

Architecting JavaScript

AUTOMATED FIRING of ONLOAD EVENTS

“Javascript doesn’t suck,
you’re just doing it wrong”

- Doug Crockford

THE PROBLEM

As more and more code
moves on to the client side,
maintainability and flexibility become
genuine concerns



How do you make Transmit 4 the best ever?
45+ new features, up to 25x speed, and one more thing...

You need to transfer files. Maybe to an FTP or SFTP server, or the cloud via Amazon S3, or using WebDAV. You maintain a website, do backups, or upload photos.

You need **Transmit**, the #1 Mac OS X FTP client.¹ Now, in Transmit 4, we took everything good about Transmit, and added a dollop of **unbelievably great**.

Features

A SIMPLE(ISH), SINGLE PAGE SITE



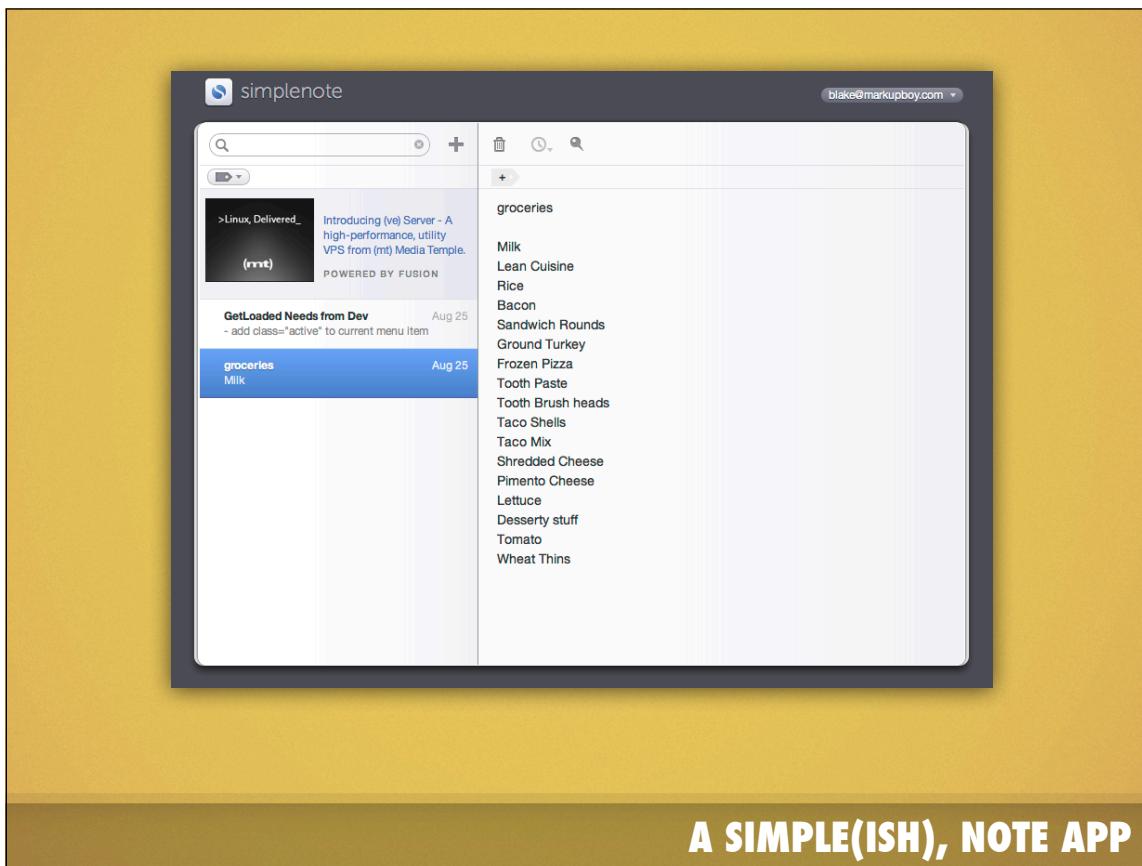
The image shows the Twitter homepage. At the top, there's a search bar with the placeholder "Search for a keyword or phrase..." and a "Search" button. Below the search bar, the Twitter logo is prominently displayed with the tagline "Discover what's happening right now, anywhere in the world". A navigation bar includes links like "BrazilNeedsMcFLY", "WeLoveBandaCine", "OrgulhoNXZERO", "Gerson", "TRENDING TOPICS", "Football Game", and "Victoria". On the left, a sidebar titled "See who's here" shows a grid of user icons. The main content area features a section titled "Top Tweets" with three visible tweets:

- OurWinnerJosie** In 10 years time we wont b tellin our kids cinderella and snow white we'll be tellin them bout #Triple
about 1 hour ago
- Astro_Wheels** 'Hurricane Danielle' – as we passed directly overhead this evening in the central Atlantic. I'm not a tropical sto <http://twitpic.com/2isdbk>
47 minutes ago
- BiebersMiracle** This Tweet Is Dedicated To Everyone Who Has Ever Walked Into A Glass Door.
16 minutes ago

On the right side, there's a sign-in form with fields for "Username or email" and "Password", a "Sign in" button, and a "Remember me" checkbox. Below the sign-in form are links for "Forgot password?", "Forgot username?", and "Already using Twitter on your phone?". Further down, there's a box for "Customize Twitter by choosing who to follow. Then see tweets from those folks as soon as they're posted." and a link "Using Twitter for a business? Check out Twitter 101".

At the bottom of the page, there's a footer with copyright information ("© 2010 Twitter"), links to "About Us", "Contact", "Blog", "Status", "Goodies", "API", "Business", "Help", "Jobs", "Terms", "Privacy", and a language selection dropdown set to "English".

TWITTER - LESS JS THAN YOU MIGHT GUESS



The image shows the Simplenote application interface. The title bar reads "blake@markupboy.com". The main window has a dark header with a search bar and a "+" button. The content area is divided into two columns. The left column displays a list of notes:

- >Linux, Delivered_ (mmt) Introducing (ve) Server - A high-performance, utility VPS from (m) Media Temple. POWERED BY FUSION
- GetLoaded Needs from Dev Aug 25 - add class="active" to current menu item
- groceries Aug 25 Milk

The right column contains a list of grocery items:

- groceries
- Milk
- Lean Cuisine
- Rice
- Bacon
- Sandwich Rounds
- Ground Turkey
- Frozen Pizza
- Tooth Paste
- Tooth Brush heads
- Taco Shells
- Taco Mix
- Shredded Cheese
- Pimento Cheese
- Lettuce
- Desserty stuff
- Tomato
- Wheat Thins

At the bottom of the application window, there's a dark footer bar.

A large, bold, white text banner at the bottom of the entire page reads "A SIMPLE(ISH), NOTE APP".

The screenshot shows the Facebook Notes interface. At the top, there's a navigation bar with 'Sign Up' and 'Facebook helps you connect and share with the people in your life.' Below it, a sidebar on the left lists 'Facebook Engineering's Notes' and 'Notes About Facebook Engineering'. The main content area displays two notes:

- HipHop for PHP: six months later** (By Facebook Engineering - Friday, August 13, 2010)

It's been six months since we released HipHop and I wanted to share an update on its progress. In February we released 693,613 lines of source code which on average reduced our CPU usage here at Facebook by about 50%. Since February, the team has made HipHop another 1.8 times faster and all of that code is open source. We've also seen improvements ...
- Reflecting on 3 years at Facebook** (By Facebook Engineering - Wednesday, August 11, 2010)

Last Friday, I hit my 3-year milestone at Facebook. This got me thinking about all that I've experienced and learned since I started here. Before coming to Facebook, I worked at Google as an engineer for two years. While I learned a number of things there, I began to realize that I wanted to have more autonomy to build and work on larger, higher im...

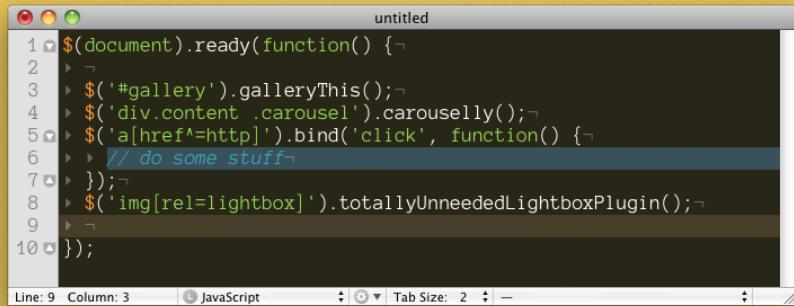
At the bottom of each note, there are links for 'View Full Note', 'Comment', and 'Like'. A sidebar on the right includes 'Keep me logged in', 'Forgot your password?', and a 'Login' button.

WTF IS WITH ALL THE JS RUNNING ON FACEBOOK?

THE PROBLEM

So how do we handle
page and section specific code
along with global functionality?

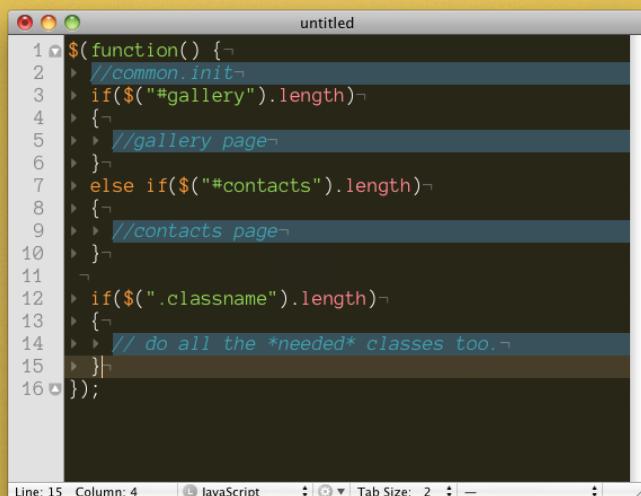
(all spiraling out of control)



```
1 $(document).ready(function() {  
2   //  
3   $('#gallery').galleryThis();  
4   $('div.content .carousel').carouselly();  
5   $('a[href^=http]').bind('click', function() {  
6     // do some stuff  
7   });  
8   $('img[rel=lightbox]').totallyUnneededLightboxPlugin();  
9  
10});
```

Line: 9 Column: 3 | JavaScript | Tab Size: 2

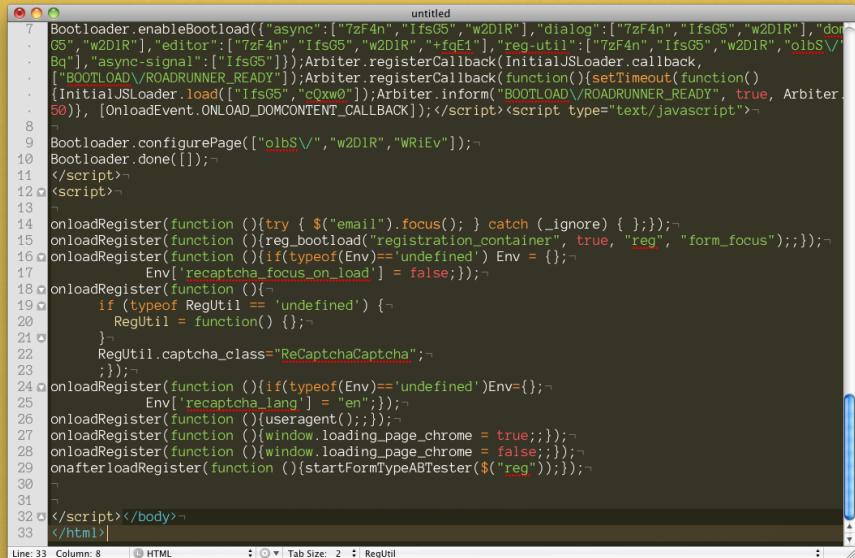
THROW A BUNCH OF STUFF AT THE DOM?



```
1 $(function() {  
2   //common.init  
3   if($("#gallery").length){  
4     //gallery page  
5   }  
6   else if($("#contacts").length){  
7     //contacts page  
8   }  
9   if($(".classname").length){  
10    // do all the *needed* classes too.  
11  }  
12 } );
```

Line: 15 Column: 4 | JavaScript | Tab Size: 2

CONDITIONAL CLASSING?



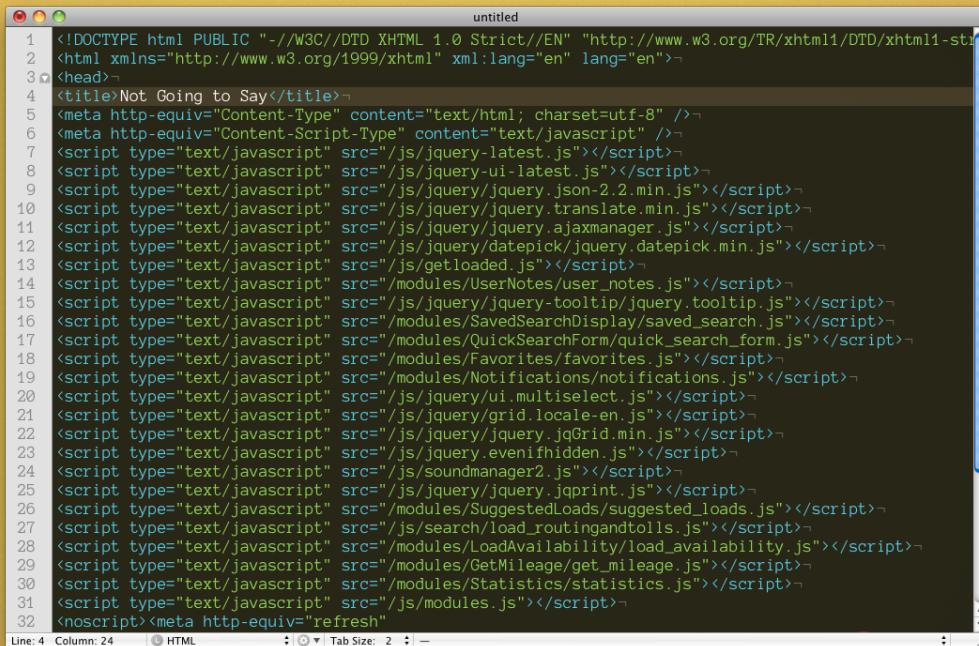
```

1 <!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Strict//EN" "http://www.w3.org/TR/xhtml1/DTD/xhtml1-strict.dtd">
2 <html xmlns="http://www.w3.org/1999/xhtml" xml:lang="en" lang="en">
3 <head>
4 <title>Not Going to Say</title>
5 <meta http-equiv="Content-Type" content="text/html; charset=utf-8" />
6 <meta http-equiv="Content-Script-Type" content="text/javascript" />
7 <script type="text/javascript" src="/js/jquery-latest.js"></script>
8 <script type="text/javascript" src="/js/jquery-ui-latest.js"></script>
9 <script type="text/javascript" src="/js/jquery/jquery.json-2.2.min.js"></script>
10 <script type="text/javascript" src="/js/jquery/jquery.translate.min.js"></script>
11 <script type="text/javascript" src="/js/jquery/jquery.ajaxmanager.js"></script>
12 <script type="text/javascript" src="/js/jquery/datetimepicker/jquery.datetimepicker.min.js"></script>
13 <script type="text/javascript" src="/js/getloaded.js"></script>
14 <script type="text/javascript" src="/modules/UserNotes/user_notes.js"></script>
15 <script type="text/javascript" src="/js/jquery/jquery.tooltip.js"></script>
16 <script type="text/javascript" src="/modules/SavedSearchDisplay/saved_search.js"></script>
17 <script type="text/javascript" src="/modules/QuickSearchForm/quick_search_form.js"></script>
18 <script type="text/javascript" src="/modules/Favorites/favorites.js"></script>
19 <script type="text/javascript" src="/modules/Notifications/notifications.js"></script>
20 <script type="text/javascript" src="/js/jquery/ui.multiselect.js"></script>
21 <script type="text/javascript" src="/js/jquery/grid.locale-en.js"></script>
22 <script type="text/javascript" src="/js/jquery/jquery.jqGrid.min.js"></script>
23 <script type="text/javascript" src="/js/jquery.evenifhidden.js"></script>
24 <script type="text/javascript" src="/js/soundmanager2.js"></script>
25 <script type="text/javascript" src="/js/jquery/jquery.jqprint.js"></script>
26 <script type="text/javascript" src="/modules/SuggestedLoads/suggested_loads.js"></script>
27 <script type="text/javascript" src="/js/search/load_routingandtools.js"></script>
28 <script type="text/javascript" src="/modules/LoadAvailability/load_availability.js"></script>
29 <script type="text/javascript" src="/modules/GetMileage/get_mileage.js"></script>
30 <script type="text/javascript" src="/modules/Statistics/statistics.js"></script>
31 <script type="text/javascript" src="/js/modules.js"></script>
32 <noscript><meta http-equiv="refresh"

```

Line: 33 Column: 8 HTML Tab Size: 2 RegUtil

HARDCODE THOSE FUNCTIONS RIGHT INTO THE PAGE?



```

1 <!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Strict//EN" "http://www.w3.org/TR/xhtml1/DTD/xhtml1-strict.dtd">
2 <html xmlns="http://www.w3.org/1999/xhtml" xml:lang="en" lang="en">
3 <head>
4 <title>Not Going to Say</title>
5 <meta http-equiv="Content-Type" content="text/html; charset=utf-8" />
6 <meta http-equiv="Content-Script-Type" content="text/javascript" />
7 <script type="text/javascript" src="/js/jquery-latest.js"></script>
8 <script type="text/javascript" src="/js/jquery-ui-latest.js"></script>
9 <script type="text/javascript" src="/js/jquery/jquery.json-2.2.min.js"></script>
10 <script type="text/javascript" src="/js/jquery/jquery.translate.min.js"></script>
11 <script type="text/javascript" src="/js/jquery/jquery.ajaxmanager.js"></script>
12 <script type="text/javascript" src="/js/jquery/datetimepicker/jquery.datetimepicker.min.js"></script>
13 <script type="text/javascript" src="/js/getloaded.js"></script>
14 <script type="text/javascript" src="/modules/UserNotes/user_notes.js"></script>
15 <script type="text/javascript" src="/js/jquery/jquery.tooltip.js"></script>
16 <script type="text/javascript" src="/modules/SavedSearchDisplay/saved_search.js"></script>
17 <script type="text/javascript" src="/modules/QuickSearchForm/quick_search_form.js"></script>
18 <script type="text/javascript" src="/modules/Favorites/favorites.js"></script>
19 <script type="text/javascript" src="/modules/Notifications/notifications.js"></script>
20 <script type="text/javascript" src="/js/jquery/ui.multiselect.js"></script>
21 <script type="text/javascript" src="/js/jquery/grid.locale-en.js"></script>
22 <script type="text/javascript" src="/js/jquery/jquery.jqGrid.min.js"></script>
23 <script type="text/javascript" src="/js/jquery.evenifhidden.js"></script>
24 <script type="text/javascript" src="/js/soundmanager2.js"></script>
25 <script type="text/javascript" src="/js/jquery/jquery.jqprint.js"></script>
26 <script type="text/javascript" src="/modules/SuggestedLoads/suggested_loads.js"></script>
27 <script type="text/javascript" src="/js/search/load_routingandtools.js"></script>
28 <script type="text/javascript" src="/modules/LoadAvailability/load_availability.js"></script>
29 <script type="text/javascript" src="/modules/GetMileage/get_mileage.js"></script>
30 <script type="text/javascript" src="/modules/Statistics/statistics.js"></script>
31 <script type="text/javascript" src="/js/modules.js"></script>
32 <noscript><meta http-equiv="refresh"

```

Line: 4 Column: 24 HTML Tab Size: 2 -

INCLUDE SEPARATE FILES?

THE GARBER-IRISH IMPLEMENTATION

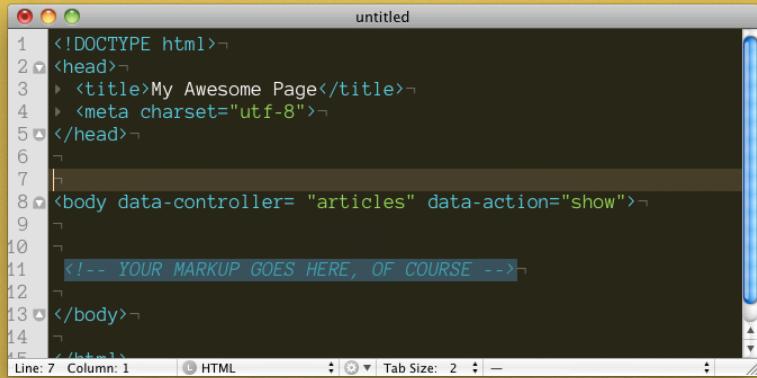


Paul Irish

Jason Garber

THE GARBER-IRISH IMPLEMENTATION

Use data attributes on the body
to store page and section information
and automatically fire predetermined methods
based on those settings



```
1 <!DOCTYPE html>
2 <head>
3   <title>My Awesome Page</title>
4   <meta charset="utf-8">
5 </head>
6
7 <body data-controller= "articles" data-action="show">
8   <!-- YOUR MARKUP GOES HERE, OF COURSE -->
9
10 </body>
11
12
13 </html>
```

Line: 7 Column: 1 HTML Tab Size: 2

THE ONLY MARKUP ADJUSTMENTS YOU'LL EVER NEED

WHAT'S THIS "DATA" THING

- Newly introduced in HTML 5 spec
- Allows you to write valid markup while still embedding data in the page
- No more bastardizing of classes, hrefs, rels and other assorted attributes
- You can use it today!

```
1 FOO = {  
2   common: {  
3     init: function() {  
4       this.articles = {};  
5     }  
6   },  
7   articles: {  
8     init: function() {  
9       this.show = function() {  
10      this.articles.init();  
11    }  
12  }  
13 },  
14 UTIL = {  
15   exec: function( controller, action ) {  
16     var ns = FOO,  
17     action = ( action === undefined ) ? "init" : action;  
18     if ( controller !== "" && ns[controller] && typeof( ns[controller][action] ) == "function" ) {  
19       ns[controller][action]();  
20     }  
21   },  
22   init: function() {  
23     var body = document.body, controller = body.getAttribute( "data-controller" ), action = body.getAttribute(  
24       "data-action" );  
25     UTIL.exec( "common" );  
26     UTIL.exec( controller );  
27     UTIL.exec( controller, action );  
28   }  
29 },  
30 }  
31 }  
32 }  
33 }  
34 }  
35 }  
36 }|
```

Line: 36 Column: 3 JavaScript Tab Size: 2

THE WHOLE ENCHILADA

```
1 UTIL = {  
2   exec: function( controller, action ) {  
3     var ns = FOO,  
4     action = ( action === undefined ) ? "init" : action;  
5     if ( controller !== "" && ns[controller] && typeof( ns[controller][action] ) == "function" ) {  
6       ns[controller][action]();  
7     }  
8   },  
9 }  
10 }  
11 }
```

Line: 7 Column: 11 JavaScript Tab Size: 2

EVERYTHING RUNS THROUGH EXEC

```
untitled

1 init: function() {-
2   var body = document.body, -
3     controller = body.getAttribute( "data-controller" ), -
4     action = body.getAttribute( "data-action" );-
5   -
6   UTIL.exec( "common" );-
7   UTIL.exec( controller );-
8   UTIL.exec( controller, action );-
9 }-
10 };
```

INIT GETS THE BALL ROLLING

```
untitled

1 var FOO = FOO || {};
2
3 FOO = {
4   common: {
5     init: function() {
6       // do some stuff
7     },
8   },
9
10 controller: {
11   init: function() {
12     // do some more stuff
13   },
14
15   action: function() {
16     // do some stuff on a specific page
17   },
18 }
19};

Line: 19 Column: 3 | L JavaScript | ⌂ ⌃ ⌄ Tab Size: 2 ⌅ action
```

SETTING UP OUR NAMESPACE, ACTIONS AND CONTROLLERS

```
untitled
1 var FOO = FOO || {};
2
3 FOO = {
4   common: {
5     init: function() {
6       // do some stuff
7     },
8   },
9
10 controller: {
11   init: function() {
12     // do some more stuff
13   },
14 }
15
16 action: function() {
17   // do some stuff on a specific page
18 }
19 };
```

Line: 2 Column: 1 | JavaScript | Tab Size: 2

INSTANTIATE THE NAMESPACE

```
untitled
1 var FOO = FOO || {};
2
3 FOO = {
4   common: {
5     init: function() {
6       // do some stuff
7     },
8   },
9
10 controller: {
11   init: function() {
12     // do some more stuff
13   },
14 }
15
16 action: function() {
17   // do some stuff on a specific page
18 }
19 };
```

Line: 4 Column: 1 | JavaScript | Tab Size: 2

OUR UNIVERSAL ACTIONS THAT WILL EXECUTE EVERYWHERE

```
untitled
1 var FOO = FOO || {};
2
3 FOO = {
4   common: {
5     init: function() {
6       // do some stuff
7     }
8   },
9
10 controller: {
11   init: function() {
12     // do some more stuff
13   }
14 }
15
16 action: function() {
17   // do some stuff on a specific page
18 }
19 };
```

Line: 10 Column: 1 | JavaScript | Tab Size: 2 | init

AN OBJECT FOR EACH CONTROLLER

```
untitled
1 var FOO = FOO || {};
2
3 FOO = {
4   common: {
5     init: function() {
6       // do some stuff
7     }
8   },
9
10 controller: {
11   init: function() {
12     // do some more stuff
13   }
14 }
15
16 action: function() {
17   // do some stuff on a specific page
18 }
19 };
```

Line: 11 Column: 1 | JavaScript | Tab Size: 2 | init

CODE TO EXECUTE CONTROLLER-WIDE

```
untitled
1 var FOO = FOO || {};
2
3 FOO = {
4   common: {
5     init: function() {
6       // do some stuff
7     }
8   },
9
10 controller: {
11   init: function() {
12     // do some more stuff
13   }
14 }
15
16 action: function() {
17   // do some stuff on a specific page
18 }
19 };
```

Line: 15 Column: 1 | JavaScript | Tab Size: 2 | action

JUST THE ACTION NOW

```
untitled
1 // jQuery
2 $(document).ready( UTIL.init );
3
4 // prototype
5 document.observe('dom:loaded', UTIL.init );
6
7 // YUI
8 YAHOO.util.Event.onDOMReady( UTIL.init );
9
10 // old school
11 body.onload = UTIL.init;
```

Line: 11 Column: 1 | JavaScript | Tab Size: 2 | -

HOW IT ALL GETS EXECUTED

```
1 var FOO = FOO || {};
2 ...
3 FOO = {-
4   common: {-
5     init: function() {-
6       // do some stuff-
7     },-
8   },-
9   -
10  controller: {-
11    init: function() {-
12      // do some more stuff-
13    },-
14    -
15    action: function() {-
16      // do some stuff on a specific page-
17    },-
18  },-
19};-
20-
21 UTIL = {-
22   exec: function( controller, action ) {-
23     var ns = FOO,-
24     action = ( action === undefined ) ? "init" : action;-
25-
26     if ( controller !== "" && ns[controller] && typeof( ns[controller][action] ) == "function" ) {-
27       ns[controller][action]();-
28     },-
29   },-
30   -
31   init: function() {-
32     var body = document.body, controller = body.getAttribute( "data-controller" ), action = body.getAttribute(
33       "data-action" );-
34     -
35     UTIL.exec( "common" );-
36     UTIL.exec( controller );-
37     UTIL.exec( controller, action );-
38   },-
39   -
40 $(document).ready( UTIL.init );

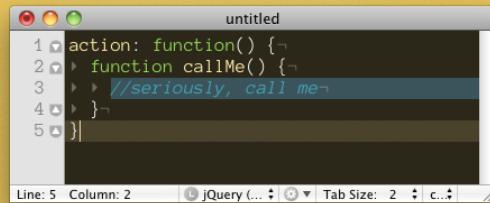
```

Line: 40 Column: 11 jQuery (JavaScript) Tab Size: 2

BACK TO THE BIG PICTURE

THE GARBER-IRISH IMPLEMENTATION

How are we going to handle
abstracted methods?

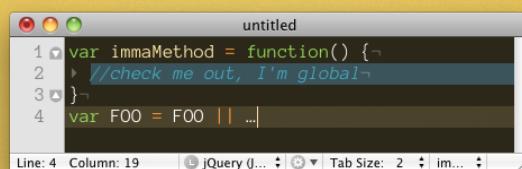


```
untitled
1 ↵ action: function() {-
2 ↵   ↪ function callMe() {-
3 ↵     ↪ ↪ //seriously, call me-
4 ↵   ↪ }-
5 ↵ }|
```

Line: 5 Column: 2 | jQuery (... | Tab Size: 2 | c... |

A screenshot of a code editor window titled "untitled". The code is written in JavaScript and defines an object with a method named "action". Inside "action", there is a nested function named "callMe". A multi-line comment is present within "callMe", starting with "//seriously, call me". The code editor interface includes standard window controls (red, green, blue), a status bar at the bottom with line and column numbers, and tabs for jQuery and other files.

KEPT “PRIVATE” INSIDE EACH EXECUTION BLOCK



```
untitled
1 ↵ var immaMethod = function() {-
2 ↵   ↪ //check me out, I'm global-
3 ↵ }-
4 ↵ var FOO = FOO || ...|
```

Line: 4 Column: 19 | jQuery (... | Tab Size: 2 | im... |

A screenshot of a code editor window titled "untitled". The code defines a global variable "immaMethod" as an anonymous function and also declares a global variable "FOO". The code editor interface includes standard window controls, a status bar at the bottom with line and column numbers, and tabs for jQuery and other files.

MADE PUBLIC/GLOBAL OUTSIDE ALL OBJECTS

```
untitled
1 FOO = { ...
2   ...
3     shared: {
4       doSomething: function() {
5         // is lunch here yet?
6       }
7     }
8 }
```

Line: 8 Column: 2 | jQuery (JavaS... | Tab Size: 2 | doSomething

IN A NESTED “SHARED” OBJECT

```
untitled
1 var FOO = FOO || {}
2 
3 FOO = {
4   ...
5   controller: {
6     ...
7   }
8 }
```

Line: 5 Column: 13 | jQuery (JavaS... | Tab Size: 2

```
untitled
1 var FOO = FOO || {}
2 
3 FOO = {
4   ...
5   controller: {
6     ...
7   }
8 }
```

Line: 5 Column: 13 | jQuery (JavaS... | Tab Size: 2

```
untitled
1 var FOO = FOO || {}
2 
3 FOO = {
4   ...
5   controller: {
6     ...
7   }
8 }
```

Line: 5 Column: 13 | jQuery (JavaS... | Tab Size: 2

```
untitled
1 var FOO = FOO || {}
2 
3 FOO = {
4   ...
5   controller: {
6     ...
7   }
8 }
```

Line: 5 Column: 13 | jQuery (JavaS... | Tab Size: 2

SEPARATE FILES? NO PROBLEM

```
1 //Bind actions to the window's "finalize" event-
2
3 controller: {
4   init: function() {
5     $(document).bind('finalized',function() {
6       // last call
7     });
8   },
9 }
10 },
11
12 action: function() {
13   // do some stuff on a specific page-
14 }
15 }
16 }
```

Line: 6 Column: 1 | jQuery (JavaScript) | Tab Size: 2 | init

THE CHERRY ON TOP, SUPER LOW PRIORITY EXECUTION

```
1 //Bind actions to the window's "finalize" event-
2
3 init: function() {
4   var body = document.body, controller = body.getAttribute( "data-action" );
5
6   UTIL.exec( "common" );
7   UTIL.exec( controller );
8   UTIL.exec( controller, action );
9
10  $(document).trigger('finalized');
11 }
12
13 }
```

Line: 11 Column: 1 | jQuery (JavaScript) | Tab Size: 2 | init

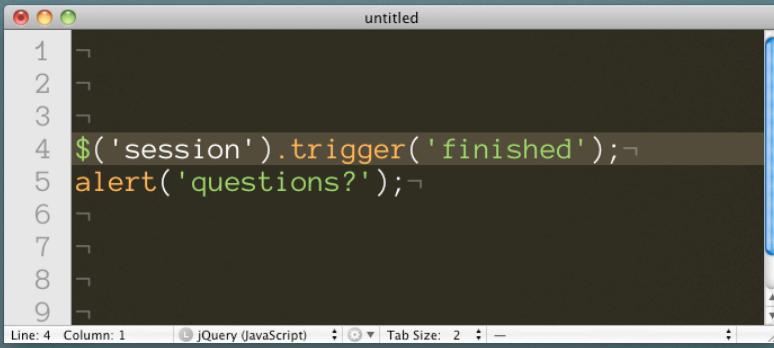
TRIGGER THAT FINALIZED EVENT

NOT A SILVER BULLET

- savings aren't performance based
(but it's not slower)
- adds a layer of complexity
- methods fired are coupled to markup

NOT A SILVER BULLTER

But it's still pretty great



```
1
2
3
4 $( 'session' ).trigger( 'finished' );
5 alert('questions?');
6
7
8
9
```

Line: 4 Column: 1 jQuery (JavaScript) Tab Size: 2

Architecting JavaScript **AUTOMATED FIRING of ONLOAD EVENTS**

twitter @markupboy

www www.markupboy.com

slides, notes & code <http://mrkp.me/lv>

Thanks!