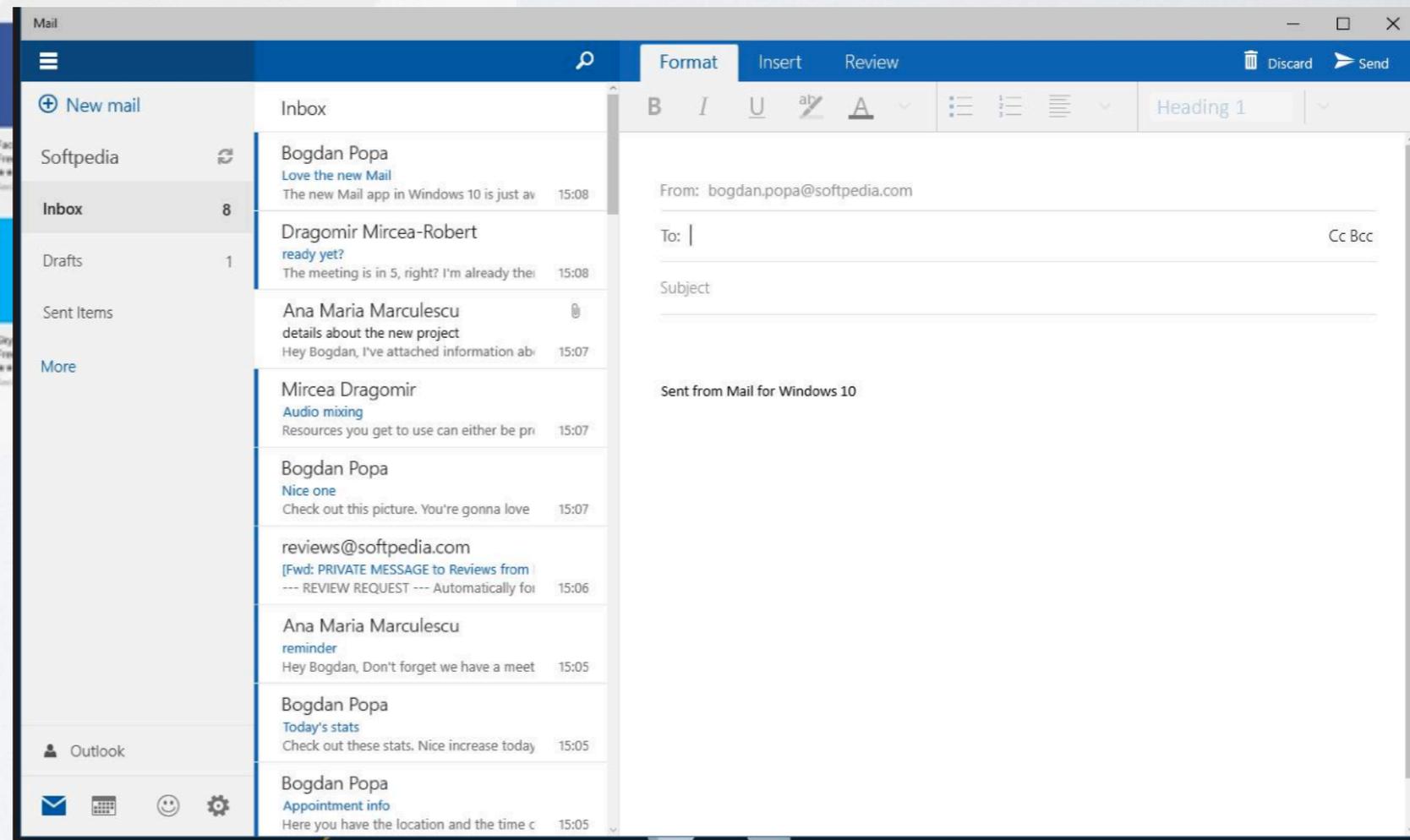
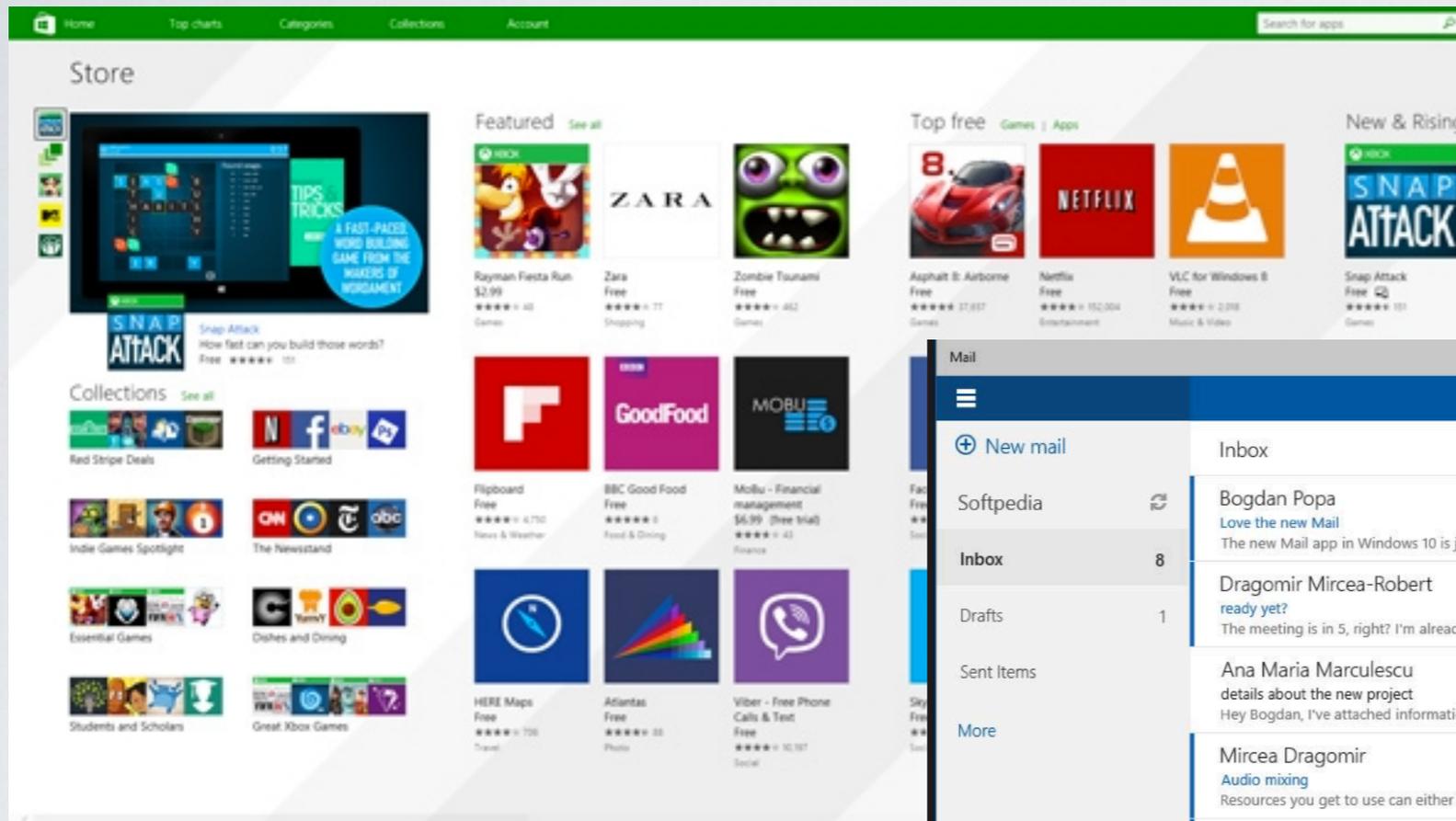


ARDUINO

nodebots.io

espruino.com

Desktop Apps built with WinJS

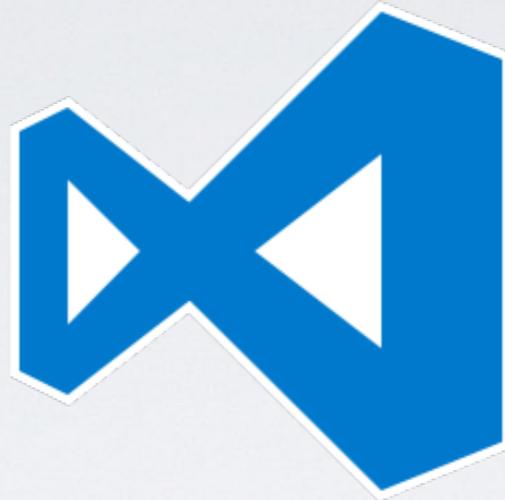


<http://try.buildwinjs.com/>

Desktop Apps built with Electron



Atom



Visual Studio Code



Slack



WhatsApp



Brave



Nylas Mail

... and many more: <https://electron.atom.io/apps/>

Hybrid Mobile Apps

App Store > Finance > Schweizerische Mobiliar Versicherungsgesellschaft AG

Die Mobiliar ⁴⁺

Schweizerische Mobiliar Versicherungsgesellschaft AG >

Details Ratings and Reviews Related

iPhone Screenshots

Schaden erfassen

- Schadendatum: 4. Oktober 2016
- Schadenort: Birmannsgasse 14, 4055 Basel, Switzerland
- Beschreibung: Textnotiz, 1 Foto

Meine Verträge

- Verträge von Myrtha Saxer
- Reiseversicherung
- Haushalt- und Gebäudeversicherung, Rankstrasse 2, CH - 4058 Basel

Kundenkarte

- Myrtha Saxer, 26 Jahre
- Für Junge bis 26 Jahre
- Kundennummer: P-1102-3668
- Geburtsdatum: 03.06.1997
- MEINE VORTEILE

Rating: 4+

LINKS

- Privacy Policy
- Developer Website

© 2017 Schweizerische Mobiliar Versicherungsgesellschaft AG

Description

IHRE VERSICHERUNG IN DER TASCHEN
Dank der Mobiliar App können Sie jederzeit überall Ihre Versicherungsgeschäfte tätigen. So einfach wie noch nie. Der Service steht allen Kundinnen und Kunden zur Verfügung.

React Native Apps



Facebook
iOS · Android

[Using React Native in the Facebook App](#)



Facebook Ads Manager
iOS · Android

[How We Built the First Cross-Platform React Native App](#)



Instagram
iOS · Android

[React Native at Instagram](#)



F8
iOS · Android

[Tutorial: Building the F8 conference app](#)



Airbnb
iOS · Android

[Hybrid React Native Apps at Airbnb](#)



Walmart
iOS · Android

[React Native at Walmart Labs](#)



Tesla
iOS · Android



Tencent QQ
Android

[QQ is China's largest messaging platform, with over 829 million active accounts](#)

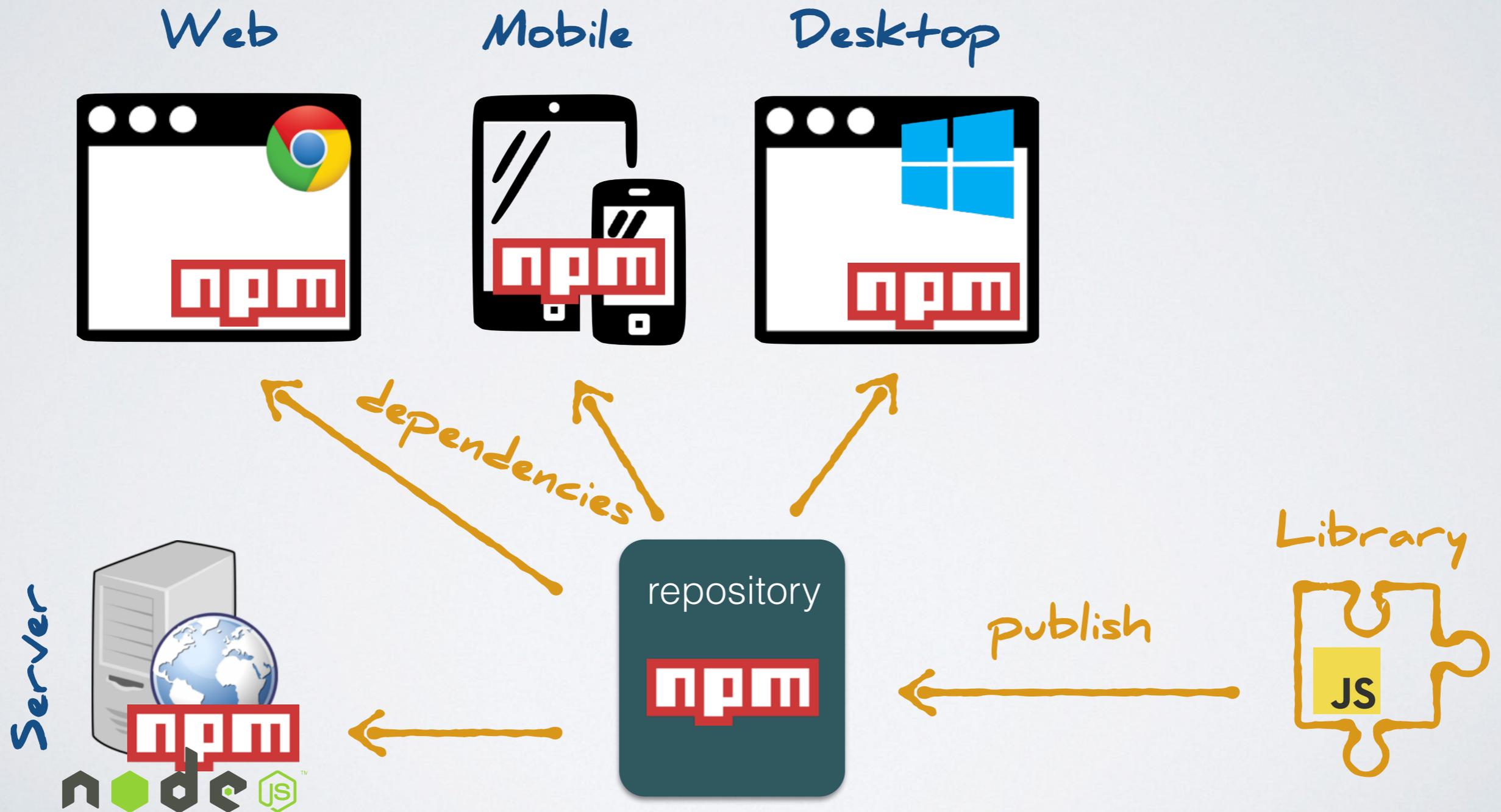
JavaScript is really the only true
cross-platform game in town.
- Anders Hejlsberg, Build 2017

Today ?



Run everywhere ✓
Write once?

Reuse: Sharing Code

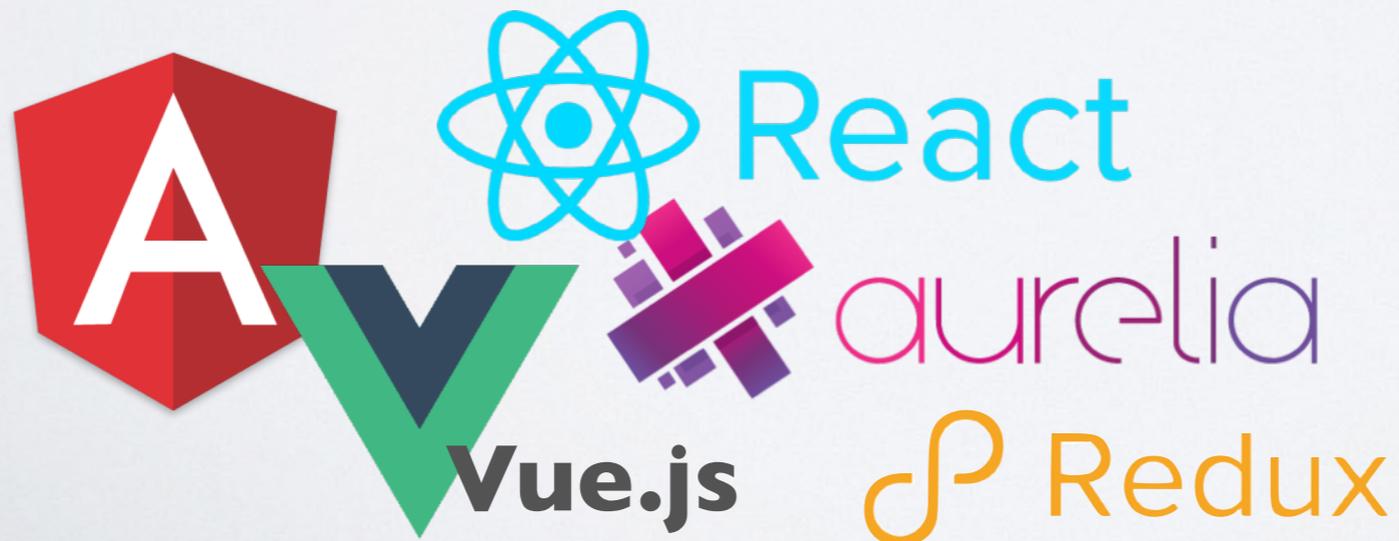


Reuse: Sharing Knowhow

Languages



Frameworks & Libraries



Development:

- Concepts
- Methodologies
- Tooling
- Fast Cycles
- Debugging

Learn once,
write everywhere.



The Dark Side

Unearthing the Excellence in JavaScript



JavaScript: The Good Parts

JavaScript: The Good Parts

Crockford



O'REILLY

JavaScript

The Definitive Guide

Flanagan

O'REILLY

The Bad Parts

GWT is a reasonable implementation of a poor architectural choice. GWT attempts to hide many of the details of the web as a platform by creating desktop metaphors in Java and generating JavaScript code to implement them. First, in many ways, **JavaScript is more powerful and expressive than Java**, so we suspect that the generation is going in the wrong direction.



How can anybody love JavaScript?

ECMAScript 2015

"The big makeover..."



5
5
4

```
(function () {  
    'use strict';  
  
    var app = angular.module('todoApp');  
    app.controller('todoController', ToDoController);  
  
    ToDoController.$inject = ['todoService'];  
    function ToDoController(todoService) {  
        var ctrl = this;  
  
        ctrl.newToDo = new ToDoItem();  
        ctrl.todos = todoService.getTodos();  
  
        ctrl.addToDo = function () {  
            ctrl.newToDo.created = new Date();  
            todoService.addToDo(ctrl.newToDo);  
            ctrl.newToDo = new ToDoItem();  
        };  
  
        ctrl.removeToDo = function (todo) {  
            todoService.removeToDo(todo);  
        };  
    }  
})();
```

ES2015

```
import { Component, Output,  
        EventEmitter } from '@angular/core';  
import {ToDo} from "../../model/todo.model";  
  
@Component({  
    selector: 'td-new-todo',  
    templateUrl: './new-todo.component.html'  
})  
export class NewTodo {  
  
    constructor(){  
        this.newToDo = new ToDo();  
    }  
  
    @Output() onAddToDo = new EventEmitter();  
  
    addToDo() {  
        this.onAddToDo.emit(this.newToDo);  
        this.newToDo = new ToDo();  
    }  
}
```

JavaScript was never engineered for large applications. It was intended for 100-1000 lines of codes.

Today we build apps with millions of lines of code. Very large JavaScript code bases tend to become “read-only”.

- Anders Hejlsberg, Build 2016

TypeScript

JavaScript that scales!

TypeScript is a language for application-scale
JavaScript development.



flow

Flow is a static type checker
for JavaScript.

<https://flow.org/>



Ecosystem?

Active Ecosystem



503,929
total packages



463,127,635
downloads in the last day



2,426,266,102
downloads in the last week

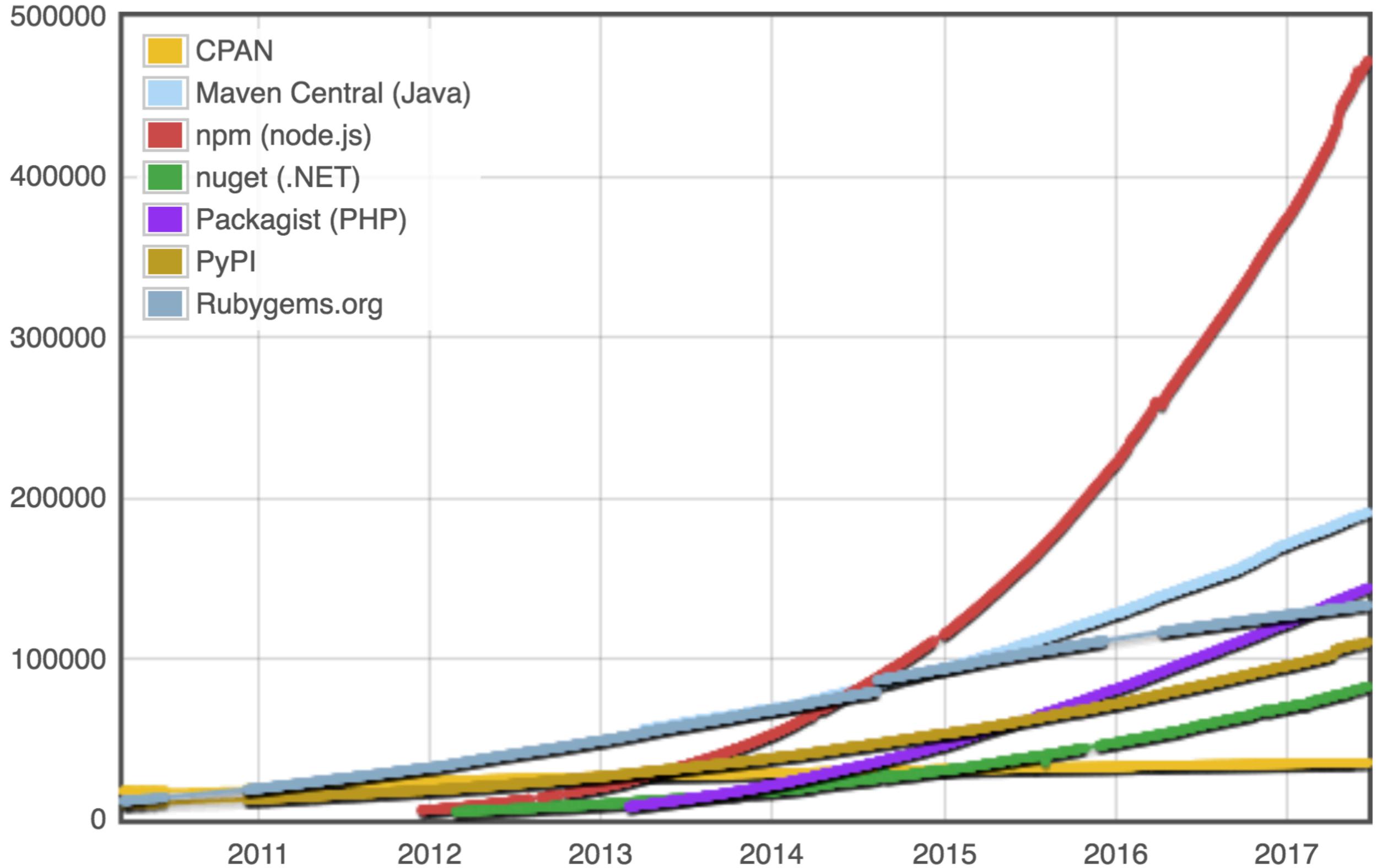


10,162,288,786
downloads in the last month

(Maven Central has 191'033 unique artifacts)

<https://unpm.nodesource.com/>
<http://www.modulecounts.com/>

Module Counts





Gary Bernhardt

@garybernhardt



 **Follow**

every javascript programmer I follow mentions at least five tools every day that I've never heard of before and never hear of again



RETWEETS

99

FAVORITES

52

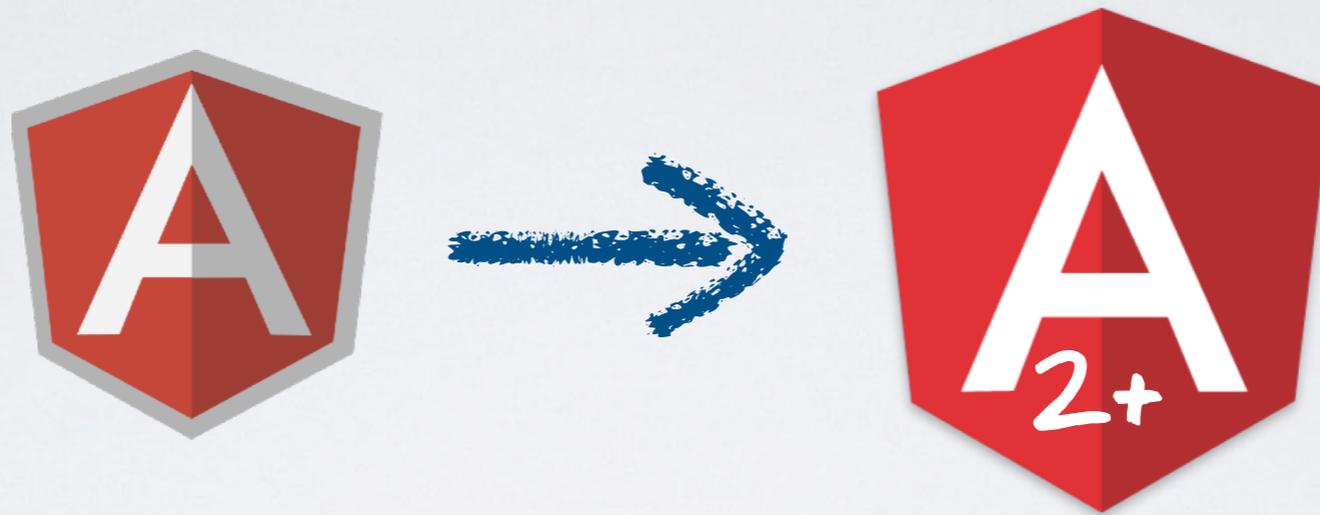


2:58 PM - 29 Aug 2013

Not every week-end project should be made public and available through Bower. The Javascript community needs to learn to filter itself.

- Manuel Bernhardt, 2014

Churn and Waste



How many hundreds of thousands of human hours were wasted dealing with the pain of upgrading a version of Angular 2 and all of its related dependencies?

- Liz Bennett, Why Learning Angular2 was Excruciating

<http://bit.ly/2sYnvAG>



I Am Developer

@iamdeveloper



Following

Being a JavaScript developer in 2014 is like speed dating.

45 seconds with each framework before you have to re-write.



RETWEETS

1,104

FAVORITES

637

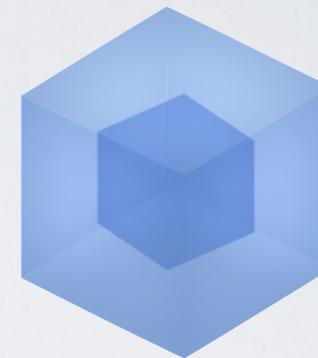


8:25 AM - 16 Dec 2014

Re-Inventing the Wheel

Jake

JavaScript build Tool
similar to Make.



Webpack



Evolution or Hype?



Bower



yarn

Accidental Complexity

Example: Angular Size Optimization

Angular 2+ is bloated



Google Closure Compiler
can eliminate unused code

Google Closure has
it's own module
system:
goog.module



Typescript cant
compile to
goog.module
modules



Google Closure
Compiler needs
Java

introduce tsickle a
TypeScript to
Closure Translator



Result:

TS -> ES2015 -> goog.module -> ES5

Over-Engineering

Transpiling to JavaScript causes problems #2412

 Closed alexea



alexea

Many users
to adopt

Many users don't have Java on their machines anymore. Installing it is slow and confusing and a major blocker to adoption.

There are a bunch of bugs with the current approach.

- GWT unicode support [#2383](#)
- Node process runs out of heap memory [aooale/closure-compiler-is#23](#)
- Not 100% feature

Aside from these bugs
chase down the long t

Users may also want to
we still need a way to g
Bazel is about to releas
[bazelbuild/bazel#1666](#)

The approach:

- ship an [OpenJDK](#)
- either statically lin
- closure compiler b

The approach:

- ship an OpenJDK JRE to npm (for the three major architectures, windows, darwin x64, linux x64)
- closure compiler binary runs Java without the user needing to know about it.

Over-Engineering

frontend-maven-plugin

A plugin that downloads/installs Node and NPM locally as part of your Maven build.

why?



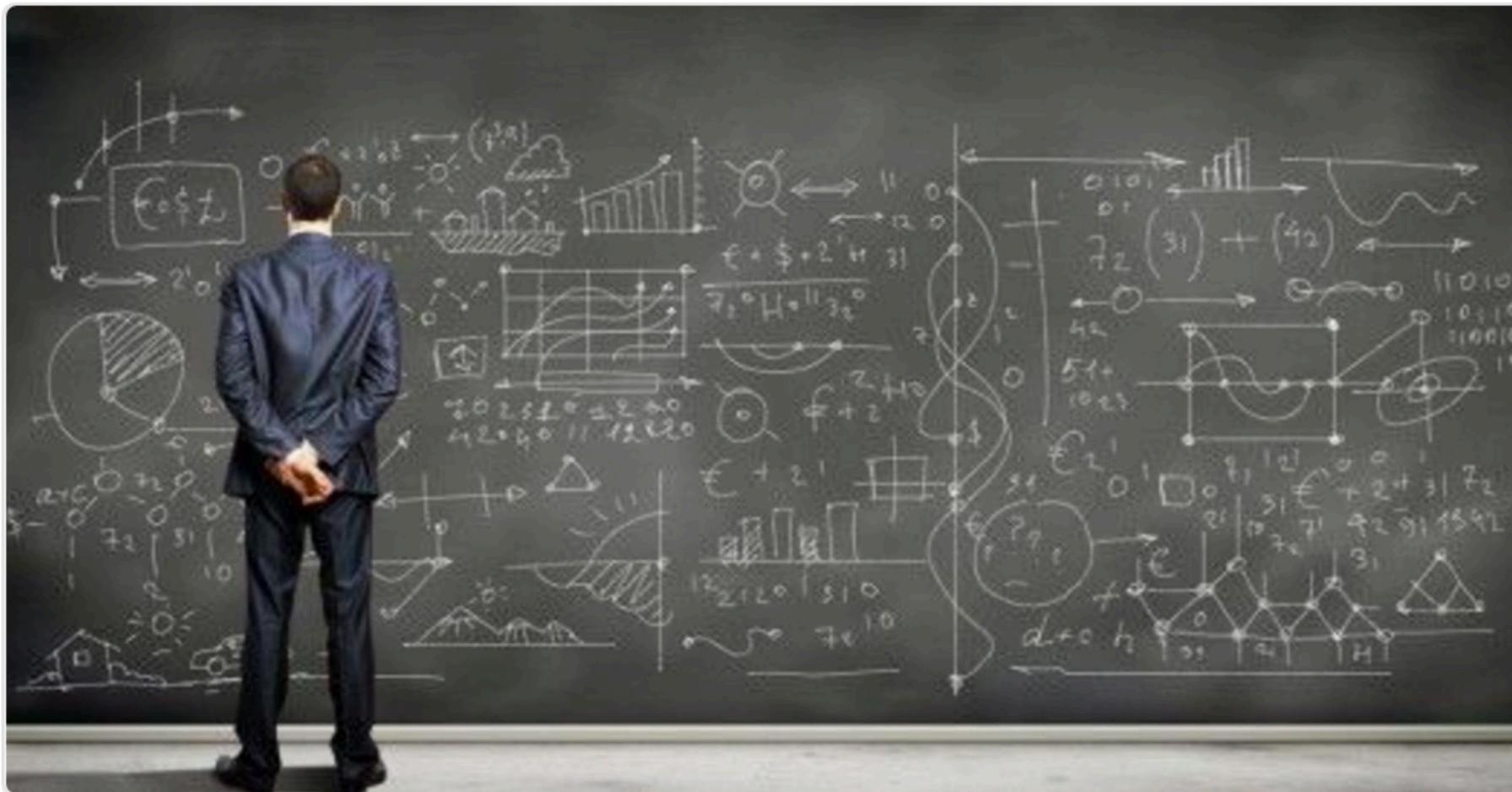
Thomas Fuchs ✓

@thomasfuchs

Following



Marc was almost ready to implement his "hello world" React app



Retweets
4,241

Likes
5,262



12:24 PM - 12 Mar 2016

Perhaps the Javascript ecosystem is just experiencing *intense* growing pains.

- Liz Bennett, Why Learning Angular2 was Excruciating

Or, maybe, just maybe, the Javascript world will always be sort of a joke, a place where engineering hipsters go to waste time and feel like they're on the cutting edge of innovation when really, they are living in a world of madness and chaos, throwing hours of productivity down the drain so that they can use the latest and 'greatest' tools out there.

- Liz Bennett, Why Learning Angular2 was Excruciating

Questions?



JavaScript Schulungen & Coachings,
Project-Setup & Proof-of-Concept:
<http://ivorycode.com/#schulung>
jonas.bandt@ivorycode.com