Taming JavaScript with Cloud9 IDE: a Tale of Tree Hugging

Zef Hemel (@zef)


goto;
conference
Amsterdam May 24, 25 & 26, 2012
Zef Hemel
Cloud9 DIE
SPEAKER

Cloud9 IDE

Your code anywhere, anytime

.js

browser.js

db.js

server.js

*.js

The collaborative application platform v3.0 Beta2 (unstable)

Ajax.org Platform is a pure javascript application framework for creating real-time collaborative applications that run in the browser. **Ajax.org Platform radically changes the way you write applications:**

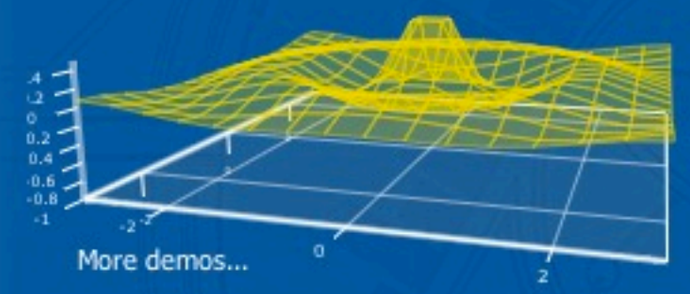
- **Live markup**
- **Markup and JSON api**
- **Collaborative backbone**
- **100% open source software** (more info)

Download Now

AJAX.org Platform

This is a demo of the charting engine.

Use your mouse to interact!



APF is free software

Read more about this

open source

Promote JS

Getting Started

Read about APF

- Getting Started Tutorial
- APF Manual

Get APF into your Editor

aptana

IntellijIDEA

Visual Studio

NetBeans

<oXygen/> xml editor

~140,000

Tooling matters

JavaScript Developer

Java – testapp/www/testapp.html – Eclipse SDK – /Users/zef/Dropbox/Documents/workspace

Transform

Java

Package Explorer

- testapp
  - www
    - js
    - mobl
    - mobl.js
    - testapp.html
    - testapp.js
  - www.release
    - testapp.css
    - testapp.html
    - testapp.js
  - config.mobl
  - testapp.mobl

testapp.mobl | testapp.html

```
<!DOCTYPE html>
<html >
    <head>
        <title>testapp</title>
        <meta name="viewport" content="user-scalable=no, width=device
        <meta name="apple-mobile-web-app-capable" content="yes" />
        <meta names="apple-mobile-web-app-status-bar-style" content="

    </head>
    <body>
    <div id="mobl-loading">
      Loading... <img src="
    </div>
    <script src="js/jquery-1.4.min.js" type="application/x-javascript
    <script src="js/persistence.js" type="application/x-javascript" s
```

Outline

An outline is not available.

Javadoc

Declaration

Console

No consoles to display at this time.

Problems

0 items

Description	Resource	Path	Location	Type

Writable | Insert | 14 : 11

Java – testapp/www/testapp.html – Eclipse SDK – /Users/zef/Dropbox/Documents/workspace

Transform

Java

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testapp.mobl | testapp.html

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Description	Resource	Path	Location	Type

Writable | Insert | 14 : 11

Cloud9 IDE

Your code anywhere, anytime

File Edit Selection Find View Goto Tools Help Preview debug • All changes saved

cloud9-lib.js | *alive.js | session-ext.js | sandbox-plugin.js | *process_manag...

PROJECT FILES

- cloud9.ide.gittools
- cloud9.ide.hg
- cloud9.ide.npm
- cloud9.ide.revisions
- cloud9.ide.run-node
- cloud9.ide.run-python
- cloud9.ide.settings
- cloud9.ide.shell
- cloud9.ide.state
- cloud9.ide.watcher
- cloud9.log
- cloud9.permissions
- cloud9.process-manager
  - package.json
  - process-manager-ext.js
  - *process_manager.js
  - process_manager_test.js
- cloud9.run.node
- cloud9.run.node-debug
- cloud9.run.npm
- cloud9.run.shell
- cloud9.sandbox
  - package.json
  - sandbox-plugin.js
- cloud9.sandbox.fs
- cloud9.session
  - package.json
  - session-ext.js
- cloud9.session.file
- cloud9.session.memory
- cloud9.socket
- cloud9.sourcemint
- cloud9.static

```
40              if (!processCount)
41                  return callback();
42          }, 100);
43      };
44
45      this.spawn = function(runnerId, options, eventName, callback) {
46          if (this.disposed)
47              return callback("cannot run script - the process manager has already been disposed");
48
49          var self = this;
50          var runnerFactory = this.runners[runnerId];
51          if (!runnerFactory)
52              return callback("Could not find runner with ID " + runnerId);
53
54          var child = runnerFactory(options, this.eventEmitter, eventName);
55          child.spawn(function(err) {
56              if (err)
57                  return callback(err);
58
59                  self.processes[child.pid] = child;
60                  callback(null, child.pid);
61              });
62              this.
63      };
64
65      /**
66       * execu                                              err are returned
67       * in th
68       */
69      this.exe
70          if (
71                                                             nager has already been disposed");
72
73          var
74
75          var runnerFactory = this.runners[runnerId];
76          if (!runnerFactory)
77              return onStart("Could not find runner with ID " + runnerId);
78
79          var child = runnerFactory(options, this.eventEmitter, "");
80          child.exec(function(err, pid) {
81              if (err)
82                  return onStart(err);
```

- debug(pid, debugMessage, callback)
- destroy()
- disposed
- eventEmitter
- exec(runnerId, options, onStart, onExit)
- execCommands(runnerId, cmds, callback)
- kill(pid)
- prepareShutdown(callback)
- processes

62:14

HTML

CSS

JavaScript

Client

HTML5
CSS3
JavaScript

Client

HTML5
CSS3
JavaScript

Server

Node.js
Redis

Client

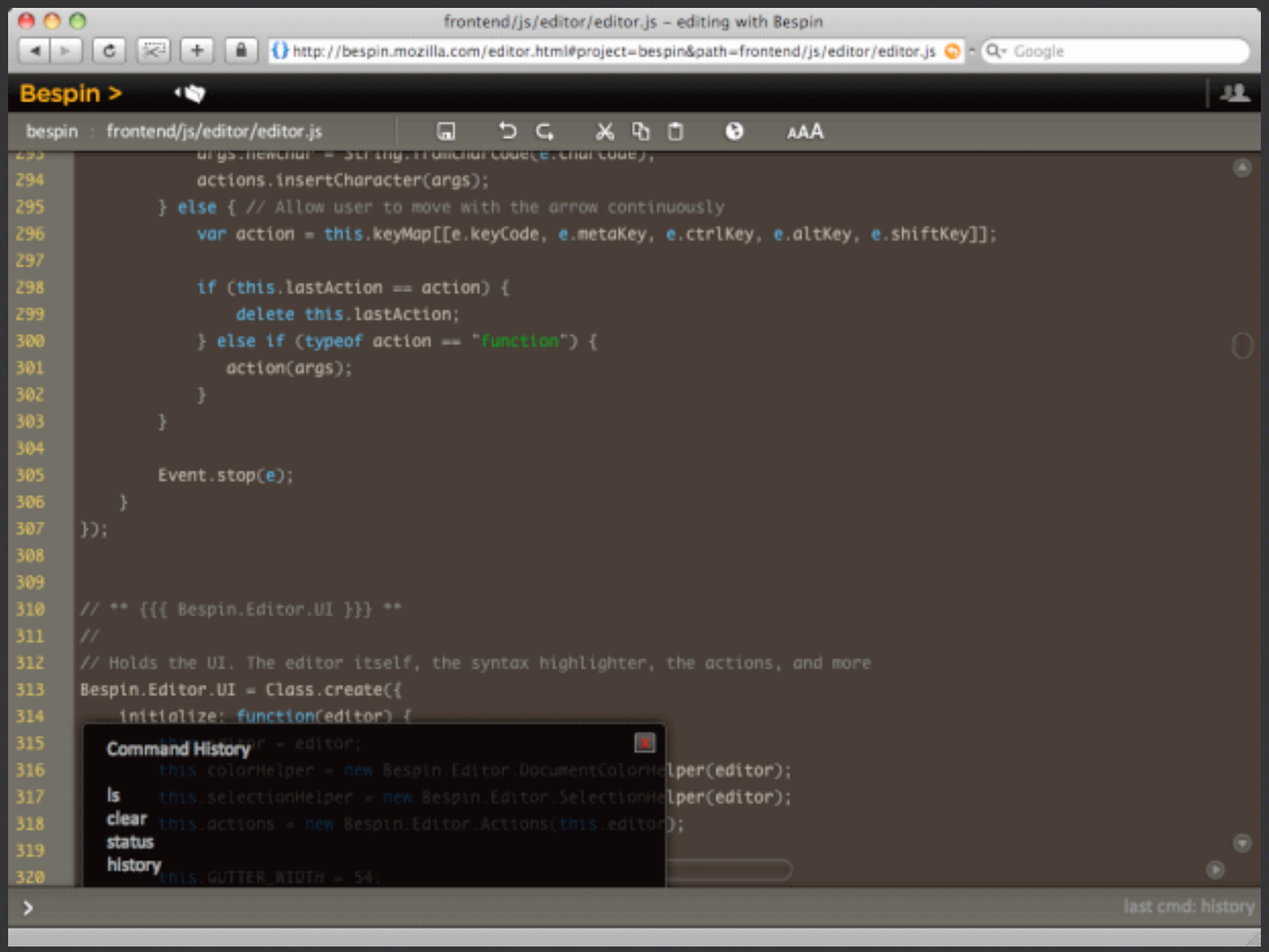
HTML5
CSS3
JavaScript

XMLHttpRequest
HTML5 WebSockets

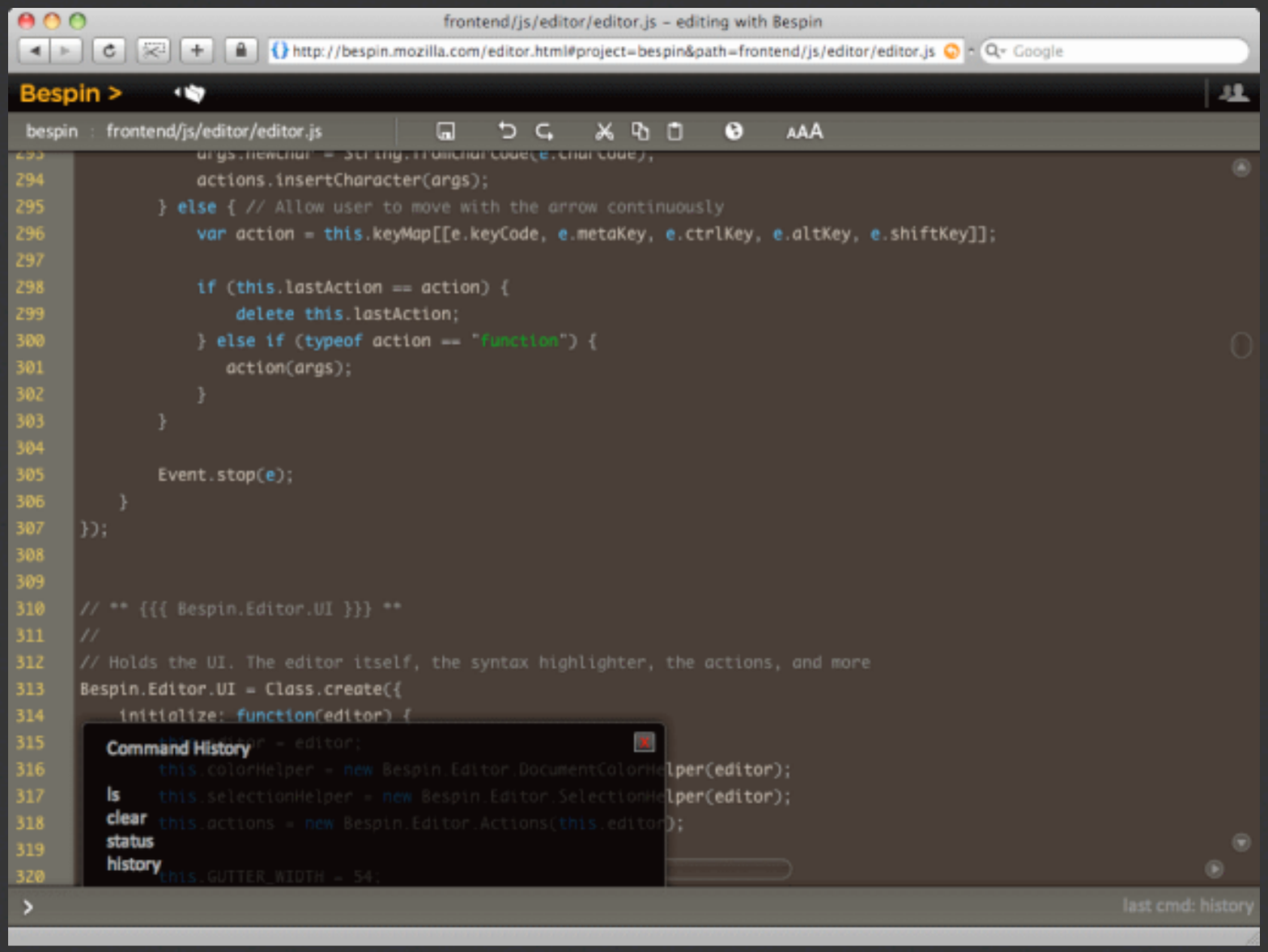
Server

Node.js
Redis

Mozilla Bespin



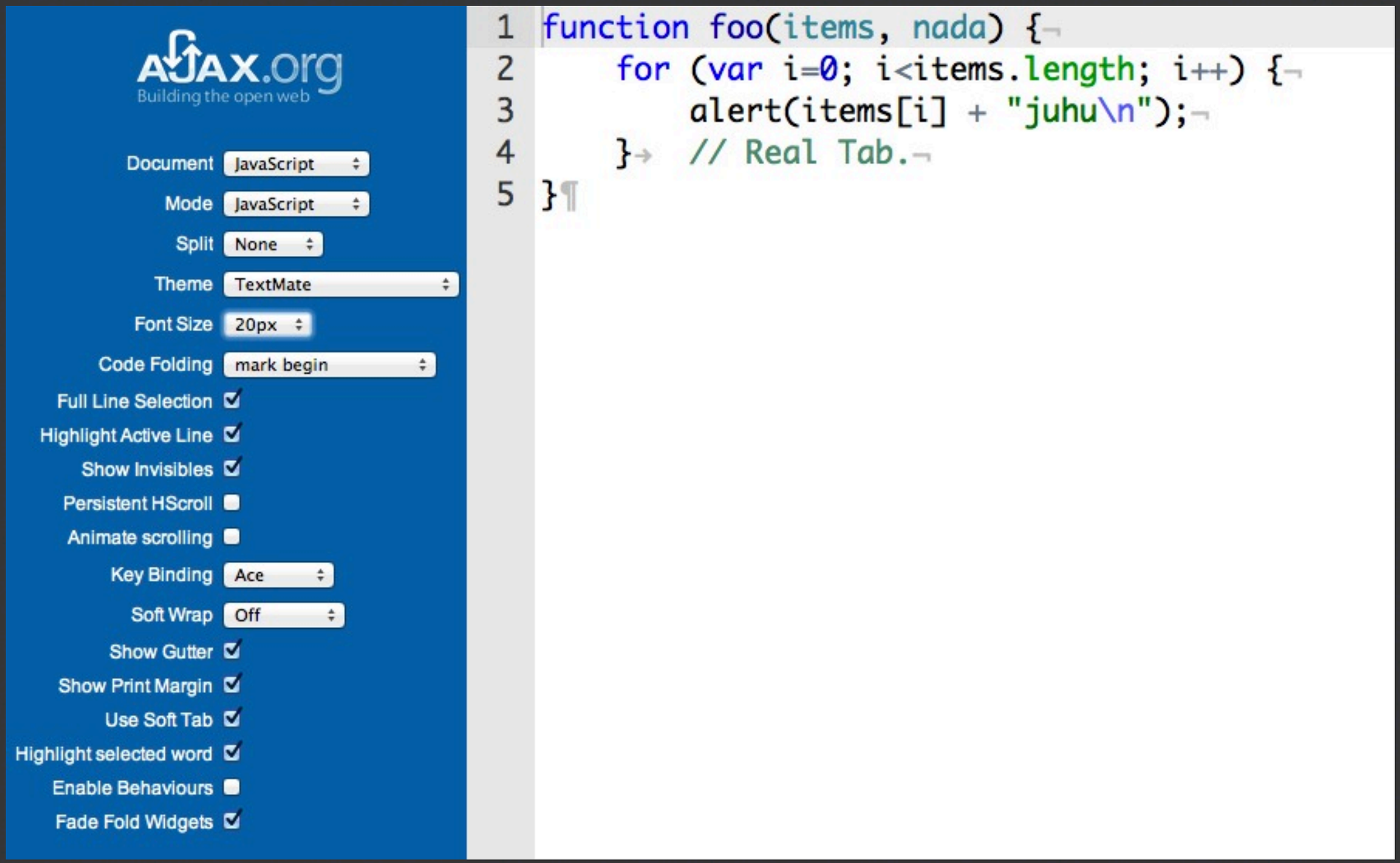
Mozilla Bespin



Canvas

Browser Wars

2.0


AJAX.org
Building the open web
Document JavaScript
Mode JavaScript
Split None
Theme TextMate
Font Size 20px
Code Folding mark begin
Full Line Selection
Highlight Active Line
Show Invisibles
Persistent HScroll
Animate scrolling
Key Binding Ace
Soft Wrap Off
Show Gutter
Show Print Margin
Use Soft Tab
Highlight selected word
Enable Behaviours
Fade Fold Widgets
1 function foo(items, nada) {
2 for (var i=0; i<items.length; i++) {
3 alert(items[i] + "juhu\n");
4 } // Real Tab.
5 }

DOM

Sidebar

```
16 (function( window, undefined ) {
17
18 // Use the correct document accordingly with window argument (sandbox)
19 var document = window.document,
20     navigator = window.navigator,
21     location = window.location;
22 var jQuery = (function() {
23
24 // Define a local copy of jQuery
25 var jQuery = function( selector, context ) {
26         // The jQuery object is actually just the init constructor 'enhanced'
27         return new jQuery.fn.init( selector, context, rootjQuery );
28     },
29
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Ajax.org Cloud9 Editor

Previously Skywriter, Bespin

JavaScript

Scala

HTML

Lua

C/C++

SCSS

Java

Markdown

Closure

PHP

SVG

SQL

Perl

C#

CoffeeScript

CSS

Ruby

Textile

Coldfusion

JSON

Scad

OCaml

Groovy

XML

LaTeX

zefhemel / persistencejs

Admin | Unwatch | Pull Request | 464 | 43

Code | Network | Pull Requests 2 | Issues 9 | Stats & Graphs

Files | Commits | Branches 3 | Tags 7 | Downloads

Current branch: master

persistencejs / lib / persistence.js

Back to source view

Code | Preview | Tabs | 8 | No wrap

```
27          exports.createPersistence = function() {
28                  return initPersistence({})
29          }
30          var singleton;
31          exports.__defineGetter__("persistence", function () {
32          if (!singleton)
33                          singleton = exports.createPersistence();
34                  return singleton;
35          });
36  }
37  else {
38          window = window || {};
39          window.persistence = initPersistence(window.persistence || {});
40  }
41
42
43  function initPersistence(persistence) {
44          if (persistence.isImmutable) // already initialized
45                  return persistence;
46
47  /**
48   * Check for immutable fields
49   */
50  persistence.isImmutable = function(fieldName) {
51    return (fieldName == "id");
52  };
53
54  /**
55   * Default implementation for entity-property
56   */
57  persistence.defineProp = function(scope, field, setterCallback, getterCallback) {
58    scope.__defineSetter__(field, function (value) {
59        setterCallback(value);
60      });
61    scope.__defineGetter__(field, function () {
```

Commit message:

Edited lib/persistence.js via GitHub

Cancel | Commit Changes

~240,000

Component Systems

Decoupling

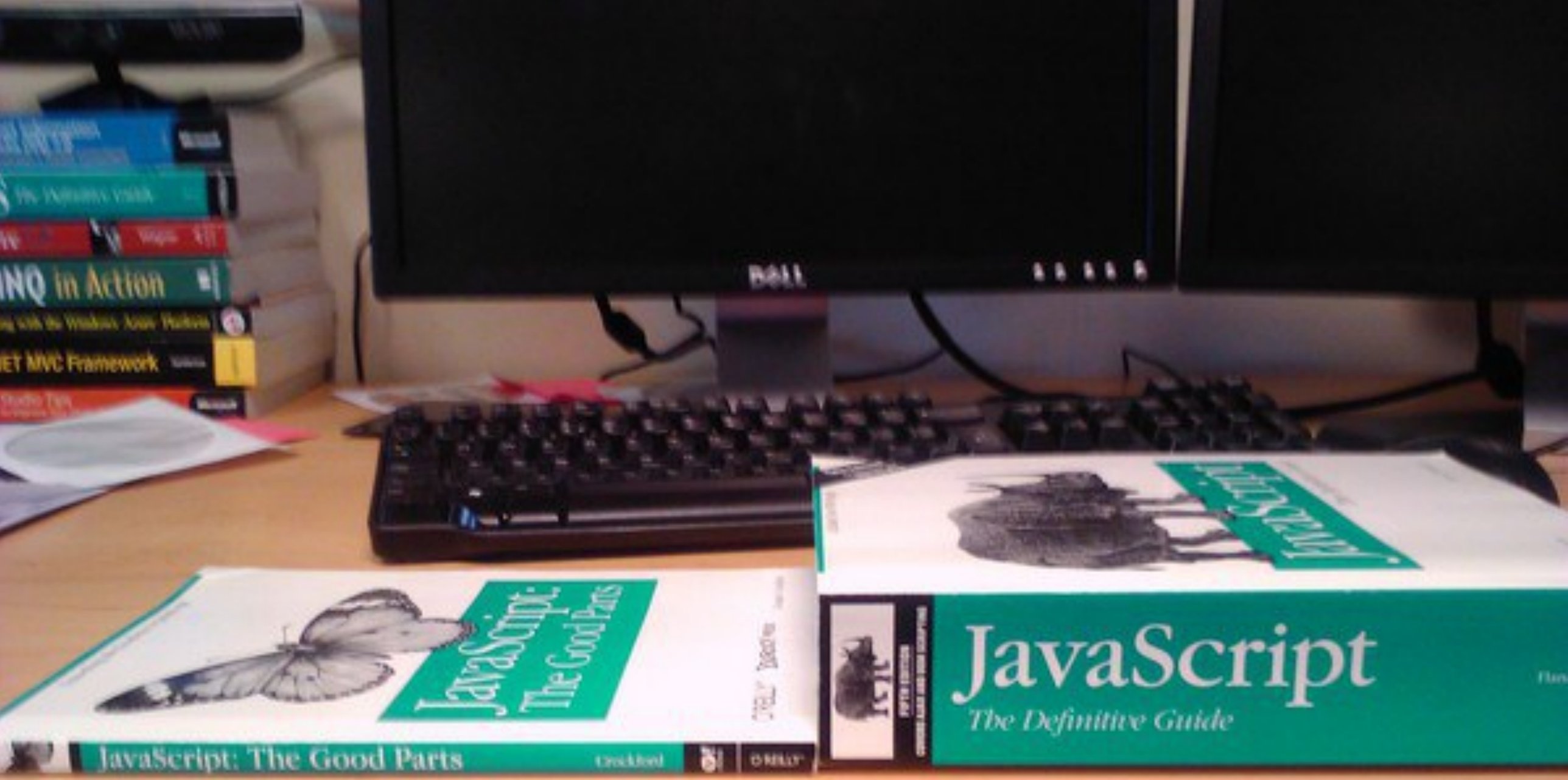
Message Queues

Unearthing the excellence in JavaScript

JavaScript: The Good Parts

O'REILLY® | YAHOO! PRESS

Douglas Crockford

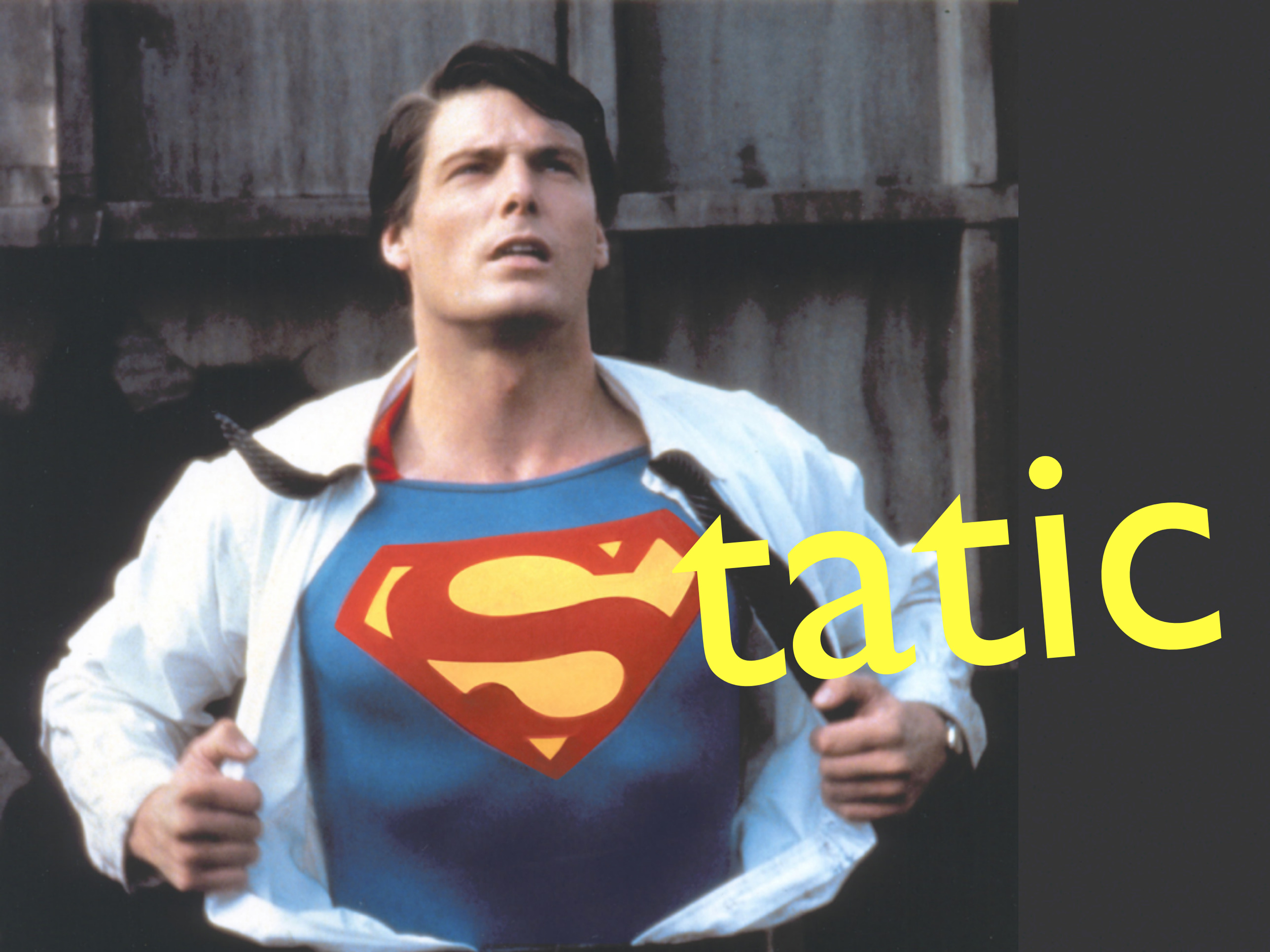

DELL
JavaScript: The Good Parts
Crockford
O'REILLY
JavaScript
The Definitive Guide

Tooling matters

especially for JavaScript

```
Person.prototype.process = function() {
    var data = this.getObj();
    for (p in data) {
        var item = data[p];
        this.makeCall(item, this.friends.lenght, function(result) {
            this.registerCallResult(item, result);
        });
    }
};
```

Unleash the awesome power of...


tatic


program analysis

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        });
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```

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10     });
11   }
12 };
```

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```

Iterating using undeclared variable

```
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10     });
11   }
12 };
```

Warning: you are in an anonymous inner function with its own “this” pointer

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10     });
11   }
12 };
```

Did you mean “length”?

“The most important thing I have done as a programmer in recent years is to aggressively pursue static code analysis.”

John Carmack

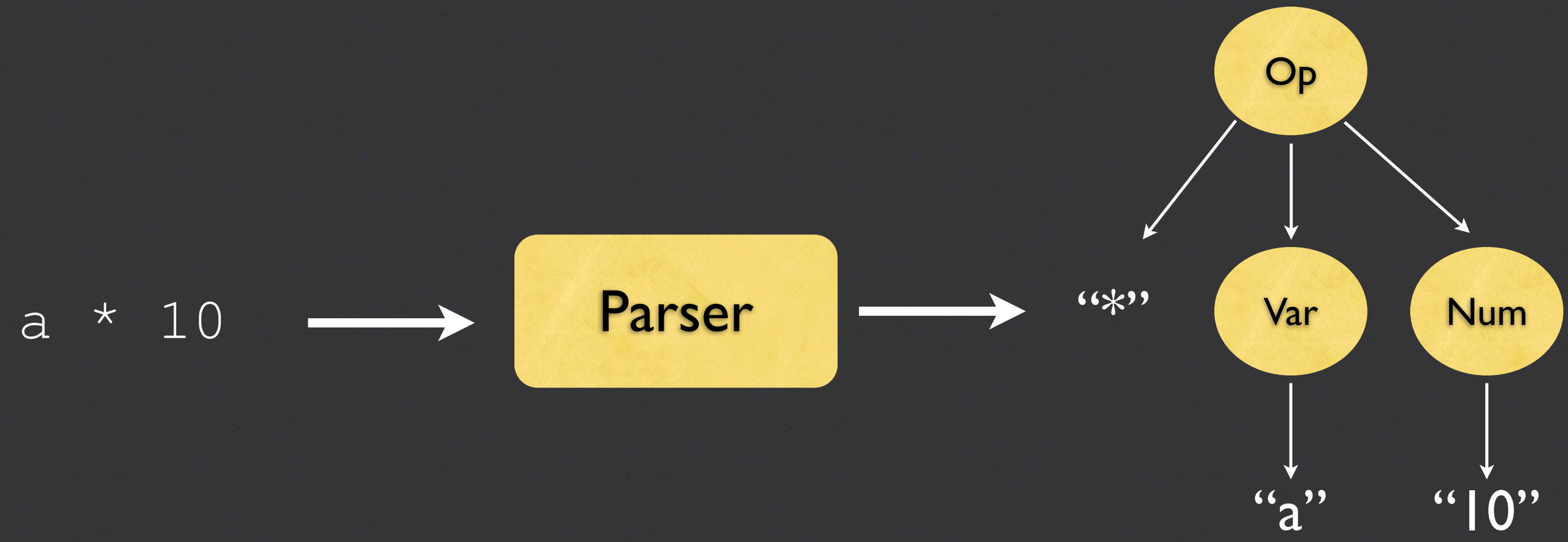
How?

Parse

Analyze


Code
Parser
AST

Abstract Syntax Tree



Zeon

Narcissus

UglifyJS

language.js

Esprima

performance (speed/memory)

AST datastructure

traversal tools

performance (speed/memory)

AST data structure

traversal tools

JavaScript specific

treehugger.js

"The JQuery of AST analysis."

treehugger.js

Generic AST
Data structure

treehugger.js

Generic AST
Data structure

treehugger.js

Generic
Traversals

Generic AST
Data structure

DSL with
Pattern
Matching

treehugger.js

Generic
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Generic AST
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DSL with
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treehugger.js

Language-
Specific Parsers

Generic
Traversals

Generic AST
Data structure

DSL with
Pattern
Matching

treehugger.js

Language-
Specific Parsers

JavaScript
(UglifyJS-based)

Generic
Traversals

Generic AST
Data structure

DSL with
Pattern
Matching

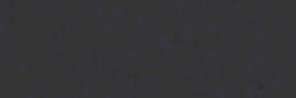
treehugger.js

Language-
Specific Parsers

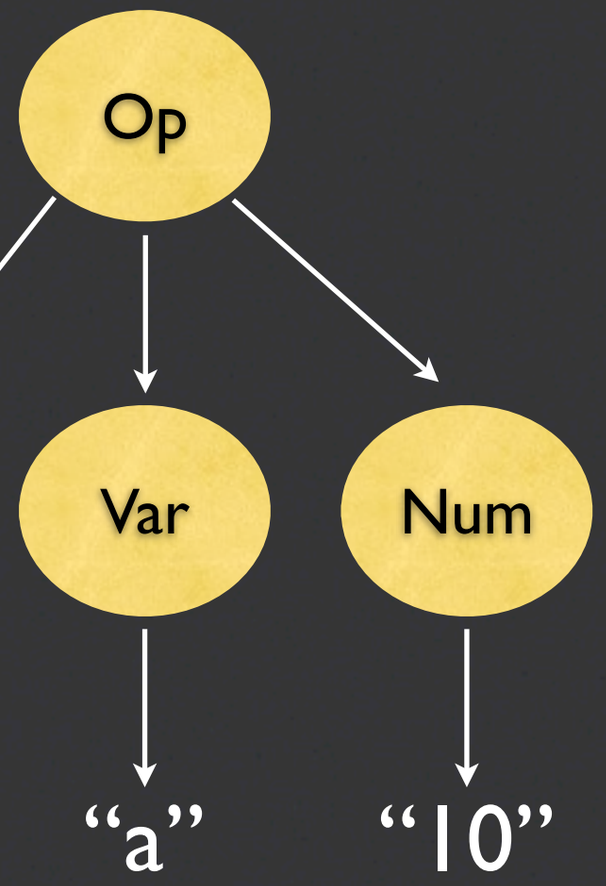
JavaScript
(UglifyJS-based)

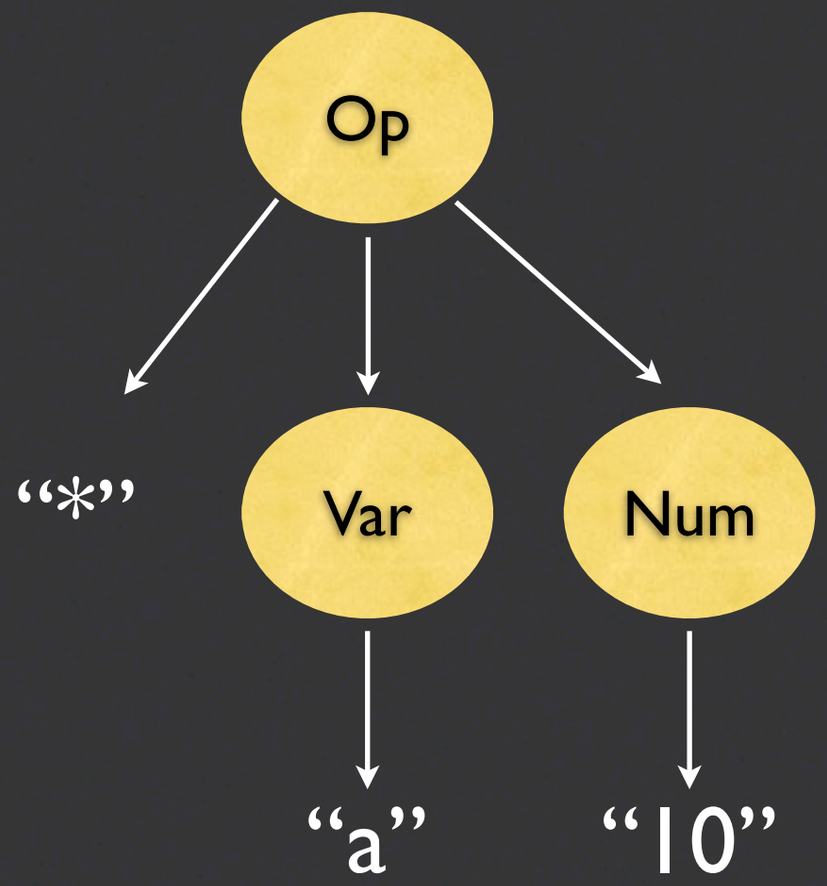
Generic
Traversals

```
a * 10
```

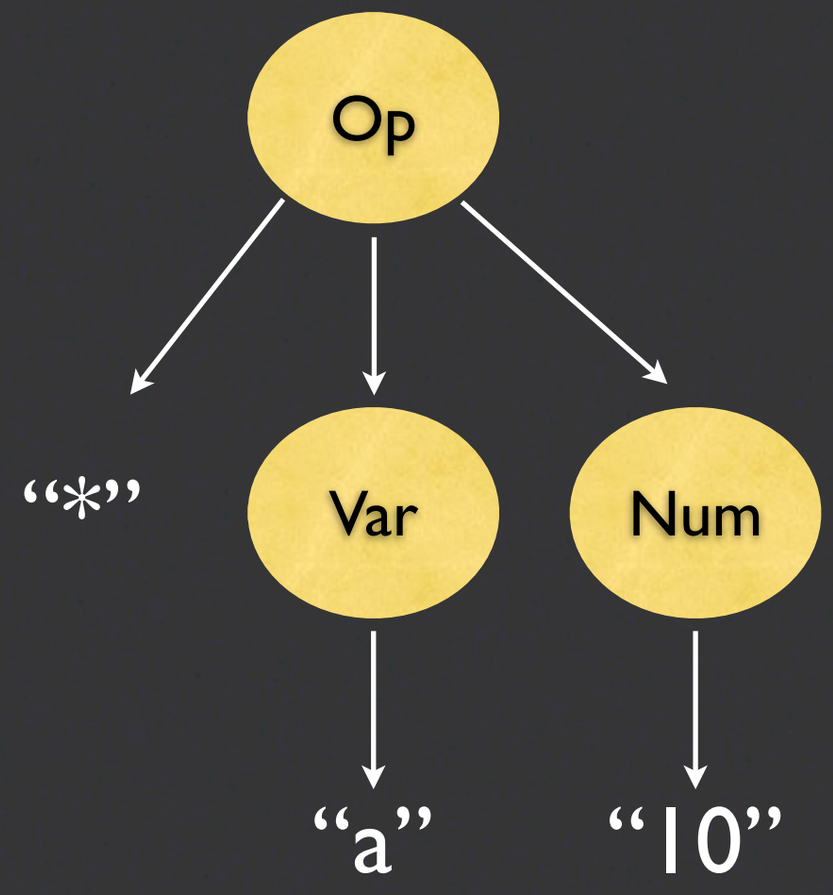


“*”






```
Op("*", Var("a"),
        Num("10"))
```



ATerm

```
Op("*", Var("a"),
        Num("10"))
```

Constructors	`Var(_)`
Lists	`[_, _]`
Strings	`"hello"`
Placeholders	`x`

let's play

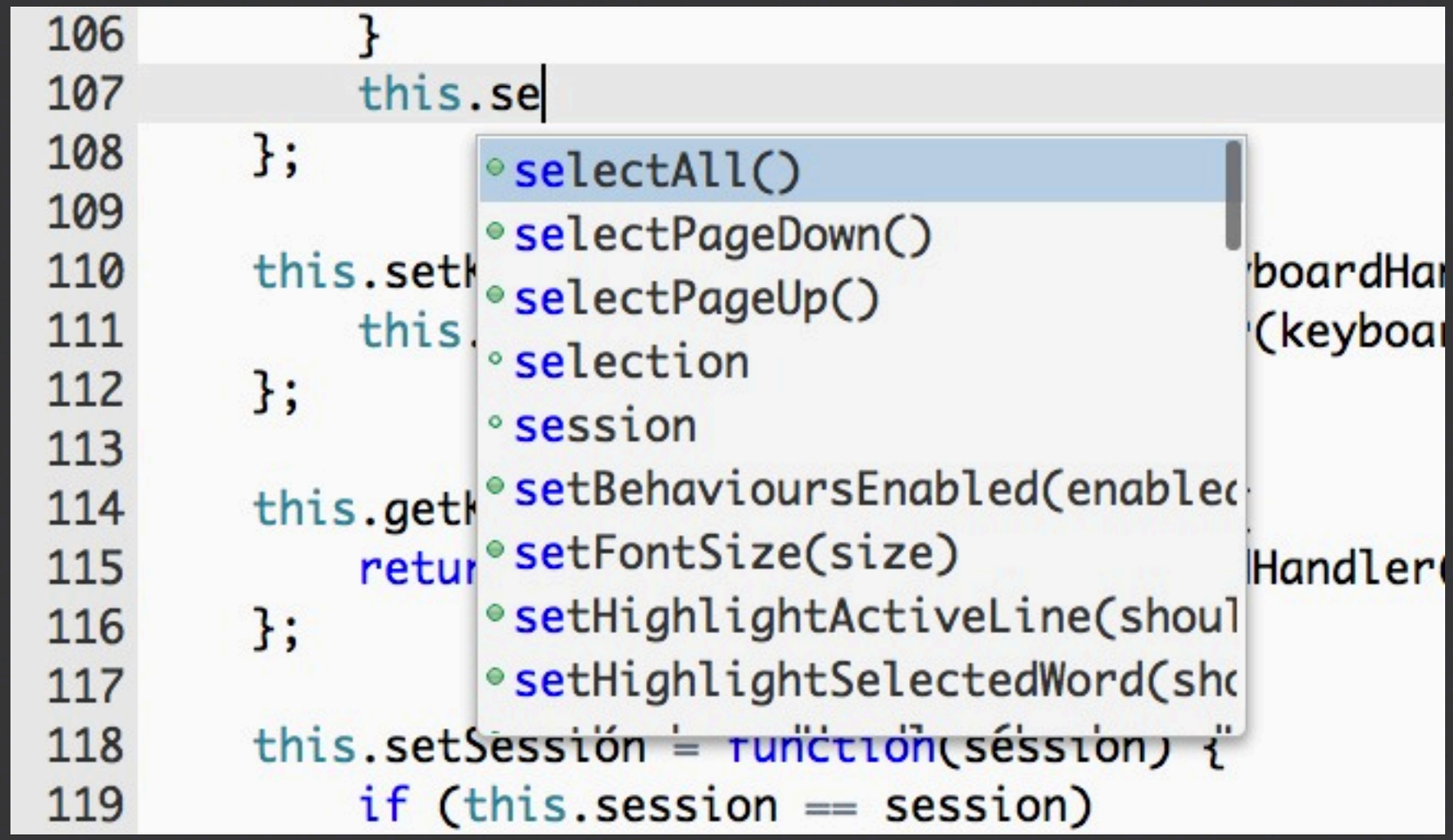
What

can you do with it?

Low-level tooling

```
106         }
107         this.se
108     };
109
110     this.setK                                    boardHan
111         this.                                    (keyboar
112     };
113
114     this.getK                                    Handler(
115         retur
116     };
117
118     this.setSession = function(session) {
119         if (this.session == session)
```

- selectAll()
- selectPageDown()
- selectPageUp()
- selection
- session
- setBehavioursEnabled(enablec
- setFontSize(size)
- setHighlightActiveLine(shoul
- setHighlightSelectedWord(sh



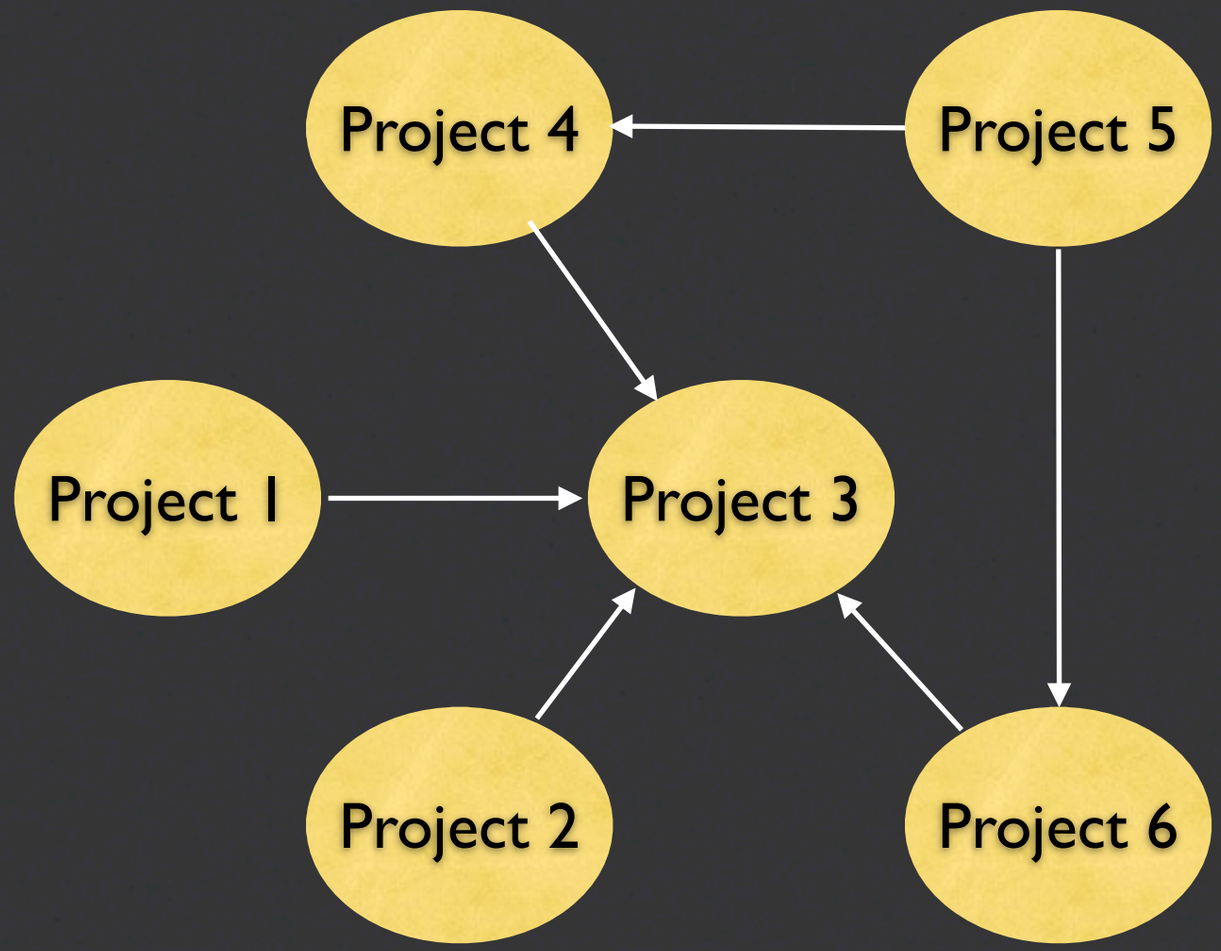
Intelligent code completion

Complex refactoring

Cloud

Big data

What if...


Project 4
Project 5
Project 1
Project 3
Project 2
Project 6

Your (dev) environment matters

use static analysis tools

@zef

http://github.com/ajaxorg/treehugger

Cloud9 IDE
Your code anywhere, anytime

http://c9.io