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Fluent

THE WEB PLATFORM

fluentconf.com

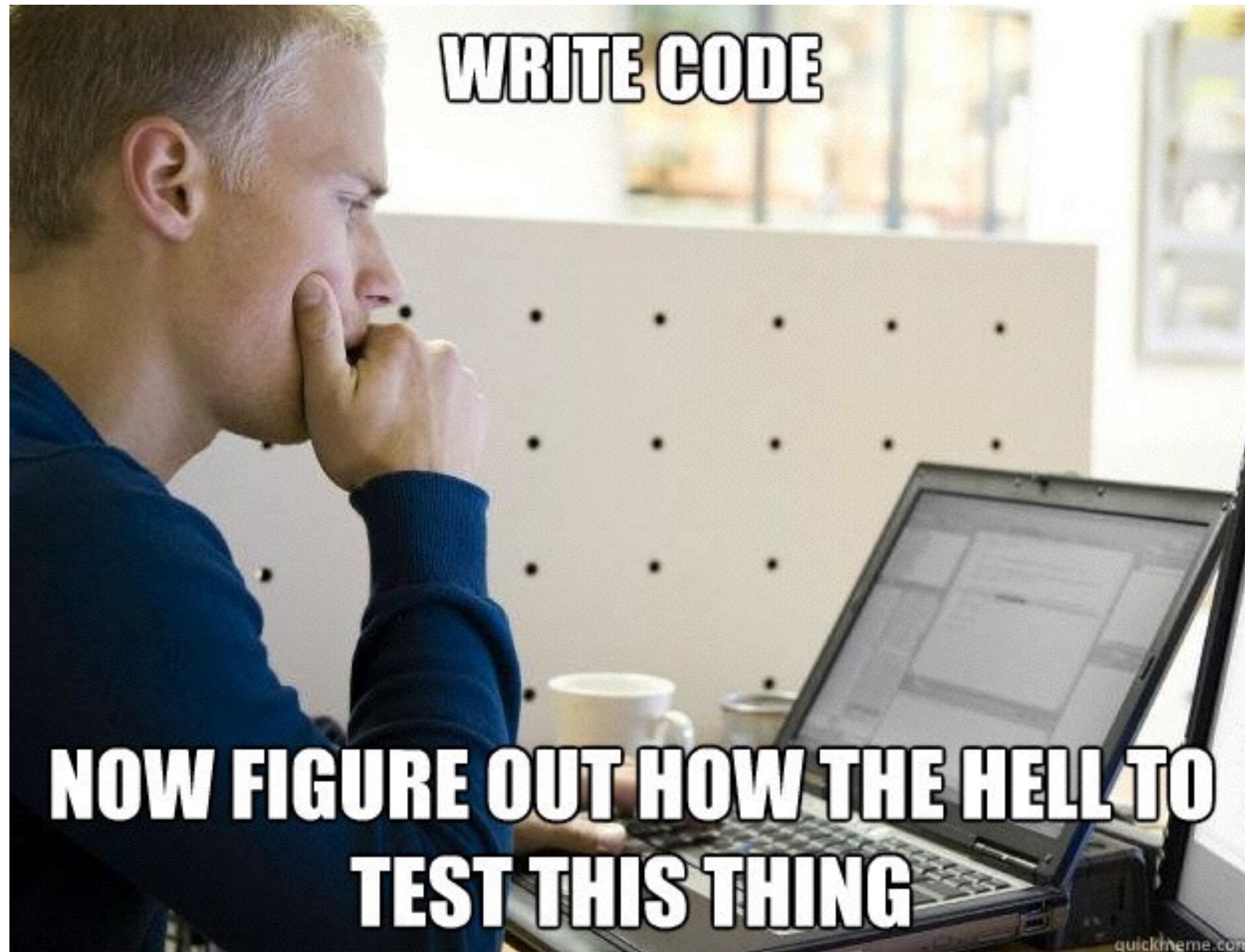
[#fluentconf](https://twitter.com/fluentconf)

[@JSArtisan](https://twitter.com/JSArtisan)

End-to-end testing for progressively enhanced sites

Brian Belhumeur
Front End Developer,
craigslist.org

Twitter: [@JSArtisan](https://twitter.com/JSArtisan)




Source: <http://www.quickmeme.com/meme/355b3t>



Source: <http://i.imgur.com/U6GJVg2.jpg>



Slide Deck!



**Code
samples!**

Twitter:

@JSArtisan

#ProgressivelyAwesome

Please note that some of these tests represents existence, not functionality or full conformance. Sort by number of features? Show obsolete platforms? Show unstable platforms?

Legend: All, SpiderMonkey, JavaScriptCore, Chrome, Concan, Firefox, Other. Default feature (1 point), Significant feature (2 points), Landmark feature (3 points)

Compatibility table with columns for feature names and various browser versions (e.g., Firefox, Chrome, Safari, Edge, IE, Opera, PhantomJS, Node.js, etc.). Rows are categorized into sections like Optimization, Syntax, Bindings, Functions, Built-in, Built-in extensions, Subclassing, Misc, and Annex B.

Source: http://dab1nmslvvntp.cloudfront.net/wp-content/uploads/2015/07/1438315888ES6-Support-Table.png



Source: http://i.telegraph.co.uk/multimedia/archive/03478/btff2_3478174a.jpg

Source: <https://d.ibtimes.co.uk/en/full/1416993/marty-mcfly-uses-mattel-hoverboard-escape-thugs-2015.jpg>



Application: HTML + CSS + JavaScript + browser

Progressive enhancement: Basic site + feature tests + selective JS upgrades

End-to-end tests: testing entire finished product as a whole

SF bay area antiques - craig... x

https://sfbay.craigslist.org/search/ata

CL SF bay area > all SF bay area > for sale > antiques

★ 2 favorites [account] post

antiques

all owner dealer

search titles only
 has image
 posted today
 search nearby areas

MILES FROM ZIP
miles from zip

PRICE
min max

+ condition

reset update search

• safety tips
• prohibited items
• product recalls
• avoiding scams

search antiques

list thumb gallery map

<< < prev 1 to 100 of 2500 next >

save search

newest \$\$\$ \$\$\$

- ★ Feb 29 EXCLUSIVE ANTIQUE ART HISTORIC RUG \$2500 (SOMA / south beach) pic map
- ★ Feb 29 Antique Large Bronze Hand Mirror \$75 (dublin / pleasanton / livermore) pic map
- ★ Feb 29 Rococo Style Bench's \$295 (willow glen / cambrian) pic map
- ★ Feb 29 Vintage Chinese Hand-carved jade Peacock \$65 (sunnyvale) pic map
- ★ Feb 29 Large Old Chinese Scroll Hand Painting \$120 (sunnyvale) pic map
- ★ Feb 29 A set of 3 Chinese Snuff Bottles \$50 (sunnyvale) pic map
- ★ Feb 29 Vintage Chinese Beautiful jade Bird \$75 (sunnyvale) pic map
- ★ Feb 29 Beautiful Vintage Chinese Jade \$30 (dublin / pleasanton / livermore) pic map
- ★ Feb 29 Two Vintage Old Jade Thumb Rings \$45 (sunnyvale) pic map
- ★ Feb 29 Antique Sofa and Chair Ormate wood carvings \$2000 (south san francisco) pic map
- ★ Feb 29 Antique Ceramic Capodimonte lamps 1900's \$800 (daly city) pic map
- ★ Feb 29 Ridgeway Grandfather Clock w/ papers and original receipt \$700 (daly city) pic map
- ★ Feb 29 Antique Living Room Set \$4000 (daly city) pic map

favorites

SF bay area antiques - craig... x

https://sfbay.craigslist.org/search/ata

CL SF bay area > all SF bay area > for sale > antiques go [account] post

antiques

all owner dealer

search titles only
 has image
 posted today
 search nearby areas

MILES FROM ZIP
miles from zip

PRICE
min max

+ condition
 new
 like new
 excellent
 good
 fair
 salvage

reset update search

- safety tips
- prohibited items
- product recalls
- avoiding scams

search antiques save search

<< < prev 1 to 100 of 2500 next >

newest \$\$\$ \$\$\$\$

Feb 29 [EXCLUSIVE ANTIQUE ART HISTORIC RUG](#) \$2500 (SOMA / south beach) [pic map](#)

Feb 29 [Antique Large Bronze Hand Mirror](#) \$75 (dublin / pleasanton / livermore) [pic map](#)

Feb 29 [Rococo Style Bench's](#) \$295 (willow glen / cambrian) [pic map](#)

Feb 29 [Vintage Chinese Hand-carved jade Peacock](#) \$65 (sunnyvale) [pic map](#)

Feb 29 [Large Old Chinese Scroll Hand Painting](#) \$120 (sunnyvale) [pic map](#)

Feb 29 [A set of 3 Chinese Snuff Bottles](#) \$50 (sunnyvale) [pic map](#)

Feb 29 [Vintage Chinese Beautiful jade Bird](#) \$75 (sunnyvale) [pic map](#)

Feb 29 [Beautiful Vintage Chinese Jade](#) \$30 (dublin / pleasanton / livermore) [pic map](#)

Feb 29 [Two Vintage Old Jade Thumb Rings](#) \$45 (sunnyvale) [pic map](#)

Feb 29 [Antique Sofa and Chair Ornate wood carvings](#) \$2000 (south san francisco) [pic map](#)

Feb 29 [Antique Ceramic Capodimonte lamps 1900's](#) \$800 (daly city) [pic map](#)

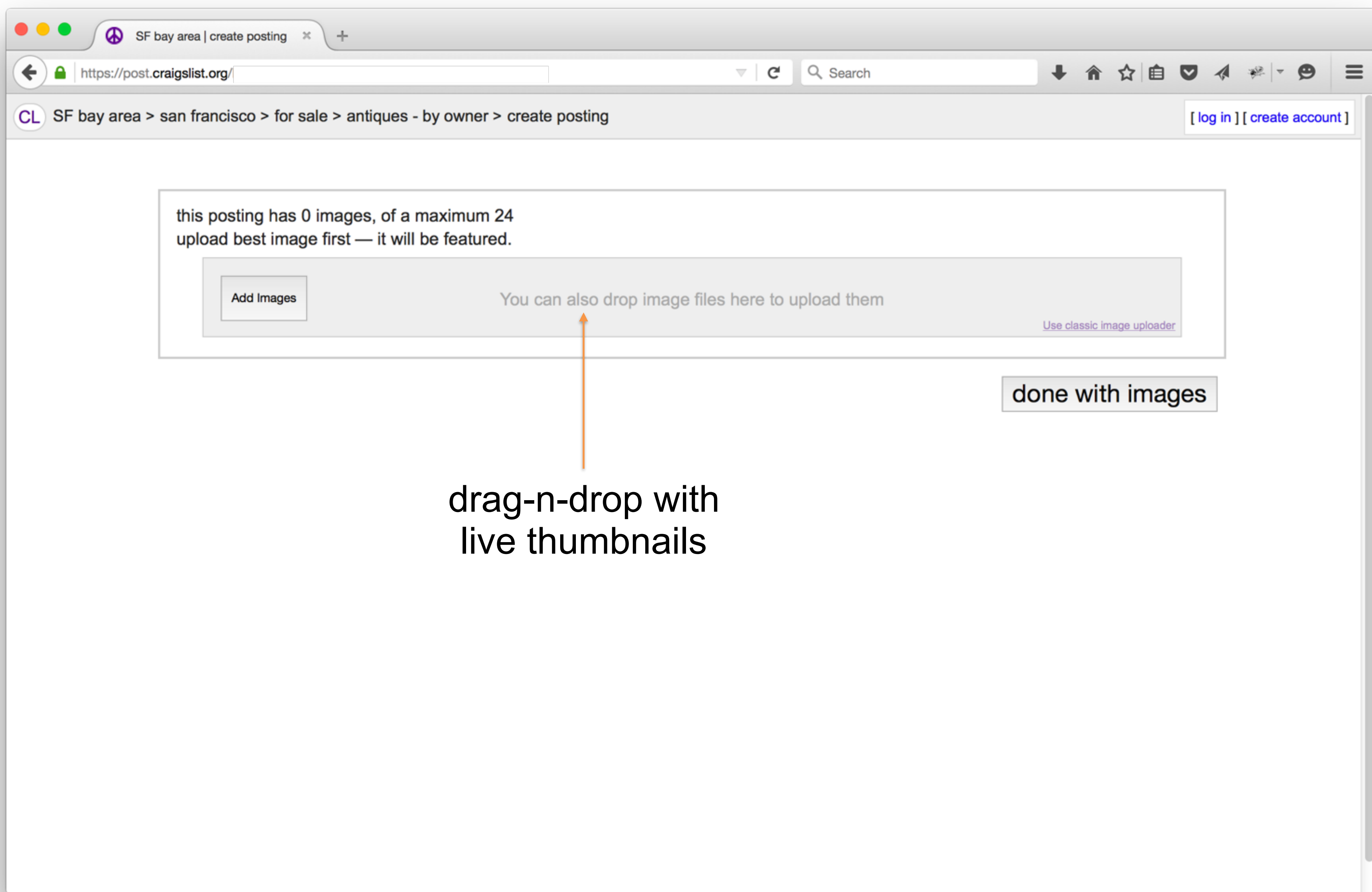
Feb 29 [Ridgeway Grandfather Clock w/ papers and original receipt](#) \$700 (daly city) [pic map](#)

Feb 29 [Antique Living Room Set](#) \$4000 (daly city) [pic map](#)

Feb 29 [Beautiful Vintage Chinese Jade](#) \$30 (dublin / pleasanton / livermore) [pic map](#)

Feb 29 [Vintage Chinese Beautiful jade Bird](#) \$75 (sunnyvale) [pic map](#)

Feb 29 [English wash stand](#) \$650 (dublin / pleasanton / livermore) [pic](#)



SF bay area | create posting

https://post.craigslist.org

SF bay area > san francisco > for sale > antiques - by owner > create posting

[log in] [create account]

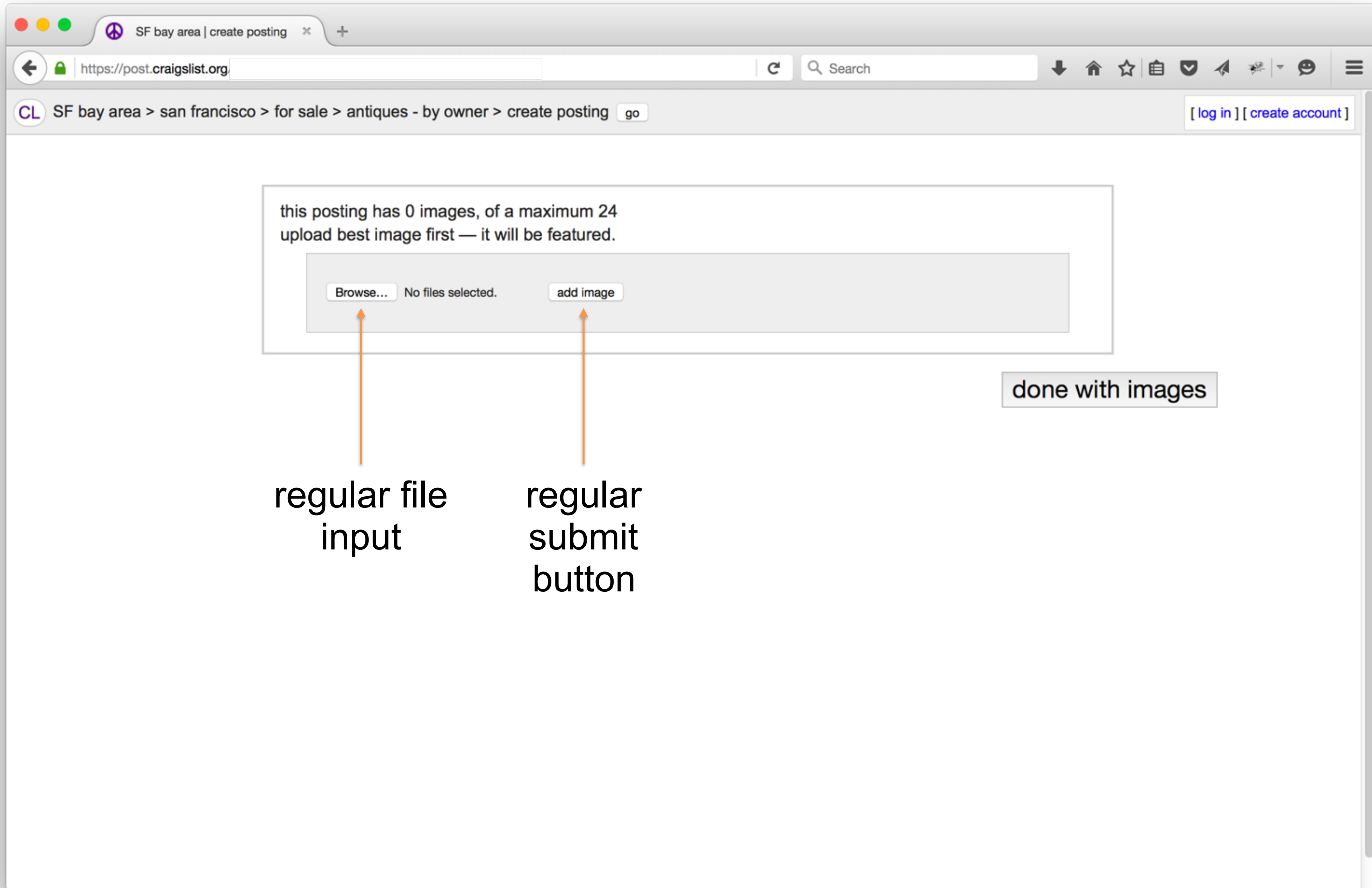
this posting has 0 images, of a maximum 24
upload best image first — it will be featured.

Browse... No files selected. add image

done with images

regular file input

regular submit button



Application: HTML + CSS + JavaScript + browser

Progressive enhancement: Basic site + feature tests + selective JS upgrades

End-to-end tests: testing entire finished product as a whole




Nightwatch.js

Browser automated testing done easy.

```
google.js x
1 module.exports = {
2   tags: ['google'],
3   'Demo test Google' : function (client) {
4     client
5       .url('http://www.google.com')
6       .waitForElementVisible('body', 1000)
7       .assert.title('Google')
8       .assert.visible('input[type=text]')
9       .setValue('input[type=text]', 'nightwatch')
10      .waitForElementVisible('button[name=btnG]', 1000)
11      .click('button[name=btnG]')
12      .pause(1000)
13      .assert.containsText('#main', 'The Night Watch')
14      .end();
15    }
16  };
17
```

Write End-to-End tests in Node.js quickly and effortlessly that run against a Selenium server.

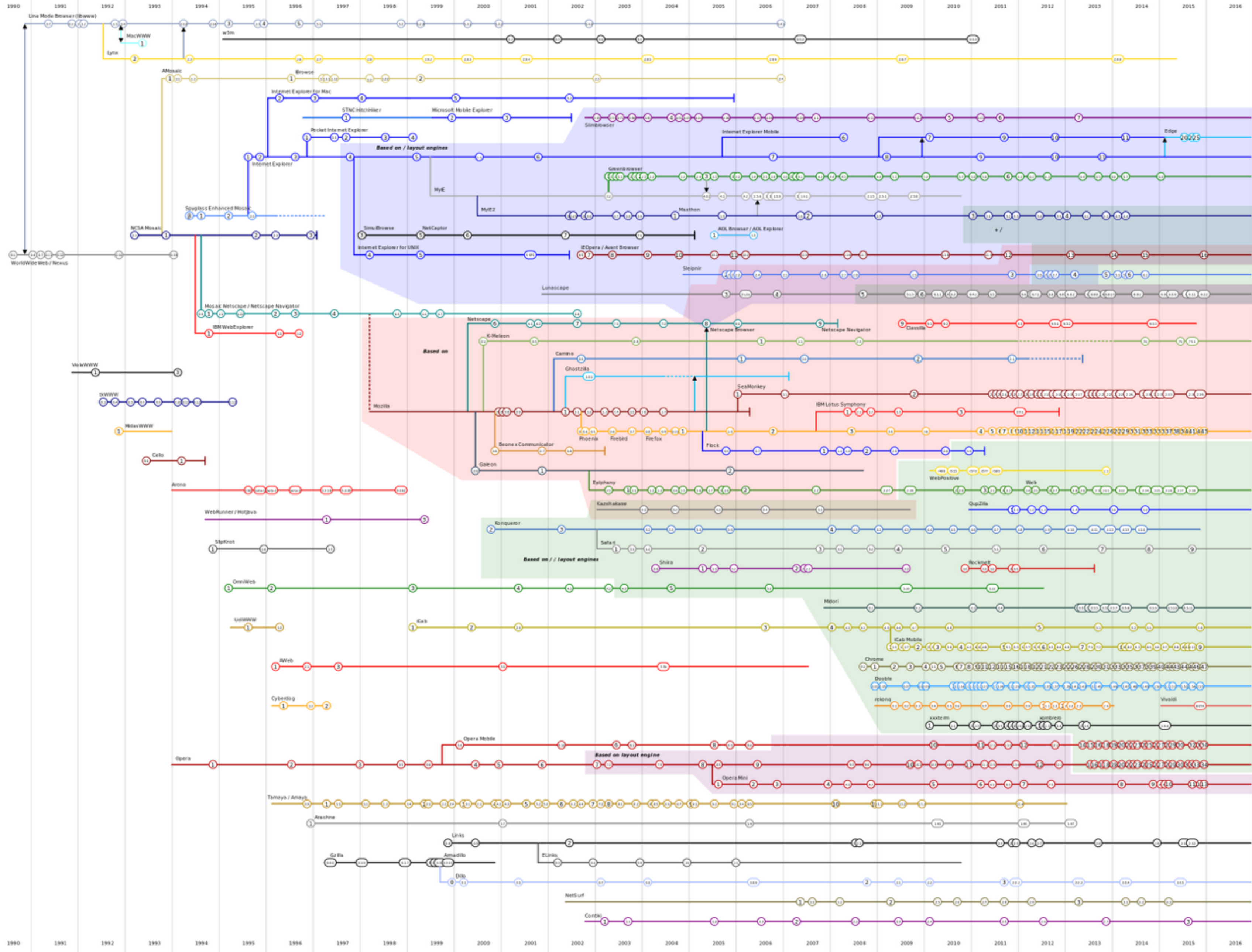
 [Download](#) (v0.8.16)

[View on GitHub](#)

[Tweet](#)  [Star](#) 3,887


Benefits

- Essential for holistic verification
- Most realistic form of test automation
- Necessary to ensure ship-worthiness



Simply test all of these

Source: https://en.wikipedia.org/wiki/List_of_web_browsers#/media/File:Timeline_of_web_browser_s.svg



... but the unit tests PASSED!

Source: <http://www.zerohedge.com/sites/default/files/images/user5464/imageroot/2014/06/All%20Hands%20On%20Deck%20-%20Clean.jpg>

#fluentconf

@JSArtisan

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Drawbacks



fragile



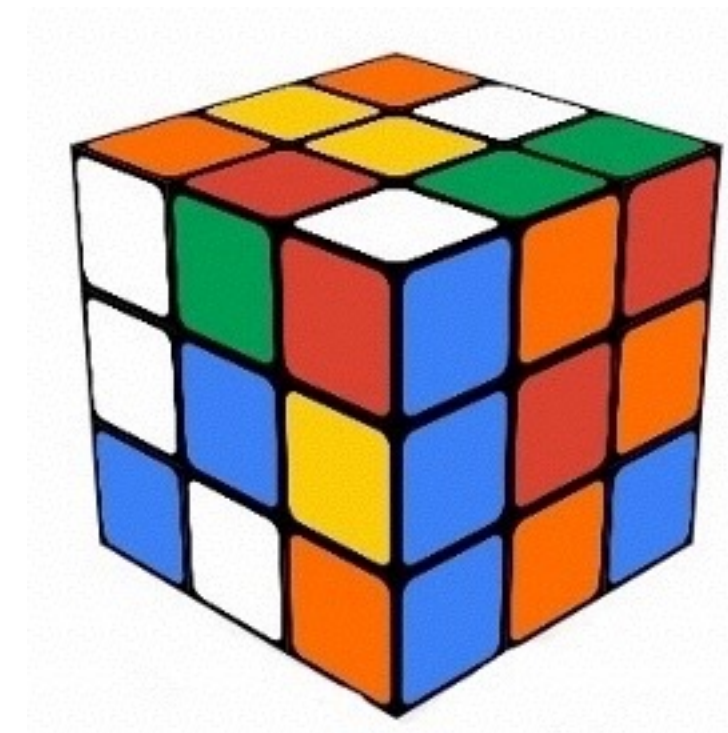
flaky



expensive

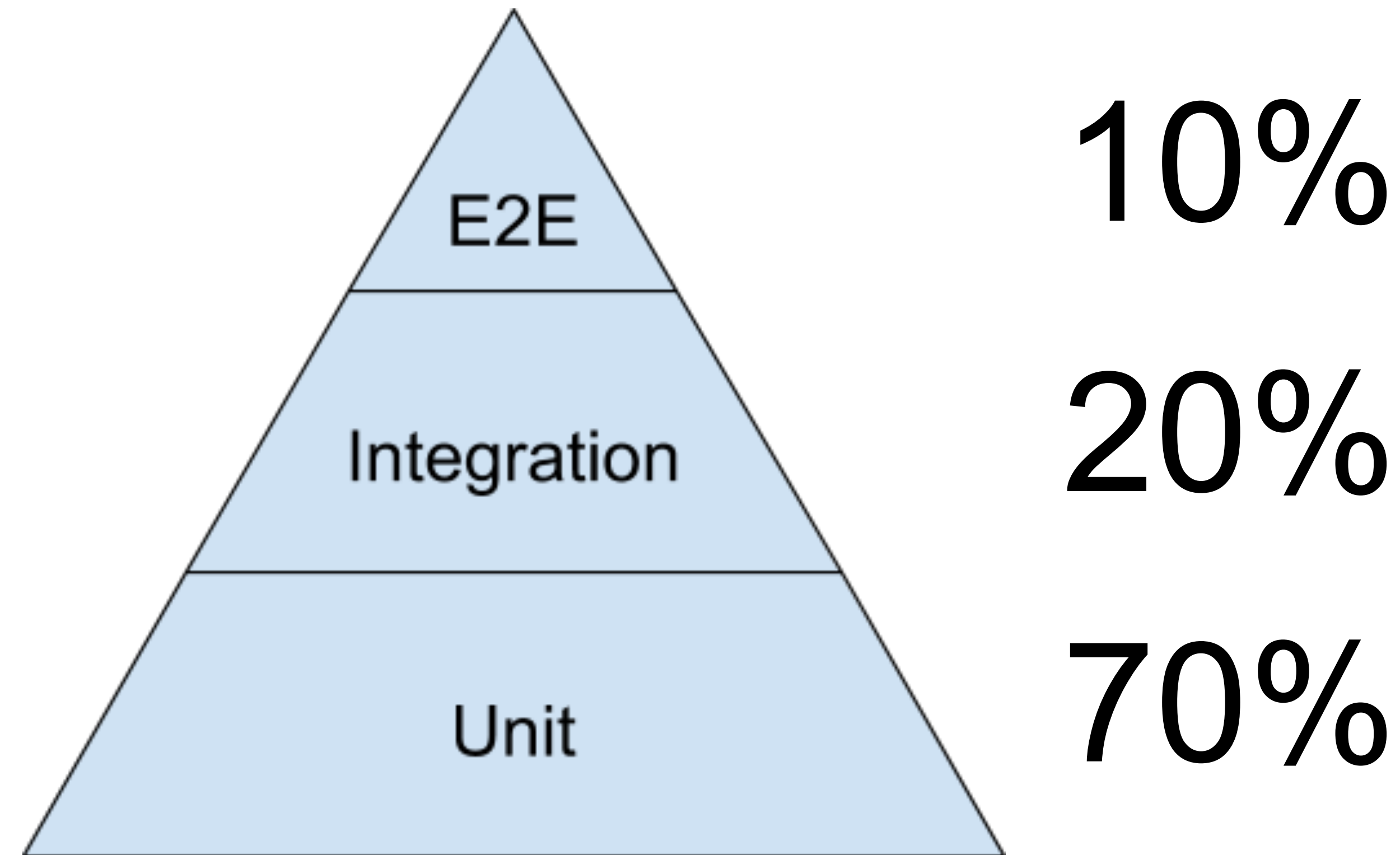


3rd party dependent



permutations

Test Distribution



Source: Google Testing Blog <http://googletesting.blogspot.com/2015/04/just-say-no-to-more-end-to-end-tests.html>



You are not alone!

Source: <http://images4.fanpop.com/image/photos/18800000/MJ-You-Are-Not-Alone-you-are-not-alone-3-18855004-800-784.jpg>

Responsive News: BBC dev blog

Cutting the mustard

The browser is a hostile development environment and supporting a wide range of desktop browsers can be tough work.

One of the immediate challenges we discovered when we first started the [responsive news prototype](#) was the large range of devices that we would have to support. It terrified us. This article is about a solution we use to alleviate this problem.

#Nobody

State and market evolution

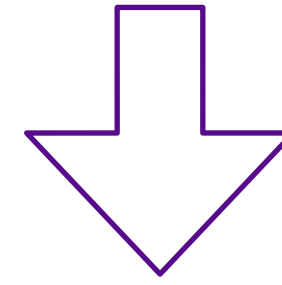
Looking at mobile devices that a [cross-section](#) of users in the early stages of our project highlighted the challenge. We have ~80 *significant* browsers / operating system combinations regularly using our application across the globe and a long tail of hundreds more. In the four months since we first gathered the statistics there's been many more releases and updates - Amazon's Fire, Apple's new iPad, Ice Cream Sandwich, Microsoft's Mango.

To support everything on desktop we typically have to test a dozen different browsers with a multitude of different configurations and subtle differences between major and minor version numbers across three operating systems. But developers are used to this, we have coping strategies - multi-browser installs, virtual and remote environments - and it's a fairly well trodden ground.

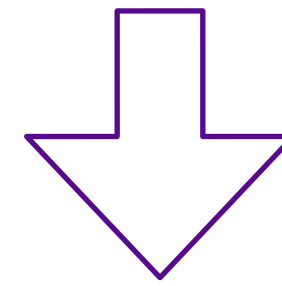
Source: <http://responsivenews.co.uk/post/18948466399/cutting-the-mustard>

<code>

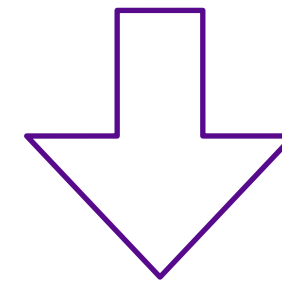
HTML



CSS



JavaScript



DOM


```
waitForJSTest.js — /Users/brian/Documents/Fluent 2016
waitForJSTest.js  waitForJSReady.js  pageReloadTest.js  willReload.js  waitForReload.js  featureTest.js  featureTestTest.js

Fluent 2016
└─ code
   ├── featureTest.js
   ├── featureTestTest.js
   ├── pageReloadTest.js
   ├── waitForJSReady.js
   └── waitForJSTest.js

1  module.exports = {
2    'Waiting for JavaScript basic test': function(client){
3      client.url('http://www.yoursite.com/')
4      .waitForJSReady()
5      .assert.visible('.some-widget')
6      .end()
7    },
8    'Waiting for JavaScript jQuery document.ready()': function(client){
9      client.url('http://www.yoursite.com/')
10     .waitForJSReady(function(){
11       var iAmReady = false;
12       $(function(){
13         // this function runs synchronously if jQuery is ready
14         iAmReady = true;
15       });
16       return iAmReady;
17     })
18     .click('.some-button')
19     .end()
20   },
21   'Waiting for AJAX loaded test': function(client){
22     client.url('http://www.yoursite.com/')
23     .waitForJSReady(function(){
24       var contentIsLoaded = false;
25       YourAPI.friendsListLoaded.done(function(){
26         contentIsLoaded = true;
27       });
28       return contentIsLoaded;
29     })
30     .assert.containsText('.friends-list', 'Kimberly Bryant')
31     .end()
32   }
33 };

code/waitForJSTest.js 34:1  LF UTF-8 JavaScript
```

```
waitForJSReady.js — /Users/brian/Documents/Fluent 2016
waitForJSTest.js  waitForJSReady.js  pageReloadTest.js  willReload.js  waitForReload.js  featureTest.js  featureTestTest.js

Fluent 2016
└─ code
   └─ featureTest.js
   └─ featureTestTest.js
   └─ pageReloadTest.js
   └─ waitForJSReady.js
   └─ waitForJSTest.js
   └─ waitForReload.js
   └─ willReload.js
   └─ Fluent 2016 - End to End testi

1  exports.command = function(testFn, timeout) {
2      var client = this;
3
4      // both timeout and testFn are optional params
5      if ( typeof testFn !== 'function' ) {
6          timeout = testFn;
7          testFn = undefined;
8      }
9
10     timeout = timeout || client.globals.waitForConditionTimeout || 15000;
11
12     var isReady = false;
13     var endTime = Date.now() + timeout;
14
15     var checkJSReadiness = function() {
16         client.execute(
17             testFn || function(){
18                 // default test to determine if application is ready (JS can run)
19                 return true;
20             },
21             [],
22             function(result){
23                 isReady = (result || {}).value;
24             }
25         );
26
27         if ( ! isReady ) {
28             client.pause(1000, function(){
29                 if ( ! isReady ) {
30                     if ( Date.now() < endTime ) {
31                         // Application is not ready and we've not timed out, so run this function recursively
32                         checkJSReadiness();
33                     } else {
```

code/waitForJSReady.js 45:1

LF UTF-8 JavaScript


```
waitForJSReady.js — /Users/brian/Documents/Fluent 2016
waitForJSTest.js  waitForJSReady.js  pageReloadTest.js  willReload.js  waitForReload.js  featureTest.js  featureTestTest.js

Fluent 2016
└─ code
   └─ featureTest.js
   └─ featureTestTest.js
   └─ pageReloadTest.js
   └─ waitForJSReady.js
   └─ waitForJSTest.js
   └─ waitForReload.js
   └─ willReload.js
   └─ Fluent 2016 - End to End testi

12  var isReady = false;
13  var endTime = Date.now() + timeout;
14
15  var checkJSReadiness = function() {
16    client.execute(
17      testFn || function(){
18        // default test to determine if application is ready (JS can run)
19        return true;
20      },
21      [],
22      function(result){
23        isReady = (result || {}).value;
24      }
25    );
26
27    if ( ! isReady ) {
28      client.pause(1000, function(){
29        if ( ! isReady ) {
30          if ( Date.now() < endTime ) {
31            // Application is not ready and we've not timed out, so run this function recursively
32            checkJSReadiness();
33          } else {
34            // application is still not ready and we've timed out
35            client.assert.ok(false, 'JavaScript was not ready after ' + timeout + ' milliseconds.');
```

```
pageReloadTest.js - /Users/brian/Documents/Fluent 2016
waitForJSTest.js  waitForJSReady.js  pageReloadTest.js  willReload.js  waitForReload.js  featureTest.js  featureTestTest.js

Fluent 2016
└─ code
   ├── featureTest.js
   ├── featureTestTest.js
   └─ pageReloadTest.js
      ├── waitForJSReady.js
      ├── waitForJSTest.js
      ├── waitForReload.js
      └─ willReload.js
         └─ Fluent 2016 - End to End testi

1  module.exports = {
2      'Page reload test': function(client){
3          client.url('http://www.yoursite.com/upload')
4          .click('.upload-button')
5          .waitForElementVisible('#uploader')
6          // file list starts off empty
7          .willReload('.uploaded-file-list')
8          // upload a file
9          .doFileUpload('selfie.jpg')
10         // make sure upload is complete
11         .waitForReload('.uploaded-file-list')
12         // verify the list has the file in it
13         .assert.containsText('.uploaded-file-list .filename', 'selfie')
14         .end()
15     }
16 };
17
```

code/pageReloadTest.js 17:1

LF UTF-8 JavaScript


```
willReload.js — /Users/brian/Documents/Fluent 2016
waitForJSTest.js  waitForJSReady.js  pageReloadTest.js  willReload.js  waitForReload.js  featureTest.js  featureTestTest.js

Fluent 2016
└─ code
   ├── featureTest.js
   ├── featureTestTest.js
   ├── pageReloadTest.js
   ├── waitForJSReady.js
   ├── waitForJSTest.js
   ├── waitForReload.js
   └── willReload.js
Fluent 2016 - End to End testi

1  exports.command = function(selector) {
2      var client = this;
3
4      var reloadClass = client.globals.reloadClass; // defined in config, e.g. "thisTooShallPass"
5
6      client.execute(
7          function(selector, reloadClass){
8              document.querySelector(selector)[0].className += ( ' ' + reloadClass);
9          },
10         [ selector, reloadClass ]
11     );
12
13     client.waitForElementPresent(selector + '.' + reloadClass, selector + ' tagged for reload.');
```

code/willReload.js 15:1

LF UTF-8 JavaScript

```
waitForReload.js — /Users/brian/Documents/Fluent 2016
waitForJSTest.js  waitForJSReady.js  pageReloadTest.js  willReload.js  ×  waitForReload.js  featureTest.js  featureTestTest.js

1  exports.command = function(selector, callback) {
2      var client = this;
3
4      callback = callback || function(){};
5
6      client.waitForElementNotPresent( selector + '.' + client.globals.reloadClass, callback, 'Reload complete.' );
7  };
8

/Users/brian/Documents/Fluent 2016/waitForReload.js

code/waitForReload.js  8:1  LF UTF-8 JavaScript
```



```
featureTestTest.js — /Users/brian/Documents/Fluent 2016
waitForJSTest.js  waitForJSReady.js  pageReloadTest.js  willReload.js  waitForReload.js  featureTest.js  featureTestTest.js

Fluent 2016
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   ├── featureTestTest.js
   ├── pageReloadTest.js
   ├── waitForJSReady.js
   ├── waitForJSTest.js
   ├── waitForReload.js
   └── willReload.js
Fluent 2016 - End to End testi

1  module.exports = {
2    'Feature test, basic and enhanced versions': function(client){
3      client.url('http://www.yoursite.com/uploader')
4      .featureTest(['FileReader', 'draggable'],
5        function(){
6          client.assert.visible('.enhanced-uploader');
7        },
8        function(unsupportedFeatures) {
9          client.assert.visible('.basic-uploader');
10       }
11     )
12     .end()
13   },
14   'Feature test, enhanced test only': function(client){
15     client.url('http://www.yoursite.com/imageEditor')
16     .featureTest(['FileReader', 'canvas'],
17       function(){
18         // test image editor here
19       },
20       function(unsupportedFeatures) {
21         client.assert.ok(true, "Test skipped because " + unsupportedFeatures.join(', ') + " not supported.");
22       }
23     )
24     .end()
25   }
26 };
27
```

code/featureTestTest.js 27:1

LF UTF-8 JavaScript

```
featureTest.js — /Users/brian/Documents/Fluent 2016
waitForJSTest.js  waitForJSReady.js  pageReloadTest.js  willReload.js  waitForReload.js  featureTest.js  featureTestTest.js

Fluent 2016
└─ code
   └─ featureTest.js
      featureTestTest.js
      pageReloadTest.js
      waitForJSReady.js
      waitForJSTest.js
      waitForReload.js
      willReload.js
      Fluent 2016 - End to End testi

1  exports.command = function(features, runIfSupported, runIfNotSupported) {
2      var client = this;
3
4      // can be string or array of strings
5      features = Array.isArray( features ) ? features : [ features ];
6
7      client.execute(
8          function(features){
9              var unsupportedFeatures = [];
10
11             features.forEach(function(feature){
12                 if ( /* do feature test here, evaluate to true if NOT supported */ ) {
13                     unsupportedFeatures.push(feature);
14                 }
15             });
16
17             return unsupportedFeatures;
18         },
19         [ features ],
20         function(result){
21             var unsupportedFeatures = (result || {}).value;
22
23             if ( Array.isArray( unsupportedFeatures ) && unsupportedFeatures.length ) {
24                 console.log("Going unsupported route because browser can't handle: ", unsupportedFeatures);
25                 runIfNotSupported(unsupportedFeatures);
26             } else {
27                 runIfSupported();
28             }
29         }
30     );
31 };
32
```

code/featureTest.js 32:1

LF UTF-8 JavaScript

</code>



Me, too
many
times

A few final thoughts...

- Avoid testing for side effects
- Limit scope of end-to-end tests
- Think like a user

`craigslist` is hiring!



Visit our booth for info!

or https://www.craigslist.org/about/craigslist_is_hiring

Thanks!

Office hour tomorrow
Golden Gate Room, Table C

Brian Belhumeur

Twitter: @JSArtisan